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# About the UCI General Catalogue

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UNIVERSITY OF CALIFORNIA, IRVINE

2020-21 General Catalogue, Volume 54

The *UCI General Catalogue* is published annually in July by the University of California, Irvine, University Editor's Office, 215 Aldrich Hall, Irvine, CA 92697-4975.

The *UCI General Catalogue* constitutes the University of California, Irvine's document of record. While every effort is made to ensure the correctness and timeliness of information contained in the *Catalogue*, the University cannot guarantee its accuracy. Changes may occur, for example, in course descriptions; teaching and administrative staff; curriculum, degree, and graduation requirements; and fee information. Contact the individual academic program or administrative office for further information.

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## Additional Catalogue Information

Because the *UCI General Catalogue* must be prepared well in advance of the year it covers, changes in some programs and courses inevitably will occur. The selection of courses to be offered each quarter is subject to change without notice, and some courses are not offered each year. The *Schedule of Classes*, available on the University Registrar's website (<http://www.reg.uci.edu/>) at shortly before registration begins each quarter, provides current information about course offerings, instructors, hours, and more. Students should consult the appropriate academic unit for even more up-to-date information. (Admission to UCI does not guarantee enrollment in any particular course.)

## Course Listings

Undergraduate courses are classified as lower-division (numbered 1–99) and upper-division (numbered 100–199). Courses numbered 200 and above are graduate or professional courses. Lower-division usually refers to freshman-sophomore courses, upper-division to junior-senior courses. However, junior and senior students may take lower-division courses, and freshmen and sophomores may normally take upper-division courses when upper-division standing is not a prerequisite and when any other prerequisites have been met. A course has no prerequisites unless indicated.

Some courses are structured as three-quarter sequences, such as 1A-1B-1C; *except as noted, each course in a sequence is prerequisite to the one following*. The letter L following a number usually designates a laboratory course. The letter H preceding a number designates an honors course.

The '4 Units' designation following the course title indicates the quarter unit credits toward graduation. Some courses give other than four units of credit; for example, two, five, or a range from one to 12.

When a course is approved for satisfaction of the UCI general education (GE) requirement, the general education category is indicated by a Roman numeral in parentheses at the end of the description. Courses approved to fulfill the upper-division writing requirement are designated with the letter W following the course number and the GE symbol **(Ib)** following the course description.

## Course Terms Definitions

**Concurrent Courses** - Concurrent courses are those that are offered at the same time and place, with the same instructor, but credit is given at two levels: graduate and undergraduate. In the Catalogue, concurrent courses can be found under the course description of the course. For example, PHYSICS 100 is concurrent with PHYSICS 229A. Under the course description for PHYSICS 100, it states the following: "Concurrent with PHYSICS 229A."

**Overlaps** – When a course includes a substantial amount of material that is also covered in a different UCI course, the courses will be considered "overlaps" of one another. When a course is identified as overlapping with another, students may not receive credit for both courses. Therefore, students who earn a passing grade in one course will not receive credit if they later take the overlapping course, and students who earn a non-passing grade in a course with an overlap should not repeat that course with the overlapping course. In the Catalogue, an overlapping course appears under the course description of the course. For example, EARTHSS 17 overlaps with PUBHLTH 90. Under the course description for EARTHSS 17, it states the following: "Overlaps with PUBHLTH 90."

**"Same as" or Cross-Listed Courses** - A cross-listed course is one course that is offered at the same time and place with the same instructor, and appears under more than one department name. In the Catalogue, a cross-listed course appears as "Same as" under the course description. For example, BIO SCI 14 is cross-listed with PHY SCI 5. Under the course description for BIO SCI 14, it states the following: "Same as PHY SCI 5."

One course can be cross-listed up to three times, which in total would be four department names for one course.

## Where to Find:

### Courses

View all of the University's course offerings, organized by subject matter, here.

To view courses offered by a particular School, Department, or Program, select a School or Program here. Then, click on the tab labeled “Courses” at the top of the page, under the banner image.

### **Admissions Information**

For information for prospective students, including undergraduate and graduate admissions, transfer student services, financial aid, tuition, and more, visit the Information for Prospective Students section.

### **Information on a Specific Degree, Major, or Minor**

View Undergraduate Degrees and/or Graduate Degrees. Or, view a page with all degrees in one table.

You can also search by the degree or program name via the search bar on any Catalogue page.

### **A Previous Edition of the *General Catalogue***

Previous editions of the *General Catalogue* can be found in the *Catalogue* archive. Most previous *Catalogue* editions are available, however, if you don't see the edition you need on the list, send an email to [aehassan@uci.edu](mailto:aehassan@uci.edu) (%20aehassan@uci.edu).

### **A Hard Copy of the *Catalogue***

UCI stopped printing hard copies of the *General Catalogue* in 2011. If you're looking for a *Catalogue* page from a previous year, and you don't want the online version, you can download a PDF. View the *General Catalogue* archive.

### **Contact Us**

To report a correction, broken link(s), or submit a question or suggestion, please email the University Editor ([aehassan@uci.edu](mailto:aehassan@uci.edu)), or call 949-824-5600.

# About UCI

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## The University of California

The University of California (UC) was chartered as the state's only land grant college in 1868. Today, UC is one of the world's largest and most renowned centers of higher education and has a combined enrollment of more than 275,000 students on 10 campuses—Berkeley, Davis, Irvine, Los Angeles, Merced, Riverside, San Diego, San Francisco, Santa Barbara, and Santa Cruz. Among the campuses there are six medical schools, a school of veterinary medicine, and professional schools of business administration, education, engineering, law, oceanography, and many others. The collections of the more than 100 UC libraries are surpassed in size on the American continent only by the Library of Congress collection.

The UC faculty is internationally noted for its distinguished academic achievements. UC-affiliated faculty and researchers have won 63 Nobel Prizes and more than 60 National Medals of Science. National Academy of Sciences membership exceeds 350 and Institute of Medicine membership exceeds 160. UC creates an average of four new inventions every day, and for 15 years in a row has developed more patents than any other university in the country.

UC maintains a variety of research facilities, agricultural field stations, and extension centers in more than 100 locations throughout California. Public services include medical and dental clinics, information services for agricultural and urban populations, a broad program of continuing education, museums and art galleries, and more. Detailed information about the University of California's teaching, research, and public service mission is available at the University of California website (<http://www.universityofcalifornia.edu/>).

## The Irvine Campus

### Howard Gillman, Chancellor

The University of California, Irvine (UCI) opened in 1965 with 116 faculty and 1,589 students. Since then, UCI programs, faculty and graduates have achieved distinction in virtually every discipline.

Two Nobel Prizes in 1995 for founding faculty F. Sherwood Rowland in Chemistry and Frederick Reines in Physics helped to secure UCI's position among the leading American research universities. In 2004, Irwin A. Rose, Department of Physiology and Biophysics, became UCI's third Nobel Laureate (chemistry). UCI has been ranked prominently alongside much older universities for excellence in the arts and humanities, Earth system science, management, social sciences, technology, and information systems.

For quality of educational experience and caliber of faculty, UCI consistently ranks among the nation's best public universities, and among the top research universities in the world. Election to the American Association of Universities (AAU), a group of 62 of the most distinguished research institutions, is another indication of UCI's stature in the academic community.

As a research university, UCI challenges students at every level, both academically and personally. While research is critical to graduate education, the research environment also opens up new educational experiences for undergraduates. Students have access to faculty at the forefront of their fields, and they also have opportunities to participate directly in faculty research projects. In addition, to empower students for the future in an information-focused society, UCI has integrated computer technology throughout the curriculum and campus life.

UCI is committed to the discovery and transmission of knowledge. It makes available to its 36,742 students (29,736 undergraduate and 7,006 graduate, medical, and credential students) the education, skills, and credentials which provide the basis for lifelong personal and professional growth.

UCI's education and research missions are fulfilled in its academic units, which are described briefly below, and in its formal research units, which are described in the Office of Research section.

## Claire Trevor School of the Arts

The **Claire Trevor School of the Arts** teaches the creative as well as the academic and critical dimensions of the arts. The School of the Arts is concerned with the vitality of the arts in society. Faculty energies are directed toward the refinement, enhancement, and encouragement of students' artistic and creative talents and toward the development of the students' understanding of related theory and history. The School offers programs which emphasize extensive studio and workshop experiences, essential theoretical and historical background studies, and exercises in criticism. There are 970 students in the School, including 821 undergraduate students and 149 graduate students.

## School of Biological Sciences

The **School of Biological Sciences** is one of the campus's larger academic units, with 4,287 students (3,976 undergraduate and 311 graduate). Faculty research areas include neural plasticity and behavior (which in part encompasses the development of the nervous system, memory, response to injury, and degenerative brain diseases such as Alzheimer's); the nature of cell-cell interactions; pattern formation; the elucidation of ecological conditions and evolutionary histories that have been the driving forces in organism design and functional diversity; the organization and expression of genes; biomolecular structure; molecular pathogenesis; human mitochondrial genetics; and cell biology.

## Paul Merage School of Business

The **Paul Merage School of Business** faculty conduct research and teach in the fields of accounting, economics, finance, health care management, information systems, marketing, operations and decision technologies, organization management, public policy, real estate, and strategy. Based on a thematic approach throughout the curriculum, the School focuses on three critical drivers of business growth: strategic innovation, information technology, and analytic decision making. The Merage School enrolls approximately 996 Business Administration and 144 Business Information Management undergraduate students. The Merage School also enrolls 200 students in the Full-time M.B.A. and Ph.D. programs, 137 students in four specialty one-year masters' programs: Master in Professional Accountancy, Master in Business Analytics, Master in Finance, and Master of Innovation and Entrepreneurship, and 430 students in the Fully Employed M.B.A. and Executive M.B.A. programs.

## School of Education

The **School of Education** offers an undergraduate major in Education Sciences, a minor in Education, a research-focused Ph.D. program, and MAT and credential programs for those becoming teachers. The School integrates the themes of learning, cognition, and development; educational policy and social context; and language, literacy, and technology across its programs. The faculty is multidisciplinary; their scholarly work arises from the common belief that education environments, both in and out of school, are the loci of change in the quality of life and the availability of productive life choices for learners of all ages.

## Henry Samueli School of Engineering

The **Henry Samueli School of Engineering**, with 4,787 students (3,914 undergraduate, 873 graduate), focuses on advancing the frontier of innovative engineering education and pioneering research that will shape the future of the nation and the world. Through an integrative and cross-disciplinary educational experience that blends fundamentals, research, and hands-on experience, the School trains future leaders in the engineering profession. Working in partnership with state and federal agencies and industry, the School promotes the transfer of research to applications that benefit society. The major research disciplines are aerospace, biomolecular, biomedical, chemical, civil, computer, computer science, electrical, environmental, materials science, and mechanical engineering. Research areas include biomolecular, biomedical, and rehabilitation engineering, earthquake engineering, water resources, transportation, parallel and distributed computer systems, embedded systems, intelligent systems, machine learning, wireless communications and networking, image and signal processing, opto-electronic devices and materials, high-frequency devices and systems, integrated micro and nanoscale systems, green energy, fuel cell technology, fluid mechanics, combustion and jet propulsion, materials processing, robotics, and modern control theory.

## School of Humanities

The **School of Humanities** faculty have been repeatedly honored for their teaching and scholarly excellence. Included in the faculty's more than 100 research specialties are literary criticism, studies in film, media and gender, philosophical analysis, historical inquiry, art history, and world languages and literatures. The faculty also participate in interdisciplinary programs such as Global Cultures, Global Middle East Studies, Medical Humanities, Humanities and Law, and Religious Studies. At the core of the educational mission of the humanities is imparting to students tools of analysis that will help them interpret, understand, describe, and explain the world around them. The School has approximately 1,900 students - 1,600 undergraduate and 300 graduate.

## Donald Bren School of Information and Computer Sciences

The **Donald Bren School of Information and Computer Sciences** (ICS) has grown to almost 4,000 students (3,427 undergraduate and 570 graduate students). ICS faculty members are engaged in research (<http://www.ics.uci.edu/faculty/area/>) and teaching in computer science, information technology, and statistics. Specific areas of faculty research include: design of algorithms and data structures; computer architecture and embedded computer systems; networked and distributed systems; systems software; social and mobile computing; artificial intelligence, machine learning, and data mining; computer games and virtual worlds; databases and information retrieval; computer graphics and visualization; bioinformatics, computational biology, and genomics; computer-supported cooperative work, human-centered computing, and human-computer interaction; security and privacy; software engineering; managerial and social aspects of computing technology; and statistics.

## Interdisciplinary Studies

**Interdisciplinary Studies** programs provide students with opportunities to pursue subject areas which derive from the interaction of different disciplines such as Computer Science and Engineering, Civic and Community Engagement, and Transportation Science.

## School of Law

The University of California, Irvine School of Law is the culmination of several generations of revolutionary dreamers. Those not satisfied with the status quo who wanted to redefine, reimagine and reinvent legal education. Celebrating its 10th anniversary in 2018, the University of California, Irvine School of Law begins its second decade a larger, stronger, more dynamic academic institution than its founders could have ever imagined. UCI Law provides an innovative and comprehensive curriculum, and prioritizes public service and a commitment to diversity within the legal profession. UCI Law students have completed more than 80,000 hours of pro bono work in the past decade. Forty-five percent of UCI Law's graduates are students of color. The collaborative and interdisciplinary community at UCI Law includes extraordinary students, world-renowned faculty, engaged alumni, and enthusiastic supporters. UCI Law continues to rank highly, including: The National Jurist ranks UCI Law No. 4 in the nation for practical training; U.S. News & World Report ranks UCI Law No. 21 in the nation overall out of 194 law schools, and ranks UCI Law's robust clinical program No. 13 in the nation. We look forward to continuing our remarkable journey with our faculty, staff, students, alumni and community partners.

The **School of Law** welcomed its inaugural class of 60 students in August 2009, graduated its first class in May 2012, and received full accreditation by the American Bar Association in June 2014. The School offers the J.D. (Juris Doctor) degree. The curriculum includes traditional areas of legal doctrine taught in an innovative context designed to prepare students for the practice of law in the 21st century. The School of Law also offers the Master of Laws (LL.M) degree program. The LL.M. program offers a first-rate legal education to lawyers, judges, government officials and others wishing to become educated about the legal system and practice of law in the United States. The School's concurrent degree programs (J.D./M.B.A., J.D./M.A., and J.D./Ph.D.) connect UC Irvine's legal education with the wide range of academic and professional opportunities at a major research university.

## School of Medicine

The **School of Medicine**, with roughly 135 graduate students, 480 medical students, and 700 residents and fellows, is dedicated to advancing medical knowledge and clinical practice through scholarly research, physician education, and high-quality care; nurturing the development of medical students, resident physicians, and scholars in the clinical and basic sciences; and supporting the dissemination of research advances for the benefit of society. On the UCI campus, a state-of-the-art Medical Education building offers the latest in technology to advance active, small group learning opportunities. The UCI Medical Center located in Orange, CA, and part of the UCI Health system, offers modern facilities for conducting medical research and training future and practicing physicians, allowing more opportunities for researchers and clinicians to collaborate on patient care.

## Sue and Bill Gross School of Nursing

The **Sue and Bill Gross School of Nursing** provides a strong research-based academic and professional program to prepare graduates for basic clinical and advanced practice roles, as well as for educational, administrative, and research positions across the healthcare delivery system, and for faculty positions in academic institutions. The School has 175 undergraduate and 47 graduate students.

## Department of Pharmaceutical Sciences

The **Department of Pharmaceutical Sciences**, founded in 2007, offers its students interdisciplinary educational programs integrating concepts from fields as diverse as biology, chemistry, cell and molecular biology, chemical engineering, materials science, pharmaceuticals, pharmacology, and physiology. Its faculty includes world-renowned scientists encompassing a variety of backgrounds with wide-ranging research programs that cover every facet of pharmaceutical research.

## School of Physical Sciences

The **School of Physical Sciences** has a student body of 3,014 (2,469 undergraduate and 545 graduate). Researchers in the School are conducting investigations in atmospheric chemistry (including the discovery of the adverse impact of human-made chlorofluorocarbon compounds on the Earth's ozone layer), biogeochemistry and climate, synthetic chemistry, laser spectroscopy, condensed matter physics, elementary particle physics, plasma physics, pure and applied mathematics, and mathematical physics.

## Program in Public Health

The **Program in Public Health** provides institutional focus for UC Irvine's academic strengths in various disciplines of public health including population health science. The core of this program is interdisciplinary and focuses on the facilitation and integration of well-grounded education, innovative research and skills based practice. The Program in Public Health consists of the Department of Population Health and Disease Prevention and will be joined in the 2020-2021 academic year by the new Department of Environmental and Occupational Health, the new Department of Health, Society and Behavior, and the Department of Epidemiology and Biostatistics. Under the Program, these four departments will advance the mission of health and well-being, locally, nationally and globally. Currently, the Program has 1291 undergraduate and 85 graduate students (M.P.H., Ph.D.).

## School of Social Ecology

The **School of Social Ecology**, a multidisciplinary unit established in 1970, is unique to UCI. The School's central objectives are the application of scientific methods to the analysis and resolution of societal problems, and the development of theory and knowledge pertinent to social, behavioral, environmental, and legal phenomena. Among issues of long-standing interest are crime and justice in society, social influences on human development



over the life cycle, urban and community planning, and the effects of the physical environment on health and behavior. There are 3,479 students in the School, including 3,205 undergraduate and 274 graduates.

## School of Social Sciences

The **School of Social Sciences**, with 6,899 students (6,440 undergraduate and 459 graduate), is the largest academic unit at UCI. The faculty, many of whom are nationally recognized, have expertise in a wide range of specific social science topics. Research areas include mathematical modeling of perception and cognitive processes; economic analysis of transportation; examination of the impact of society's political system on its economy; study of social structure and values in different cultures through a rigorous scientific methodology; exploration of authority structures and inequality in society; and globalization and international affairs.

## Academic Goals

UCI offers programs designed to provide students with a foundation on which to continue developing their intellectual, aesthetic, and moral capacities. Programs and curricula are based on the belief that a student's collective university experience should provide understanding and insight, which are the basis for an intellectual identity and lifelong learning.

An important aspect of UCI's educational approach is the emphasis placed on student involvement in research, independent study, and the creative process as complements to classroom study. Independent research in laboratories, field study, participation in writing workshops, and in arts productions are normal elements of the UCI experience. Many departments integrate into the curriculum special programs and courses which involve students in original research and creative activities.

UCI provides an inclusive atmosphere conducive to pursuing creative work and scholarship at all levels, to exploring the accumulated knowledge of humanity, and to developing new knowledge through basic and applied research. Along with these objectives, UCI has a serious commitment to public service. The campus generates research expertise that it applies to regional, national, and global challenges, and engages in humanistic inquiry to address societal problems.

## Academic Structure

UCI's instruction and research programs focus on fundamental areas of knowledge and, at the same time, provide for interdisciplinary and professional study through the Claire Trevor School of the Arts, School of Biological Sciences, The Paul Merage School of Business, School of Education, The Henry Samueli School of Engineering, School of Humanities, Donald Bren School of Information and Computer Sciences, Interdisciplinary Studies, School of Law, School of Medicine, Sue and Bill Gross School of Nursing, Department of Pharmaceutical Sciences, School of Physical Sciences, Program in Public Health, School of Social Ecology, and School of Social Sciences.

The Provost & Executive Vice Chancellor has responsibility for all programs of instruction and research. The Vice Provost for Teaching and Learning serves as the Dean of Undergraduate Education, and the Vice Provost for Graduate Education serves as the Dean of the Graduate Division. Matters of educational policy, courses, and grades are the responsibility of the Irvine Division of the Academic Senate. The Academic Senate and the Vice Provost for Academic Planning oversee academic program reviews and approvals.

## UCI Student Affairs

UCI Student Affairs (<http://studentaffairs.uci.edu/>) supports the university's academic mission from orientation through graduation and beyond. The Division of Student Affairs offers comprehensive programs and services preparing students to be leaders in a global society by advancing co-curricular learning, enhancing student life, fostering student leadership and promoting the general welfare of the campus community. Student Affairs' 30+ departments are clustered under the Vice Chancellor, Student Affairs into Auxiliary Services, Student Life & Leadership and Wellness, Health & Counseling Services creating an alignment that lends to UCI's "small college feel" within a large, dynamic research university.

## The Division of Undergraduate Education

The Division of Undergraduate Education (<http://home.due.uci.edu/>) provides leadership, advocacy, and coordination for campus initiatives that impact undergraduate education and enhance student access and retention. The Division works with faculty and staff on a range of activities including advising, curricular development, undergraduate scholarship and research activities, international education, civic and community engagement, assessment, and effective instruction.

## Graduate Division

The Graduate Division (<http://www.grad.uci.edu/>) serves as the campuswide advocate for the advancement of graduate education and oversees all master's and doctoral programs, postdoctoral training programs, and the postbaccalaureate teacher credential program. The Graduate Division has a leadership role with UCI's academic units and provides implementation guidelines and procedures related to university policy as it affects the interconnected aspects of graduate student education, including admissions, student financial support and fellowships, enrollment and registration, academic standards, requirements for graduate degree programs, student services, professional development, and diversity programs.



The Division of Undergraduate Education (<http://home.due.uci.edu/>) and the Graduate Division (<http://www.grad.uci.edu/>) also administer programs and services affecting undergraduate and graduate education, respectively, that require campus-level attention and coordination, and that do not come under the direct authority of the heads of academic units or the Irvine Division of the Academic Senate.

## Accreditation

UCI is a member of the Western Association of Schools and Colleges (WASC). The campus is accredited by the WASC Senior College and University Commission (WSCUC). This accreditation requires periodic review in accord with WSCUC policies and standards. UCI is pleased to participate in these comprehensive reviews as one way to demonstrate our commitment to 1) student learning and success; 2) quality and improvement; and 3) institutional integrity, sustainability, and accountability. Further information is available through the Office of Academic Planning (<http://www.provost.uci.edu/academic-planning/accreditation.html>) and at the WSCUC website (<http://www.wascsenior.org/>).

In addition

- The undergraduate degree program of the Department of Chemistry is accredited by the American Chemical Society (<https://www.acs.org/content/acs/en.html>).
- Credential programs of the School of Education are approved by the California Commission on Teacher Credentialing (<https://www.ctc.ca.gov/>).
- Undergraduate majors in Aerospace Engineering, Biomedical Engineering, Chemical Engineering, Civil Engineering, Computer Engineering, Computer Science and Engineering, Electrical Engineering, Environmental Engineering, Materials Science and Engineering, and Mechanical Engineering are accredited by the Engineering Accreditation Commission of ABET (<http://www.abet.org>) <http://abet.org>. Computer Science and Engineering also is accredited by the Computing Accreditation Commission of ABET (<http://www.abet.org>) <http://abet.org>. The undergraduate major in Biomedical Engineering Premedical is not designed to be accredited; therefore, it is not accredited by ABET (<http://www.abet.org>) <http://abet.org>. Annual student enrollment and graduation data per major can be found at: <http://www.oir.uci.edu/student-data.html>.
- The master's degree program in Genetic Counseling is accredited by the Accreditation Council for Genetic Counseling (<http://www.gceducation.org/Pages/default.aspx>), which has been approved by the American Board of Genetic Counseling (<https://www.abgc.net/home/>).
- UCI's School of Law is accredited by the American Bar Association (<https://www.americanbar.org/aba.html>).
- The Paul Merage School of Business is accredited by The Association to Advance Collegiate Schools of Business (<http://www.aacsb.edu/>).
- The M.D. program of the School of Medicine is accredited by the Liaison Committee on Medical Education (<http://lcme.org/>).
- Baccalaureate and master's degrees in the Sue and Bill Gross School of Nursing Science are accredited by the Commission on Collegiate Nursing Education (<http://www.aacnnursing.org/CCNE/>). The pre-licensure RN program and the nurse practitioner program are approved by the California Board of Registered Nursing (<http://www.m.ca.gov/>). The DNP program, begun in fall 2018, is progressing through BRN and CCNE approval processes in 2019 and 2020, as required by those organizations.
- The Program in Public Health, including its baccalaureate, master's, and Ph.D. programs in Public Health, is accredited by the Council on Education for Public Health (<https://ceph.org/>).
- UCI's Master of Urban and Regional Planning program is accredited by the Planning Accreditation Board (<http://www.planningaccreditationboard.org/>).

## Office of Equal Opportunity and Diversity

The Office of Equal Opportunity and Diversity (OEOD) provides consultation services and training programs to the UCI campus and the medical center on the interpretation and application of UCI policies and Federal and State laws regarding sexual harassment, sex offense, discrimination, disability access and accommodation, and equal opportunity. It also develops and monitors UCI's Affirmative Action Plan for staff and faculty as required by Federal regulations.

OEOD investigates and provides assistance to UCI students, faculty, staff, applicants, patients, and visitors in resolving complaints of discrimination, nonaccommodation, sexual harassment, and sex offense. OEOD also offers a variety of workshops on the prevention of discrimination, sexual harassment and sex offense, conflict resolution, and accessibility considerations in a diverse workplace/community to promote equal opportunity and provide support for the university's commitment to diversity, equity, and advancement of inclusive excellence.

OEOD is located in 103 Multipurpose Science and Technology Building; telephone 949-824-5594 (voice), 949-824-7593 (TDD); email: [oeod@uci.edu](mailto:oeod@uci.edu); or visit the Office of Equal Opportunity and Diversity website (<http://www.oeod.uci.edu>).

Refer to the *Catalogue's* Appendix for UCI's Nondiscrimination and Sexual Harassment Policy Statements and Sex Offenses and Consensual Relationships Policies.

## Office of the University Ombudsman

The Office of the University Ombudsman receives complaints, concerns, or problems that students, faculty, staff, and visitors may encounter on the UC Irvine campus. The office is an informal resource. Users of the office are provided a confidential place to explore options to make informed decisions.

When appropriate, the office will initiate an informal intervention with the goal of facilitating or negotiating a resolution that is acceptable to all parties involved.

The Ombudsman acts as an independent, impartial, and confidential problem solver. The office advocates for fairness and equity. If a matter cannot be resolved through the office, the appropriate referral will be made. The Office of the Ombudsman does not replace or substitute for formal grievance, investigative, or appeals processes made available by the university. The office does not have the authority to make decisions or decide policy. However, the office can elevate legitimate matters or concerns to decision makers when appropriate. In addition, the Ombudsman can make recommendations regarding policy review and change as appropriate.

The Office of the Ombudsman also manages the Campus Mediation Program which provides alternative dispute resolution services to the campus and UC Irvine Medical Center communities. The office is located in 205 Multipurpose Science and Technology Building; telephone 949-824-7256. For more information about the office, visit the Office of the Ombudsman (<http://www.ombuds.uci.edu/>) and the Campus Mediation Program websites (<http://www.mediate.uci.edu/>).

## The Campus Setting

UCI's location combines the cultural and economic resources of an urban area with access to Southern California's spectrum of recreational, scenic, and entertainment venues.

Fifty miles south of Los Angeles, five miles from the Pacific Ocean, and nestled in 1,474 acres of coastal foothills, UCI lies amid rapidly growing residential communities and the dynamic international business environment of Orange County and the surrounding region.

The famed sailing and surfing beaches of Newport, Laguna, and Huntington are a short bike ride from campus, while hiking trails, desert camping, and mountain resorts for snowboarding and skiing are within two-hour's travel distance from Irvine. The campus itself is a natural arboretum of native species, as well as of trees and shrubs from all over the world. Adjacent to the campus, the San Joaquin Marsh serves as a natural classroom or peaceful refuge, with trails for viewing the rich diversity of wildlife.

A full roster of intramural sports and recreation events helps fill the daily fitness needs of students, along with UCI's Anteater Recreation Center. This 115,000-square-foot, state-of-the-art facility includes a pool, gymnasiums, racquetball courts, weight room, and jogging track. UCI is an NCAA Division I campus that competes in men's and women's intercollegiate athletics.

Across Campus Drive, and linked by a pedestrian bridge, an area of shops and restaurants also features a movie theater complex, post office, and other services. Complementing UCI on-campus sports and cultural events throughout the year is the vigorous Orange County arts and entertainment environment. It offers everything from small venues for bands and performers to galleries, museums, the Irvine Barclay Theatre, Orange County Performing Arts Center, and South Coast Repertory. And within a one- to two-hour drive are the metropolitan attractions of Los Angeles and San Diego.

With plenty of land for growth, UCI is building to accommodate greater numbers of students, as well as to provide the most updated classroom and laboratory space. Recent projects include the Contemporary Arts Center, with studio, theater, and rehearsal areas; the Medical Education building, the high-tech hub of all educational activities for UCI medical students; luxury student housing complexes Camino del Sol and Puerto del Sol, and the award-winning Mesa Court Towers. On the west campus, the 180-acre UCI Research Park (UCIRP) attracts businesses that want to access the resources of a major research university and form strategic partnerships. UCIRP companies interact with UCI's academic programs, enhance the region's reputation as a center for advanced technology, and contribute to an educated workforce.

Due to the high caliber of UCI faculty and scholarship, the campus is home to national organizations including the National Fuel Cell Research Center and is a major site for the nationwide cancer genetics research network. For its range of services and research, UCI's Chao Family Comprehensive Cancer Center is Orange County's only cancer facility designated "comprehensive" by the National Cancer Institute. UCI is noted, in fact, for its strengths in cancer and neuroscience research, much of which takes place at the University of California, Irvine Medical Center. Located in the city of Orange, 13 miles to the north, the medical center is the primary teaching and research hospital for the UC Irvine School of Medicine.

Bus transportation makes travel convenient between the campus, medical center, and major housing areas, shopping centers, and recreation locales. In addition, the campus and surrounding communities are designed for bicycle traffic, with trails connecting UCI with student housing and the coast.

## Celebrate UCI

**Come to Celebrate UCI!** (<https://admissions.uci.edu/discover/visit/celebrate.php>) "One day. One campus. Many options." UCI's annual spring open house event welcomes new Anteaters, their families and the community to learn more about our renowned academics; tour our campus, housing and recreational facilities; learn more about our admissions and financial aid; enjoy student performances and more. Many academic units and student services offices will be open or available to answer questions. Events and parking are **FREE**. For more information and a schedule of events, visit the Celebrate UCI website (<https://admissions.uci.edu/discover/visit/celebrate.php>). #UCIPride #UCIYES #FutureAnteater

## University Advancement

UCI relies on the generosity of donors to achieve its mission of research, teaching and public service. University Advancement works to generate private philanthropic support for the UCI Foundation, a separate 501(c)(3) nonprofit organization created to advance the mission of the university. The Advancement team also manages the legal and fiduciary requirements associated with accepting all charitable donations to UCI through the UCI Foundation or UC Regents. Each success is accomplished through the combined efforts of professional staff, academic leaders and dedicated volunteers. Program areas include prospect development, planned giving, corporate and foundation relations, alumni relations and constituent engagement, and health advancement. Individuals in these areas provide a bridge between the university and the community, thereby promoting a culture of philanthropy and engagement. For additional information, contact University Advancement at 949-824-8696 or visit the University Advancement website (<http://advancement.uci.edu/about/>).

## UCI Alumni

Located in the Newkirk Alumni Center on the corner of University Drive and Mesa Road, the UCI Alumni Association (<https://alumni.uci.edu/>) is committed to engaging UC Irvine's more than 200,000 alumni with the campus. It sponsors many key campus events, including the annual UCI Homecoming; Lauds & Laurels Awards, the distinguished alumni awards ceremony; Anteater Meetups; networking and career events; cap and gown sales; and the senior send-off events. UCI Alumni members receive a range of access and privileges which include discounts on travel, financial and career services, online research library access, and more.

UCI Alumni also oversees the Student Alumni Association (<https://alumni.uci.edu/saa/>) at UCI, a student group that works to connect students to one another, alumni, and the university. The students help organize Dinners with Anteaters, a quarterly event that brings alumni and students together for an evening of dining and networking; What Matters to Me and Why, a quarterly event where alumni share why UCI matters to them; and Alumni Back 2 Campus, an event where alumni are interviewed by students and share valuable professional advice and personal insights into building success after graduation.

For additional information about the UCI Alumni Association and its programs, visit [alumni.uci.edu](http://www.alumni.uci.edu) (<http://www.alumni.uci.edu>), or contact us at [alumni@uci.edu](mailto:alumni@uci.edu) or 949-824-2586.

## UCIAA Club Affiliate Program

The UCI Alumni Association (<https://alumni.uci.edu/students/clubs.php>)(UCIAA) Club Affiliate Program is for registered campus organization (RCOs) interested in building and leveraging their alumni network to support professional development of their members. UCIAA strives to empower RCOs proactively and independently to connect and engage with alumni by providing applicable resources, training, and guidance. In exchange, club affiliates will further the mission of UCIAA by creating their own alumni programming and participating in UCIAA student events among other things. The Alumni Association supports club affiliates in the following ways:

1. Direct Access to UCIAA Staff
2. Alumni Outreach Support
3. Priority in the Student Alumni Engagement Sponsorship (SAES) (<https://alumni.uci.edu/saa/funding.php>)
4. Publicity and Marketing
5. Workshops and Resources
6. Event Partnership
7. Alumni Giveaways
8. Newkirk Alumni Center Room Reservations
9. Additional Funding

## Student Alumni Engagement Sponsorship

The Student Alumni Engagement Sponsorship (<https://alumni.uci.edu/saa/funding.php>)(SAES) provides funding to registered campus organizations (RCO's) that seek to promote the Student Alumni Association (<https://alumni.uci.edu/saa/>)'s values through campus events or programs. RCO's seeking to host events or programs that promote alumni engagement by creating opportunities to build connections between alumni and students are eligible to apply.

## Dinners with Anteaters

Dinners with Anteaters (<https://alumni.uci.edu/saa/dinners.php>) is a dinner program that brings students, alumni, staff, faculty, retirees and emeriti together for an evening of food, fun and mentorship throughout Orange County and Los Angeles.

Organized by the Student Alumni Association in cooperation with the UCI Alumni Association, the program began in 2003 and has since become a long-lasting Anteater tradition. Last year, the event brought more than 500+ Anteaters together to share stories and give advice over a nice warm meal.

The dinners are hosted and sponsored by Anteater volunteers (i.e. alumni, staff, faculty, etc.) either in their homes or a local restaurant. Over dinner, volunteers and students engage in casual and friendly conversation about their UCI experiences, personal journeys, career goals and more. Over the years, this program has brought together thousands of Anteaters for a fulfilling and uplifting evening.

Questions? Email [dinnerwithanteaters.uci@gmail.com](mailto:dinnerwithanteaters.uci@gmail.com).

## Strategic Communications & Public Affairs

The Office of Strategic Communications & Public Affairs advances UCI's reputation, mission, priorities and values through an integrated approach that includes the following:

- **Brand development and management**
- **Community relations**
- **Executive communications**
- **Government relations and advocacy**
- **Internal communications**
- **Marketing**
- **Media relations**
- **Publications and digital properties**
- **Visual communications**

Strategic Communications & Public Affairs is the campus's storyteller, providing information in a way that's accurate, credible, engaging, and influential. It uses a wide range of platforms to share the university's story—*UCI Magazine*; websites and social networks; university news and features in prominent media outlets; advertising and marketing materials; visual assets such as photography, videography, and graphics; as well as advocacy and community engagement—all designed to build connections with multiple constituents.

The office also develops and monitors communication policies, procedures, and standards to ensure a consistent, accurate, and appropriate presence. In addition, it provides strategy, counsel, services, and support to the university's schools, programs, and units.

For more information, call 949-824-6922 or visit the Strategic Communications & Public Affairs website (<http://www.communications.uci.edu>).

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- Laser Microbeam and Medical Program
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- UCI Center for Occupational and Environmental Health
- Additional Facilities

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## UCI Libraries

**Lorelei Tanji, University Librarian**

General Information: 949-824-6836

<https://www.lib.uci.edu/>

Established in 1963 as one of the founding academic units on campus, the UCI Libraries connects users—faculty, researchers, scholars, students, staff, or community members—to information resources, facilitating the creation, preservation, and sharing of knowledge in all disciplines. The Libraries support the research needs of the campus and general community, through the Libraries' website and at four library facilities: the Langson Library, the Science Library, and the Libraries Gateway Study Center on the UCI campus, and the Grunigen Medical Library at the UCI Medical Center in Orange, Calif.

**Langson Library:** The Jack Langson Library supports research and teaching in the arts, humanities, social sciences, social ecology, education, and business/management.

**Special Collections and Archives:** The Department of Special Collections and Archives holds non-circulating collections of rare books, archives, manuscripts, photographs, maps, and pamphlets, emphasizing; the Critical Theory Archive; Southeast Asian Archive; Orange County Regional History

collection; the Dance and Performing Arts collections; the personal papers of distinguished UCI faculty, including Nobel Laureates; and the University Archives.

**Libraries' Gateway Study Center:** Located across the plaza from the Langson Library, the Libraries Gateway Study Center provides comfortable individual and group study areas as well as late-night study hours throughout the academic year.

**OC & SEAA Center:** On the lower plaza of the Gateway building, the Orange County and Southeast Asian Archive Center (OC & SEAA Center) holds circulating collections on these topics, has an oral history recording studio, and serves as a resource for the campus and community.

**Science Library:** The Science Library supports research and teaching in the sciences, medicine, and technology. The Multimedia Resource Center (<https://www.lib.uci.edu/mrc/>) is a technological sandbox with a diversity of tools and services to encourage experimentation, creative expression, and experiential learning.

**Grunigen Medical Library:** The Forest J. Grunigen Medical Library is located at the UCI Medical Center in Orange and serves the research, clinical, and teaching needs of the health sciences programs.

**Law Library:** Located in the Law School, the Law Library supports the research and teaching needs of the law school and others at UCI who need to use material unique to the Law Library's collection. The Law Library reports to the Dean, School of Law.

**Library Search:** Library Search is a discovery platform that provides access to the UCI Libraries' premier collections, which include nearly 3.9 million volumes, nearly 180,000 serial titles in electronic and print formats, and substantial collections of manuscripts and visual materials.

**MELVYL:** The MELVYL® Catalog, on the Libraries' website, connects users to the vast collections of the University of California library system, and the scholarly resources of the world. Expedited interlibrary loans and digital desktop delivery services help facilitate the exchange of valuable research materials between our users and the UC Libraries.

**Librarians:** Librarians with disciplinary expertise serve each academic department. They select materials for the Libraries' collection, provide specialized reference assistance to faculty, graduate students, and undergraduates, and are available to meet the research, teaching, learning, and patient care needs of the members of their liaison departments.

**Ask A Librarian:** The UCI Libraries' Ask A Librarian services provide expert in-person and online research assistance to users. Online reference services are available 24 hours a day, seven days a week. More than 13,000 people received personalized, one-on-one research consultations, and over 26,000 students attended library research workshops last year. These workshops develop students' lifelong learning skills and assist researchers to use rapidly changing information resources and technologies effectively and efficiently.

**Subject and Course Guides:** Librarians create subject guides that recommend curated resources for each academic discipline and for research intensive courses.

**Study Spaces:** Wireless access and more than 500 desktop and laptop computers are available for general use in the four library facilities. The Study Space Locator (<https://www.lib.uci.edu/study-space-locator/>) provides a convenient way to locate study spaces and identify open computer workstations in real-time.

**Virtual Tour:** The virtual tour familiarizes users with library spaces and services.

## Office of Information Technology

The Office of Information Technology (OIT) provides computing, network, and telephone services to support and enhance instruction, research, and administration at UCI. OIT provides campus email and calendaring, computer labs, departmental and research computing support, business application support, and campuswide technical coordination. The campus network infrastructure (including WiFi) maintained by OIT provides connectivity on campus and to the Internet.

UCI G Suite (<http://www.google.uci.edu/>) (formerly known as Google Apps) is a collection of services contracted from Google, including UCI Gmail and Google Drive. Incoming students are given UCI Gmail accounts as their default email service (<https://www.oit.uci.edu/help/email/>) (except students in Health Sciences, who have Microsoft Office 365 accounts). UCI Google accounts are also available to faculty and staff (outside Health Sciences), providing an effective platform for communication and collaboration.

OIT administers UCI's ecosystem of instructional technology tools, with the homegrown EEE+ GrandCentral (<https://grandcentral.eee.uci.edu/>) as the main student hub. GrandCentral will list your current courses and give you easy access to other tools, including:

- UCI Canvas: (<https://canvas.eee.uci.edu/>) Hosts course content online, including syllabi, files, quizzes, assignments, and more. Not all courses will use Canvas.
- EEE+ RapidReturn (<https://rapidreturn.eee.uci.edu/>): Receive a scanned copy of on-paper exams.
- EEE+ Evaluations (<https://evaluations.eee.uci.edu/>): Submit feedback for online instructor evaluations.

- **EEE+ EaterEvals** (<https://eaterevals.eee.uci.edu/>): Displays summaries of qualitative data from official, final instructor evaluations.
- **EEE+ ScoreShare** (<https://scoreshare.eee.uci.edu/>): Allows advisors to view students' academic progress.
- **EEE+ Scout** (<https://scout.eee.uci.edu/>): Submit responses to forms in an intuitive interface.

For assistance with these instructional technology tools, call (949)824-3113 during business hours (generally 8-11,12-5, Monday through Friday) or email [eee-support@uci.edu](mailto:eee-support@uci.edu).

**ZotPortal** (<http://portal.uci.edu/>) brings together campus tools and services in one easy-to-use, customizable place. Get the status of your courses, finals, and grades. Look up library hours, search for an available study space, and check the academic calendar for important deadlines. View and pay your ZOTBill, download tax documents, and get the latest financial aid news. Find campus announcements, news, club activities, and much more.

OIT manages computer labs distributed across campus. Lab computers offer many common applications, including Microsoft Office as well as certain mathematical software and statistics packages. Self-service printing is available in many labs. For additional details on Instructional labs, Drop-in labs, Training labs, the lab printing system, Mobile Printing and PC Availability, visit the OIT Computer Labs website (<http://www.oit.uci.edu/labs/>).

The Virtual Computer Lab (VCL) (<http://www.oit.uci.edu/labs/vcl/>) allows UCI students, faculty, and staff to access university-licensed computer applications via the Internet. Certain software is available free or at a discount to UCI students through campus-wide contracts. Visit our Service Portal at <https://uci.service-now.com/sp> (<https://uci.service-now.com/sp/>) and type "Student" in the search bar at the top. In the results page, you'll find links to the software available.

OIT provides media services including a lecture capture and media management service branded UCI Replay (<http://catalogue.uci.edu/introduction/file:///C:/Users/Lyle/Documents/OIT/replay.uci.edu>). Replay uses the YuJa enterprise video platform to allow instructors and staff to easily record classes, presentations, or other short instructional videos, and to allow students to capture, upload, and share academically related media clips.

OIT Classroom Technology Support (<http://catalogue.uci.edu/introduction/file:///C:/Users/Lyle/Documents/OIT/classrooms.uci.edu>) (CTS) manages, maintains, and refreshes instructional technology in 136 general assignment classrooms, consults on new room renovations, supports audience response systems, and operates a will-call equipment rental service for faculty, departments, and registered campus organizations. OIT CTS can be reached at 949-824-8833 or email [smartclassrooms@uci.edu](mailto:smartclassrooms@uci.edu).

**Residential Network Services** (<http://resnet.uci.edu/>) provides a range of services to student residents including service desk, field support, security, network engineering, and the cable TV system.

IT Security and Privacy are vital concerns. To protect yourself and your work, find advice and support at the IT Security website (<http://security.uci.edu/>).

**ZotALERT** (<https://www.oit.uci.edu/zotalert/>) is an emergency alert system that uses cell phone text messaging to quickly notify the UCI community with safety information. It is one of several modes of emergency communication used at UCI.

OIT offers a variety of additional services, detailed on the OIT website (<http://www.oit.uci.edu/>). Information about applications and services can also be found in the Help Center (<https://www.oit.uci.edu/help/>) and the OIT Knowledge Base ([https://uci.service-now.com/sp/?id=kb\\_view](https://uci.service-now.com/sp/?id=kb_view)), a searchable collection of articles on specific topics (UCInetID login required). The OIT Service Desk offers walk-in support in Aldrich Hall during business hours and 24/7 telephone support at 949-824-2222. For assistance, please call 949-824-2222 or email [oit@uci.edu](mailto:oit@uci.edu).

## UCI Ecological Preserve

The UCI Ecological Preserve is one of four natural assets overseen by UCI-NATURE. UCI-NATURE offers UC Irvine's faculty and students opportunities to bring their research, scholarship, teaching, public service, and developing careers out into the natural environment in a wide diversity of settings characteristic of California. Together, these field-based assets span regional gradients across environments from the ocean to the desert, as well as a diversity of societal contexts, all within a few hours of campus. The place-based focus fosters excellence in research and scholarship, tangible interdisciplinary interactions, and community-based partnerships that engage our faculty and students in meaningful real-world problems.

The 62-acre UCI Ecological Preserve is located on campus and consists of several small hills and drainage's bearing remnants of coastal sage scrub flora and associated fauna, including the California gnatcatcher (Federally listed as Threatened) and the coastal cactus wren. The property is protected under the Natural Communities Conservation Plan and is part of the Nature Reserve of Orange County (<https://oconconservation.org/>). For more information contact UCI-NATURE Administrative Director Megan Lulow at [mlulow@uci.edu](mailto:mlulow@uci.edu), or Faculty Advisors Travis Huxman [thuxman@uci.edu](mailto:thuxman@uci.edu) and Peter Bowler, [pabowler@uci.edu](mailto:pabowler@uci.edu).

## Steele/Burnand Anza-Borrego Desert Research Center

The Steele/Burnand Anza-Borrego Desert Research Center is one of four natural assets overseen by UCI-NATURE. UCI-NATURE offers UC Irvine's faculty and students opportunities to bring their research, scholarship, teaching, public service, and developing careers out into the natural environment in a wide diversity of settings characteristic of California. Together, these field-based assets span regional gradients across environments from the ocean to the desert, as well as a diversity of societal contexts, all within a few hours of campus. This system of assets available to UC Irvine's faculty and students is connected on yet a larger scale to the system-wide UC Natural Reserve System (<http://ucnrs.org/>). The place-based focus fosters



excellence in research and scholarship, tangible interdisciplinary interactions, and community-based partnerships that engage our faculty and students in meaningful real-world problems.

The Steele/Burnand Anza-Borrego Desert Research Center, adjacent to the town of Borrego Springs, includes approximately 80 acres, with a large historic clubhouse that serves as home base for researchers and students. Through a cooperative agreement with California State Parks and the Anza-Borrego Foundation, the Research Center offers access to California's largest state park. The 615,000-acre Anza-Borrego Desert State Park encompasses native fan palm oases and piñon pine-juniper forests, and is home to the endangered desert bighorn sheep. The Research Center encourages the study of current and future environmental and societal challenges in the region and supports scholarship across disciplines. For further information, visit <http://anzaborrego.ucnrs.org> (<http://anzaborrego.ucnrs.org/>).

## UCI Arboretum and Herbarium (IRVC)

The UCI Arboretum is a botanical garden developed and managed by the School of Biological Sciences. It contains areas planted with floras adapted to climates similar to those of Southern California and maintains a large collection of plants native to Southern California and Baja California, as well as South African monocots. The Arboretum provides materials and space for research and teaching needs and its collections are also used as an educational resource for the community at large. The UCI Herbarium (<http://arboretum.bio.uci.edu/plant-exhibits/herbarium/>) (IRVC) curates ca. 35,000 vascular plant specimens and is a part of the Arboretum. For further information call 949-824-5833 or contact Rebecca Crowe, Nursery Manager at [rcrowe@uci.edu](mailto:rcrowe@uci.edu) and Peter Bowler, Faculty Advisor at [pabowler@uci.edu](mailto:pabowler@uci.edu).

## Laser Microbeam and Medical Program

The Laser Microbeam and Medical Program (LAMMP) is a Research Center formerly funded by the National Institute of Biomedical Imaging and Bioengineering (NIBIB) at the National Institutes of Health. Located within the Beckman Laser Institute and Medical Clinic at UCI, LAMMP is dedicated exclusively to the use of lasers and optics in biology and medicine. LAMMP supports activities in technological research and development, collaborative research, and training/dissemination. LAMMP research and technology development is based on fundamental light-tissue interaction mechanisms. The LAMMP program also emphasizes “translational” research by rapidly moving basic science and technology from “benchtop to bedside.” Additional information is available at the Laser Microbeam and Medical Program website (<http://www.bli.uci.edu/research/>) or from the LAMMP Coordinator at 949-824-2251.

## UC Irvine Health

UC Irvine Health is committed to providing the highest quality healthcare to more than 3 million people in Orange County, western Riverside County, and southeast Los Angeles County.

UC Irvine Medical Center is Orange County's only university hospital and features more than 600 specialty and primary care physicians. The medical center offers a full scope of acute- and general-care services including cardiac surgery, cancer, digestive disease, neurosurgery, and trauma. *U.S. News & World Report* consistently lists UC Irvine among “America's Best Hospitals.” Since 2001, the publication has bestowed national recognition on UC Irvine Health programs in urology, gynecology, geriatrics, cancer, digestive disorders, kidney disease, orthopedic surgery and ear, nose, and throat. It was only the third hospital in California and the first in Orange County to receive Magnet Designation for nursing excellence. It is the county's first Joint Commission-designated Comprehensive Stroke Center, an advanced certification reserved for hospitals able to receive and treat the most complex stroke cases.

Located in the city of Orange, 13 miles from the UC Irvine campus, UC Irvine Medical Center has 417 beds and is the principal teaching hospital for the UC Irvine School of Medicine. As part of its focus on family and preventive health, the medical center has additional patient care locations in Anaheim, Irvine, the UCI campus, Costa Mesa, Tustin, Orange, Yorba Linda, Placentia, Santa Ana, and in Riverside and San Bernardino counties.

UC Irvine Medical Center houses a 24-hour emergency department and is designated as Orange County's only Level I trauma center—the most comprehensive for the treatment of life-threatening injuries—and Level II pediatric trauma center. Specialists are available for the expert management of high-risk pregnancies, and critically ill newborns are cared for in the county's most sophisticated Level III neonatal care unit.

The medical center is also home to the Chao Family Comprehensive Cancer Center, the only facility in Orange County designated as a comprehensive cancer center by the National Cancer Institute. It offers patients a full range of cancer therapies, including leading edge clinical trials, immunotherapy, radiation oncology, and minimally invasive surgery. It is one of only 48 comprehensive cancer centers in the country.

In March 2009, UC Irvine Health Douglas Hospital opened at UC Irvine Medical Center. A modern facility for the 21st century, the hospital features the latest medical and surgical technology for the delivery of world-class care as well as top training programs for future physicians. The seven-story hospital has a 45-bed regional neonatal intensive care unit, 21 high-tech operating rooms, the county's only regional burn center and advanced interventional procedure rooms. Private patient rooms emphasize individualized care and permit family members to stay overnight.

For additional information visit the UC Irvine Health website (<http://www.ucirvinehealth.org>).

## UCI Center for Occupational and Environmental Health

In 1980, the University established occupational health centers in Northern and Southern California for the purpose of training occupational health professionals, conducting research on occupational health issues, and providing clinical evaluation and services to employers and workers/patients. During the early 1990s, the mandate was expanded to include environmental health issues. The Centers have strong ties to the UC Schools of Medicine, Nursing, and Public Health.

The Irvine Center is comprised of UCI academic faculty and health professionals. Faculty research is concerned with identification of causal association between disease and occupational or environmental exposures with an emphasis on prevention of occupational and environmental disease and injury. The Center's primary areas are occupational and environmental medicine, toxicology, epidemiology, and environmental health sciences. The Center includes a consulting clinic in Irvine, a specialty clinic at the UCI Medical Center, facilities for research and teaching in epidemiology and toxicology, and study space for residents in occupational medicine and graduate students in environmental health sciences. For additional information, call 949-824-8641 or visit the Center for Occupational and Environmental Health website (<http://catalogue.uci.edu/introduction/%20http://www.coeh.uci.edu/>).

## Additional Facilities

Information about many other UCI research and instructional facilities and programs is available in the academic unit sections and the Office of Research section of this *Catalogue*, as well as at the Office of Research Centers and Institutes website (<http://www.research.uci.edu/centers/>).



# Academic Calendar

## Fall Quarter, 2020

Event	Date(s)
Quarter Begins	Sep. 28 (Mon.)
Academic Advising and Orientation	Sep. 28-30 (Mon.–Wed.)
Instruction Begins	Oct. 1 (Thu.)
Veterans' Day Holiday	Nov. 11 (Wed.)
Thanksgiving Holiday	Nov. 26–27 (Thu.–Fri.)
Instruction Ends	Dec. 11 (Fri.)
Final Examinations	Dec. 12–18 (Sat.–Fri.)
Quarter Ends	Dec. 18 (Fri.)
Winter Administrative Recess	Dec. 24–Jan. 3 (Thu.–Sat.)

## Winter Quarter, 2021

Event	Date(s)
Quarter Begins	Jan. 4 (Mon.)
Instruction Begins	Jan. 4 (Mon.)
Martin Luther King Jr. Holiday	Jan. 18 (Mon.)
Presidents' Day Holiday	Feb. 15 (Mon.)
Instruction Ends	Mar. 12 (Fri.)
Final Examinations	Mar. 13–19 (Sat.–Fri.)
Quarter Ends	Mar. 19 (Fri.)

## Spring Quarter, 2021

Event	Date(s)
Quarter Begins	Mar. 24 (Wed.)
Cesar Chavez Day Holiday (Observed)	Mar. 26 (Fri.)
Instruction Begins	Mar. 29 (Mon.)
Memorial Day Holiday	May 31 (Mon.)
Instruction Ends	Jun. 4 (Fri.)
Final Examinations	Jun. 5–10 (Sat.–Thu.)
Quarter Ends	Jun. 11 (Fri.)
Commencement	Jun. 11–14 (Fri.–Mon.)

## Summer Sessions, 2021

Event	Date(s)
Session I	Jun. 21–Jul. 28 (Mon.–Wed.)
10–Week Session	Jun. 21–Aug. 27 (Mon.–Fri.)
Independence Day Holiday (Observed)	Jul. 5 (Mon.)
Session II	Aug. 2–Sep. 8 (Mon.–Wed.)
Labor Day Holiday	Sep. 6 (Mon.)

Calendar updates, detailed information on registration procedures and late charges, and the School of Law academic calendar are available on the University Registrar's website (<http://www.reg.uci.edu>). The M.D. program academic calendar is available at the School of Medicine (<http://www.meded.uci.edu/>).

# All Courses

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For more information on course listings and for definitions of course terms, visit the [About](#) page.

## Academic English and ESL (AC ENG)

### Courses

#### **AC ENG 20A. Academic Writing. 5 Units.**

Grammar, sentence structure, paragraph and essay organization of formal written English.

Prerequisite: Placement into AC ENG 20A.

Grading Option: Pass/no pass only.

#### **AC ENG 20B. Academic Writing. 5 Units.**

Grammar, sentence structure, paragraph and essay organization of formal written English.

Prerequisite: AC ENG 20A. Placement into AC ENG 20B is also accepted.

Grading Option: Pass/no pass only.

#### **AC ENG 20C. Essentials of Academic Writing. 5 Units.**

Grammar, sentence structure, paragraph and essay organization of formal written English.

Prerequisite: AC ENG 20B. Placement into AC ENG 20C is also accepted.

Grading Option: Pass/no pass only.

#### **AC ENG 20D. Academic Writing. 5 Units.**

Grammar, sentence structure, paragraph and essay organization of formal written English.

Prerequisite: AC ENG 20C

Grading Option: Pass/no pass only.

#### **AC ENG 22A. Academic English Reading and Vocabulary. 2 Units.**

Intensive reading exercises with occasional practice in extensive reading, focusing on comprehension, development of vocabulary, syntax, rhetorical features, reading strategies, and study skills.

Prerequisite: Placement into AC ENG 22A is required.

#### **AC ENG 22B. ESL Reading and Vocabulary. 2 Units.**

Extensive reading and discussion with emphasis on journal articles, textbook chapters, notetaking, and the interpretation of charts, diagrams, tables, and figures.

Grading Option: Pass/no pass only.

#### **AC ENG 23A. ESL Pronunciation I. 2 Units.**

Designed for international graduate students. Provides an emphasis on pronunciation. Development of listening and speaking skills in five fundamental areas: pronunciation, intonation, word stress, listening comprehension, and informal campus communication. Presentations of personal experiences and reports on graphs.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

#### **AC ENG 23B. ESL Conversation II. 2 Units.**

Designed for international graduate students. Provides an emphasis on conversational fluency. Further development of listening and speaking skills: review of English sounds, sentence stress, and rhythm. Oral reports, debates, and reports on graphs and surveys.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**AC ENG 23C. ESL Advanced Communication III. 2 Units.**

Designed for international graduate students with advanced communication skills. Further development of listening and speaking skills: review of minimal pairs, consonant blends, intonation, stress and rhythm. Oral presentations emphasized utilizing graphs, syllabi, academic terms, and video presentations on academic work.

Prerequisite: AC ENG 23A or AC ENG 23B

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**AC ENG 24. ESL International TA Workshop. 2 Units.**

Designed for advanced-level international students preparing to be teaching assistants. Provides extensive practice in oral and written communication skills associated with teaching introductory-level college courses and participating in academic presentations and discussions. Review and analysis of language problems.

Prerequisite: AC ENG 23A or AC ENG 23B or AC ENG 23C

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**AC ENG 28. Grammar. 2-4 Units.**

A full review of English grammar covering the following areas: grammar terms, verb tenses, verb forms, conditionals, passive and word forms, punctuation, sentence structure. The concepts are applied in targeted sentence and paragraph writing practice.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**AC ENG 29. Special Topics in ESL. 2 Units.**

Directed and individualized work in English as a second language not covered in the AC ENG 20, 21, 22 sequence.

Grading Option: Pass/no pass only.

Repeatability: Unlimited as topics vary.

**AC ENG 139W. Advanced Academic Writing Across the Curriculum. 4 Units.**

Designed for transfer students who speak English as a second language. Focuses on developing academic reading and writing skills including essay content, organization, vocabulary, and grammar. Academic content also covered.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Restricted to students whose first language is not English.

(Ib)

## African American Studies (AFAM)

### Courses

**AFAM 40A. African American Studies I. 4 Units.**

Discusses main contours of African American experience from the forced importation of Africans into the Americas in the late fifteenth century to the development of social movements in post-emancipation societies of the late nineteenth and twentieth centuries.

((III or IV) and VII ).

**AFAM 40B. African American Studies II. 4 Units.**

Introduction to the history of modern racial thinking in Western society and its relationship to the material contexts of racial oppression, with emphasis on its development in British colonies and U.S.

((III or IV) and VII ).

**AFAM 40C. African American Studies III. 4 Units.**

Introduction to theories of racial blackness in the modern world, with emphasis on developments in British colonies and U.S. Traces emergence of blackness as term of collective identity, social organization, and political mobilization.

((III or IV) and VII ).

**AFAM 50. Introductory Topics in African American Studies. 4 Units.**

Introduction to a broad range of topics in African American studies, exploring history, literature, art, culture, politics, and contemporary social issues. Topical organization of courses addresses issues that have been of importance historically and are reshaping the African diaspora today.

Repeatability: Unlimited as topics vary.

**AFAM 111A. Modern African American Art. 4 Units.**

Investigates the history of modern African American art; emphasis on the politics of representation. Examines art in a variety of media from material culture and textiles to painting and photography. Issues of migration, nationalism, gender, sexuality, and hybridity are discussed.

Same as AHIS 164A.

**AFAM 111B. Contemporary African American Art. 4 Units.**

Investigates the history of contemporary African American art; emphasis on the politics of representation. Explores art in a variety of media: painting, sculpture, photography, installation, and new media. Cultural politics, appropriation, identity, gender, sexuality, hybridity and civil rights issues discussed.

Same as AHIS 164B.

**AFAM 112A. Early African American Literature. 4 Units.**

Examines the earliest forms of black literary practices, including the jeremiad, the slave narrative, the pamphlet, poetry, the short story, and how these literary forms are related to the historical experiences of enslavement and emancipation.

Repeatability: Unlimited as topics vary.

**AFAM 112B. African American Literature 1900-Present. 4 Units.**

Examines individual literary forms and/or authors, as well as movements such as the Harlem Renaissance and the Black Arts Movement. Explores how black literary practices represent the conditions of modern subjectivities and environments.

Repeatability: Unlimited as topics vary.

**AFAM 113. African American Cinema and Media. 4 Units.**

Explores the diversity of Black creative production and the historical, social, and economic forces that shaped their emergence. May include Black film, hip-hop culture, fine art, photography, and others.

Repeatability: Unlimited as topics vary.

**AFAM 114. International Cultures. 4 Units.**

Explores the various cultures of the African diaspora and their impacts on a global scale. Examines a diverse range of media, including music (reggae, hip-hop), literature, film, and others and the links between culture and social movements throughout the diaspora.

Repeatability: Unlimited as topics vary.

**AFAM 115. Race and Visual Representation. 4 Units.**

Examines film, documentary, fine art, photography, and other visual media to explore the multiple ways in which ideas about race are projected and woven through the visual landscape and the impacts this has on perpetuating social inequalities.

Repeatability: Unlimited as topics vary.

**AFAM 117. Asian American and African American Relations. 4 Units.**

Addresses relationships of Asian American and African American communities in the United States. Topics include race, class, gender, labor, economic systems, political mobilization, community, civil rights, activism, cultural expression.

Same as HIST 152B, ASAM 167.

**AFAM 118. Topics in African American Humanities. 4 Units.**

Provides students with an opportunity to pursue advanced work in African American studies from one or more humanities approaches (literature, film and media studies, art history, and others).

Repeatability: Unlimited as topics vary.

**AFAM 125. African American Women in Art. 4 Units.**

Examines depictions of and by African American women in art and popular culture through a variety of media including textiles, painting, sculpture, photography, and installation. Focuses on African American women's experiences, perspectives, and strategies for contemporary representation.

Same as AHIS 164D.

**AFAM 128. Topics in Gender/Sexuality. 4 Units.**

Expressions of genders and sexualities across the spectrum of African American experience and creativity.

Repeatability: Unlimited as topics vary.

**AFAM 134A. Caribbean History: Colonization to Emancipation. 4 Units.**

Exploration of the history of the archipelago from pre-Columbian times to the end of slavery; examining the impact of European colonization, decimation of the indigenous populations, African slavery, resistance, and emancipation; the unity and diversity of experience in region.

Same as HIST 164A.

**AFAM 134B. Caribbean History: Emancipation to Independence. 4 Units.**

Post-emancipation and anti-colonial struggles ending with political independence for most of the region. Examines social, political, economic, cultural dimensions of post-emancipation period, including large-scale migration to Central America, the U.S., and Britain; the region's global cultural and political contribution.

Same as HIST 164B.

**AFAM 137. History of the African Diaspora. 4 Units.**

Examines the causes and consequences of the multiple diasporas of African peoples since the sixteenth century in the Atlantic world, especially the Americas and Europe.

Same as HIST 134E.

**AFAM 138. Topics in African American History. 4 Units.**

Studies in selected areas of African American history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as HIST 150.

**AFAM 143. Topics in African American Music. 4 Units.**

Examines African American musical forms and traditions, such as blues, jazz, and reggae, in performance and/or critical and theoretical contexts.

Repeatability: Unlimited as topics vary.

**AFAM 144. Topics in Expressive Forms. 4 Units.**

Examines various forms of aesthetic expression in the African diaspora, including dance, music, and the plastic arts, as well as artistic visions of black cyberspace, digital activism, film, video, and aesthetic conceptions of the future.

Repeatability: Unlimited as topics vary.

**AFAM 145. African Americans and Photography. 4 Units.**

Explores depictions of and by African Americans through photography. Examines the history of photography in relationship to African American culture through a variety of media from early daguerreotype processes to digital imagery.

Same as AHIS 164E.

**AFAM 151. Comparative Minority Politics. 4 Units.**

Examines the political experiences of Blacks, Latinos, and Asian Americans in the United States from roughly 1950 to the present. Focuses on how each group has pursued political empowerment via both conventional political channels and social movements.

Same as ASAM 132, CHLT 147, PLSC 124C.

**AFAM 152. African American Politics. 4 Units.**

Examines politics of African Americans in order to gain a broader perspective of the American political process. Major developments in African American politics (including the civil rights movement, Black presidential bids), continuing problem of racism, responsiveness of key governing institutions.

Same as PLSC 124E.

**AFAM 153. African American Psychology. 4 Units.**

Historical overview of the development of black psychology and the African American frame of reference. Topics include personality development, psychological assessment, issues in education, black mental health, and the role of the African American psychologist in the community.

Same as PSYC 174E.

**AFAM 154. African American Social Formations. 4 Units.**

Topics which promote critical investigation into the historical, political, and social formations associated with the Black Diaspora.

Repeatability: Unlimited as topics vary.

**AFAM 155. Intercultural Studies. 4 Units.**

Studies relationships between various cultural formations within the Black Diaspora and the exchange, amalgamations, and tensions between Black Diasporic formations and non-Black formations. Examines expressions of racialization as representation, adaption, and resistance.

Repeatability: Unlimited as topics vary.

**AFAM 156. African Societies and Politics. 4 Units.**

Examines the violent incorporation of Africa within European modernity. Places the discourse of Pan-Africanism, African Nationalisms, Negritude, African Marxism, and/or African Socialism in juxtaposition to the forces of capitalism, colonialism, and imperialism that restructure African history.

Repeatability: Unlimited as topics vary.

**AFAM 157. Critical Race Theory. 4 Units.**

Introduction to Critical Race Theory and key American cases on racial inequality. Using this literature, examines the possibilities and pitfalls of legal claims of race, gender, and sexuality discrimination in the age of colorblindness.

Same as CLS C178.

Restriction: Upper-division students only.

**AFAM 158. Topics in African American Social Sciences. 4 Units.**

Provides students with an opportunity to pursue advanced work in African American studies from one or more social science approaches (psychology, sociology, anthropology, economics, and others).

Repeatability: Unlimited as topics vary.

**AFAM 159. Prisons and Public Education. 4 Units.**

Looks at the connections between schools and prisons in the United States. Students learn about ideas that push beyond common trope of the "school to prison pipeline."

Same as ANTH 138.

**AFAM 162W. The Black Protest Tradition. 4 Units.**

History and discourses of the black protest tradition. Traces emergence of black protest against racial slavery and white supremacy from the early colonial period to present and the complex elaboration of identity politics within black communities in the twentieth century.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only.

**(Ib)**

**AFAM 163. Seminar in African American Studies. 4 Units.**

Explores theoretical and methodological issues in Black Studies via concentrated work on a specific ensemble of questions. Emphasis is on generating student responses to the material covered through oral and written reports.

Repeatability: Unlimited as topics vary.

**AFAM 198. Directed Group Study. 1-4 Units.**

Special topics through directed reading. Paper required.

Repeatability: May be taken for credit for 24 units.

**AFAM 199. Independent Study. 1-4 Units.**

Investigation of special topics through directed reading. Paper required.

Repeatability: May be repeated for credit unlimited times.

**AFAM 399. University Teaching. 4 Units.**

Limited to teaching assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## **Anatomy and Neurobiology (ANATOMY)**

### **Courses**

**ANATOMY 200. Research in Anatomy. 2-12 Units.**

Individual research supervised by a particular faculty member.

Repeatability: May be repeated for credit unlimited times.

**ANATOMY 200R. Research in Anatomy and Neurobiology for First-Year Students. 2-12 Units.**

Independent research within the laboratories of graduate training faculty in the Department of Anatomy and Neurobiology for first-year Ph.D. students.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

**ANATOMY 201. Human Gross Anatomy. 8 Units.**

Study and dissection of the human body, including muscular, skeletal, nervous, and cardiovascular systems. Emphasis on both normal and abnormal structure and function.

Restriction: Graduate students only.

**ANATOMY 202B. Human Neuroscience. 4 Units.**

Study of the human nervous system at the systems level including the physiology and anatomy of sensory, motor, and integrative functions.

Prerequisite: ANATOMY 202A

**ANATOMY 203A. Human Microscopic Anatomy. 3 Units.**

Lecture and laboratory course on human microscopic anatomy. Emphasis is on functional implications of structure of cells and tissues.

Restriction: Graduate students only.

**ANATOMY 203B. Human Microscopic Anatomy. 3 Units.**

Lecture and laboratory course on human microscopic anatomy. Emphasis is on functional implications of structure of cells and tissues.

Prerequisite: ANATOMY 203A

Restriction: Graduate students only.

**ANATOMY 206. Tutorial in Anatomy. 3 Units.**

Series of tutorials on advanced topics in anatomy.

Repeatability: May be repeated for credit unlimited times.

**ANATOMY 210A. Systems Neuroscience. 5 Units.**

Study of the mammalian nervous system at the systems level. Anatomy and physiology of sensory, motor, and integrative functions.

Repeatability: May be taken for credit 2 times.

Same as NEURBIO 208.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**ANATOMY 215. Epilepsy as a Window to Mechanisms of Neuronal Plasticity. 4 Units.**

Understanding the mechanisms of brain disorders provides novel insights into the normal function of neurons and circuits. Discusses approaches to studying mechanisms of brain function ranging from imaging, the use of models and others to study epilepsy.

Grading Option: Satisfactory/unsatisfactory only.

**ANATOMY 227A. Current Topics in Neuroscience. 1-4 Units.**

Focuses on critical reading, presentation, and discussion of current literature in neuroscience research.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ANATOMY 227B. Current Topics in Neuroscience. 1-4 Units.**

Focuses on critical reading, presentation, and discussion of current literature in neuroscience research.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ANATOMY 227C. Current Topics in Neuroscience. 1-4 Units.**

Focuses on critical reading, presentation, and discussion of current literature in neuroscience research.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ANATOMY 230. Topics in Translational Neuroscience. 2-4 Units.**

One-hour seminar presentation by participating faculty or guest lecturer and open to the science community, followed by one-hour student discussion of the lecture topic or related topic. Students are responsible for presentations and readings.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Graduate students only. Interdepartmental Neuroscience Majors have first consideration for enrollment.

**ANATOMY 230A. Molecular, Cellular, & Developmental Neurobiology. 4 Units.**

Molecular aspects of the structure and function of neurons and glia including neurotransmission, synaptic modulation, and channels. Neural development at the cellular and molecular level including neurogenesis, pattern formation, trophic factors, axonal growth, and synaptic rearrangement.

Restriction: Graduate students only.

**ANATOMY 292A. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**ANATOMY 292B. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**ANATOMY 292C. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Anesthesiology (ANESTH)



# Anthropology (ANTHRO)

## Courses

### **ANTHRO 2A. Introduction to Sociocultural Anthropology. 4 Units.**

Introduction to cultural diversity and the methods used by anthropologists to account for it. Family relations, economic activities, politics, gender, and religion in a wide range of societies. Stresses the application of anthropological methods to research problems.

(III and VIII ).

### **ANTHRO 2B. Introduction to Biological Anthropology. 4 Units.**

Evolutionary theory and processes, comparative primate fossil record, human variation, and the adequacy of theory, and empirical data.

(III)

### **ANTHRO 2C. Introduction to Archaeology. 4 Units.**

Archaeological theory and cultural processes with emphasis on the American Southwest, Mesoamerica, and Mesopotamia.

(III)

### **ANTHRO 2D. Introduction to Language and Culture. 4 Units.**

Explores what the study of language can reveal about ourselves as bearers of culture. After introducing some basic concepts, examines how cultural knowledge is linguistically organized and how language might shape our perception of the world.

Same as LSCI 68.

(III)

### **ANTHRO 10A. Probability and Statistics. 4 Units.**

An introduction to probability and statistics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Emphasizes examples from sociology, anthropology, and related social science disciplines.

Same as SOCIOL 10A.

Overlaps with PSYCH 10A, SOCECOL 13, SOC SCI 10A, POL SCI 10A.

Restriction: Anthropology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

(Va)

### **ANTHRO 10B. Probability and Statistics. 4 Units.**

An introduction to probability and statistics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Emphasizes examples from sociology, anthropology, and related social science disciplines.

Prerequisite: SOCIOL 10A or ANTHRO 10A

Same as SOCIOL 10B.

Overlaps with PSYCH 10B, SOCECOL 13, SOC SCI 10B, POL SCI 10B.

Restriction: Anthropology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

(Va)

### **ANTHRO 10C. Probability and Statistics. 4 Units.**

An introduction to probability and statistics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Emphasizes examples from sociology, anthropology, and related social science disciplines.

Prerequisite: SOCIOL 10B or ANTHRO 10B

Same as SOCIOL 10C.

Overlaps with PSYCH 10C, SOCECOL 13, SOC SCI 10C, POL SCI 10C.

Restriction: Anthropology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

(Vb)

**ANTHRO 20A. People, Cultures, and Environmental Sustainability. 4 Units.**

Anthropological consideration of global environmental sustainability from the perspective of human cultures and communities. Causes and consequences of population growth, natural resource management, environmental law, environmental ethics. Case studies emphasize tropical rain forests, arid lands of Africa and North America.

(VIII)

**ANTHRO 25A. Environmental Injustice. 4 Units.**

Explores how pollution, climate change, and other environmental problems impact people around the world, often worsening social inequality. Students use social science frameworks to understand environmental problems, different interpretations of these problems, and how people have organized for political change.

(III and VII ).

**ANTHRO 30A. Global Issues in Anthropological Perspective. 4 Units.**

Explores anthropological perspectives on issues of importance in an increasingly global society. Topics include emphases on ethnic conflict; identity; immigration and citizenship; religion and religious diversity; medical anthropology; legal anthropology; development and economic change; gender.

Restriction: Anthropology Majors have first consideration for enrollment.

(VIII)

**ANTHRO 30C. Visual Anthropology . 4 Units.**

Focusing on the construction of culture through visibility, this course engages traditional ethnographic films, popular media and anthropological texts to analyze ethics, "reality" and fiction; propaganda and documentary, construction of a frame, the responsibility of the filmmaker, photographer, and anthropologist.

**ANTHRO 41A. Global Cultures and Society. 4 Units.**

Offers a general overview of the rise of global interdependence in political, economic, demographic, and cultural terms. Considers what drove people from relative isolation into intensified intercourse with one another, and investigates the consequences of this shift.

Same as INTL ST 11.

Restriction: Anthropology Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(III and VIII ).

**ANTHRO 45A. Science, Culture, Power. 4 Units.**

Examines science in historical and cultural context (Scientific and Darwinian Revolutions, Manhattan Project, contemporary biosciences) to understand scientific truths and their limits, scientists as social actors, and vital intersections of sciences with religion, politics, gender, and other forms of culture.

(III)

**ANTHRO 48. Archaeology or Aliens?: Conspiracy, Pseudoscience, and the Emergence of Civilizations. 4 Units.**

Archaeology has inspired (and sometimes actively encouraged) various theories about aliens, lost civilizations, dark conspiracies, and mysterious technologies. Does such an intimate relationship with these fantastic notions undermine archaeology and its claims of authoritative knowledge about past cultures.

(III and VIII ).

**ANTHRO 89. Special Topics in Anthropology. 1-4 Units.**

Studies in selected areas of Anthropology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 100A. Ethnography and Anthropological Methods. 4 Units.**

Anthropological research, learning ethnographic methods, and how to choose a research topic, construct research questions, explore library resources, collect data, and write an analytical paper on research findings.

Prerequisite or corequisite: ANTHRO 2A

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment. Medical Anthropology Minors have first consideration for enrollment.

**ANTHRO 100B. Anthropology Careers. 4 Units.**

Gives students the skills and perspective needed to leverage undergraduate anthropology education in diverse career domains. Students explore different career domains (health care, tech development, environmental governance, etc.) and learn to represent themselves professionally.

Restriction: Anthropology Majors only. Anthropology Minors only. Medical Anthropology Minors only.

**ANTHRO 121AW. Kinship and Social Organization. 4 Units.**

Organization of social life primarily in preindustrial societies. Theories of kinship, marriage regulations, sexual behavior, and social roles. Comparisons of biological, psychological, sociological, and economic explanations of social organization.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

**(Ib)****ANTHRO 121D. Cross-Cultural Studies of Gender. 4 Units.**

Explores the construction of gender in national and transnational contexts. Special attention is given to how race, sexuality, class, and global inequalities shape different experiences of gender, and how gender structures political, institutional, and social life across the world.

Same as INTL ST 153B.

**(VII)****ANTHRO 121G. Political Anthropology. 4 Units.**

Utilizes anthropological accounts of Western and non-Western societies to question conventional ways of thinking about power and politics. Classical traditions in political anthropology are critiqued; an alternative view is presented through recent anthropological political analyses of various topics.

**ANTHRO 121J. Urban Anthropology. 4 Units.**

Cultural roles of urban centers and processes of urbanization in comparative perspective, focusing on both nonwestern, nonindustrial societies of past and present; the relationship between modern urban centers and Third World peoples. Migration, urban poverty, in Africa, Asia, Latin America.

Same as INTL ST 153C.

**ANTHRO 124. Gold: The Alchemy of Socio-Economic Practice. 4 Units.**

Before bitcoin, before derivatives and mortgage-backed securities, before even writing itself, there was gold. Explore gold's role in the development of culture, politics, and power. From Pharaohs to modern financial wizards, gold has impacted and mediated social life.

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment. Archaeology Minors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Economics Minors have first consideration for enrollment.

**ANTHRO 125. Anthropology of Debt. 4 Units.**

Explores how debt has shaped culture across varied contexts geographically and historically. In what ways have societies naturalized indebtedness, taken it for granted as a fact of life, and used it for organizing social relations.

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment. Archaeology Minors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Economics Minors have first consideration for enrollment.

**ANTHRO 125A. Economic Anthropology. 4 Units.**

Economic systems in comparative perspective: production, distribution, and consumption in market and non-market societies; agricultural development in the third world.

Prerequisite: One course in general science, anthropology, economics, geography, or sociology.

Same as ECON 152A.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment. Anthropology Majors have first consideration for enrollment.

**ANTHRO 125B. Ecological Anthropology. 4 Units.**

Studies relationships between human communities and their natural environments. The role of environment in shaping culture; effects of extreme environments on human biology and social organization; anthropologist's role in studying global environmental problems, e.g., African famine, tropical rain forests destruction.

Prerequisite: ANTHRO 2A or ANTHRO 2B or ANTHRO 2C

**ANTHRO 125C. Environmental Anthropology. 4 Units.**

Introduces students to anthropological and qualitative research on the relationship of humans, non-humans, and environments. Focuses on how to analyze and evaluate social and cultural differences in environmental perception, relations, justice, governance, sustainability, and cosmology.

Prerequisite: ANTHRO 2A or ANTHRO 2B or ANTHRO 2C or ANTHRO 2D

(III)

**ANTHRO 125F. Humans and Other Animals. 4 Units.**

Explores peoples' relationships with other animals, a topic that continues to shape anthropological understandings of humanness, culture, and the social. Subthemes: symbol and matter, nature/culture, ontologies, relations, moralities, ecologies, futures.

Prerequisite: ANTHRO 2A or ANTHRO 2B or ANTHRO 2D

**ANTHRO 125S. The Anthropology of Money. 4 Units.**

Anthropological approaches to money; impact of money on subsistence economies; cultural history of money; and modern transformations of money. Students conduct ethnographic research on alternative money practices in Southern California, and create an online exhibition and research paper.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 125U. Immigration, Nation, and Media. 4 Units.**

Examines media shapes and reflects public opinion on immigration and its representation of immigrants, citizens, and ideas about the nation, and who belongs and who is a potential threat; as well as the relationship between scholars and journalists.

Same as CHC/LAT 123, SPPS 101A.

**ANTHRO 125X. Transnational Migration. 4 Units.**

Examines the movement of people across national borders, governmentality and the role of state practices to control populations, and issues of citizenship, belonging, and identity. Examples are drawn from the United States, Europe, Latin America, Asia, and Africa.

Same as CHC/LAT 161, INTL ST 117A.

(VIII)

**ANTHRO 125Z. Islam in America. 4 Units.**

Offers a critical academic study of Islam in America, focusing on the core tenets of belief, the diversity of practices, and historical transformations that have taken place since the arrival of Muslims in the United States.

Same as ASIANAM 142.

**ANTHRO 126. Cultures of the Middle East. 4 Units.**

The diversity of cultures and peoples who constitute the Middle East demonstrates the failure of much contemporary media and discourse to understand this region. Students learn about the broad scope of the contemporary Middle East through an ethnographic lens.

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment.

**ANTHRO 126A. Elite Cultures. 4 Units.**

The distinctive contribution that ethnographic studies have made to the understanding of elites past and present, in particular societies and globally.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 127. Controversies, Courts, Cultures: The Anthropology of Law. 4 Units.**

Assesses the contributions anthropology has made to legal scholarship, reviewing historical and contemporary themes. Considers both comparative questions of law's norms, structures, and practices around the globe, and the specific insights anthropology offers about contemporary U.S. law.

Same as CRM/LAW C183.

(III)

**ANTHRO 127A. Law and Modernity. 4 Units.**

The rise and spread of Enlightenment legal traditions, social contract theory, individual rights, ideologies of 'liberty, equality, fraternity'; contradictions of liberal law, its understandings of 'primitive' and 'civilized'; pervasive myths of property, difference, race, and rights. Reading- and writing-intensive.

Same as CRM/LAW C191.

**ANTHRO 127B. Global Migrations, Anthropology, and the Law. 4 Units.**

Course explores how cultural contexts and national laws frame migration, and define categories of migrants, families, and people. Topics include illegality, transnational families, refugees and economic migrants, labor conditions, deportation practices, discipline and crime, citizenship controversies, and nativism.

**ANTHRO 128A. Science, Technology, Controversy. 4 Units.**

Explores ways in which the social sciences conceive of science as a sociocultural practice. Emphasis on literature in Science and Technology Studies (STS), especially writings that concern the relationship of science to space and place, power, and politics.

Restriction: Anthropology Majors only.

**ANTHRO 128B. Race, Gender, and Science. 4 Units.**

Perfect for pre-health, science and social science majors wanting to appreciate how science and society interact. Race and gender as biological and socio-cultural constructs are examined. Questions explored: What is disease? What is science? What are social and biological differences.

Same as CHC/LAT 176.

**(VII)****ANTHRO 128C. Digital Cultures . 4 Units.**

Explores cultural and political implications of the infotech revolution and the ways new media are used around the world, new cultural practices and spaces (e.g., cybercafes), debates surrounding the meanings of these new technologies, and their implications for transforming society.

Prerequisite: ANTHRO 2A and (ANTHRO 2B or ANTHRO 2C or ANTHRO 2D)

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 129. Special Topics: Social and Economic Anthropology. 1-4 Units.**

Studies in selected areas of Social and Economic Anthropology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 132A. Psychological Anthropology. 4 Units.**

Cultural differences and similarities in personality and behavior. Child-rearing practices and consequent adult personality characteristics, biocultural aspects of child development and attachment, culture and behavior evolutionary models, politically linked personality, cognitive anthropology, psychology of narrative forms, comparative national character studies.

Prerequisite: ANTHRO 2A or PSYCH 7A or (PSYCH 9A and PSYCH 9B and PSYCH 9C) or (PSY BEH 11A and PSY BEH 11B and PSY BEH 11C)

Same as PSYCH 173A.

Restriction: Psychology Majors have first consideration for enrollment.

**ANTHRO 134A. Medical Anthropology. 4 Units.**

Introduces students to cross-cultural perspectives and critical theories in anthropological studies of medicine. Special attention is given to diverse ways of understanding bodies, illnesses, and therapeutic practices in our changing world.

Same as CHC/LAT 178A.

**(VIII)****ANTHRO 134B. Cultures of Biomedicine. 4 Units.**

An introduction to the anthropological study of biomedicine and biotechnology. Topics include medicalization, experimentation and discovery, diagnosis, expertise, health activism, and biotechnology.

**ANTHRO 134C. Medicine, Food, and Health. 4 Units.**

With anthropological studies of edible things as its foundation, this course explores topics related to the relationship between medical knowledge, eating, and health from a medical anthropological perspective.

Prerequisite: ANTHRO 2A or ANTHRO 2B or ANTHRO 2D

**ANTHRO 134F. Anthropology of the Body. 4 Units.**

Examines human bodies as both biological and sociocultural entities and explores the relationship among mind, body, and society cross-culturally. Topics include embodiment; race, sex, gender, and the body; somatization; control of the body; commodified bodies; and hybrid/cyborg bodies.

**ANTHRO 134G. HIV/AIDS in a Global Context. 4 Units.**

Examines issues concerning cultural conceptions of HIV infection and disease worldwide. Topics include treatment and prevention, identity and behavior, risk, ethnicity, gender, youth, sexuality, activism, drug use, illness, religion, the clinical encounter, national belonging, and the pharmaceutical industry.

(VIII)

**ANTHRO 134H. Anthropology of Food. 4 Units.**

Examines how food communicates ideas about ethnocentrism, disgust, privilege, gender, race, labor, social identities and hierarchies, globalization, power, and the 'Western diet' and its health consequences.

Same as CHC/LAT 118.

**ANTHRO 134N. Disease, Health, and Inequality. 4 Units.**

Examines the relationships among disease, health, and social inequality in the U.S. and globally. Topics include infectious and chronic disease case studies, health policy, and strategies for promoting health equity.

**ANTHRO 135A. Religion and Social Order. 4 Units.**

An anthropological exploration of religious belief and practices in diverse social and historical contexts. Emphasis placed on selected non-western traditions of the sacred, and on issues of power, ritual, moral order, and social transformation.

**ANTHRO 136A. Nationalism and Ethnicity in the Contemporary World. 4 Units.**

An exploration of the concepts of identity, culture, ethnicity, race, and nation through ethnographic cases, with a view to asking larger questions: how do people create nativeness and foreignness? How does 'culture' get worked into contemporary racisms and nationalisms.

Same as INTL ST 153E.

(VIII)

**ANTHRO 136B. History of Anthropological Theory. 4 Units.**

Provides foundational knowledge in the discipline of anthropology by reviewing competing approaches in anthropological theory, from the nineteenth century to the present. Covers historically fundamental approaches—social evolutionism, functionalism—and recent movements such as feminism, cultural studies, poststructuralism, and postmodernism.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 136D. Conflict Resolution in Cross-Cultural Perspective. 4 Units.**

Examines theories of conflict management. Analyzes how conflict is mitigated in diverse cultures: at the interpersonal level, between groups, and on the international scale. Students discuss readings, hear from conflict management practitioners, and simulate negotiations.

Same as POL SCI 154G, SOC SCI 183E, INTL ST 183E.

(VIII)

**ANTHRO 136G. Colonialism and Gender. 4 Units.**

An anthropological enquiry into the ways colonial relations of power have been structured and gendered throughout the world, and to what effect. Examines the social locations of men and women in the everyday exercise of colonial and imperial power.

Same as INTL ST 153D.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 136K. The Woman and the Body. 4 Units.**

Probes culture and politics of the female body in contemporary American life. Focusing on 'feminine beauty,' examines diverse notions of beauty, bodily practices, and body politics embraced by American women of different classes, ethnicities, and sexualities.

(VII)

**ANTHRO 138. Prisons and Public Education. 4 Units.**

Looks at the connections between schools and prisons in the United States. Students learn about ideas that push beyond common trope of the "school to prison pipeline."

Same as AFAM 159.

**ANTHRO 139. Special Topics in Cultural and Psychological Anthropology. 1-4 Units.**

Studies in selected areas of Cultural and Psychological Anthropology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 140. Sex and Conquest in Latin America. 4 Units.**

Competing ideas of masculinity and femininity, sexual violence, sexual identities, and gendered hierarchies informed how the Spanish engaged in military and religious domination of Mexican and Andean communities, as well as the forms of native resistance throughout colonial Latin America.

Same as HISTORY 160, CHC/LAT 150A, GEN&SEX 171A.

**ANTHRO 141A. Ancient Civilization of Mexico and the Southwest. 4 Units.**

The prehistory and cultural evolution of the civilization which originated in Mexico, including the Olmecs, Aztecs, Toltecs, Maya, and Zapotec, as well as the Pueblos of the Southwestern U.S. Topics include the origins of food production and of the state.

Same as INTL ST 177I.

**ANTHRO 146. Consumption and Culture. 4 Units.**

Our modern 'society of the spectacle' often equates your consumption to your very humanity. Explores the ways in which our desire for things expresses our identity, politics, place within society, and how what we consume dominates social life.

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment.

**ANTHRO 147. Egyptomania. 4 Units.**

An exploration into the archaeological heritage and cultures of ancient Egypt. Also examines how ancient Egypt became appropriated as a popular cultural phenomenon and site of scholarship in the centuries after the Pharaohs.

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment. Archaeology Minors have first consideration for enrollment.

**ANTHRO 147A. Archaeology of the Islamic World. 4 Units.**

The archaeological record connected with the Islamic tradition spans nearly 1,500 years and stretches from Spain to South East Asia. Working with artifacts and other materials, students learn about the sites and historical transformations associated with Islam and Muslim societies.

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment. Archaeology Minors have first consideration for enrollment.

**ANTHRO 147B. Archaeology, Politics, and Identity. 4 Units.**

Archaeologists don't excavate in a political vacuum. Their research has profound consequences for the ways in which people identify with and claim their cultural heritage. Examines archaeology's role in constructing such identities through the traces of the past.

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment. Archaeology Minors have first consideration for enrollment.

**ANTHRO 148. I Dig UCI. 4 Units.**

An introduction to archaeological fieldwork through participation in an active excavation on campus. Students engage with research design and learn the foundational methods of archaeological recovery: survey, mapping, sampling strategies, documentation, excavation, artifact identification, and interpretation.

**ANTHRO 149. Special Topics in Archaeology. 1-4 Units.**

Studies in selected areas of Archaeology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 150A. Language and Social Cognition. 4 Units.**

Explores the relationship between language and cognition in social and cultural contexts. The overall goal is to think through how language structure and use impact how individuals perceive, think about, and understand the world around them.

Same as LSCI 168S.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 151A. Improvisation, Language, and Culture. 4 Units.**

Addresses improvisation, both in performance and in everyday life. Examines improvisation as the 'flexible regulation' of everyday behavior by exploring different scholarly treatments of language and interaction, and working on developing actual theatrical improvisation skills.

Same as LSCI 168J.

Restriction: Upper-division students only.

**ANTHRO 152A. Language Origins: Evolution, Genetics, and the Brain. 4 Units.**

Examines how human language(s) may have originated. Studies pertinent techniques (reconstruction) and addresses related questions, including is our language faculty inborn (i.e., genetically encoded)? Can brain imaging and population genetics research help to unlock this mystery of human evolution?.

Same as LSCI 175, GLBLCLT 105, HISTORY 135G.

**ANTHRO 162A. Peoples and Cultures of Latin America. 4 Units.**

Surveys the prehistory of Latin America and its indigenous cultures, emphasizing the impact of colonial rule, capitalism, and twentieth-century transformations. Emphasis on communities from several countries. In some years, emphasis on comparisons between the Latin American and Caribbean experiences.

Same as INTL ST 177J, CHC/LAT 120.

**(VIII)****ANTHRO 162B. Indian North America. 4 Units.**

A survey of indigenous peoples in North America: American Indians, Alaska Natives, First Nations, Native Americans. Tribal populations and geographic distributions, political and social organization, sovereignty, self-determination, intergovernmental relations; cultural continuity and change; management, preservation, development of environments/resources.

**(VII)****ANTHRO 162C. Race and Empire in Colonial Latin America. 4 Units.**

Explores how native people of Latin America with enslaved and free African incorporated and defied Spanish and Portuguese colonization. Focuses on religious adaptations, resistance movements, legal systems, and the emergence of multicultural communities to explain how race shaped European empires.

Same as HISTORY 165.

**ANTHRO 162D. Anthropology of the United States. 4 Units.**

Examines anthropological research in and of the United States. Topics include race, class, identity, politics, law, and media.

**ANTHRO 163A. Peoples of the Pacific. 4 Units.**

The cultural history and recent developments among the Pacific peoples of Polynesia, Micronesia, Melanesia, New Guinea, and Australia.

Same as INTL ST 158B.

**(VIII)****ANTHRO 164A. 21st Century Africa. 4 Units.**

Comparative studies of the cultures and societies of Sub-Saharan Africa, with emphasis on critical study of colonialism and postcoloniality, social transformation, and the politics of identity.

Prerequisite: ANTHRO 2A

Same as INTL ST 157A.

Restriction: Anthropology Majors have first consideration for enrollment.

**(Ib)****ANTHRO 164P. Peoples and Cultures of Post-Soviet Eurasia. 4 Units.**

Examines the cultures and political conflicts of the more than 130 indigenous ethnic groups in the European and Asian territories of the former U.S.S.R. Emphasis is on the theoretical issues of ethnicity, nationalism, and conflict management.

Same as INTL ST 162B, POL SCI 154F.

**(VIII)**



**ANTHRO 165A. Modern Iran: Cinema and the City. 4 Units.**

Exploring modern Iran through film, literature, photography, travel writing, and philosophy and social science texts that introduce students to important concepts in post-colonial studies, social thought, war culture, religion, and media as experienced through the paradigm of a non-Western modernity.

Same as PERSIAN 165A.

**ANTHRO 169. Special Topics in Area Studies. 1-4 Units.**

Studies in selected areas of Anthropology. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 179. Special Topics: Methods and Formal Representations. 1-4 Units.**

Studies in selected areas of Methods and Formal Representations. Topics addressed vary each quarter.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 180AW. Anthropology Majors Writing Seminar. 4 Units.**

Anthropological theory designed especially for majors in Anthropology. Topics addressed vary each quarter.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 3 times as topics vary.

Restriction: Anthropology Majors only.

**(Ib)****ANTHRO 190. Senior Thesis. 4 Units.**

Senior thesis with Anthropology faculty.

Repeatability: May be taken for credit 3 times.

**ANTHRO H190A. Honors Research Design. 3 Units.**

Students design a research project and articulate its goals and significance. Written work consists of a research proposal describing the research questions, the relevant literature, methods of data collection and analysis, and ethical considerations.

Prerequisite or corequisite: ANTHRO 199

Restriction: Anthropology Honors students only.

**ANTHRO H190B. Honors Field Research. 3 Units.**

Students begin or continue ethnographic field research and gain experience with a variety of data collection methods, including participant-observation, interviews, surveys, and the study of archival and documentary materials.

Prerequisite or corequisite: ANTHRO 199 and ANTHRO H190A

Restriction: Anthropology Honors students only.

**ANTHRO H190C. Honors Research Analysis. 3 Units.**

Students apply qualitative data analysis techniques to ethnographic data collected as part of their Honors research.

Prerequisite or corequisite: ANTHRO H190B and ANTHRO 199. Anthropology Honors ONLY.

**ANTHRO H190W. Honors Thesis Writing. 3 Units.**

Students draft a senior honors thesis (typically) with the following sections: problem statement, literature review, ethnographic background, and descriptions of the methods, results, and conclusions.

Prerequisite or corequisite: ANTHRO H190C and ANTHRO 199. Anthropology Honors ONLY. Satisfactory completion of the Lower-Division Writing requirement.

**(Ib)**

**ANTHRO 197. Field Study. 1-4 Units.**

Field study with Anthropology faculty.

Repeatability: May be repeated for credit unlimited times.

**ANTHRO 198. Directed Group Study. 1-4 Units.**

Directed study with Anthropology faculty.

Repeatability: May be repeated for credit unlimited times.

**ANTHRO 199. Independent Study. 1-4 Units.**

Independent research with Anthropology faculty.

Repeatability: May be repeated for credit unlimited times.

**ANTHRO 202A. Proseminar in Anthropology. 4 Units.**

Year-long intensive introduction to the history of anthropological thought and reading in classical and contemporary ethnography for first-year graduate students.

Restriction: Graduate students only.

**ANTHRO 202B. Proseminar in Anthropology. 4 Units.**

Year-long intensive introduction to the history of anthropological thought and reading in classical and contemporary ethnography for first-year graduate students.

Prerequisite: ANTHRO 202A

Restriction: Graduate students only.

**ANTHRO 202C. Proseminar in Anthropology. 4 Units.**

Year-long intensive introduction to the history of anthropological thought and reading in classical and contemporary ethnography for first-year graduate students.

Prerequisite: ANTHRO 202B

Restriction: Graduate students only.

**ANTHRO 204A. Proseminar in Medicine, Science, and Technology. 4 Units.**

Explores the phenomena studied by 'medical anthropology' and 'science and technology studies' are inextricably linked, and how understanding formations requires moving between disparate fields of inquiry. Required for students pursuing a Graduate Certificate in Anthropologies of Medicine, Science, and Technology.

Restriction: Students pursuing a Graduate Certification in Anthropologies of Medicine, Science, and Technology have first consideration for enrollment.

**ANTHRO 215A. Ethnographic Methods. 4 Units.**

Exposes students to diverse methods, both traditional and experimental, used in anthropological ethnographic research. Students gain experience practicing diverse methods, and learn to select methods appropriate to particular study designs and contexts.

Restriction: Graduate students only.

**ANTHRO 215B. Research Design. 4 Units.**

Introduces research design for anthropology, including concept work and mapping, research topic and aims development, research question construction, and fieldwork planning.

Prerequisite: ANTHRO 215A

Restriction: Graduate students only.

**ANTHRO 215C. Grant and Proposal Writing. 4 Units.**

Focuses on production, critique, and revision of student research proposals. A practical seminar designed to improve student proposals, help students through the application processes, and increase students' chances of obtaining support for their research.

Prerequisite: ANTHRO 215B

Restriction: Graduate students only.

**ANTHRO 229A. Anthropology of Knowledge. 4 Units.**

Examines the politics of knowledge. Considers the long history of anthropological studies concerning a wide variety of knowledge forms and practices, including more recent feminist and postcolonial studies. Aims to investigate and enlarge normative definitions of knowledge and science.

**ANTHRO 230D. Ethnography and its Collaborative Futures. 4 Units.**

Structured readings of selected career-making ethnographic works, past and present, with an emphasis on how ethnographic projects evolve into diverse, collaborative projects.

**ANTHRO 230F. Ethnography. 4 Units.**

Explores the theory and practice of ethnography with a focus on anthropology, the discipline most associated with ethnography. Students are exposed to the theoretical underpinnings of ethnographic work, traditional and innovative practices, and sample ethnographies.

Same as CRM/LAW C222, CHC/LAT 217.

Restriction: Graduate students only.

**ANTHRO 232B. Medical Anthropology. 4 Units.**

Explores historical and contemporary theoretical positions and debates in medical anthropology. Topics may include subjectivity, theories of the body, biopolitics, biomedical technologies, sexuality, pharmaceuticals, political economy and health, infectious disease and epidemics, health disparities, and humanitarianism.

Restriction: Students pursuing a Graduate Certification in Anthropologies of Medicine, Science, and Technology have first consideration for enrollment.

**ANTHRO 235A. Transnational Migration. 4 Units.**

Examines borders and boundaries as material and semiotic constructs. Drawing upon an array of literatures, but loosely situated in U.S. geo/biopolitics, explores transformative troubleings of places, spaces, borders, and bodies of all sorts.

Same as SOC SCI 254A, CHC/LAT 215.

Restriction: Graduate students only.

**ANTHRO 240A. Economic Anthropology. 4 Units.**

Classic and contemporary theory in economic anthropology. Case studies: Latin America (primarily Mexico and the Andes), Africa, and the Pacific. Substantive topics: non-market exchange, markets and marketplaces, households, gender, management of common property (fisheries, pastoral lands, forests), labor, and development.

Restriction: Graduate students only.

**ANTHRO 245A. Seminar in Political Anthropology. 4 Units.**

Explores anthropological approaches to politics. Covers a range of issues and topics, including: theories of culture, power, and hegemony; approaches to colonial and post-colonial relations of global inequality; and ethnographic approaches to the modern state.

Restriction: Graduate students only.

**ANTHRO 246. Feminist Anthropology. 4 Units.**

Examines feminist anthropology's rise as an interdisciplinary field. Paying special attention to issues of power, subjectivity, and authority in the research encounter, feminist anthropologists' major contributions to ethnography, gender studies, queer studies, and cultural anthropology are surveyed.

Restriction: Graduate students only.

**ANTHRO 246E. Capital and Empire. 4 Units.**

Examines theories of capital and empire via anthropological theory, post/colonial critique, feminist theory, and Black political thought. Moreover, it examines social movements, geo/political trajectories and formations, and political economic trends that have emerged after the 2008 financial crisis.

Restriction: Graduate students only.

**ANTHRO 247A. Structuralism and Post-Structuralism. 4 Units.**

Traces recent theoretical discussions and arguments over the philosophical and historical 'subject' from structuralist decenterings toward the characteristically 'post-structuralist' contemporary concern with the historical and political constitution of subjectivities and subject positions.

Restriction: Graduate students only.

**ANTHRO 249A. Humanism and Posthumanism. 4 Units.**

Examines alternative forms of human, humanisms, and posthumanisms to explore the inherent ambiguities and shifting boundaries of knowing and being human, and to venture into modes of analysis that problematize the universality and globality of liberal humanism.

**ANTHRO 250A. The Cultural Politics of Visual Representation. 4 Units.**

Develops a theoretical framework for analyzing and reading visual images. Images, as cultural productions, are steeped in the values, ideologies, and taken-for-granted beliefs of the culture which produced them and a political economy that is class, race, and gender inflected.

**ANTHRO 250B. Digital Technologies, Culture, and Media. 4 Units.**

Explores questions of sociality in cyberspace, including what social theories and ethnographic methods are effective in studying online cultures. Topics include general issues like indexicality, reference, temporality, spatiality, and embodiment, and topics such as language, gender, ethnicity, property, and inequality.

Restriction: Graduate students only.

**ANTHRO 252A. Queer Anthropology. 4 Units.**

Explores historical and contemporary scholarship that employs ethnographic approaches to address the discursive construction of sexuality. Also examines how the discipline of anthropology has been shaped by the study of sexuality.

Restriction: Graduate students only.

**ANTHRO 253A. Design, Aesthetics, and Social Life. 4 Units.**

Anthropology has only recently recognized that design demands consideration as a cultural form linked to, yet nonetheless distinct from, other aesthetic endeavors. Course is largely oriented toward collaboratively working out a conceptual basis for a distinctly anthropological approach to design.

**ANTHRO 254. Digital Anthropology. 4 Units.**

Examines "the digital" from an anthropological perspective by exploring ethnographic research on digital culture and using anthropological frameworks to approach the digital and the human. Readings are interdisciplinary, including work from history and communications.

Restriction: Graduate students only.

**ANTHRO 255A. Disability Worlds. 4 Units.**

Explores disability from a range of methodological and theoretical perspectives. Examines the genealogy of disability in anthropology and related disciplines, with an emphasis on ethnographic work. Topics addressed include access, embodiment, politics, selfhood, and sexuality.

Restriction: Graduate students only.

**ANTHRO 256B. Secrecy, Security, and Surveillance. 4 Units.**

Explores secrecy and security as fundamental to constructions of public and private domains, relations of citizenship and sovereignty, the militarization of everyday life, and the ways that the fabrics of societies are woven of both trust and deceit.

Restriction: Graduate students only.

**ANTHRO 257A. Natures and Environments. 4 Units.**

Examines social scientific understandings of natural contexts and human milieus via a survey of key analytic categories. Begins by examining historical and ongoing definitions and problems organized around "nature" and "environment" as separate but imbricated concepts.

**ANTHRO 259A. Dissertation Writing Seminar. 4 Units.**

Intended for advanced, post-fieldwork Anthropology graduate students. Emphasis on the presentation of research design and results, problems of ethnographic writing, and qualitative and quantitative data and analysis. Prerequisites: post-fieldwork; graduate standing in Anthropology or consent of instructor.

Restriction: Graduate students only.

**ANTHRO 289. Special Topics in Anthropology. 1-4 Units.**

Studies in selected areas of Anthropology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ANTHRO 290. Dissertation Research. 4-12 Units.**

Dissertation research with Anthropology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ANTHRO 299. Independent Study. 4-12 Units.**

Independent research with Anthropology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Arabic (ARABIC)

### Courses

**ARABIC 1A. Fundamentals of Arabic. 5 Units.**

Designed for students with little or no exposure to Arabic. Using real world texts, provides a firm foundation in the orthography, grammar, syntax, and vocabulary of Modern Standard Arabic. Introduces students to Arab world cultures.

Prerequisite: Placement into ARABIC 1A.

Overlaps with ARABIC S1AB.

Restriction: ARABIC 1A and ARABIC S1AB may not be taken for full credit.

**ARABIC 1B. Fundamentals of Arabic. 5 Units.**

Designed for students with little or no exposure to Arabic. Using real world texts, provides a firm foundation in the orthography, grammar, syntax, and vocabulary of Modern Standard Arabic. Introduces students to Arab world cultures.

Prerequisite: ARABIC 1A. ARABIC 1A with a grade of C or better. Placement into ARABIC 1B is also accepted.

Overlaps with ARABIC S1AB, ARABIC S1BC.

Restriction: ARABIC 1B and ARABIC S1AB and ARABIC S1BC may not be taken for full credit.

**ARABIC 1C. Fundamentals of Arabic. 5 Units.**

Designed for students with little or no exposure to Arabic. Using real world texts, provides a firm foundation in the orthography, grammar, syntax, and vocabulary of Modern Standard Arabic. Introduces students to Arab world cultures.

Prerequisite: ARABIC 1B or ARABIC S1AB. ARABIC 1B with a grade of C or better. ARABIC S1AB with a grade of C or better. Placement is also accepted.

Overlaps with ARABIC S1BC.

### (VI)

**ARABIC 2A. Intermediate Arabic Language and Culture. 4 Units.**

Designed for students to advance their Arabic language skills to intermediate level. Students will develop their understanding of grammar and syntax to a more sophisticated level. Facilitates intermediate-level reading, writing, and speaking skills. Fosters college-level cultural literacy.

Prerequisite: ARABIC 1C or ARABIC S1BC. ARABIC 1C with a grade of C or better. ARABIC S1BC with a grade of C or better. Placement into ARABIC 2A is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

### (VIII)

**ARABIC 2B. Intermediate Arabic Language and Culture. 4 Units.**

Designed for students to advance their Arabic language skills to intermediate level. Students will develop their understanding of grammar and syntax to a more sophisticated level. Facilitates intermediate-level reading, writing, and speaking skills. Fosters college-level cultural literacy.

Prerequisite: ARABIC 2A. ARABIC 2A with a grade of C or better. Placement into ARABIC 2B is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

### (VIII)

**ARABIC 2C. Intermediate Arabic Language and Culture. 4 Units.**

Designed for students to advance their Arabic language skills to intermediate level. Students will develop their understanding of grammar and syntax to a more sophisticated level. Facilitates intermediate-level reading, writing, and speaking skills. Fosters college-level cultural literacy.

Prerequisite: ARABIC 2B. ARABIC 2B with a grade of C or better. Placement into ARABIC 2C is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)****ARABIC 10A. Arabic Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. ARABIC 10A is for language mentors.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**ARABIC 10B. Arabic Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. ARABIC 10B is for language mentees.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**ARABIC 51. Introduction to the Koran. 4 Units.**

An introduction to understanding the Koran and its significance to Muslim life, culture, and history. An overview of scholarly traditions related to the Koran, and its critics. Close readings of the Koran in English translation.

**(IV, VIII)****ARABIC 199. Independent Study. 4 Units.**

Research paper required.

Repeatability: May be repeated for credit unlimited times.

## Armenian (ARMN)

### Courses

**ARMN 1A. Elementary Armenian. 5 Units.**

Written and conversational Armenian for students with no knowledge of the language. Students learn the Armenian alphabet, read and comprehend simple texts, and carry basic conversation. Emphasis on reading and comprehension, grammar rules, and basic composition.

Prerequisite: Placement into ARMN 1A.

**ARMN 1B. Elementary Armenian. 5 Units.**

Continues development of the fundamentals of Armenian, including comprehension, reading of simple texts, basic conversation, and writing with a fair degree of grammatical correctness. Students learn basic reading, writing, and sentence structure through lectures, games, and assignments.

Prerequisite: ARMN 1A. ARMN 1A with a grade of C or better. Placement into ARMN 1B is also accepted.

**ARMN 1C. Elementary Armenian. 5 Units.**

Focus on building grammatical knowledge of the Armenian language and developing skills in reading, writing, listening, and speaking. Includes a strong emphasis on expanding vocabulary and developing oral proficiency in higher/formal registers.

Prerequisite: ARMN 1B. ARMN 1B with a grade of C or better. Placement into ARMN 1C is also accepted.

**(VI)**

**ARMN 2A. Intermediate Armenian. 4 Units.**

Designed to develop students' ability to communicate further orally and in writing in Armenian (Western or Eastern) by consolidating knowledge of grammar, increasing vocabulary, and developing reading, comprehension, and writing.

Prerequisite: ARMN 1C. ARMN 1C with a grade of C or better. Placement into ARMN 2A is also accepted.

(VIII)

**ARMN 2B. Intermediate Armenian. 4 Units.**

Designed to develop students' ability to communicate further orally and in writing in Armenian (Western or Eastern) by consolidating knowledge of grammar, increasing vocabulary, and developing reading, comprehension, and writing.

Prerequisite: ARMN 2A. ARMN 2A with a grade of C or better. Placement into ARMN 2B is also accepted.

(VIII)

**ARMN 2C. Intermediate Armenian. 4 Units.**

Designed to develop students' ability to communicate further orally and in writing in Armenian (Western or Eastern) by consolidating knowledge of grammar, increasing vocabulary, and developing reading, comprehension, and writing.

Prerequisite: ARMN 2B. ARMN 2B with a grade of C or better. Placement into ARMN 2C is also accepted.

(VIII)

## Art (ART)

### Courses

**ART 1A. Art in Context: History, Theory, and Practice. 4 Units.**

First in a three-quarter foundation sequence introducing students to a broad range of contemporary art, media, and practices in relation to their twentieth-century cultural and historical antecedents. ART 1A deals specifically with contemporary painting and photography.

Restriction: Art Majors have first consideration for enrollment.

(IV)

**ART 1B. Art in Context: History, Theory, and Practice. 4 Units.**

Deals with film/video/performance. Concerned with the development of modern/contemporary film, video, and performance, with a focus on experimental and avant-garde production from the early twentieth-century to today.

Restriction: Art Majors have first consideration for enrollment.

(IV)

**ART 1C. Art in Context: History, Theory, and Practice. 4 Units.**

Third in a three-quarter foundation sequence introducing students to a broad range of contemporary art, media, and practice in relation to their twentieth-century cultural and historical antecedents. Deals specifically with space and cyberspace.

Restriction: Art Majors have first consideration for enrollment.

(IV)

**ART 8. Changing Creativity. 4 Units.**

Explores creativity as a changing concept in historical and contemporary terms from the perspectives of producers, consumers, and institutions. Encompasses international perspectives and the role of new technologies in considering creativity as a resource for innovation and social change.

(IV)

**ART 9A. Visual Culture: Media, Art, and Technology. 4 Units.**

Examines creative activities in all spheres of life, including the 'artistic' impulses that dwell in the individual. Culture is addressed in broad terms of the many institutions and cultural forces that shape everyday activities of listening, seeing, doing.

Restriction: Art Majors have first consideration for enrollment.

(IV)

**ART 9B. Visual Culture: A Culture Divided. 4 Units.**

Throughout the 1980s and 1990s, controversies flourished in the mainstream media over purportedly obscene art, anti-American writing, and moral decay, among other issues. Examines these new conflicts as they manifest themselves in public life and everyday experience.

Restriction: Art Majors have first consideration for enrollment.

(IV)

**ART 9C. Visual Culture: Thematic Investigations. 4 Units.**

Considers a broad range of concerns and questions raised by various acts of appropriation in contemporary art and visual culture, such as originality, authenticity, authorship, translation, audience and aesthetics, temporal dimensions of a work, and context.

Restriction: Art Majors have first consideration for enrollment.

(IV)

**ART 11A. Topics in History of Contemporary Art. 4 Units.**

Surveys mid-nineteenth and twentieth-century art production, from modernity through post-modernity, in a historical and cultural context.

Prerequisite: ART 9A

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Art Majors only.

**ART 12A. Art, Design, and Electronic Culture. 4 Units.**

Introduction to historical and theoretical foundations of digital media art, tracing how information technologies seeded growth of new expressive medium. Considers how today's pervasive digital culture evolved through interdisciplinary collaborations between artists, engineers, scientists, scholars.

(IV)

**ART 12B. Technology, Culture, and Society: Steam to Steampunk. 4 Units.**

A survey of the ongoing interactions between technological and social change through the 19th century and 20th century, with special attention to the history of computing, changing arts and cultural practices, and the idea of the Anthropocene.

(IV)

**ART 12C. Intelligences of Arts. 4 Units.**

Introduces contemporary neuroscience and new approaches to cognition – embodied, enactive, extended, situated, distributed. Reviews the history of related ethological, biological, psychological, technological, and philosophical traditions. Considers arts and cultural practices from these and other perspectives, and considers case studies.

(III)

**ART 20A. Basic Drawing I. 4 Units.**

Encourages an investigation of the premises and limits of drawing, primarily, but not inevitably, as a two-dimensional medium. Includes slide presentations and discussions of the historical uses of a wide range of drawing. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 20B. Basic Drawing II. 4 Units.**

Continuation of the investigation initiated in ART 20A, with an emphasis on experimentation, personal investigation, and development of conceptual working premises, as well as the acquisition of necessary skills. Group discussion and critique are emphasized. Materials fee.

Prerequisite: ART 20A

Restriction: Art Majors have first consideration for enrollment.

**ART 30A. Basic Painting I. 4 Units.**

Examination of the fundamental components of painting: color, form, space, surface, scale, and content. Studio work, slide presentations, and critiques of student work. Materials fee.

Restriction: Art Majors have first consideration for enrollment.



**ART 30B. Basic Painting II. 4 Units.**

Further examinations of the essential qualities of painting: color, form, space, surface, scale, and content. Studio work, slide presentations, and critiques of student work. Materials fee.

Prerequisite: ART 30A

Restriction: Art Majors have first consideration for enrollment.

**ART 40. Basic Sculpture. 4 Units.**

The practice of sculpture in the contemporary arts; inclusion of spatial interventions, site-specific and environmental design, appropriation of found materials; techniques in cutting joining, and assembly of wood, metals, and plastics. May include casting, welding, and ceramics. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 50A. Matter and Media . 4 Units.**

A project-based introduction to tools and approaches for creating and sharing digital media content within Internet-mediated social environments, with a particular emphasis on art-making and personal expression. Includes an overview of basic user experience and interaction design principles.

**ART 50B. Interaction and Experience. 4 Units.**

An overview of digital video and audio production for the Web, emphasizing art-making and personal expression. Includes digital media aesthetics and conceptual design, basic audio and video recording, and fundamentals of desktop video, audio, and Web authoring software applications.

Prerequisite: ART 50A

**ART 50C. Digital Media: Interaction Design. 4 Units.**

Principles and practices of interaction design for interactive digital media systems that provide for active involvement of the participant. Students gain experience with interaction design issues through a series of media art projects, emphasizing art-making and personal expression.

Prerequisite: ART 12A and ART 12B and ART 50A and ART 50B

**ART 51. Basic Ceramic Sculpture. 4 Units.**

Exploration of use of clay as sculptural basis with an emphasis on development of an idea and its relation to contemporary and experimental art practice. Hand-building, glazing, finishing processes, and use of other structural materials. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 65A. Foundations in Media Design. 4 Units.**

Provides an overview of media design in the digital age, covering principles of design for different media (2D, time-based, interactive); history of relationship between art and design; and practice in working with different design approaches. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 65B. Foundations in Internet Art and Design. 4 Units.**

Introduction to creating art for the Internet, covering history and structure of networks; key types of net-based interactivity; basics of Web design and scripting. Materials fee.

Prerequisite: ART 65A. Recommended: ART 11B.

Restriction: Art Majors have first consideration for enrollment.

**ART 65C. Gizmology and Kinetics. 4 Units.**

Provides students with basic skills in materials, construction and design applicable to making machines, musical instruments and things with moving parts enabling work in kinetic sculpture, custom interactive systems, Mechatronics, Robotics, and Maker/DIY culture. Materials fee.

**ART 71A. Introduction to Photography I. 4 Units.**

Introduction to technical underpinnings emphasizing photography as a contemporary art practice. Topics include 35mm non-automatic camera operation, exposure and lighting, black and white printing, introduction to digital photography, discussion of critical and historical issues. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 71B. Introduction to Photography II. 4 Units.**

Techniques covered include medium and large format cameras, digital photography, studio lighting, digital and analog color printing, mural room. Conceptual direction is developed through critiques, critical readings, discussions, slide lectures. Materials fee.

Prerequisite: ART 71A

Restriction: Art Majors have first consideration for enrollment.

**ART 81A. Digital Filmmaking Production I. 4 Units.**

Introduction to three production stages of video making. Study of the narrative structure of cinema and acquisition of video production skills in camera, lighting, sound, and editing. Production work, readings, and screenings outside of class are assigned. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 81B. Digital Filmmaking Production II. 4 Units.**

Focuses on video stage production, technical skills including camera operation, stage lighting, sound recording, and construction of basic scenic elements. Emphasis is placed on the function and responsibilities of the production crew and proper working and safety procedures. Materials fee.

Prerequisite: ART 81A

Restriction: Art Majors have first consideration for enrollment.

**ART 91. Basic Performance Art. 4 Units.**

Exploration of objects, gesture, action, text, image, and media to create narrative or non-narrative works. Elements of theory and history of performance art are discussed to illustrate techniques and styles to understand, identify, and articulate artistic vision and voice.

Repeatability: May be taken for credit 2 times.

Restriction: Art Majors have first consideration for enrollment.

**ART 95. SPECIAL TOPICS IN BASIC MEDIA. 4 Units.**

Basic instruction in media or disciplines not otherwise represented in the regular curriculum. Topics vary according to the instructor.

Repeatability: Unlimited as topics vary.

Restriction: Art Majors have first consideration for enrollment.

**ART 100. Special Topics in Art. 4 Units.**

Materials fee, topic dependent.

Prerequisite: ART 9A. Lower-division writing strongly recommended.

Repeatability: May be taken for credit 6 times as topics vary.

Restriction: Art Majors only.

**ART 101W. Artists as Writers. 4 Units.**

Contemporary art practice involves text, as final form or an integral element. Many contemporary artists consider writing as essential to their practice. Covers historical and contemporary uses of text and image as well as artists' writing.

Prerequisite: ART 9A and ART 11A. Satisfactory completion of the lower-division writing requirement.

Restriction: Art Majors only.

**(Ib)**

**ART 106A. Programming for Artists. 4 Units.**

Programming as a means to create interactive artworks with an emphasis on the integration of video, sound, text, and stills. Topics include basic concepts in programming, understanding the limits of code, working with video and audio files, interface design. Materials fee.

Prerequisite: ART 65A. Recommended: ART 11B.

Repeatability: May be taken for credit 2 times.

Restriction: Art Majors only.

**ART 106C. Design for Print. 4 Units.**

Investigates the use of print for communication as an artist. Covers the fundamentals of print design and output using digital media. Materials fee.

Prerequisite: ART 65A. Recommended: ART 11B.

Repeatability: May be taken for credit 2 times.

Restriction: Art Majors only.

**ART 108. Digital Filmmaking Project I. 4 Units.**

Students learn to conceive, develop, and produce original video works building directly upon previously learned skills. Use of video stage and post-production editing facilities. Lectures on video/film subjects, production strategies, readings, screening, field trips, and group critiques. Materials fee.

Prerequisite: ART 81A and ART 81B

Restriction: Art Majors only.

**ART 109. Performance and the Camera. 4 Units.**

Surveys the development of contemporary artists who use performance strategies in the making of videos and films. Students analyze the artist's conceptual approach to performative gestures, actions, and landscapes created for their video or film art.

Prerequisite: ART 1B or ART 81A or ART 91 or ART 128

Restriction: Art Majors only.

**ART 110A. Mechatronic Art I. 4 Units.**

Introduces the practice and theory of analog electronics, emphasizing the design and development of simple interactive systems and the integration of such systems into real-world contexts of performance, installation, sculpture, and automated artifacts. Materials fee.

**ART 110B. Mechatronic Art II. 4 Units.**

Introduces the practice and theory of embedded microcontrollers, digital electronics, coding, sensor interfacing, motor control, and output stages along with mechanical and electromechanical design and construction, emphasizing the integration of such systems into real-world contexts of performance, installation, and art-making. Materials fee.

Prerequisite: ART 110A

**ART 110C. Mechatronic Art III. 4 Units.**

As the capstone to the Mechatronic Art series, students develop major projects utilizing electronics, microcontrollers, sensors, and electromechanical devices, in a methodical and supervised context, with technical, design, and aesthetic advice and critique. Materials fee.

Prerequisite: ART 110A

**ART 113. How to be Clever with Stuff. 4 Units.**

How to Be Clever with Stuff is an introduction to the skilled embodied practices of arts and crafts, working with hand tools, wood, and steel. Class includes technical lecture/demos, short technical assignments, a self-initiated final project, and design drawing. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 115W. Writing Nearby. 4 Units.**

Art writing is increasingly an area of scholarship unto itself as well as a discursive arm of contemporary art practice. Investigates the politics of art writing as well as training students in its various writing practices.

Prerequisite: ART 9A and ART 11A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only.

**(Ib)****ART 119. Issues in Contemporary Painting. 4 Units.**

Investigation of issues in modern and contemporary art work and criticism, wherein an assessment of Modernist influences is followed by the examination of contemporary painting as a cross-disciplinary practice employing popular culture, 'high art,' theory, and new technology.

Prerequisite: ART 9A. Recommended: Satisfactory completion of the upper-division writing requirement.

Repeatability: May be taken for credit 2 times.

Restriction: Art Majors only.

**ART 119A. Issues in Contemporary Drawing. 4 Units.**

Investigation of drawing as a primary practice rather than a developmental tool. Explores the relationship between Conceptualism, process and content, and considers the historical changes in method, presentation, and theory, from past to present.

Prerequisite: ART 9A

**ART 121A. Afro-Futurism I. 4 Units.**

First of a two-part course on the futuristic artistic vision of Black film, video, and cyberspace. Deals with critical analyses of the Black image in Western Art history, and its association to contemporary Hip Hop culture, art, and music.

Prerequisite: ART 9A. Satisfactory completion of upper-division writing strongly recommended.

Restriction: Art Majors only.

**ART 121B. Afro-Futurism II. 4 Units.**

Second of a two-part course on the futuristic artistic visions of Black film, video, and cyberspace. Deals with modern techno-culture, digital activism, and designing technology based on African aesthetic principles of contemporary Hip Hop International Culture.

Prerequisite: ART 9A. Satisfactory completion of upper-division writing strongly recommended.

Restriction: Art Majors only.

**ART 123B. Issues in Media, Violence, and Fear. 4 Units.**

Violence has been instrumental in story-telling throughout history in art, literature, religion, and entertainment. Continuing presence of media violence provoked debates among parents, politicians, media producers, and academics. Examines history, theory, aesthetics, economics, and politics of violent representation.

Prerequisite: ART 9A. Satisfactory completion of the Upper-Division Writing requirement is recommended.

Restriction: Art Majors only.

**ART 125. Issues in Photography. 4 Units.**

Rigorous investigation of photographic practices and critical writings, the relationship of photography to the construction and maintenance of cultural institutions, the circulation of photographic ideas in society, and photography and technology.

Prerequisite: ART 1A or ART 71A or ART 71B or ART 152A or ART 152B or ART 152C or ART 152D or ART 152E or ART 190B. Recommended: Satisfactory completion of the Upper-Division Writing requirement.

Repeatability: May be taken for credit 2 times.

Restriction: Art Majors only.

**ART 126. Issues in Media and Migration: Asia. 4 Units.**

Media and migration are profound, twinned influences on contemporary globalized experience. A discourse on Asian cultural production and of its transnational dimensions. Students will explore migration in its multiple facets to include migrations of people, ideas, and technologies.

Prerequisite: ART 9A

**ART 126B. Issues in Techno-Arts. 4 Units.**

Addresses issues related to artmaking practices that emerge in tandem with new technologies. Topics include sociopolitical contexts of techno-art; utopic/dystopic framings; key moments in the history of techno-arts.

Prerequisite: ART 9A. Recommended: ART 11B.

Restriction: Art Majors only.

**ART 127B. Issues in Experimental Film History. 4 Units.**

A critical study of experimental film/video art genres and production techniques considering their narrative, structural, iconographic, and cultural aspects. Hollywood narrative, Nouvelle Vague, American Independent, and Video Art compared in terms of production innovation, design, and conceptual content. Materials fee.

Prerequisite: ART 9A

Restriction: Art Majors only.

**ART 128. Issues in New Genres. 4 Units.**

Investigates issues in post-studio practices, including concepts of time, relational aesthetics, site-specificity, institutional critique, and the post-medium condition.

Prerequisite: ART 9A. Recommended: Satisfactory completion of the Upper-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Art Majors only.

**ART 130A. Projects in New Technologies. 4 Units.**

Working with media such as electronic still cameras, desktop publishing, faxes, satellites, virtual reality, digitized imaging. Cultural issues pertinent to the emergence of new technology (e.g., ethical concerns, social impact, copyright laws, nontraditional approaches to distribution, cyberpunk, global markets).

Prerequisite: ART 65A. Recommended: ART 11B and ART 106A.

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 131. Projects in Installation. 4 Units.**

Investigates interior installation in particular spaces. Working in teams, students install, discuss, and remove projects. Technical information and hands-on experience with various media is provided. Materials fee.

Prerequisite: ART 40

Repeatability: May be repeated for credit unlimited times.

**ART 132A. Digital Filmmaking Pre-Production. 4 Units.**

Examines the preparatory and planning stages of video production, including script writing, story boarding, location scouting, script breakdown, and budgeting. Projects may encompass one or more of these stages which will be explored through readings, discussions, and demonstrations. Materials fee.

Prerequisite: ART 81A and ART 81B

Restriction: Art Majors only.

**ART 132B. Digital Filmmaking Post-Production. 4 Units.**

Examines procedures and techniques utilized in video production after principal shooting is completed, including effects processing, composting, sound design, and DVD authoring. Projects focus on these processes, and are explored through readings, discussions, and demonstrations. Materials fee.

Prerequisite: ART 81A and ART 81B

Restriction: Art Majors only.

**ART 133. The Graphic Novel . 4 Units.**

An intensive workshop during which students will create a short graphic novel, taking the process all the way from concept to publication. Course work will focus on understanding how narrative emerges from a combination of visual and textual elements.

Prerequisite: ART 65A. Strongly recommended: ART 106C.

**ART 138. Place Making and Public Art. 4 Units.**

How do art interventions in public spaces inform our definition of 'place' and develop culturally informed audiences? Students will engage in class projects and group investigations that question the traditional and institutional conceptual boundaries of exhibition/distribution.

Prerequisite: ART 40 and ART 9A

Restriction: Art Majors only.

**ART 141. Digital Filmmaking Advanced Project I. 4 Units.**

Incorporating narrative structures in a multi-screen context. Students design and produce an active space in which activities will move from one screen to another. Materials fee.

Prerequisite: ART 81A and ART 81B

Restriction: Art Majors only.

**ART 144. Artist Books as Objects. 4 Units.**

Are artist books still relevant in the contemporary creative community? Focusing on intellectual content and raw physicality, students will explore this question and image/text relationships by creating handmade one-of-a-kind or edition book projects utilizing various mechanical reproduction techniques.

Prerequisite: (ART 20A or ART 30A or ART 40 or ART 51 or ART 65A or ART 71A or ART 81A or ART 91) and ART 9A

**ART 150. Advanced Studio Topics--Painting. 4 Units.**

Provides an intensive and specialized working environment. Thematic issues and material strategies will be explored. Materials fee.

Prerequisite: ART 30B

Repeatability: Unlimited as topics vary.

Restriction: Art Majors only.

**ART 150C. Advanced Drawing . 4 Units.**

Advanced studio problems in visual exploration. Students pursue individual solutions to self-defined and presubscribed projects. Techniques/materials are individual choice. Continual analysis of the personal process.

Prerequisite: ART 20B

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 150F. Advanced Figure Drawing. 4 Units.**

Students develop technical skills in rendering the figure. Live model sessions and an introduction to anatomy. Investigates use of the figure in contemporary art. Materials fee.

Prerequisite: ART 20B

Repeatability: May be taken for credit 2 times.

Restriction: Art Majors only.

**ART 150G. Advanced Figure Painting. 4 Units.**

Students develop technical skills in painting the figure. Live model sessions and projects that investigate the use of the figure in contemporary art.

Prerequisite: ART 150F

**ART 151. Advanced Studio Topics--Sculpture. 4 Units.**

Provides an intensive and specialized working environment. Thematic issues and material strategies will be explored. Materials fee.

Prerequisite: ART 40

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 152A. Advanced Studio Topics: Photography. 4 Units.**

Focused investigation of a range of issues in photographic practice, with an emphasis on developing individual student projects, refining critical thinking, and conceptual framing. Technical topics covered as required. Readings, lectures, critiques, labs. Materials fee.

Prerequisite: ART 71B

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 152B. Documentary Photography. 4 Units.**

Documentary practice is examined through the realization of photo-based projects. Thematic focus of student's choosing will be refined through lectures, discussion, technical demonstrations, field trips, labs, and individual meetings. Materials fee.

Prerequisite: ART 71B

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 152C. The Public Image. 4 Units.**

Strategies for artistic intervention in the public circulation of images are examined alongside the role images play in constructing public identity. Individual or collaborative student projects will be directed around course themes. Materials fee.

Prerequisite: ART 71B

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 152D. The Photographic Tableau. 4 Units.**

Examines and develops photographic projects intended for traditional artistic venues (i.e., galleries and museums). In addition to exploring appropriate techniques and presentation strategies, students consider the interdependency between construction of images and semantic shaping of traditional art venues. Materials fee.

Prerequisite: ART 71B

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 152E. The Constructed Image. 4 Units.**

A studio investigation of theoretical ideas, critical possibilities, historical precedents, and various techniques involving the production of fabricated images. Techniques may include montage, digital, chemical and in-camera manipulations, studio constructions, appropriations, performance, and projected images. Materials fee.

Prerequisite: ART 71B

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 152F. Seminar Production Component. 4 Units.**

Photographic and/or inter-media production course tied to a specific Issues course (for example, Issues in Photography, Issues in Feminism, Issues in New Genres). Critiques, labs, field trips, discussion, demonstrations. Materials fee.

Prerequisite: ART 71B

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 153. Digital Filmmaking Advanced Project II. 4 Units.**

Directed to the production of individual or collaborative videotapes, using studio, portable camera, editing facilities, and sound and computer elements. Emphasis will be on individually initiated projects. Readings and screenings are assigned. Materials fee.

Prerequisite: ART 81A and ART 81B

Restriction: Art Majors only.

**ART 154. Advanced Studio Topics: Performance. 4 Units.**

An intensive investigation of the practice of performance art, with an emphasis on the development of individual projects, and the refinement of various technical skills, as well as audiences, spaces, and cultural connections.

Prerequisite: ART 91 or ART 109 or ART 128

Repeatability: May be taken for credit 3 times.

Restriction: Art Majors only.

**ART 156. Advanced Studio Topics: Ceramic Sculpture. 4 Units.**

Discussion of ideas, techniques, and personal control of form. Clay body, fabrication, glazing, and firing. Emphasis on development of personal direction. Materials fee.

Prerequisite: ART 51

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 166A. Digital Filmmaking Web Series. 4 Units.**

Original video projects produced in collaborative teams combining advanced video students with students from other areas, including Dance, Drama, and Music. Shoots may be carried out on the video stage as well as field locations. Materials fee.

Prerequisite: ART 81A and ART 81B

Restriction: Art Majors only.

**ART 170. Advanced Projects. 4 Units.**

Students working in different mediums will focus on ambitious research, planning, development, and experimentation, leading to a single work or focused series that is large in scope. The project will be exhibited and documented at the end of the quarter. Materials fee.

Prerequisite: ART 150 or ART 150C or ART 151 or ART 152A or ART 152B or ART 152C or ART 152D or ART 152E or ART 152F or ART 153 or ART 166A or ART 190 or ART 190B or ART 190C

Restriction: Art Majors only.

**ART 189. Critical Aesthetics . 4 Units.**

Surveys critical thought that has influenced twentieth-century art production, preparing the student to engage contemporary art with a critical eye, specifically addressing aesthetic and political debates of the historical avant-garde, the neo-avant garde, and postmodern culture.

Prerequisite: ART 1A and ART 1B and ART 1C

Restriction: Upper-division students only. Art Majors only.

**ART 190. Senior Project and Critique. 4 Units.**

Directed-study critique class in preparation for final project and life after graduation; documentation and portfolio preparation for graduate school. Investigation of exhibition spaces and funding opportunities, participation in artists' communities outside the university, and artists' rights issues.

Repeatability: May be repeated for credit unlimited times.

Restriction: Seniors only. Art Majors only.

**ART 190B. Senior Projects and Critique in Photography. 4 Units.**

Directed group study focused on production of photographic projects of significant scope and ambition. Emphasis on preparation for continued study and/or practice in photography in advanced settings beyond the undergraduate university experience. Materials fee.

Prerequisite: ART 1A and ART 1B and ART 1C and ART 71A and ART 71B

Repeatability: May be repeated for credit unlimited times.

Restriction: Seniors only. Art Majors only.

**ART 197. Art Internship. 1-4 Units.**

Under faculty supervision, students participate directly in a variety of art institution settings, including museums, galleries, and nonprofit organizations.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

Restriction: Juniors only.

**ART 198. Honors Exhibition. 4 Units.**

Preparation, installation, and participation in the annual honors exhibition. Materials fee.

Grading Option: Pass/no pass only.

Restriction: Upper-division students only. School of Arts Honors students only.



**ART 199. Independent Study. 1-4 Units.**

Individual study or directed creative projects as arranged with faculty member. Materials fee.

Repeatability: May be repeated for credit unlimited times.

**ART 210. First-Year Graduate Seminar. 4 Units.**

Introductory theory class to contemporary art: intellectual history, theoretical antecedents, and current critical concerns.

Restriction: Graduate students only.

**ART 215. Graduate Seminar Topics. 4 Units.**

In-depth discussion of contemporary art production in relation to a variety of theoretical, cultural, and historical topics. Material is determined by the given instructor's current research interest. Topics vary.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ART 220. Graduate Seminar: Issues in Contemporary Art. 4 Units.**

Classroom interaction with artists, curators, critics, lecturers from fields outside of the arts or from cross-disciplines. Includes recommended readings, discussions, panel participation, writing assignments.

Prerequisite: ART 210

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**ART 230. Graduate Group Critique. 4 Units.**

Focus on studio production. Students are expected to help foster and develop an environment in which serious and sophisticated peer critique can take place.

Repeatability: May be taken for credit 9 times.

Restriction: Graduate students only.

**ART 236. Graduate Topics in Studio Production. 4 Units.**

Graduate group study of a specific medium or art practice (e.g., painting; video, installation, photography, sculpture/3D, performance, digital media, public art, sound art; film). Includes consideration of technical, theoretical, historical, and/or formal issues.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ART 240. Interdisciplinary Projects. 4 Units.**

Intensive faculty-led discussion of in-progress graduate studio projects--can be discipline driven or working across fields in a rigorous interdisciplinary studio environment where students meet with the professor both individually and in small groups.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ART 250. Directed Reading and Research. 4 Units.**

Independent study with a supervising faculty member to direct academic research, develop bibliographies, and discuss assigned readings.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ART 251. Special Topics Seminar. 4 Units.**

Directed reading and/or study group on a given research topic. Agreed-upon meeting structure may be flexible in order to accommodate off-campus field trips and travel.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ART 255. Graduate Interdisciplinary and Collaborative Projects. 4 Units.**

For graduate students working collaboratively across the School of the Arts or cross-university. May be team taught with one of the faculty members based in the Department of Art.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ART 261. Graduate Thesis Writing Seminar. 4 Units.**

Seminar for writing as a component of the thesis. Different models of writing, text, and spoken word will be discussed. Required second year.

Corequisite: ART 262

Prerequisite: ART 210 and ART 215 and ART 220

Restriction: Graduate students only.

**ART 262. Graduate Thesis Independent Study. 1-4 Units.**

Tutorials and directed study in thesis writing, research and/or studio production with thesis committee chair and/or thesis committee members to be taken during final quarters of study.

Corequisite: ART 261

Prerequisite: ART 210 and ART 215 and ART 220

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ART 263. Graduate Thesis, Exhibition Critique. 4 Units.**

Group critique required for matriculating M.F.A. students during the quarter in which their thesis exhibitions are scheduled. Public presentation/lecture on student's work required.

Prerequisite: ART 210 and ART 215 and ART 220 and ART 230 and ART 240 and ART 261 and ART 262

Restriction: Graduate students only.

**ART 264. Critical and Curatorial Thesis Exhibition. 8 Units.**

Intensive tutorial geared toward execution of professional gallery exhibition, which is one half of the degree requirement for the M.F.A. concentration in Critical and Curatorial Studies. Must be taken under direction of Committee Chair.

**ART 280. Contemporary Exhibition Systems. 4 Units.**

Investigates contemporary case studies of curatorial practice. Sometimes taught in collaboration with a host institution. The history, theory and criticism or curatorial practice are tested through the explication of real exhibitions.

Prerequisite: ART 280A

Repeatability: May be taken for credit 4 times.

**ART 280A. Introduction to Exhibition Systems. 4 Units.**

Introduces the basics of curating, covering the fundamentals of collection, research, fundraising, publicity, and installation. Also introduces the related categories of public programming and art criticism.

Restriction: M.F.A. students only.

**ART 399. University Teaching. 4 Units.**

Limited to Teaching Associates working under the active guidance and supervision of a regular rank faculty member responsible for curriculum and instruction at the University.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit for 12 units.

Restriction: Graduate students only.

# Art History (ART HIS)

## Courses

### **ART HIS 40A. Ancient Greek and Roman Art, and Architecture. 4 Units.**

An overview of Greek and Roman art, and related ancient visual cultures. Considers how and why the peoples of antiquity created art and architecture, as well as the significance of these works within their social, religious, and historical contexts.

(IV and VIII ).

### **ART HIS 40B. Arts of Europe: Medieval and Renaissance. 4 Units.**

Focuses on the art of the Mediterranean area and Europe between ca. A.D. 350 and 1600. By means of movements and artists, examines the cultural identities of the Christian, Islamic, and Early Modern worlds.

(IV, VIII)

### **ART HIS 40C. Early Modern and Modern Art in Europe and America. 4 Units.**

The visual arts from the seventeenth to the twenty-first centuries. Explores the purposes and meaning of painting, sculpture, and architecture in relation to artists, viewers, and historical events.

(IV, VIII)

### **ART HIS 42A. History of Asian Art: Arts of India. 4 Units.**

Emphasizing Hindu, Buddhist, and Islamic art of greater India (Pakistan, Bangladesh, Sri Lanka) from proto-historic to modern times. Themes include art as a source of history, commercial and religious pan-Asian connections, nationalism, and modern versus historical identities.

(IV, VIII)

### **ART HIS 42B. History of Asian Art: Arts of China. 4 Units.**

An introduction to the arts and visual culture of China from Neolithic to modern times. Themes includes the representation of power, death and the afterlife, popular culture and elite arts, landscape and women's painting, and concludes with contemporary China.

(IV, VIII)

### **ART HIS 42C. History of Asian Art: Arts of Japan. 4 Units.**

Examines compelling images and objects of spirit and power created in Japan over many centuries. Themes include Buddhist icons, narrative illustration, popular prints, architecture, manga, and the avant-garde. Japanese interactions with Korean, Chinese, and European culture are emphasized.

(IV, VIII)

### **ART HIS 42D. History of Asian Art: Arts of Islam. 4 Units.**

Examines past and present Islamic art, spanning 1,500 years and extending from the Americas through Indonesia. Themes include Islam as a globalizing force, the definition of 'Islamic,' and the competing roles of religion and politics in making art.

(IV, VIII)

### **ART HIS 42E. Art and Archaeology of Ancient Persia, Egypt, and Mesopotamia. 4 Units.**

An introduction to the art and archaeology of ancient Egypt, Mesopotamia, Anatolia, Persia, and the wider Iranian world from the Neolithic to the coming of Islam. Considers wider impact on the ancient and early medieval worlds and their present legacy.

(IV and VIII ).

### **ART HIS 44. Image Collision: A Multicultural Approach to Images and Their Users. 4 Units.**

Comparisons between present-day visual culture and pre-modern art to re-evaluate the ways in which one understands the contemporary histories of underrepresented groups in the United States.

(IV and VII ).

### **ART HIS 55. Disneyland. 5 Units.**

From Dole Whips to roller coasters, the focus is on the innovations in industrial automation and manufacturing that made Disneyland's attractions possible. Discusses fandom, guest experiences, operating procedures, technical and design patents, and how rides work.

(II and IV ).

**ART HIS 100. Studies in Ancient Art . 4 Units.**

Topics in Egyptian, Prehistoric, and Etruscan art of the Mediterranean area treated with specific reference to relevant cultural and historical settings. Specialized courses in Greek and Roman art are also taught.

Repeatability: Unlimited as topics vary.

**ART HIS 103. Studies in Greek Art. 4 Units.**

Topics in Greek art, architecture, and topography from the Prehistoric period through the end of the fourth century B.C.E.

Repeatability: Unlimited as topics vary.

**ART HIS 107. Studies in Roman Art. 4 Units.**

Topics in Hellenistic and Roman art and architecture; stresses historical and political background.

Repeatability: Unlimited as topics vary.

**ART HIS 110. Studies in Medieval Art. 4 Units.**

Specialized topics in Medieval art and architecture in Europe, the Mediterranean area, and the Near East between the fourth and fifteenth centuries. Examples: the Art of the Migration Period, Medieval City.

Repeatability: Unlimited as topics vary.

**ART HIS 111B. Byzantine Art: 650-1450. 4 Units.**

Studies in the development of the art and architecture of the Byzantine Empire between ca. 650 and 1450.

**ART HIS 112. Studies in Early Christian and Byzantine Art. 4 Units.**

Selected topics on the development of the art and architecture of the Later Roman and Byzantine Empires between ca. 300 and 1453. Examples: Early Christian architecture, Byzantine painting.

Repeatability: Unlimited as topics vary.

**ART HIS 114. Studies in Western Medieval Art. 4 Units.**

Selected topics on the development of art and architecture in Western Europe between ca. 700 and 1400. Examples: Romanesque painting, Gothic architecture.

Repeatability: Unlimited as topics vary.

**ART HIS 120. Studies in Renaissance and Baroque Art. 4 Units.**

Selected topics on the art and architecture of Europe between the fifteenth and eighteenth centuries. Examples: Renaissance and Baroque prints, Bruegel to Rubens.

Repeatability: Unlimited as topics vary.

**ART HIS 121. Studies in Southern Renaissance Art. 4 Units.**

Selected topics determined by individual faculty members exploring historical developments and individual artists of the fifteenth and sixteenth centuries in Italy and Spain. Examples: Renaissance Venice, Age of Michelangelo.

Repeatability: Unlimited as topics vary.

**ART HIS 123. Studies in Northern Renaissance Art. 4 Units.**

Selected topics determined by individual faculty members exploring historical developments and individual artists of the fifteenth and sixteenth centuries in Northern Europe. Examples: Late Medieval art, painting from Van Eyck to Bosch.

Repeatability: Unlimited as topics vary.

**ART HIS 125. Studies in Southern Baroque Art. 4 Units.**

Selected topics determined by individual faculty members exploring historical developments and individual artists of the seventeenth and eighteenth centuries in Italy and Spain. Example: Rome in the seventeenth century.

Repeatability: Unlimited as topics vary.

**ART HIS 128. Studies in Northern Baroque Art. 4 Units.**

Selected topics determined by individual faculty members exploring historical developments and individual artists of the seventeenth and eighteenth centuries in Northern Europe. Example: the Age of Rembrandt.

Repeatability: Unlimited as topics vary.

**ART HIS 134C. Modern European Art: From Impressionism to the Fauves. 4 Units.**

History of European painting and urban transformation from 1851 to 1907, when Paris stood strong as the unquestioned cultural capital of the nineteenth century.

**ART HIS 134D. Modern European Art: From Cubism to Surrealism. 4 Units.**

History of European painting, sculpture, and design from 1907 to 1940, when Paris and painting lost their dominance as other cultural centers and other media claimed renewed importance.

**ART HIS 134E. Topics in Modern European Art. 4 Units.**

Selected topics within the period 1643 to 1940.

Repeatability: Unlimited as topics vary.

**ART HIS 140A. History of Contemporary Art. 4 Units.**

Selected topics exploring historical developments of contemporary art from 1945 to the present. Examples: American Art 1945-1989, European Art 1945-1989, Art After 1989. Works of art are studied as cultural, social, and political practices.

Repeatability: Unlimited as topics vary.

**ART HIS 140B. Topics in Contemporary Art. 4 Units.**

Selected topics exploring artistic movements, artists, and/or issues in contemporary art from 1945 to the present. Examples include Junk Art, Countercultures, Art and Politics Now. Works of art are studied as cultural, social, and political practices.

Repeatability: Unlimited as topics vary.

**ART HIS 145A. Studies in Modern Architecture. 4 Units.**

Architecture and related design practices from the late eighteenth century through 1945 are studied in relation to social, aesthetic, technological, and political questions.

Repeatability: Unlimited as topics vary.

**ART HIS 145B. Studies in Architecture after 1945. 4 Units.**

Architecture and related design practices from 1945 through present are studied in relation to social, aesthetic, technological, and political questions.

Repeatability: Unlimited as topics vary.

**ART HIS 145C. Topics in the History of Modern and Contemporary Architecture. 4 Units.**

Varying topics from the late eighteenth century to the present. Architecture and related design practices are studied in relation to social, aesthetic, technological, and political questions.

Repeatability: Unlimited as topics vary.

**ART HIS 150. Studies in Asian Art. 4 Units.**

Topics include visual studies in China, Japan, Korea and India.

Repeatability: Unlimited as topics vary.

**ART HIS 151B. Later Imperial China. 4 Units.**

Investigates the uses, subjects, styles, and social contexts of art made in the later Imperial dynasties, whether court art, religious art, women's painting, scholar painting, or art for the market.

**ART HIS 151C. Modern China. 4 Units.**

Examines the evolution and media of Chinese art and visual culture in the context of modern China's sweeping historical, social, and political changes.

**ART HIS 155A. Ancient India. 4 Units.**

Examines the visual and religious history of the region defined as 'India' today, but necessarily encompassing modern Bangladesh and Pakistan. Culminates with the supposed Golden Age of the Gupta empire and its far-reaching legacies.

Same as HISTORY 170A, REL STD 122.

Concurrent with ART HIS 255A.

**ART HIS 155B. Medieval India. 4 Units.**

Begins with the Gupta period's aesthetic legacies in South Asia's architecture, sculpture, and painting. Explores the dispersal of Islam throughout South Asia, including the Muslim communities of southern India.

Same as HISTORY 170B, REL STD 123.

Concurrent with ART HIS 255B.

**ART HIS 155C. Modern India. 4 Units.**

Examines the imperial patronage of the Mughal emperors, covering their territorial holdings extending from Afghanistan through western Bangladesh. Continues with the 'aftermath' of the Mughal empire and the rise of British commercialism and colonialism.

**ART HIS 155D. Topics in the Art and Architecture of India. 4 Units.**

Studies in selected areas of Art and Architecture of India. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**ART HIS 156. Art and Globalization, Modern. 4 Units.**

Study of modern art as a cause and expression of increasing contacts between cultures. Focusing on regions in Asia and the Americas, adoption of European oil painting, indigenous art movements, and national capital architecture are explored.

**ART HIS 162C. Contemporary Japan. 4 Units.**

Study of various media of Japanese art from the time of war defeat in 1945 until the present. Topics include artists' responses to the nuclear bomb, the aesthetics of the 'economic miracle,' avant-garde groups, manga, and innovations in architecture.

**ART HIS 163. Asian American Art, Contemporary. 4 Units.**

Study of the Asian American experience in contemporary art and visual culture. Art by Asian Americans of diverse backgrounds as well as the history of visualization of Asian identities in American art/visual culture.

**ART HIS 164A. Modern African American Art. 4 Units.**

Investigates the history of modern African American art; emphasis on the politics of representation. Examines art in a variety of media from material culture and textiles to painting and photography. Issues of migration, nationalism, gender, sexuality, and hybridity are discussed.

Same as AFAM 111A.

**ART HIS 164B. Contemporary African American Art. 4 Units.**

Investigates the history of contemporary African American art; emphasis on the politics of representation. Explores art in a variety of media: painting, sculpture, photography, installation, and new media. Cultural politics, appropriation, identity, gender, sexuality, hybridity and civil rights issues discussed.

Same as AFAM 111B.

**ART HIS 164D. African American Women in Art. 4 Units.**

Examines depictions of and by African American women in art and popular culture through a variety of media including textiles, painting, sculpture, photography, and installation. Focuses on African American women's experiences, perspectives, and strategies for contemporary representation.

Same as AFAM 125.

**ART HIS 164E. African Americans and Photography. 4 Units.**

Explores depictions of and by African Americans through photography. Examines the history of photography in relationship to African American culture through a variety of media from early daguerreotype processes to digital imagery.

Same as AFAM 145.

**ART HIS 165A. Early American Art. 4 Units.**

An examination of American visual culture from 1620 to 1860 from the era of European exploration and colonization of the New World to the beginning of the Civil War.

**ART HIS 165B. Nineteenth Century American Art. 4 Units.**

An exploration of American visual culture from 1860 to 1900, including paintings, sculpture, and photographs produced during the Civil War and during the decades of prosperity that followed.

**ART HIS 165C. Modern American Art. 4 Units.**

Focusing on the period from 1900 until 1965, this course considers the emergence and institutionalization of modern art in the United States.

**ART HIS 165D. Topics in American Art. 4 Units.**

Varying topics within the period 1620 to 1970. Works of art are studied in their cultural, social, and political contexts.

Repeatability: Unlimited as topics vary.

**ART HIS 180. Topics in the Criticism of Art. 4 Units.**

Selected topics discussed on the theoretical and/or practical dimensions of art historical criticism.

Repeatability: Unlimited as topics vary.

**ART HIS 181. Topics in Museum Studies. 4 Units.**

Addresses the historical and contemporary function of the museum as an instructional device. The function of exhibitions in the public sphere, and the roles of curators, educators, and the public are analyzed.

Repeatability: Unlimited as topics vary.

**ART HIS 183B. 20th Century Photographic History. 4 Units.**

Varying topics within the history of photography in the 20th century. Photographic practice studied in relation to art history, cultural history, and social history.

Repeatability: Unlimited as topics vary.

**ART HIS 183C. Selected Topics in Photographic History. 4 Units.**

Varying topics within the history of photography from the early 19th century to the present. Photographic practice studied in relation to art history, cultural history, and social history. Examples include documentary; pictorialism and art photography; photomontage, photographic books.

Repeatability: Unlimited as topics vary.

**ART HIS 185. Topics in Visual Studies. 4 Units.**

Interdisciplinary topics on the cultural analysis of visual artifacts and practices.

Repeatability: Unlimited as topics vary.

**ART HIS 190W. Art History Methods. 4 Units.**

Theory and practice of art history, with an emphasis on formal and social models of analyzing and writing about art.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Art History Majors only.

(Ib)

**ART HIS 196. Ethics, Law, and Art. 4 Units.**

Addresses a broad range of ethical and legal issues pertaining to art, ownership, looting and theft, museum policies, and cultural heritage.

Concurrent with ART HIS 296.

**ART HIS 198. Advanced Seminar: Topics in Art History. 4 Units.**

Discussion and report-oriented seminar with emphasis on reading, writing, and thinking about problems in art history. Examples: Gothic Cathedral, Portraiture East and West.

Prerequisite: Recommended: ART HIS 190W.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. Art History Majors have first consideration for enrollment.

Concurrent with ART HIS 298.

**ART HIS 199. Independent Study in Art History. 1-4 Units.**

Supervised, but independent reading or research on art historical topics.

Repeatability: May be taken for credit 4 times.

Restriction: Art History Majors only.

**ART HIS 255A. Ancient India. 4 Units.**

Examines the visual and religious history of the region defined as 'India' today, but necessarily encompassing modern Bangladesh and Pakistan. Culminates with the supposed Golden Age of the Gupta empire and its far-reaching legacies.

Same as IRAN 255A.

Restriction: Graduate students only.

Concurrent with ART HIS 155A.

**ART HIS 255B. Medieval India. 4 Units.**

Begins with the Gupta period's aesthetic legacies in South Asia's architecture, sculpture, and painting. Explores the dispersal of Islam throughout South Asia, including the Muslim communities of southern India.

Same as IRAN 255B.

Restriction: Graduate students only.

Concurrent with ART HIS 155B.

**ART HIS 296. Ethics, Law, and Art. 4 Units.**

Addresses a broad range of ethical and legal issues pertaining to art, ownership, looting and theft, museum policies, and cultural heritage.

Prerequisite: Background in Art History or Legal Studies.

Same as IRAN 296.

Concurrent with ART HIS 196.

**ART HIS 298. Master's Seminar: Topics in Art History. 4 Units.**

Studies in selected areas of Art History. Examples include Gothic Cathedral, Portraiture East and West.

Repeatability: Unlimited as topics vary.

Concurrent with ART HIS 198.

**ART HIS 299. Master's Thesis Research. 4 Units.**

Research and writing of the Master's thesis.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ART HIS 399. University Teaching. 4 Units.**

Limited to teaching assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Arts (ARTS)

### Courses

**ARTS 1. ArtsCore. 4 Units.**

An introduction to the arts in general, and to the arts at UCI. Concentration on (1) the interdisciplinary nature of the arts, and (2) the content of particular arts disciplines.

(IV)

**ARTS 75. Digital Media: Exhibition. 4 Units.**

A discussion and critique course in all media arts. Includes a review of key media arts concepts and the preparation of an end-of-quarter exhibition.

Prerequisite: Proposal submission required.



**ARTS H81. Improvisation and Modes of Research / Creative Expression. 4 Units.**

Through immersion, readings, analysis, and observation, students are trained to recognize, build, and engage a set of "improvisatory" cognitive skills in order to enhance artistic creation, the generation of language, data analysis, and the application of the scientific method.

Restriction: Campuswide Honors Collegium students only. Seniors only.

(IV)

**ARTS 173. Athletics Bands . 1-2 Units.**

Bands support athletics events. Includes Pep Band: Rehearsal and performance of band standards; Marching Band: Exercises and performance involving marching fundamentals, formations, and half-time pageantry; and, Drumline: Study and rehearsal of rudiments, cadences, and arrangements.

Repeatability: Unlimited as topics vary.

**ARTS 199. Independent Study. 1-4 Units.**

Individual study or directed projects as arranged with faculty member.

Repeatability: May be repeated for credit unlimited times.

## Arts and Humanities (ARTSHUM)

### Asian American Studies (ASIANAM)

#### Courses

**ASIANAM 50. Asian American Histories. 4 Units.**

Examines and compares diverse experiences of major Asian American groups since the mid-nineteenth century. Topics include origins of emigration; the formation and transformation of community; gender and family life; changing roles of Asian Americans in American society. Formerly ASIANAM 60A.

Same as HISTORY 15C, SOC SCI 78A.

((III or IV) and VII ).

**ASIANAM 51. The U.S. and Asia. 4 Units.**

Explores the historical and contemporary transnational linkages between the U.S. and regions in Asia and their resultant flows of people, goods, and ideas. Attention given to the role of militarism and processes of globalization, and the histories of cultural contact/conflict.

((III or IV) and VIII ).

**ASIANAM 52. Asian American Communities. 4 Units.**

Examines the renewal of Asian immigration following World War II. Explores contemporary Asian American populations and communities in the U.S., and the impact of contemporary Asian immigration on the U.S. political economy and social order.

Same as SOC SCI 78B.

(III, VII)

**ASIANAM 53. Asian Americans and Race . 4 Units.**

Analyzes the Asian American experience in comparative perspective, which includes comparisons of different ethnic and racial groups, and across gender and class. Possible topics include labor, economy, politics, migration, nation, popular culture, gender, family, sexuality, and multiraciality.

Same as SOC SCI 78C.

(III, VII)

**ASIANAM 54. Asian American Stories. 4 Units.**

Examines stories from Asian American communities through literary texts and other media. Selected themes may include the following: dislocation/relocation, finding/inventing a usable past, poetics/politics in language, identities/ethnicities.

(IV, VII)

**ASIANAM 55. Asian Americans and the Media. 4 Units.**

Investigates popular representations of and cultural productions by Asian Pacific Americans and Asians in the Americas from the late-nineteenth century to the present. Cultural media may include political cartoons, film/television, popular music, visual art, blogs/Web sites, and performance.

(IV, VII)

**ASIANAM 100W. Research Methodologies for Asian American Studies. 4 Units.**

Explores various research methodologies for Asian American Studies combining theoretical knowledge with field research. Goals: conduct field research about immigrants and refugees from Asia. Topics vary: migration and labor, assimilation and cultural preservation, cultural expressions in the diaspora.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**ASIANAM 110. Asian American Writers. 4 Units.**

Literary analysis of Asian American writers' representations of issues of identity, class, history among others. Variety of literary forms—novel, poem, drama, essay—included in a study of a variety of Asian American ethnic groups.

Repeatability: Unlimited as topics vary.

**ASIANAM 111. Asian American History. 4 Units.**

Introduction to important themes in the history of people of Asian ancestry in the United States from the nineteenth century to the present.

Repeatability: Unlimited as topics vary.

**ASIANAM 112. Asian American Art History. 4 Units.**

Investigation of Asian American experience expressed by art and visual culture throughout the twentieth century. Art by Asian Americans of diverse backgrounds as well as the history of cultural visualization of Asian identities in American art/visual culture.

Repeatability: Unlimited as topics vary.

**ASIANAM 114. Asian American Film and Video. 4 Units.**

Topics include histories of Asian American film and video, including documentaries, experimental, short subjects, feature-length independent film, and other forms of cinematic expression. Explores issues of identity (national, racial, gendered, among others).

Repeatability: Unlimited as topics vary.

**ASIANAM 116. Asian Americans and Popular Culture. 4 Units.**

Focuses on Asian Americans' relationship to popular culture as both producers and consumers. Topics include consumer cultures and subcultures, cyberspace and public space, popular music, indie comics and other print media.

Repeatability: Unlimited as topics vary.

**ASIANAM 130. Undocumented Immigrant Experiences. 4 Units.**

Examines the experiences of undocumented immigrants and the policies that structure their educational, economic, social, and political participation.

Same as CHC/LAT 164A, CRM/LAW C187, SOCIOL 177C.

(III and VII ).

**ASIANAM 132. Comparative Minority Politics. 4 Units.**

Examines the political experiences of Blacks, Latinos, and Asian Americans in the United States from roughly 1950 to the present. Focuses on how each group has pursued political empowerment via both conventional political channels and social movements.

Same as AFAM 151, CHC/LAT 147, POL SCI 124C.

**ASIANAM 137. Asian American Labor. 4 Units.**

Explores history of Asian Americans and work from the nineteenth century to the present. Areas of study include migration, colonialism, family, social organization, and work culture.

Same as HISTORY 152A.

**ASIANAM 138. Race and Urban Space. 4 Units.**

Examines how ethnic and racial processes shape and structure interactions in urban settings, such as schools, housing, employment, and public spaces, with attention to the international impact of globalization and postcolonial forces.

**ASIANAM 142. Islam in America. 4 Units.**

Offers a critical academic study of Islam in America, focusing on the core tenets of belief, the diversity of practices, and historical transformations that have taken place since the arrival of Muslims in the United States.

Same as ANTHRO 125Z.

**ASIANAM 143. Religious Traditions of Asian Americans. 4 Units.**

Studies the religious traditions of Asian Americans, focusing on the transplantation of religious institutions, establishment of sacred spaces, celebration of religious holidays, socialization of children, as well as birth, marriage, gender relations, death, family.

Same as SOCIOL 136.

**ASIANAM 144. The Politics of Protest. 4 Units.**

Examines the Civil Rights, Black Power, and women's movements in relationship to the Asian American movement. Uses social movement theories to illuminate the cases, and the cases to critique and revise the theories.

Same as POL SCI 124A.

**(VII)****ASIANAM 150. Special Topics in Asian American Studies. 4 Units.**

Analyzes a variety of themes in Asian American Studies—identity, history, culture—from various interdisciplinary perspectives in humanities, arts, social sciences.

Repeatability: Unlimited as topics vary.

**ASIANAM 151C. Korean American Studies. 4 Units.**

Explores the factors that have distinctly shaped the Korean American experience, including patterns of racial domination, the profile of immigrant flow, immigrant roles in the urban political economy, politics in Korea, and the role of the church.

Same as SOC SCI 178C.

**ASIANAM 151D. Vietnamese American Studies. 4 Units.**

Studies the resettlement of Vietnamese in the United States following their exodus from Southeast Asia. Topics include the Vietnam War, the 1975 evacuation, boat and land refugees, the shaping of Vietnamese communities, and Vietnamese American literature.

Same as SOC SCI 178D.

**ASIANAM 151E. Japanese American Studies. 4 Units.**

Studies the settlement of Japanese in Hawaii and the continental United States since the late 19th century. Topics include sugar plantations, development of rural Japanese America, World War II internment, post-War community development, and persistence of Japanese American identity.

Same as SOC SCI 178E.

**ASIANAM 151F. South Asian American Studies. 4 Units.**

Examines and compares the experiences of South Asian immigrants in the U.S. over time. Looks at the economic, political, and social positions of the immigrants, with special emphasis on religious changes and the changes in the second and later generations.

Same as SOC SCI 178F.

Restriction: Asian American Studies Majors have first consideration for enrollment. Social Policy/Public Service Majors have first consideration for enrollment.

**ASIANAM 151H. Southeast Asian American Studies. 4 Units.**

Analyzes experiences of refugees and immigrants from Southeast Asia, which may include those from Cambodia, Laos, Vietnam, and the Philippines. Examines political and economic factors for their exodus and how they reconstruct their identities, histories, and communities.

Same as SOC SCI 178H.

**ASIANAM 151J. Chinese American Studies. 4 Units.**

Analyzes the experiences of Chinese in the United States. Immigration, Chinese exclusion, racial and gender identity. Historical overview and contemporary issues covered.

Same as SOC SCI 178J.

**ASIANAM 151K. Filipina/Filipino American Studies. 4 Units.**

Explores the experience of Filipina/Filipino Americans from the era of Spanish colonization of the Philippines to present-day community formations in the United States, with special emphasis on the 20th century. Topics include colonialism, nation, migration, gender, and culture.

Same as SOC SCI 178K.

**ASIANAM 162. Asian American Women. 4 Units.**

Examines the representations and experiences of Asian American women from diverse perspectives. Explores the commonalities and differences among various groups of Asian American women, with particular focus on history, culture, values, and family roles.

Same as SOC SCI 177B.

**ASIANAM 164. Topics in Intersectionality. 4 Units.**

Topics include intersectional analysis of various themes related to ethnicity, gender, sexuality, and race within Asian American communities.

Repeatability: Unlimited as topics vary.

**ASIANAM 166. Race and Citizenship. 4 Units.**

Explores historical and contemporary patterns of racialization in relation to citizenship. Topics may include racial categorization, immigration, and comparative racialization.

**ASIANAM 167. Asian American and African American Relations. 4 Units.**

Addresses relationships of Asian American and African American communities in the United States. Topics include race, class, gender, labor, economic systems, political mobilization, community, civil rights, activism, cultural expression.

Same as AFAM 117, HISTORY 152B.

**ASIANAM 168. Politics of Animal Rights. 4 Units.**

Examines animal rights/welfare movement's efforts to transform moral, practical, and legal standing of nonhuman animals in contemporary U.S. Explores intersection of racism, sexism, and speciesism informed by theories of race and ethnicity, including Asian American Studies.

Same as POL SCI 126F.

Restriction: Political Science Majors have first consideration for enrollment. Asian American Studies Majors have first consideration for enrollment.

**ASIANAM 199. Independent Study. 1-4 Units.**

Directed reading and research in consultation with a faculty member. Substantial written work required.

Repeatability: May be repeated for credit unlimited times.

**ASIANAM 200A. Theory and Methods in Asian American Studies. 4 Units.**

Introduction to the intersection of the social sciences, humanities, and other fields that constitute the theory and methodology of Asian American Studies. Focuses on the interventions and contestations within Asian American Studies that have transformed the discipline in recent years.

Restriction: Graduate students only.

**ASIANAM 200B. Contemporary Issues in Asian American Studies. 4 Units.**

Examines the interrelations between history, theory, and race in the aftermath of the twentieth-century decolonial movements, offering an account of race through postcolonial and postnationalist approaches in comparative contexts. Considers the interventions made by transnational feminist and racialized queer critiques.

Restriction: Graduate students only.

**ASIANAM 200C. Leadership and Social Change in Asian American Communities. 4 Units.**

Introduces students to models of community-engaged learning and leadership that are central to the field of Asian American studies. Designed to expose students to histories and models of organizing in Asian American communities and forms of community-based research.

Restriction: Graduate students only.

**ASIANAM 200D. Introduction to Asian American Studies Research. 4 Units.**

Introduces students to research topics and methods within the field of Asian American studies. Aims to expose students to core and affiliated faculty to help them identify possible advisors for master's research projects or members of doctoral committees.

Restriction: Graduate students only.

**ASIANAM 201. Graduate Topics in Asian American Studies. 4 Units.**

Seminars on various topics in Asian American Studies.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ASIANAM 250. Advanced Topics in Asian American Studies. 4 Units.**

Seminar covering various areas of research within Asian American Studies as an interdisciplinary field. Recommended for advanced graduate students.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ASIANAM 290. Directed Research. 4-12 Units.**

Directed graduate study/research in Asian American Studies.

Repeatability: May be taken for credit for 24 units.

Restriction: Graduate students only.

**ASIANAM 291. Directed Reading. 4 Units.**

Readings focused on specialized topics in consultation with, and with the consent of, a faculty member.

Repeatability: May be taken for credit for 12 units.

Restriction: Graduate students only.

**ASIANAM 399. University Teaching. 4 Units.**

Limited to teaching assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Emphasis in Asian American Studies graduate students only.

## Bio Sci & Educational Media Design (BSEMD)

## Biological Chemistry (BIOCHEM)

### Courses

**BIOCHEM 200A. Research in Biological Chemistry. 2-12 Units.**

Individual research under the supervision of a professor.

Repeatability: Unlimited as topics vary.

**BIOCHEM 200B. Research in Biological Chemistry. 2-12 Units.**

Individual research under the supervision of a professor.

Repeatability: Unlimited as topics vary.

**BIOCHEM 200C. Research in Biological Chemistry. 2-12 Units.**

Individual research under the supervision of a professor.

Repeatability: Unlimited as topics vary.

**BIOCHEM 200R. Research in Biological Chemistry for First-Year Students. 2-12 Units.**

Independent research within the laboratories of graduate training faculty in the Department of Biological Chemistry for first-year Ph.D. students.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

**BIOCHEM 202A. Laboratory Seminar Series. 1 Unit.**

Study within a laboratory group including research and journal presentations.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

**BIOCHEM 202B. Laboratory Seminar Series. 1 Unit.**

Study within a laboratory group including research and journal presentations.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

**BIOCHEM 202C. Laboratory Seminar Series. 1 Unit.**

Study within a laboratory group including research and journal presentations.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

**BIOCHEM 207. Current Topics in Cancer Genomics. 4 Units.**

Literature-based discussion of molecular principles in genetics and functional genomics, with focus on cancer and stem cell biology.

Repeatability: May be taken for credit 2 times.

**BIOCHEM 210A. Medical Biochemistry and Molecular Biology. 12 Units.**

Covers the following topics from a biomedical perspective: protein and nucleic acid biochemistry, carbohydrates, lipids, amino acids, purines and pyrimidines, genome structure, molecular mechanisms of development, and signal transduction.

Restriction: Graduate students only.

**BIOCHEM 215. Mouse Developmental Genetics. 4 Units.**

Introduction to using the mouse in contemporary biomedical research. The biology and development of the laboratory mouse, methods for manipulation of the mouse genome and embryos, and examples of application of these methods to understand mammalian development and homeostasis.

Same as DEV BIO 207.

Restriction: Graduate students only.

**BIOCHEM 217. Human Evolution and Behavior. 4 Units.**

Covers theories and empirical research concerning the evolutionary origins of human behaviors and their variations. An interdisciplinary course emphasizing both evolutionary psychology (e.g., mating strategies, kinship, and parenting) and molecular evolution (i.e., evolution of genes for various behaviors).

Same as PSCI P271.

Restriction: Graduate students only.

**BIOCHEM 225. Epigenetics in Health and Disease . 4 Units.**

Focuses on the role of chromatin/nuclear structure organization (histone and DNA modification, chromatin remodeling, higher order chromatin structure and nuclear organization) on gene regulation, DNA replication and repair, relevant to development, metabolism, learning and memory, and human disease.

Prerequisite: MOL BIO 203 or MOL BIO 204 or NEURBIO 206

Same as NEURBIO 230.

Restriction: Graduate students only.

**BIOCHEM 240. New Breakthroughs in Basic and Translational Cancer Research. 4 Units.**

Highlights breakthroughs in molecular and cellular aspects of cancer biology and emerging therapeutic approaches. Emphasis on new discoveries of critical pathways/processes in cancer etiology, progression, and metastasis. Introduces strategies used in the discovery, design of biological and small molecules-based therapies.

Prerequisite: MOL BIO 204 or PHYSIO 252. A gene regulation course is also required.

Restriction: Graduate students only.

**BIOCHEM 291. Research Seminar. 2 Units.**

Student research-based colloquium covering current topics in gene organization and expression, cell cycle and differentiation, DNA repair, checkpoint control, and the physical, chemical, and biological properties of macromolecules. Students are encouraged to read critically and analyze recent literature.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**BIOCHEM 292A. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**BIOCHEM 292B. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**BIOCHEM 292C. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Biological Sciences (BIO SCI)

### Courses

**BIO SCI 1A. Life Sciences. 4 Units.**

Designed to introduce nonmajors to the basic concepts of modern biology. Discussion of evolutionary biology, ecology, molecular biology, and genetics.

(II)

**BIO SCI 2A. Freshman Seminar. 2 Units.**

Weekly meetings consisting of presentations by faculty, professional staff, and Peer Academic Advisors provide information about the School of Biological Sciences, campus resources, learning skills, and special programs/opportunities.

Grading Option: Pass/no pass only.

Restriction: Freshmen only. School of Biological Sciences students only.

**BIO SCI 2B. Freshman Seminar . 1 Unit.**

Faculty presentations and readings focused on the structure, function, opportunities, and current issues in the biological sciences.

Grading Option: Pass/no pass only.

Restriction: Freshmen only. School of Biological Sciences students only.

**BIO SCI 2C. Solutions in Science. 1 Unit.**

Students will be introduced to approaches that can be used to solve scientific problems. These methods can be utilized in introductory to advanced classes and will allow students to become independent thinkers.

**BIO SCI 2D. EASE Seminar. 1 Workload Unit.**

Seminars designed to help students achieve success in STEM courses. Provides collaborative learning environment facilitated by undergraduate mentor. Students develop critical thinking and study skills. Also receive guidance to campus resources that assist acclimation to University.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**BIO SCI 3A. Career Decision Making. 1 Workload Unit.**

An introductory course designed to facilitate the career decision-making process. Decision-making processes, values, and standardized tests of aptitudes, interests, and values are utilized with non-test data in appraising biological sciences career options.

Grading Option: Workload Credit P/NP Only.

**BIO SCI 3B. Non-Health Sciences Career Exploration. 1 Workload Unit.**

A survey course designed to assist students in exploring non-health science career options. Lectures by professionals in various fields.

Grading Option: Workload Credit P/NP Only.

**BIO SCI 6. Tropical Biology: Race to Save the Tropics. 4 Units.**

Population growth combines with tropical resource consumption by industrialized nations to cause high rates of deforestation, pollution, habitat fragmentation, and extinction of species. Discusses tropical biomes, their population, community, ecosystem processes, and possible means of conservation of biodiversity.

(II)

**BIO SCI 9A. Nutrition Science. 4 Units.**

An introduction to nutrition science, integrating concepts from biology, biochemistry, microbiology, physiology, and psychology to explain the interaction between nutrients and the human body. Biological basis of nutrient standards is analyzed. Effects of nutrition, behavior, exercises on health/disease.

(II)

**BIO SCI 9B. Biology and Chemistry of Food and Cooking . 4 Units.**

The kitchen is used as a laboratory to introduce fundamental principles of biology, chemistry, and physics. A molecular/cellular analysis of cooking, including concepts such as protein structure, browning reactions, colloids, emulsions, carbohydrate metabolism, and development of flavor/texture through biochemical transformations.

(II)

**BIO SCI 9D. Diseases of the Twenty-First Century . 4 Units.**

Why do we get sick? An introduction to the biological basis of human disease, including diseases of the cardiovascular, respiratory, nervous, and reproductive systems. Case studies present diagnosis, treatment, and prevention protocols. Inheritable and infectious diseases also discussed.

Overlaps with BIO SCI 10, BIO SCI 12D.

(II)

**BIO SCI 9E. Horticulture Science . 4 Units.**

Scientific principles of horticulture at the UCI Arboretum. Taxonomy, plant life history strategies; experiments with seed dormancy; morphological adaptations for specialized sexual and clonal reproduction; basics of plant propagation and ecological restoration. Materials fee.

(II)

**BIO SCI 9G. Physiology of Fitness. 4 Units.**

An introduction to the organ systems of the human body, including muscle, cardiovascular, immune, and reproductive systems, with an emphasis on how the body responds to exercise, diet, and disease.

(II)

**BIO SCI 9J. Biology of Oriental Medicine. 4 Units.**

With lectures, demonstrations, and hands-on learning, the theory and practice of herbal medicine, acupuncture, qigong, and manipulative therapies are explained in Western biomedical terms. The latest basic and clinical research advances in each area are also described.

Overlaps with BIO SCI 9N, BIO SCI D124.

(II)

**BIO SCI 9K. Global Change Biology. 4 Units.**

Field trips and lectures that address ways in which humans are altering the global environment, with consequences for the ecology of animals, plants, and microbes.

(II)



**BIO SCI 10. The Biology of Human Diseases. 4 Units.**

Introduction to concepts of diagnosis, treatment, and prevention of major human infectious diseases. Covers some aspects of epidemiology. Scope and impact of infectious diseases in the present and past experiences in controlling infectious disease. Reviews biology of human organ systems.

Overlaps with BIO SCI 9D, BIO SCI 12D.

(II)

**BIO SCI 11. Topics in Biological Sciences. 4 Units.**

Studies in selected areas of biological sciences.

Repeatability: May be taken for credit 3 times.

**BIO SCI 12. Molecular Basis of Human Disease. 4 Units.**

Describes the cause and treatment of human diseases at the cutting edge of modern molecular understanding for non-science majors, including history, interviews, and stories.

(II)

**BIO SCI 14. California Teach 1: Introduction to Science and Mathematics Teaching. 3 Units.**

First in a series for students interested in becoming middle or high school teachers of mathematics or science. Students gain an understanding of effective, research-based teaching strategies. Includes supervised field experience in a K-12 classroom.

Same as PHY SCI 5.

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment. School of Engineering students have first consideration for enrollment.

**BIO SCI 17. Evolutionary Psychology. 4 Units.**

Introductory overview of the field of evolutionary psychology. Surveys topics operating at the interface of social sciences, i.e. behavioral psychology and evolutionary biology, while developing select aspects of the history of this developing field.

(II)

**BIO SCI 23. Sustainable Landscaping: Design and Practices. 4 Units.**

Through lectures and hands-on work, students learn how to design habitats around dwellings, within cities, and in rural environments. These include traditional/sustainable landscaping, restoration, stormwater/wastewater treatment, xeriscaping, and low impact development design. Sustainable landscape plant materials emphasized.

(II)

**BIO SCI 25. Biology of Cancer. 4 Units.**

Biological, clinical, and psychosocial nature of cancer through the perspectives of medical researchers, biologists, physicians, and health educators. For students of all majors, designed so that each can increase personal awareness of the biology of cancer.

Restriction: BIO SCI 25 may not be taken for credit if taken after BIO SCI M125.

**BIO SCI 35. The Brain and Behavior. 4 Units.**

Introduction to how the brain works. Biological processes underlying perception, movement, sleep-wake cycles, motivation, language, learning, and memory. Changes in the brain associated with sex differences, drug use, aging, seasons, and time of day. Fundamental properties of the nervous system.

(II)

**BIO SCI 36. Drugs and the Brain. 4 Units.**

Introduction to the actions of drugs on the brain. How studying drug action helps reveal normal functions of neurons. How drugs can correct neural disorders or disrupt neural function. Biological issues related to drug abuse, drug addiction, and drug seeking.

(II)

**BIO SCI 37. Brain Dysfunction and Repair . 4 Units.**

Introduction to the disruptions in brain function that underlie disorders such as Alzheimer's disease, Parkinsonism, schizophrenia, and depression, and the basis for drug therapies. The brain's ability to repair itself after damage and the pros and cons of that repair.

(II)

**BIO SCI 38. Mind, Memory, Amnesia, and the Brain. 4 Units.**

Introduction to neural mechanisms underlying learning and memory. Emphasis on molecular changes that mediate memory as well as structures involved in different forms of memory. Additionally, examines the biology of memory phenomena, from extraordinary memory to false memory to amnesia.

(II)

**BIO SCI 41. Aspects of Mood Disorder. 4 Units.**

There are significant differences in response to psychiatric illness across cultures. Delves into the neuroscience underlying mood disorder, investigating current pharmacological treatments and sociocultural influences on treatment outcomes.

(II)

**BIO SCI 43. Media on the Mind. 4 Units.**

Surveys an ever-increasing collection of research, suggesting modern technology and social media are changing in the way our brains function.

(II)

**BIO SCI 44. Stem Cells and Brain Repair. 4 Units.**

Students introduced to the field of regenerative neurobiology. Both basic stem cell discoveries and their potential clinical application to brain disorders examined. Discussion of opportunities, challenges, and implications of this research.

Overlaps with BIO SCI N172.

(II)

**BIO SCI 45. AIDS Fundamentals. 4 Units.**

Considers the biological and sociological bases of the AIDS epidemic. Topics include the history of AIDS, current medical knowledge, transmission, risk reduction, and how the community can respond.

Same as PUBHLTH 80.

(II)

**BIO SCI 46. Discussion and Literature Research in AIDS. 2-4 Units.**

Students carry out two activities: (1) leading discussions about HIV/AIDS (predominantly regarding sociological and personal reactions) among students taking the AIDS Fundamentals course and (2) literature research about biomedical aspects of AIDS.

Prerequisite: BIO SCI 45 or PUBHLTH 80

**BIO SCI 47. Stress. 4 Units.**

Investigates stress at a psychological, physiological, and molecular level, and provides a current overview of the field of stress research.

(II)

**BIO SCI 55. Introduction to Ecology. 4 Units.**

Principles of ecology; application to populations, communities, ecosystems, and humans.

Restriction: No Biological Sciences Majors. BIO SCI 55 may not be taken for credit if taken after BIO SCI 96 or BIO SCI E106.

(II)

**BIO SCI 56. Life Sciencing from Aristotle to Venter. 4 Units.**

History of biology from Aristotle through to the scientific revolutions precipitated by Darwin, geneticists, molecular biologists, and now genomics. Introduces the practices and achievements of biological research to both beginning biology students and non-majors.

Overlaps with BIO SCI H90, BIO SCI H90B.

(II)

**BIO SCI 75. Human Development: Conception to Birth. 4 Units.**

Processes leading to the birth of a healthy child and the avoidance of birth defects. Male and female reproductive systems, hormonal control of egg-sperm formations, sexual intercourse, contraception, venereal diseases, fertilization, cell division, embryonic development, fetal physiology.

(II)

**BIO SCI H90. The Idiom and Practice of Science. 4 Units.**

The importance of biological sciences in our world is discussed. Topics may include brain and behavior, health and disease, genetics and society, and conservation biology. Primary goal is to encourage students to understand better the world in which they live.

Restriction: Campuswide Honors Collegium students only.

(II)

**BIO SCI 92. Curriculum. 1-4 Units.**

Initiation, planning, and coordination of student-run courses.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 12 times.

Restriction: School of Biological Sciences students only.

**BIO SCI 93. From DNA to Organisms. 4 Units.**

Cell biology, biochemistry, genetics, and the biology of organ systems. Covers concepts of building blocks (nucleotides, amino acids, and cells) and of information flow (DNA to proteins, receptors to nuclei, the blood to distant organs, and DNA to offspring).

Restriction: BIO SCI 93 may not be taken for credit if taken after BIO SCI 97 or BIO SCI 98.

(II)

**BIO SCI H93. Honors From DNA to Organisms. 4 Units.**

Cell biology, biochemistry, genetics, and the biology of organ systems. Covers concepts of building blocks (nucleotides, amino acids, and cells) and of information flow (DNA to proteins, receptors to nuclei, the blood to distant organs, and DNA to offspring).

Restriction: BIO SCI H93 may not be taken for credit if taken after BIO SCI 97 or BIO SCI 98.

(II)

**BIO SCI 94. From Organisms to Ecosystems. 4 Units.**

Patterns of diversity, ecology, and evolutionary biology. Emphasis is on the Tree of Life and how its members are distributed and interact.

Prerequisite: BIO SCI 93 or BIO SCI H93

Restriction: BIO SCI 1A may not be taken for credit if taken after BIO SCI 94.

(II)

**BIO SCI 97. Genetics. 4 Units.**

Introduction to genetics. Basic features of replication and expression of DNA, cell division, and gene transmission. Recombination and mutation in diploid organisms.

Prerequisite: BIO SCI 94

Restriction: Pharmaceutical Sciences Majors have first consideration for enrollment. Public Health Majors have first consideration for enrollment. Nursing Science Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment.

**BIO SCI H97. Honors Genetics. 4 Units.**

Introduction to genetics. Basic features of replication and expression of DNA, cell division, and gene transmission. Recombination and mutation in diploid organisms.

Restriction: Campuswide Honors Collegium students only. BIO SCI H97 may not be taken for credit if taken after BIO SCI 97.

**BIO SCI 98. Biochemistry. 4 Units.**

Structure and properties of proteins; major biochemical pathways and mechanisms for their control.

Prerequisite or corequisite: BIO SCI 97 or BIO SCI H97 and CHEM 51B

Restriction: School of Biological Sciences students have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. Nursing Science Majors have first consideration for enrollment. Pharmaceutical Sciences Majors have first consideration for enrollment. Public Health Majors have first consideration for enrollment.

**BIO SCI 99. Molecular Biology. 4 Units.**

Biochemistry and replication of nucleic acids; molecular genetics; protein biosynthesis; genetic code; regulation of expression of genetic information; biochemical evolution.

Prerequisite: BIO SCI 98

Restriction: Pharmaceutical Sciences Majors have first consideration for enrollment. Public Health Majors have first consideration for enrollment. Nursing Science Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment.

**BIO SCI 100. Scientific Writing. 3 Units.**

Designed to give an overview of the basic aspects of scientific writing relevant to reporting research in the Biological Sciences.

Prerequisite: BIO SCI 99. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: School of Biological Sciences students have first consideration for enrollment. Bio Sci and Educ Media Design Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. Pharmaceutical Sciences Majors have first consideration for enrollment.

**BIO SCI 101. California Teach 2: Middle School Science and Mathematics Teaching. 3 Units.**

Second in a series for students interested in becoming middle or high school teachers of mathematics or science. Students gain an understanding of effective, research-based teaching strategies for grades 6-8. Includes supervised field experience in a middle school classroom.

Prerequisite: PHY SCI 5

Same as PHY SCI 105.

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment. School of Engineering students have first consideration for enrollment.

**BIO SCI D103. Cell Biology. 4 Units.**

Analysis of the basic structure and function of animal cells, with an emphasis on the regulation of cellular processes. The basic features of membranes, cellular compartmentalization, protein trafficking, vesicular transport, cytoskeleton, adhesion, signal transduction, and cell cycle are covered.

Prerequisite: BIO SCI 99

Restriction: Students who require this class for completion of their degree have first consideration for enrollment.

**BIO SCI D104. Developmental Biology. 4 Units.**

Cellular and molecular analysis of how a fertilized egg develops into an organism consisting of complex structures such as the eye, arms, and brain. Emphasis is on the key concepts of developmental processes underlying pattern formation, growth, and regeneration.

Prerequisite: BIO SCI 99

Restriction: Students who require this class for completion of their degree have first consideration for enrollment.

**BIO SCI D105. Cell, Developmental, and Molecular Biology of Plants . 4 Units.**

Emphasizes the special features of plant cells and plant development as compared to animals. Two central topics: plants' ability to fuel our planet through photosynthesis, and the interactions of plants with microorganisms in making nitrogen available to other life forms.

Prerequisite: BIO SCI 97 or BIO SCI H97

Restriction: Students who require this class for completion of their degree have first consideration for enrollment.

**BIO SCI E106. Processes in Ecology and Evolution. 4 Units.**

An in-depth study of the mechanisms that drive evolution and ecology including: natural selection, mutation, genetic drift, speciation, extinction, life history patterns, population dynamics, ecosystem and community structure, predator-prey and host pathogen interactions, and social behavior.

Prerequisite: BIO SCI 94

Restriction: Students who require this class for completion of their degree have first consideration for enrollment.

**BIO SCI E106L. Habitats and Organisms. 4 Units.**

Introduces students to local habitats and organisms through required field trips and applies ecological and evolutionary principles from BIO SCI E106. Students also explore related literature.

Prerequisite: (BIO SCI 100 or BIO SCI 108) and BIO SCI E106. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Seniors only. BIO SCI E106L may not be taken for credit concurrently with or after taking BIO SCI E166. Students who require this lab for completion of their degree have first consideration for enrollment.

(Ib)

**BIO SCI E107. Seminar in Ecology and Evolutionary Biology. 2 Units.**

Invited speakers, graduate students, and faculty present current research in ecology and evolutionary biology.

Grading Option: Pass/no pass only.

Restriction: Upper-division students only. Ecology and Evolutionary Biol Majors only.

**BIO SCI 108. Research Methods. 4 Units.**

Explores tools of inquiry for developing and implementing science research projects. Students undertake independent projects requiring data collection, analysis, and modeling, and the organization and presentation of results. Additional topics include ethical issues and role of scientific literature.

Prerequisite: BIO SCI 14 or PHY SCI 5

Same as PHYSICS 193, CHEM 193.

**BIO SCI E109. Human Physiology. 4 Units.**

Functional features of the major organ systems in the human body. Emphasis on homeostasis and the interactions of organ systems in health and disease. (Discussion of behavior and brain function deferred to BIO SCI N110.).

Prerequisite: (BIO SCI 93 or BIO SCI H93) and CHEM 1C

Overlaps with PHRMSCI 120.

Restriction: Students who require this class for completion of their degree have first consideration for enrollment.

**BIO SCI N110. Neurobiology and Behavior. 4 Units.**

Consideration of the evolution of behavior, including ethological and psychological aspects and analysis of neuroanatomical, neurochemical, neurophysiological, and neuroendocrine systems underlying basic behavioral processes.

Prerequisite or corequisite: BIO SCI 99

Restriction: Students who require this class for completion of their degree have first consideration for enrollment.

**BIO SCI D111L. Developmental and Cell Biology Laboratory. 4 Units.**

Covers the division of cells, isolate cellular organelles (chloroplasts, mitochondria, nuclei), and follows changes in cells undergoing programmed cell death. Development is demonstrated in experiments showing cooperation of individual cells in forming a multicellular organism. Materials fee.

Prerequisite or corequisite: (BIO SCI 100 or BIO SCI 108) and (BIO SCI D103 or BIO SCI D104 or BIO SCI D105)

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

(Ib)

**BIO SCI E112L. Physiology Laboratory. 4 Units.**

Laboratory with a focus on the whole organism and its organ systems. Examples of structure-function relationships are drawn from both animal and human physiology. Cellular and molecular aspects are introduced as required. Materials fee.

Prerequisite: (BIO SCI 100 or BIO SCI 108) and (BIO SCI E109 or BME 120) and BME 121.

Overlaps with PHRMSCI 120L.

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

(Ib)

**BIO SCI D113. Genetics Majors Seminar. 1 Unit.**

Genetics majors attend a weekly seminar to discuss current research techniques and career opportunities in the field. Students have the opportunity to present their own independent research.

Repeatability: May be taken for credit 2 times.

Restriction: Genetics Majors only.

**BIO SCI N113L. Neurobiology Laboratory. 3 Units.**

An in-depth exploration into biology and physiology of the nervous system. Labs include neuroanatomy, electrophysiology, pharmacology, behavior, experimental design, EEG, and scientific writing. Materials fee.

Prerequisite or corequisite: (BIO SCI 100 or BIO SCI 108) and (BIO SCI N110 or BIO SCI N115A)

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

(Ib)

**BIO SCI D114. Developmental and Cell Biology Majors Seminar. 1 Unit.**

Developmental and Cell Biology majors attend a weekly seminar to discuss current research techniques and career opportunities in the field. Students have the opportunity to present their own independent research.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

Restriction: Developmental and Cell Biology Majors only.

**BIO SCI M114. Advanced Biochemistry. 4 Units.**

Physical-chemical properties of macromolecules. Structure-function relationships in nucleic acids, protein, carbohydrates, and lipids. Integration and regulation of metabolism. Biochemistry of organs and biochemistry of diseases.

Prerequisite: BIO SCI 99

**BIO SCI M114L. Biochemistry Laboratory. 5 Units.**

Properties of enzymes and the culture and isolation of mutants of microorganisms. Materials fee.

Prerequisite: BIO SCI 99 and (BIO SCI 100 or BIO SCI 108)

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

(Ib)

**BIO SCI E115L. Evolution Laboratory. 4 Units.**

Students perform experiments which illustrate important concepts in evolutionary biology such as natural selection, random genetic drift, inbreeding, age-specific selection, sexual selection, and phylogenetic reconstruction. Materials fee.

Prerequisite: (BIO SCI 100 or BIO SCI 108) and BIO SCI E106. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

(Ib)

**BIO SCI N115A. Advanced Neurobiology I. 4 Units.**

In-depth coverage of neurobiology, ranging from molecular neurobiology to functional brain imaging. Discussion of molecular, cellular, and developmental neurobiology.

Prerequisite: BIO SCI 99

Restriction: Neurobiology Majors only.

**BIO SCI N115B. Advanced Neurobiology II. 4 Units.**

In-depth coverage of neurobiology, ranging from molecular neurobiology to functional brain imaging.

Prerequisite: BIO SCI N115A

Restriction: Neurobiology Majors only.

**BIO SCI M116. Advanced Molecular Biology. 4 Units.**

Mechanisms of gene expression; special emphasis on regulatory events that occur in Eukaryotic organisms other than initiation of transcription. Chromatin structure and rearrangement, RNA polymerases, cis- and trans-acting elements, RNA processing, transport and stability, protein synthesis, trafficking, and turnover.

Prerequisite: BIO SCI 99 and (BIO SCI M114L or BIO SCI M116L)

**BIO SCI M116L. Molecular Biology Laboratory. 5 Units.**

Students perform experiments which illustrate the chemical and biological properties of nucleic acids. Emphasis is placed on recent techniques in recombinant DNA technology including gene isolation and characterization. Materials fee.

Prerequisite: BIO SCI 99 and (BIO SCI 100 or BIO SCI 108)

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

**(Ib)****BIO SCI E117A. Exercise Sciences Seminar. 3 Units.**

Students are introduced to fundamental concepts and topics in exercise science with an emphasis on developing innovative approaches for exploring the biological response to physical activity/inactivity. Interactive course with robust discussion amongst faculty and students.

Prerequisite: BIO SCI E109 and BIO SCI E112L and BIO SCI E183

**BIO SCI E117B. Exercise Sciences Seminar. 3 Units.**

Students are introduced to fundamental concepts and topics in exercise science with an emphasis on developing innovative approaches for exploring the biological response to physical activity/inactivity. Interactive course with robust discussion amongst faculty and students.

Prerequisite: BIO SCI E109 and BIO SCI E112L and BIO SCI E183

**BIO SCI E117C. Exercise Sciences Seminar. 3 Units.**

Students are introduced to fundamental concepts and topics in exercise science with an emphasis on developing innovative approaches for exploring the biological response to physical activity/inactivity. Interactive course with robust discussion amongst faculty and students.

Prerequisite: BIO SCI E109 and BIO SCI E112L and BIO SCI E183

**BIO SCI N117. Introduction to Neuroscience Clinical Trials. 4 Units.**

Provides an overview of the science of clinical development of treatments for neurological disease and injury.

Prerequisite: BIO SCI 99

**BIO SCI E118. Ecosystem Ecology. 4 Units.**

A mechanistic perspective on ecosystem processes. Covers ecosystem development, element cycling, and interactions with plants and microbes. The role of ecosystems in environmental change is also addressed.

Prerequisite: BIO SCI E106 or EARTHSS 51 or EARTHSS 60A or CHEM 51C

Same as EARTHSS 164.

Restriction: Earth System Science Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Ecology and Evolutionary Biol Majors have first consideration for enrollment.

Concurrent with EARTHSS 264.

**BIO SCI M118L. Experimental Microbiology Laboratory. 5 Units.**

Introductory general microbiology designed for preprofessional biology majors. Includes microscopy, cultivation of bacteria, morphological and biochemical characterization of bacteria, microbial metabolism, growth and genetics, microorganisms and human disease, and interactions of microorganisms with the environment. Materials fee.

Prerequisite: BIO SCI 99 and (BIO SCI 100 or BIO SCI 108)

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

**(Ib)**

**BIO SCI N118. Clinical Psychophysiology. 4 Units.**

Psychophysiology investigates the relationships between physiological processes and psychological phenomena. Technologies examined include reaction times, heart rate variability, EEGs, ERPs, magnetoencephalography, and eye tracking. Applications include diagnosis, the longitudinal assessment, and the identification of individuals at risk of disease onset.

Prerequisite: BIO SCI N110 or BIO SCI N115A or PSYCH 9A or PSCI 11A

Same as PSYCH 122P.

(II ).

**BIO SCI E119. Selfish DNA. 3 Units.**

Focuses on the genetics and evolution of selfish DNA, and introduces necessary background knowledge from molecular biology, cytogenetics, and bioinformatics.

Prerequisite: BIO SCI 94 and BIO SCI 97

**BIO SCI M119. Advanced Topics in Immunology. 4 Units.**

Literature-based, interactive discussions focused on review of seminal historic and recent immunology literature. Student responsibilities include reading, critical evaluation, and discussion of manuscripts.

Prerequisite: BIO SCI M121

Restriction: Microbiology and Immunology Majors have first consideration for enrollment.

**BIO SCI N119. History of Neuroscience. 4 Units.**

An overview of the conceptual and technical foundations of contemporary neuroscience from ancient times to the present. The subjects include synapses, neurons, brain organization, sensory, motor and regulatory systems, learning and memory, human brain function and dysfunction.

Prerequisite: BIO SCI 35 or BIO SCI N110 or BIO SCI N115A or PSY BEH 115D or (PSYCH 9A and PSYCH 9B and PSYCH 9C)

Restriction: Upper-division students only.

Concurrent with NEURBIO 255.

**BIO SCI E120. Marine Biology . 4 Units.**

Examines the biotic and abiotic factors influencing the physiology, distribution, abundances, interactions, and evolution of marine organisms and the roles of those organisms in mediating ecosystem services and functions. A field trip is required. Materials fee.

Prerequisite: BIO SCI 94

**BIO SCI M120. Signal Transduction in Mammalian Cells. 4 Units.**

Introduction to major biochemical pathways that transmit information from extracellular cues into changes in cell behavior. Focuses on kinases, phosphatases, G proteins, second messengers, and protein-protein interactions. Includes discussion of primary research articles and experimental techniques.

Prerequisite: BIO SCI D103

**BIO SCI N120A. Human Biology I. 4 Units.**

Provides an in-depth look at cutting-edge topics in physiology and epidemiology as they relate to global issues of ethics, anthropology, and socioeconomics, providing the student with an understanding of human health beyond basic biological function.

Prerequisite: BIO SCI 99

Restriction: Human Biology Majors only.

**BIO SCI N120B. Human Biology II. 4 Units.**

Provides an in-depth look at cutting-edge topics in physiology and epidemiology as they relate to global issues of ethics, anthropology, and socioeconomics, providing the student with an understanding of human health beyond basic biological function.

Prerequisite: BIO SCI 99

Restriction: Human Biology Majors only.



**BIO SCI N120C. Human Biology III. 4 Units.**

Provides an in-depth look at cutting-edge topics in physiology and epidemiology as they relate to global issues of ethics, anthropology, and socioeconomics, providing the student with an understanding of human health beyond basic biological function.

Prerequisite: BIO SCI 99

Restriction: Human Biology Majors only.

**BIO SCI M121. Immunology with Hematology. 4 Units.**

Antibodies, antigens, antigen-antibody reactions, cells and tissues of lymphoreticular and hematopoietic systems, and individual and collective components of cell-mediated and humoral immune response.

Prerequisite: BIO SCI 98

**BIO SCI M121L. Advanced Immunology Laboratory. 4 Units.**

Emphasis is placed on learning modern techniques in immunology such as ELISAs, western blotting, and immunofluorescent staining assays. Materials fee.

Prerequisite: (BIO SCI 100 or BIO SCI 108) and BIO SCI M116L and BIO SCI M121

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

Concurrent with MOL BIO 221L.

**(Ib)**

**BIO SCI N121. Drug Addiction. 4 Units.**

Provides a comprehensive overview of topics in the addiction field, including drug pharmacology, models/approaches to investigate addiction, brain circuits, genetics, epigenetics, and the cellular and molecular biology of drug addiction.

Prerequisite: BIO SCI 99

Concurrent with NEURBIO 233.

**BIO SCI E122. Physiology and Pathology of the Kidney. 4 Units.**

Examines the structure, function, and pathology of the kidney. Topics include anatomy of the kidney, cellular function, urine formation, and disease states of the kidney.

Prerequisite: BIO SCI E109

**BIO SCI M122. General Microbiology. 4 Units.**

Comparative metabolism of small molecules and cell structure and relationship to microbial classification. Macromolecule synthesis and regulation, sporulation, cell division, growth, and effect of antibiotics.

Prerequisite: BIO SCI 98

**BIO SCI M123. Introduction to Computational Biology. 4 Units.**

The use of theories and methods based on computer science, mathematics, and physics in molecular biology and biochemistry. Basics in biomolecular modeling. Analysis of sequence and structural data of biomolecules. Analysis of biomolecular functions.

Prerequisite: MATH 2D or MATH 3A or STATS 7 or STATS 8

Same as BME 132, COMPSCI 183.

Concurrent with MOL BIO 223 and BME 232.

**BIO SCI N123L. Human Neuroimaging Lab. 3 Units.**

Hands-on laboratory course in human neuroimaging, with particular emphasis on using MRI to understand brain function and how it changes over the course of the lifespan and with disease.

Prerequisite: BIO SCI 93 and (BIO SCI 100 or BIO SCI 108). Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

**(Ib)**

**BIO SCI D124. Biology of Integrative Medicine. 4 Units.**

Presentation of biological principles and the latest clinical and basic research on complementary and alternative therapies (e.g., mind-body medicine, energy medicine, herbal medicine, acupuncture, manipulative therapies) and their integration with Western medicine. Lectures supplemented by demonstrations and hands-on learning sessions.

Overlaps with BIO SCI 9J, BIO SCI 9N.

**BIO SCI E124. Infectious Disease Dynamics. 4 Units.**

Learn how the immune system interacts with infectious diseases, in particular with viral infections. An introduction to basic virology and immunology, it concentrates on the way in which the immune system is critical to the prevention of infections.

Same as PUBHLTH 181.

**BIO SCI M124A. Virology. 4 Units.**

Replication of viruses in populations, animals, and the host cell. The effects of viral infection on populations, individuals, and specific molecular effects on the target cell. Role of viral infections in cancer and degenerative diseases.

Prerequisite: BIO SCI 99

Restriction: School of Biological Sciences students only.

**BIO SCI M124B. Viral Pathogenesis and Immunity. 4 Units.**

The mechanisms of viral pathogenesis and of host resistance to viruses are explored in detail. HIV-1 and Influenza-A are used as examples. In each case, viral replication, cytopathic effects, immune response, and viral evasion are discussed.

Prerequisite: BIO SCI M121 or BIO SCI M124A. Recommended: BIO SCI M122.

**BIO SCI M125. Molecular Biology of Cancer. 4 Units.**

Molecular mechanisms of carcinogenesis. Consideration of transformation by DNA tumor viruses, RNA tumor viruses, and chemical carcinogens.

Prerequisite: BIO SCI 99

**BIO SCI M126. Learning to Read Primary Literature in Biochemistry and Molecular Biology. 4 Units.**

An introduction to primary literature focusing on methods to approach, understand, and analyze scientific papers.

Prerequisite: BIO SCI 99

**BIO SCI E127. Physiological Plant Ecology. 4 Units.**

An examination of the interactions between plants and their environment. Emphasis on the underlying physiological mechanisms of plant function, adaptations and responses to stress, and the basis of the distribution of plants and plant assemblages across the landscape.

Prerequisite: EARTHSS 51 or BIO SCI 94 or (EARTHSS 60A and EARTHSS 60C)

Same as EARTHSS 168.

Restriction: Biological Sciences Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**BIO SCI E128. Chemical Ecology. 4 Units.**

An introduction to the unspoken chemical language of nature. Emphasis on interactions between insects, plants, and microbes including plant defense, pollination, and microbial warfare.

Prerequisite or corequisite: BIO SCI 94 and CHEM 1C. CHEM 1C with a grade of C- or better

**BIO SCI N129. The Transparent Brain. 5 Units.**

Teaches students how to perform new 3-D histology techniques that reveal the complex circuitry of the brain in unprecedented detail. Students work with real brain samples as part of ongoing neuroscience research projects. Materials fee.

Prerequisite: BIO SCI 93 or BIO SCI H93

Restriction: Students who require this course for completion of their degree have first consideration for enrollment.

**BIO SCI D130. Photomedicine. 4 Units.**

Studies the use of optical and engineering-based systems (laser-based) for diagnosis, treating diseases, manipulation of cells and cell function. Physical, optical, and electro-optical principles are explored regarding molecular, cellular, organ, and organism applications.

Prerequisite: PHYSICS 3C or PHYSICS 7D

Same as BME 135.

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BIO SCI E130. Forensic Genetics. 4 Units.**

Covers techniques currently used for forensic identification and paternity testing. Topics include STR, Y-STR and mitochondrial DNA tests, database searches, mixtures, allelic drop out, likelihood ratios, laboratory errors and the interaction of science and the legal system.

Prerequisite: BIO SCI 93 and BIO SCI 94

**BIO SCI M130L. Advanced Molecular Lab Techniques. 6 Units.**

Discovery-driven experimentation in the fields of molecular biology, biochemistry, and cell biology. Also involves other aspects of the lab experience including group discussion of results, scientific paper analysis, and student presentations. Materials fee.

Prerequisite: BIO SCI 100 and (BIO SCI D111L or BIO SCI M114L or BIO SCI M116L or BIO SCI M118L)

Repeatability: May be taken for credit 3 times.

Restriction: Students who require this lab for completion of their degree have first consideration for enrollment.

**(Ib)****BIO SCI E131L. Image Analysis in Biological Research. 4 Units.**

Introduction to scientific image analysis including techniques such as high-speed, time-lapse, thermal imaging, and flow visualization. Students make movies using cameras, edit and analyze images using computers, and do a writing project.

Prerequisite: (BIO SCI E106 or BIO SCI E109) and (BIO SCI 100 or BIO SCI 108)

Restriction: Seniors only.

**(Ib)****BIO SCI M131. Innate Immunity, Infection, and Pathogenesis. 4 Units.**

Role of the innate immune system in health and disease. Molecular pathways of innate immune recognition, expression, and regulation of immune receptors, signal transduction, pathogen sensors, and detection of microbial ligands. Lecture and discussion of primary research articles.

Prerequisite: BIO SCI M121 or BIO SCI M122 or BIO SCI M124A or BIO SCI M124B or BIO SCI M143

**BIO SCI N131. Human Neurodegenerative Diseases. 4 Units.**

Clinical and epidemiological aspects of neurodegenerative diseases causing dementia are reviewed, including Alzheimer's disease, Parkinson's disease, Huntington's disease, and Frontotemporal Dementia. Seminar format includes student presentation and group discussion.

Prerequisite: BIO SCI 99

**BIO SCI D132. Introduction to Precision Medicine. 4 Units.**

Introduction to the use of genomic techniques for the study of individual genomes and transcriptomes in healthy and diseased samples. Covers GWAS, current sequencing techniques, cancer genomics, and biomarker discovery.

Prerequisite: BIO SCI 99

**BIO SCI D133. Advances in Regenerative Medicine. 4 Units.**

Introduces the rapidly growing field of regenerative medicine. New developments in stem cell research are discussed. Cellular, molecular, and engineering aspects of stem cell-based organ replacement strategies are examined, with emphasis on specific regenerative therapies.

Prerequisite: BIO SCI D103 or BIO SCI D104

Overlaps with BIO SCI N172.

**BIO SCI M133. High-Resolution Structures: NMR and X-ray. 4 Units.**

Basic principles of magnetic resonance and X-ray crystallography toward the determination of high-resolution biomolecular structures.

Prerequisite: MATH 2B or MATH 5B

Restriction: Upper-division students only.

Concurrent with MOL BIO 211.

**BIO SCI E134. Microbiomes. 4 Units.**

Students develop an understanding of microbiomes in the context of both their environment and their impact on host physiology. Discussions on how microbiomes interact with the human body.

Prerequisite: BIO SCI M122

**BIO SCI N134. Cognitive Neuroepigenetics. 4 Units.**

Current topics in the emerging field of cognitive neuroepigenetics focusing on understanding the underlying epigenetic mechanisms of memory formation and persistence. Primary literature is used to explore these processes.

Prerequisite: BIO SCI N110 or BIO SCI N115A

**BIO SCI D135. Cell Biology of Human Disease. 4 Units.**

Builds on prior biology courses about the underlying cell biological mechanisms and recent treatment advances of several model diseases. Emphasizes literature searches, reading primary literature, and student group work.

Prerequisite: BIO SCI D103

**BIO SCI D136. Human Anatomy. 4 Units.**

Presents a systems approach to the analysis of human structure. Molecular, cellular, tissue, organ, and organ system levels of structure and organization are integrated throughout.

Prerequisite: BIO SCI 99

Overlaps with BIO SCI D170.

**BIO SCI E136. The Physiology of Human Nutrition . 4 Units.**

Examines the biochemical basis of energy metabolism, physiological processes in digestion and uptake, and the biochemical transformation of carbohydrates, fats, and proteins in the human body. The emphasis is on expanding the students' understanding of physiology.

Prerequisite: BIO SCI 98 and BIO SCI E109

Overlaps with BIO SCI M150.

**BIO SCI D137. Eukaryotic and Human Genetics. 4 Units.**

Structure and function of genes in eukaryotes with emphasis on special problems of genetic studies in humans. Molecular methods of genetic analysis and gene transfer are discussed. Practical applications and ethical and social issues raised by genetic studies are addressed.

Prerequisite: BIO SCI 97 or BIO SCI H97

**BIO SCI M137. Microbial Genetics. 4 Units.**

Basic principles of microbial genetics are presented as lectures for the first half of the course. The second half is devoted to applications of these principles and requires reading review and original research papers and interactions with guest lecturers.

Prerequisite: BIO SCI 98

**BIO SCI D138. Critical Thinking in Cell Biology . 4 Units.**

Builds on prior biology courses about cell biology, and works to develop a deeper understanding of experimental techniques and interpretation of experiments. A key focus will be the question of how one moves from specific examples to general.

Prerequisite: BIO SCI 99

**BIO SCI E138. Comparative Animal Physiology. 4 Units.**

Maintenance aspects of physiology: water balance; feeding and digestion; metabolism; respiration and circulation.

Prerequisite: BIO SCI E109

**BIO SCI N138. Sex Differences in the Brain. 4 Units.**

Explores the neural bases of sex influences on brain function.

Prerequisite: BIO SCI 99

**BIO SCI E139. Animal Locomotion. 4 Units.**

The physiology, biomechanics, and neuroscience that determines how animals propel themselves and navigate through the world. Considers the principles that govern the walking, running, flying, and swimming of animals, including exercising humans.

Prerequisite: BIO SCI E109

**BIO SCI E140L. Evolution and the Environment Laboratory. 4 Units.**

Explores basic topics in ecology and evolutionary biology and applications to agriculture, conservation, environmental issues, and public health. Format involves lab activities and discussion of scientific journal articles, with focus on learning to evaluate scientific evidence.

Prerequisite or corequisite: (BIO SCI 100 or BIO SCI 108) and BIO SCI E106

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

(Ib)

**BIO SCI E142W. Writing/Philosophy of Biology. 4 Units.**

Philosophy of biology, e.g., scientific method in biology, the structure of evolutionary theory, teleology, ethics, and evolution. Course work includes one 4,000-word and four 1,000-word papers.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as LPS 142W, PHILOS 142W.

Restriction: Juniors only.

(Ib)

**BIO SCI M143. Human Parasitology. 4 Units.**

Introduction to human animal-parasitic diseases including worms and protozoan infections.

Prerequisite: BIO SCI 99

**BIO SCI M144. Cell Organelles and Membranes. 4 Units.**

Structure, function, and biogenesis of biological membranes and membrane-bound organelles.

Prerequisite: CHEM 51A

**BIO SCI D145. Genomics, Development, and Medicine. 4 Units.**

Focuses on the applications of genomics and proteomics to problems in genetics, cell, and developmental biology. Students will gain a comprehensive understanding of the techniques currently used for genomics analysis and how best to apply these tools to solve problems.

Prerequisite: BIO SCI 99

**BIO SCI E145. Animal Coloration and Vision. 4 Units.**

Physiological and behavioral mechanisms of color production and vision including crypsis, mimicry, aposematism, masquerade, sexual dimorphism, and predator-prey interactions through the lens of signals, receivers, and receptors; color and polarization vision in mate choice and visual adaptations to aquatic environments.

Prerequisite or corequisite: BIO SCI E106

**BIO SCI E146. Ecosystem Services. 4 Units.**

Covers what ecosystem services are, how to classify them, what the impacts of land degradation are on ecosystem services, how to quantify and value them, and the importance of mainstreaming ecosystem services in decision-making.

Prerequisite: (EARTHSS 70A and EARTHSS 70B) or (EARTHSS 51 and EARTHSS 53 and EARTHSS 55)

Same as EARTHSS 154.

**BIO SCI N147. Hearing and the Brain. 4 Units.**

An overview of brain mechanisms of hearing, including perception of simple sounds, speech, and music. Begins with sound itself, and looks at processing by the ear, auditory pathways, auditory cortex, and beyond. Also auditory development, learning, and clinical issues.

Prerequisite: PSYCH 160A or BIO SCI 93 or BIO SCI H93

Same as PSYCH 161H.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Biological Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**BIO SCI D148. Development and Disease. 4 Units.**

Development of animal embryos from a fertilized egg to a functioning organism. Topics include reproduction, body-axis formation, growth and differentiation of embryonic cells, and organogenesis, with an emphasis on congenital birth defects and diseases that disrupt these processes.

Prerequisite: BIO SCI D103 or BIO SCI D104

**BIO SCI E150. Conservation Biology. 4 Units.**

Genetic and ecological issues in conservation biology, including effects of human population growth, the value of biodiversity, conservation genetics, demography, metapopulation dynamics, community and ecosystem processes, species invasions, global climate change, and reserve design and management.

Prerequisite: BIO SCI E106

**BIO SCI N150. Brain Dysfunction and Repair. 4 Units.**

Introduction to the disruptions in brain function that underlie disorders such as Alzheimer's disease, Parkinsonism, schizophrenia, and depression, and the basis for drug therapies. The brain's ability to repair itself after damage and the pros and cons of that repair.

Prerequisite: BIO SCI N110 or BIO SCI N115A

Restriction: Neurobiology Majors only.

**BIO SCI E151. Evolutionary and Ecological Principles in Medicine. 4 Units.**

Explore the dynamics of populations on an ecological, epidemiological, and medical level. Considers the dynamics of competition, predation, and parasitism; the spread and control of infectious diseases; and the in vivo dynamics of viral infections and the immune system.

Prerequisite: BIO SCI 93

Same as PUBHLTH 182.

Concurrent with ECO EVO 251.

**BIO SCI N151. Neurobiology of Aging. 4 Units.**

Multidisciplinary overview of the functional capacity of the aging brain, its structural changes and the mechanisms underlying function and structure. Emphasis is on successful brain aging and those mechanisms which lead to the development of Alzheimer's disease.

Prerequisite: BIO SCI N110 or BIO SCI N115A

**BIO SCI N152. Developmental Neurobiology. 4 Units.**

The development of the nervous system is discussed with emphasis on the processes that underlie the appearance of complex and highly ordered neural circuits. Topics include neural induction, specification, migration and death; axon growth, and neural circuit formation.

Prerequisite: BIO SCI 93 or BIO SCI H93

**BIO SCI E153. Functional and Structural Evolutionary Genomics. 4 Units.**

Function and organization of genomes analyzed from an evolutionary perspective. Review of some of the most recent experimental approaches in genome analysis and comparative genomics. Relevant software to analyze DNA and expression data is used.

Prerequisite: BIO SCI 97 or BIO SCI H97

Concurrent with ECO EVO 253.

**BIO SCI N153. Neuropharmacology. 4 Units.**

Survey of neurotransmitter systems, focusing on how transmitters are made, how they interact with their receptors, and how drugs can influence these processes to alter neural function and behavior.

Prerequisite: BIO SCI N110 or BIO SCI N115A

**BIO SCI E154. Genetics and Human History. 4 Units.**

Explores topics in human health/history from an evolutionary perspective, with emphasis on genetics. Topics include the relationship between genetics and human disease as an evolutionary question, and how modern genetic techniques are used to study the history of human populations.

Prerequisite or corequisite: BIO SCI E106

**BIO SCI N154. Molecular Neurobiology. 4 Units.**

Nature and actions of genes/gene products that regulate the functioning of the nervous system and its interaction with muscles. Topics include neural control of gene expression; genetics and molecular biology of neural and neuromuscular diseases; gene therapies for neural disorders.

Prerequisite: BIO SCI 99

**BIO SCI E155. Physiology in Extreme Environments. 4 Units.**

An in-depth look at the physiological mechanisms that allow animals, including humans, to be physically active and survive in extreme environments. Physiological responses to high altitude, diving, microgravity, deserts, and extreme cold are examined.

Prerequisite: BIO SCI 94

**BIO SCI N155. Wiring the Developing Brain . 4 Units.**

The development of the nervous system is discussed with particular emphasis on the processes that underlie the appearance of complex and highly ordered neural circuits. Basic neurodevelopmental processes are discussed and correlated with normal brain function/dysfunction.

Prerequisite: BIO SCI N110 or BIO SCI N115A or BIO SCI N152

**BIO SCI N156. Molecular Mechanisms of Memory. 4 Units.**

Current topics focused on understanding the molecular mechanisms that contribute to synaptic plasticity, learning, and memory. Primary literature is used to explore the variety of molecular mechanisms underlying these processes.

Prerequisite: BIO SCI 99

**BIO SCI N158. Neurobiology of Learning and Memory. 4 Units.**

How the brain and behavior change as a result of experience, with an emphasis on identifying the neurochemical processes through which memory is stored and the parts of the brain that are involved.

Prerequisite: BIO SCI 35 or BIO SCI N110 or BIO SCI N115A

**BIO SCI N159. Animal Behavior. 4 Units.**

Explores why animals behave the way they do from evolutionary/mechanistic perspectives. Considers selective pressures and evolutionary constraints that shape animal behavior and the underlying neural and hormonal mechanisms by using examples such as why dogs bark, why some birds migrate.

Prerequisite: BIO SCI N110 or BIO SCI N115A

**BIO SCI E160. Biology of Birds. 4 Units.**

A thorough introduction to the biology of birds, covering topics ranging from avian anatomy and physiology to behavior, natural history, ecology, genetics, evolution, systematics, and conservation. Examples from both local and global avifauna.

Corequisite: BIO SCI E160L

Prerequisite: BIO SCI 94

**BIO SCI E160L. Biology of Birds Lab. 4 Units.**

The companion to Biology of Birds (E160). Consists primarily of field trips to identify local birds and study avian natural history. Students must provide their own transportation to field sites, some with entrance fees. Students must have field binoculars.

Corequisite: BIO SCI E160

Prerequisite: (BIO SCI 100 or BIO SCI 108)

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

(Ib)

**BIO SCI M160. Structure-Function Relationships of Integral Membrane Proteins. 4 Units.**

Integral membrane proteins such as voltage and ligand-gated ion channels, water channels, pumps, cotransporters, and receptors (e.g., GPCRs). The emphasis is on the relationship between atomic structure and the functional properties of these proteins.

Prerequisite: BIO SCI 98 and BIO SCI 99. BIO SCI 98 with a grade of B or better. BIO SCI 99 with a grade of B or better

Concurrent with MOL BIO 255.

**BIO SCI N160. Language and the Brain . 4 Units.**

Research analysis on biological bases of human linguistic capacity. Development, focusing on hemispheric specialization, plasticity; localization of specific linguistic functions in adults, with emphasis on study of aphasias; relation of linguistic capacity to general cognitive capacity, considering research on retardation.

Prerequisite: (PSYCH 7A or PSY BEH 9 or PSYCH 9A or PSY BEH 11A) and (PSYCH 9B or PSY BEH 11B or BIO SCI 35 or BIO SCI N110 or BIO SCI N115A)

Same as LSCI 158, PSYCH 161.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Biological Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**BIO SCI N165. Brain Disorders and Behavior. 4 Units.**

Examines the localization of human brain functions and the effects of neurological disorders on psychological functions such as perception, motor control, language, memory, and decision-making.

Prerequisite: (PSYCH 7A or PSY BEH 9) and (PSYCH 9A or PSY BEH 11A) and (PSYCH 9B or PSY BEH 11B) or BIO SCI 35 or BIO SCI N110

Same as PSYCH 160D.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Biological Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**BIO SCI E166L. Field Biology. 4 Units.**

Conducting group and independent studies in Southern California ecosystems, this course covers the fundamentals of experimental design, statistical analysis, communicating scientific findings (orally, visually, in writing), and other skills necessary for the scientific investigation of biological processes in the field. Materials fee.

Prerequisite: (BIO SCI 100 or BIO SCI 108) and BIO SCI E106. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Seniors only.

**(Ib)****BIO SCI N166. Introduction to Cognitive Neuroscience. 4 Units.**

Introduction to the neural basis of human perceptual, motor, and cognitive abilities. Topics include sensory perception, motor control, memory, language, attention, emotion, frontal lobe function, functional brain imaging, and neuropsychological disorders.

Prerequisite: PSYCH 7A or (PSYCH 9A and PSYCH 9B) or PSY BEH 9 or (PSY BEH 11A and PSY BEH 11B) or BIO SCI 35 or BIO SCI N110 or BIO SCI N115A

**BIO SCI E168. Evolution. 4 Units.**

An integrative treatment of evolutionary biology that covers evolutionary processes, basic research methods, and the history of life.

Prerequisite: BIO SCI E106

**BIO SCI D170. Applied Human Anatomy. 6 Units.**

Systems approach to analyze the form and function of the human body with an emphasis on applying anatomical concepts to evaluate clinical cases. The laboratory will use human models and a simulated cadaver dissection for structure. Materials fee.

Prerequisite: BIO SCI E109 or PHRMSCI 120. BIO SCI E109 with a grade of C or better. PHRMSCI 120 with a grade of C or better

Overlaps with BIO SCI D136.

**BIO SCI N170. Clinical Neuroscience. 4 Units.**

An introduction to the neuroclinical bases of human behavior, including neuropsychological approaches to mental disorders. Also includes case formulations, research articles, therapeutic approaches, and other discussions related to select psychopathology and other neurobehavioral topics.

Prerequisite: PSCI 9 or PSYCH 7A or PSCI 11A or PSYCH 9A or BIO SCI 99

Same as PSCI 160C.

Restriction: Psychological Science Majors have first consideration for enrollment. Biological Sciences Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.



**BIO SCI E172. Plant Diversity in a Changing World. 4 Units.**

Investigation of planet diversity in California and throughout the world, including basic systematic concepts, an introduction to major groups of flowering plants, and the effects of global biological change on plant diversity.

Prerequisite: BIO SCI E106

Concurrent with ECO EVO 272.

**BIO SCI N172. Regenerative Neurobiology. 4 Units.**

Explores the field of regenerative neurobiology. Both basic stem cell discoveries and their potential clinical application to brain disorders examined. Opportunities, challenges, and implications of this research also discussed.

Prerequisite: BIO SCI N110 or BIO SCI N115A

Overlaps with BIO SCI 44, BIO SCI D133.

**BIO SCI N173. Human Neuropsychology. 4 Units.**

A survey of human brain disorders using a clinical case study approach to illustrate fundamental issues in studying brain and behavior. Topics include sensory deficits, attentional neglect, amnesia, cortical organization, clinical psychopathology, and more.

Prerequisite: BIO SCI N110 or BIO SCI N115A or PSYCH 9A or PSCI 11A

Same as PSCI 163C, PSYCH 162N.

Restriction: School of Biological Sciences students have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**BIO SCI N174. Principles of Neural Computation. 4 Units.**

Introduction to the theoretical principles and biological mechanisms underlying how brains acquire, assimilate, store, and retrieve information, and how they compute adaptive responses to external inputs.

Prerequisite: BIO SCI N110 or BIO SCI N115A

Concurrent with NEURBIO 220.

**BIO SCI N176. Cerebral Cortex: Structure, Function, and Plasticity. 4 Units.**

The cerebral cortex is highly developed in mammals and is responsible for higher perceptual and cognitive functions. Explores some amazing aspects of cortical structure, function, and plasticity emphasizing primary literature.

Prerequisite: BIO SCI N110 or BIO SCI N115A

**BIO SCI E179. Limnology and Freshwater Biology. 4 Units.**

Biology of freshwater environments: lakes, ponds, rivers, their biota, and the factors which influence distribution of organisms.

Corequisite: BIO SCI E179L

Prerequisite: BIO SCI 94

**BIO SCI E179L. Field Freshwater Ecology. 4 Units.**

Analytical techniques for common water-quality variables of lakes, streams, and rivers. Benthic fauna, vertebrates and invertebrates, algae, and aquatic plants. Emphasis on field methods with an experimental approach; laboratory exercises. Field trips to marshes, vernal pools, rivers, and streams. Materials fee.

Corequisite: BIO SCI E179

Prerequisite or corequisite: (BIO SCI 100 or BIO SCI 108) and BIO SCI E179

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

**(Ib)****BIO SCI M180. Biotechnological Applications of Energy and Environmental Research. 4 Units.**

Covers microbiological and biochemical background related to current biotechnological applications, case studies of biotech-companies, and basic information related to patents and start-up companies. Topics include biofuel, bioremediation, agricultural, and environmental applications.

Prerequisite: BIO SCI 98

**BIO SCI E182. Mediterranean Ecosystems: Biodiversity and Conservation. 4 Units.**

Biodiversity, history of human impacts, and conservation efforts are examined in the five Mediterranean-type ecosystems. Remaining natural habitat, approaches to ecological habitat restoration, control of exotic species, and predicted consequences of global climate change are described. Field trip required.

Prerequisite: BIO SCI 94

**BIO SCI N182. Vision. 4 Units.**

Visual perception and the anatomy and physiology of the visual system. Topics include the retina and the visual pathway; visual sensitivity; color vision; spatial vision; motion perception; and the development of the visual system.

Same as PSYCH 131A.

Overlaps with PSYCH 130A.

Restriction: Upper-division students only. Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment.

**BIO SCI E183. Exercise Physiology. 4 Units.**

Focus upon critical topics in the area of exercise biology using the comparative physiological approach. Specifically examine the physiological factors that limit the capacity of an organism to sustain high levels of aerobic metabolism.

Prerequisite: BIO SCI 98 and BIO SCI E109

**BIO SCI E184. Ecology and Diversity of Insects. 4 Units.**

Insects—representing two-thirds of all species—play fundamental roles in human health, agriculture, and natural ecosystems. Topics include insect morphology, development, physiology, taxonomy, ecology, and insects in human affairs. Lecture includes interactive demonstrations and an optional weekend trip. Materials fee.

Prerequisite: BIO SCI E106

**BIO SCI E186. Population and Community Ecology. 4 Units.**

Population structure, function, development, and evolution. Topics include population structure, population growth and regulation, metapopulations, predation, competition, species diversity, ecosystem function, macroecology, and island biogeography. Offered every other Winter.

Prerequisite: BIO SCI E106

**BIO SCI E186L. Population and Community Ecology Lab. 4 Units.**

Covers processes specific to groups of the same species (populations) and multiple species (communities). Includes growth, regulation, dynamics, and persistence of populations and community interactions, development, diversity, and macroecology. Lab activities focus on application of population prediction and biodiversity assessment.

Prerequisite: BIO SCI E106 and (BIO SCI 100 or BIO SCI 108). Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Seniors only.

**(Ib)****BIO SCI E187. Exercise as Medicine. 4 Units.**

Explores the link between regular physical activity and health, focusing on mechanistic insights into how regular exercise improves overall health and alters disease trajectories of cancer, type-II diabetes, depression, and other chronic illnesses.

Prerequisite: BIO SCI E109

**BIO SCI E188. Introduction to Insect Physiology. 4 Units.**

Physiology of insects. Insect respiration, digestion, excretion, and neurobiology, including sensory systems and effectors.

Prerequisite: BIO SCI E109

**BIO SCI E189. Environmental Ethics. 4 Units.**

History of evolution of environmental ethics in America. Management problems in national parks, wilderness areas, wild and scenic rivers, national forests. Contemporary and historical aspects/contributors to the field. Mitigation, endangered species, habitat restoration, biodiversity, and environmental activism. Field trips required.

Restriction: Upper-division students only.

**BIO SCI 190. Transfer Student Seminar. 1 Unit.**

Weekly meetings consisting of presentations by faculty, professional staff, and New Student Peer Academic Advisors provide information about the School of Biological Sciences, campus resources, and special programs/opportunities.

Grading Option: Pass/no pass only.

Restriction: New transfer students only.

**BIO SCI D190. Topics in Developmental and Cell Biology. 2-4 Units.**

Studies in selected areas of developmental and cell biology.

Prerequisite: BIO SCI D103

Repeatability: May be taken for credit 3 times as topics vary.

Restriction: Upper-division students only. School of Biological Sciences students only.

**BIO SCI E190. Topics in Ecology and Evolutionary Biology. 2-4 Units.**

Studies in selected areas of ecology and evolutionary biology.

Prerequisite: BIO SCI E106

Repeatability: May be taken for credit 3 times as topics vary.

**BIO SCI M190. Topics in Molecular Biology and Biochemistry. 2-4 Units.**

Studies in selected areas of Molecular Biology and Biochemistry.

Prerequisite: BIO SCI 98

Repeatability: May be taken for credit 3 times as topics vary.

**BIO SCI N190. Topics in Neurobiology and Behavior. 2-4 Units.**

Studies in selected areas of neurobiology and behavior.

Prerequisite: BIO SCI N110 or BIO SCI N115A

Repeatability: May be taken for credit 3 times as topics vary.

**BIO SCI 191A. Senior Seminar on Global Sustainability I. 2 Units.**

Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum is also required. Seminar utilized to analyze forum presentations. Prepare bibliography.

Same as SOCECOL 186A, EARTHSS 190A.

Restriction: Seniors only. Global Sustainability Minors have first consideration for enrollment.

**BIO SCI 191B. Senior Seminar on Global Sustainability II. 2 Units.**

Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum is also required. Seminar utilized to analyze forum presentations. Prepare research proposal.

Prerequisite: BIO SCI 191A or SOCECOL 186A or EARTHSS 190A

Same as SOCECOL 186B, EARTHSS 190B.

Restriction: Seniors only.

**BIO SCI 191CW. Writing/Senior Seminar on Global Sustainability III. 4 Units.**

Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum also is required. Seminar utilized to analyze Forum presentations and to prepare senior research paper. Prepare/write research paper under direction of faculty member.

Prerequisite: BIO SCI 191B or EARTHSS 190B or SOCECOL 186B. BIO SCI 191B or EARTHSS 190B or SOCECOL 186B. Satisfactory completion of the Lower-Division Writing requirement.

Same as EARTHSS 190CW, SOCECOL 186CW.

Restriction: Seniors only.

(Ib)

**BIO SCI 192. Tutoring in Biology. 2 Units.**

Tutoring program with Biological Sciences student peers.

Repeatability: May be taken for credit 6 times.

Restriction: Biological Sciences Peer Tutoring Program students only.

**BIO SCI 193A. Campus as a Living Lab I. 2-4 Units.**

Students study sustainability concepts and theories and how they apply to our most pressing environmental, social, and economic challenges. Concurrently, they work on hands-on projects to improve the sustainability of campus operations and systems.

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Upper-division students only.

**BIO SCI 193B. Campus as a Living Lab II. 2-4 Units.**

Students study sustainability concepts and theories and how they apply to our most pressing environmental, social, and economic challenges. Concurrently, they work on hands-on projects to improve the sustainability of campus operations and systems.

Prerequisite: BIO SCI 193A

Restriction: Upper-division students only.

**BIO SCI 193C. Campus as a Living Lab III. 2-4 Units.**

Students study sustainability concepts and theories and how they apply to our most pressing environmental, social, and economic challenges. Concurrently, they work on hands-on projects to improve the sustainability of campus operations and systems.

Prerequisite: BIO SCI 193B

Restriction: Upper-division students only.

**BIO SCI 194. Current Topics in Biology. 1 Unit.**

A seminar designed to discuss recent research findings and experimental issues in biology.

Corequisite: BIO SCI 199

Grading Option: Pass/no pass only.

Repeatability: Unlimited as topics vary.

**BIO SCI 194S. Safety and Ethics for Research. 1 Unit.**

Introduces students to the concepts, techniques, and ethics involved in biological sciences laboratory work.

Grading Option: Pass/no pass only.

**BIO SCI H195. Honors Topics in Biological Sciences. 4 Units.**

Varied course topics in Biological Sciences designed for students in Honors in Biological Sciences.

Repeatability: May be taken for credit 2 times.

Restriction: Biological Sciences Honors students only.

**BIO SCI 197. Special Study in Biological Sciences. 1-5 Units.**

Individualized instruction dealing with conceptual or theoretical problems in the biological sciences, rather than technical problems.

Prerequisite: BIO SCI 94

Repeatability: May be repeated for credit unlimited times.

Restriction: Maximum of 5 units (per quarter) between BIO SCI 197, BIO SCI 198, and BIO SCI 199.

**BIO SCI 198. Directed Group Studies. 1-5 Units.**

Small group experimental laboratory or field work performed under the direction of a faculty member.

Prerequisite: BIO SCI 94

Repeatability: May be repeated for credit unlimited times.

**BIO SCI 199. Independent Study in Biological Sciences Research. 1-5 Units.**

Individual experimental laboratory or field research under a professor's direction. Required for participation in the Excellence in Research Program.

Prerequisite: BIO SCI 94

Repeatability: Unlimited as topics vary.

**BIO SCI 285. Topics in Allied Health Microbiology. 4 Units.**

Basic microbiology with emphasis for allied health professions such as nursing. Emphasis is on micro-organisms involved in human health, disease and food safety.

Prerequisite: BIO SCI 98

Repeatability: May be taken for credit for 4 units as topics vary.

Overlaps with BIO SCI M122, BIO SCI M118L.

Restriction: Program in Nursing Science students only. Master of Nursing Degree students only.

## Biomedical and Translational Science (BATS)

### Courses

**BATS 209A. Introduction to Medical Statistics. 4 Units.**

Provides understanding of medical statistics for clinicians and clinical researchers to read and interpret literature.

**BATS 209B. Introduction to Medical Statistics II. 4 Units.**

Provides sufficient understanding of medical statistics to read and interpret medical literature critically, identify appropriate statistics for basic research designs used in medicine, and discriminate between appropriate and inappropriate statistical applications for common research designs.

Prerequisite: BATS 209A

**BATS 210A. Introduction to Clinical Epidemiology. 4 Units.**

Introduces principles and practice of clinical epidemiology and the population-based approach to health and disease.

Prerequisite: BATS 209A

**BATS 232. Design and Analysis of Clinical Trials. 4 Units.**

Presents history, organization and planning, rationale for methods, limits, and ethics in conducting clinical trials.

Prerequisite: BATS 209A or STAT 250

**BATS 245A. Comparative Effectiveness Research . 4 Units.**

Provides a comprehensive overview of comparative effectiveness research (CER) with in-depth methodologic clinical practice and policy/dissemination issues related to the conduct, interpretation, and clinical applications of CER.

**BATS 247. Measurement Science, Outcomes Research, and Advanced Applied Methods. 4 Units.**

Further the understanding of methodologic issues involved in the conducting of comparative effectiveness research (CER). Topics: risk adjustment, balancing observational study designs, use of outcomes from multiple data sources, innovations clinical trial designs, the conduct of meta-analysis, and psychometric methods.

**BATS 251. Quality Efficiency and Cost Effectiveness. 4 Units.**

Introduces the principles and practice of quality of care, patient safety, and patient experience research, along with major national and statewide policy and legislative initiatives related to quality of care and patient safety.

**BATS 253. Disparities in Health and Health Care. 4 Units.**

Reviews all aspects of culture that influence health status, development of public health policy, and management and practice of health care. Explores how race and ethnicity affect health and health care, including health care services and policies governing these services.

**BATS 255. Health Politics and Policy. 4 Units.**

Offers political and analytical insights into understanding U.S. health policymaking and developing strategies that influence health policy outcomes.

**BATS 280. Biomedical and Translational Science Seminar. 2 Units.**

Students present their current research or a topic of interest and are exposed to diverse projects in the biomedical and translational science arena.

Repeatability: May be repeated for credit unlimited times.

**BATS 295. Master's Thesis Research and Writing. 2-12 Units.**

Master's thesis research and writing with Biomedical and Translational Science faculty.

Repeatability: May be repeated for credit unlimited times.

**BATS 296. Ethics in Clinical Research. 4 Units.**

Covers major frameworks and concepts of ethics in public health research as well as human subject protection issues.

**BATS 299. Independent Directed Research. 2-12 Units.**

Independent research with Biomedical and Translational Science faculty.

Repeatability: May be repeated for credit unlimited times.

## Biomedical Engineering (BME)

### Courses

**BME 1. Introduction to Biomedical Engineering. 3 Units.**

Introduction to the central topics of biomedical engineering. Offers a perspective on bioengineering as a discipline in a seminar format. Principles of problem solving, design, engineering inventiveness, entrepreneurship, information access, communication, ethics, teamwork, and social responsibility are emphasized.

(Design units: 1)

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.

**BME 3. Engineering Innovations in Treating Diabetes. 4 Units.**

Innovations in diabetes treatment from the 1800s until the present: purification of insulin, measuring and control of blood glucose, recombinant DNA, clinical trials, and ethics. Solving optimization problems in engineering with Excel.

(II and VA ).

**BME 50A. Cell and Molecular Engineering. 4 Units.**

Molecular, structural, genetic, biophysical, and cellular principles of life and bioengineering. Introduction to molecular bioengineering, genetic engineering, synthetic biology, and cell biology. Applications to genetic and biomolecular design.

(Design units: 1)

Corequisite: BME 1

Prerequisite: CHEM 1C or CHEM H2C

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**BME 50B. Cell and Molecular Engineering. 4 Units.**

Physiological function from a cellular, molecular, and biophysical perspective. Introduction to genetics, neuronal signaling, and cell cycle control.

(Design units: 1)

Prerequisite: BME 50A

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment.

**BME 60A. Engineering Analysis/Design: Data Acquisition. 4 Units.**

Fundamentals of LabVIEW programming, basics of computer-based experimentation, establishing interface between computer and data acquisition instrumentation, signal conditioning basics. Materials fee.

(Design units: 2)

Prerequisite: PHYS 7D

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.

**BME 60B. Engineering Analysis/Design: Data Analysis. 4 Units.**

Overview of MATLAB; numeric, cell, and structure arrays; file management; plotting and model building; solving linear algebraic equations; signal and image processing. Materials fee.

(Design units: 1)

Prerequisite: MATH 3A

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.

**BME 60C. Engineering Analysis/Design: Computer-Aided Design. 4 Units.**

Introduction to SolidWorks and Computer-Aided Design software; design; analysis; rapid prototyping; visualization and presentation; manufacturing planning. Materials fee.

(Design units: 2)

Prerequisite or corequisite: BME 1

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.

**BME 60D. Engineering Analysis/Design: Finite-Element Simulation. 4 Units.**

Introduction to finite-element simulation; fundamentals of Multiphysics simulation;.

(Design units: 2)

Prerequisite: BME 60B and BME 60C

**BME 110A. Biomechanics I. 4 Units.**

Introduction to statics and dynamics. Topics include rigid bodies, analysis of structures, forces in beams, moments of inertia, friction, kinetics, work, and energy.

(Design units: 1)

Prerequisite: PHYS 7C and MATH 3A and MATH 3D and BME 60B and BME 60C

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**BME 110B. Biomechanics II. 4 Units.**

Introduction to biomechanics from subcellular to tissue levels. Introduction to stress, strain, and constitutive laws of cells and tissues. Emphasis is placed on biosolids. Introduction to elastic and viscoelastic behaviors with emphasis on the standard linear model of viscoelasticity.

(Design units: 1)

Prerequisite: BME 110A

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**BME 110C. Biomechanics III. 4 Units.**

Introduction to human biomechanics with emphasis on cardiovascular biomechanics and biofluid mechanics.

(Design units: 0)

Prerequisite: BME 110B

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BME 111. Design of Biomaterials. 4 Units.**

Natural and synthetic polymeric materials. Metal and ceramics implant materials. Mechanical properties, degradation, surface characterization, and design of materials. Wound repair, blood clotting, foreign body response, biocompatibility of material. Artificial organs and medical devices. Government regulations.

(Design units: 3)

Corequisite: BME 50B or BIO SCI 99.

Prerequisite: CHEM 1C

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**BME 114. Genetic Engineering and Synthetic Biology. 4 Units.**

Exploring how biological function can be engineered and 'synthesized' from the DNA level up.

(Design units: 0)

Prerequisite: (CHEM 1C or CHEM H2C) and MATH 3D and BME 50A and BME 50B

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BME 120. Sensory Motor Systems. 4 Units.**

A quantitative and systems approach to understanding physiological systems. Systems covered include the nervous and musculoskeletal systems.

(Design units: 2)

Prerequisite: (BME 60B or EECS 10 or EECS 12 or CEE 20 or MAE 10) and MATH 3D and PHYS 7D

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

Concurrent with BME 220.

**BME 121. Quantitative Physiology: Organ Transport Systems. 4 Units.**

A quantitative and systems approach to understanding physiological systems. Systems covered include the cardiopulmonary, circulatory, and renal systems.

(Design units: 1)

Prerequisite: (BME 60B or EECS 10 or EECS 12 or CEE 20 or MAE 10) and MATH 3D

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment.

**BME 130. Biomedical Signals and Systems. 4 Units.**

Analysis of analog and digital biomedical signals; Fourier Series expansions; difference and differential equations; convolutions. System models: discrete-time and continuous-time linear time-invariant systems; Laplace and Fourier transforms. Analysis of signals and systems using computer programs.

(Design units: 1)

Corequisite: BME 60B

Prerequisite: (MATH 3A or ICS 6N) and MATH 3D. Recommended: STAT 8.

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.

**BME 132. Introduction to Computational Biology. 4 Units.**

The use of theories and methods based on computer science, mathematics, and physics in molecular biology and biochemistry. Basics in biomolecular modeling. Analysis of sequence and structural data of biomolecules. Analysis of biomolecular functions.

Prerequisite: MATH 2D or MATH 3A or STAT 7 or STAT 8

Same as BIOL M123, CS 183.

Concurrent with MBB 223 and BME 232.



**BME 135. Photomedicine. 4 Units.**

Studies the use of optical and engineering-based systems (laser-based) for diagnosis, treating diseases, manipulation of cells and cell function. Physical, optical, and electro-optical principles are explored regarding molecular, cellular, organ, and organism applications.

(Design units: 0)

Prerequisite: PHYS 3C or PHYS 7D

Same as BIOL D130.

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BME 136. Engineering Medical Optics. 4 Units.**

Principles of optics and photonics, integration of optical components into systems and devices, and analysis of physiological signals obtained from Biophotonics measurements.

(Design units: 3)

Prerequisite: BME 130 and (BME 135 or BIOL D130)

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

Concurrent with BME 251.

**BME 137. Introduction to Biomedical Imaging. 4 Units.**

Introduction to imaging modalities widely used in medicine and biology, including X-ray, computed tomography (CT), nuclear medicine (PET and SPET), ultrasonic imaging, magnetic resonance imaging (MRI), optical tomography, imaging contrast, imaging processing, and complementary nature of the imaging modalities.

(Design units: 1)

Prerequisite: BME 130 or EECS 50 or EECS 150

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BME 138. Spectroscopy and Imaging of Biological Systems. 4 Units.**

Principles of spectroscopy; absorption; molecular orbitals; multiphoton transitions; Jablonski diagram; fluorescence anisotropy; fluorescence decay; quenching; FRET; excited state reactions; solvent relaxations; instruments; microscopy: wide field, LSM, TPE; fluorescent probes, fluctuations spectroscopy; optical resolution and super-resolution; CARS and SHG microscopy.

(Design units: 1)

Prerequisite: (MATH 3A or ICS 6N) and MATH 3D. Recommended: STAT 8.

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.

Concurrent with BME 238.

**BME 140. Design of Biomedical Electronics. 4 Units.**

Analog and digital circuits in bioinstrumentation. AC and DC circuit analysis, design and construction of filter and amplifiers using operational amplifier, digitization of signals and data acquisition, bioelectrical signals, design and construction of ECG instrument, bioelectrical signal measurement and analysis. Materials fee.

(Design units: 3)

Prerequisite: BME 60A and BME 130

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BME 142. Microfabrication. 4 Units.**

Essentials of photolithography, soft-lithography, microfabrication, Microelectromechanical Systems (MEMS), BioMEMS; applications in biomedical engineering.

(Design units: 2)

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BME 147. Microfluidics and Lab-on-a-Chip. 4 Units.**

Introduction to principles of microfluidics and state-of-the-art micro Total Analysis Systems (uTAS). Lab-on-a-Chip for bimolecular assays with device design principles for microscale sample preparation, flow transport, bimolecular manipulation, separation and detection, and the technologies for integrating these devices into microsystems.

(Design units: 1)

Prerequisite: BME 110C

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

Concurrent with BME 260.

**BME 148. Microimplants. 4 Units.**

Essential concepts of biomedical implants at the micro scale. Design, fabrication, and applications of several microimplantable devices including cochlear, retinal, neural, and muscular implants.

(Design units: 1)

Prerequisite: BME 111

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

Concurrent with BME 262.

**BME 149. Biomedical Microdevices . 4 Units.**

In-depth review of microfabricated devices designed for biological and medical applications. Studies of the design, implementation, manufacturing, and marketing of commercial and research bio-medical devices.

(Design units: 0)

Concurrent with BME 261.

**BME 150. Biotransport Phenomena. 4 Units.**

Fundamentals of heat and mass transfer, similarities in the respective rate equations. Emphasis on practical application of fundamental principles.

(Design units: 0)

Prerequisite: (BME 60B or CEE 20) and (MATH 3A or ICS 6N) and MATH 3D

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.

**BME 160. Tissue Engineering. 4 Units.**

Quantitative analysis of cell and tissue functions. Emerging developments in stem cell technology, biodegradable scaffolds, growth factors, and others important in developing clinical products. Applications of bioengineering.

(Design units: 2)

Prerequisite: (BME 50B or BIOL 99) and BME 111 and BME 121 and BME 150

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment.

**BME 170. Biomedical Engineering Laboratory. 4 Units.**

Measurement and analysis of biological systems using engineering tools and techniques. Laboratory experiments involve living systems with the emphasis on measuring physiological parameters. Materials fee.

(Design units: 1)

Prerequisite: BME 50B and BME 120 and BME 130

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BME 171. Cell and Tissue Engineering Laboratory. 4 Units.**

Techniques in molecular, cellular, and tissue engineering. Topics include bacterial and mammalian cell culture, DNA cloning and gene transfer, fabrication of biomaterial scaffolds, and immunassays and microscopy techniques for cell-based assays.

(Design units: 0)

Prerequisite: BME 160

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.

**BME 180A. Biomedical Engineering Design. 3 Units.**

Design strategies, techniques, tools, and protocols commonly encountered in biomedical engineering; industrial design experience in group projects; ethics, economic analysis, and FDA product approval. Materials fee.

(Design units: 3)

Prerequisite: (BME 60B or MAE 10 or EECS 10) and (BME 60C or MAE 52 or EECS 31L) and (BME 140 or MAE 106 or EECS 170B). BME 180A, BME 180B, and BME 180C must be taken in the same academic year.

Grading Option: In progress only.

Restriction: Seniors only. Biomedical Engineering Majors only.

**BME 180B. Biomedical Engineering Design. 3 Units.**

Design strategies, techniques, tools, and protocols commonly encountered in biomedical engineering; industrial design experience in group projects; ethics, economic analysis, and FDA product approval. Materials fee.

(Design units: 3)

Prerequisite: BME 180A. BME 180A, BME 180B, and BME 180C must be taken in the same academic year.

Grading Option: In progress only.

Restriction: Seniors only. Biomedical Engineering Majors only.

**BME 180C. Biomedical Engineering Design. 3 Units.**

Design strategies, techniques, tools, and protocols commonly encountered in biomedical engineering; industrial design experience in group projects; ethics, economic analysis, and FDA product approval. Materials fee.

(Design units: 3)

Prerequisite: BME 180B. BME 180A, BME 180B, and BME 180C must be taken in the same academic year.

Restriction: Seniors only. Biomedical Engineering Majors only.

**BME 195. Special Topics in Biomedical Engineering. 1-4 Units.**

Studies in selected areas of Biomedical Engineering. Topics addressed vary each quarter.

(Design units: 1-4)

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**BME 197. Seminars in Biomedical Engineering. 2 Units.**

Presentation of advanced topics and reports of current research efforts in Biomedical Engineering.

(Design units: 1-2)

Restriction: Seniors only. Biomedical Engineering Majors have first consideration for enrollment.

Concurrent with BME 298.

**BME 199. Individual Study. 1-4 Units.**

Independent research conducted in the lab of a biomedical engineering core faculty member. A formal written report of the research conducted is required at the conclusion of the quarter.

(Design units: 1-4)

Prerequisite: BIOL 194S

Repeatability: May be taken for credit for 8 units.

**BME 199P. Individual Study. 1-4 Units.**

Supervised independent reading, research, or design for undergraduate Engineering majors. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**BME 210. Molecular and Cellular Engineering. 4 Units.**

Engineering of physiological function at the genetic, cellular, and tissue scales. Topics include cloning and genetic engineering, extracellular matrix biomaterials, principles of regenerative medicine and tissue engineering, and experimental design.

Restriction: Graduate students only.

**BME 211. Microscale Tissue Engineering. 4 Units.**

Engineering of physiological function at the scale of individual cells. Topics include cell micropatterning, microfluidic tissue culture, engineering the cellular microenvironment, and microphysiological systems.

Restriction: Graduate students only.

**BME 212. Cardiovascular Mechanobiology. 4 Units.**

Advanced topics in cellular engineering and mechanobiology, with focus on the cardiovascular system. Tools and techniques used to manipulate and measure mechanical forces at the molecular, cellular, tissue, and organ levels, and their applications in cardiovascular devices and tissue engineering.

Restriction: Graduate students only.

**BME 213. Systems Cell and Developmental Biology. 4 Units.**

Introduces concepts needed to understand cell and developmental biology at the systems level, i.e., how the parts (molecules) work together to create a complex output. Emphasis on using mathematical/computational modeling to expand/modify insights provided by intuition.

Same as DEVB 232.

Restriction: Graduate students only.

**BME 215. Linking Modeling and Experiments in Bioengineering. 4 Units.**

Overview of modeling based on experimental techniques in bioengineering. Construct and evaluate models of varying complexity and to relate them to experimental data.

Prerequisite: BME 220 and BME 221

Restriction: Graduate students only.

**BME 220. Sensory Motor Systems. 4 Units.**

A quantitative and systems approach to understanding physiological systems. Systems covered include the nervous and musculoskeletal systems.

Restriction: Graduate students only.

Concurrent with BME 120.

**BME 221. Organ Transport Systems. 4 Units.**

A quantitative and systems approach to understanding physiological systems. Systems covered include the cardiopulmonary, circulatory, and renal systems.

Restriction: Graduate students only.

**BME 222. Biofluid Mechanics . 4 Units.**

Introduces principles of biofluid mechanics in a research oriented scheme and approaches a wide spectrum of biofluid related problems in human body and solutions that involves engineering concepts.

Restriction: Graduate students only.

**BME 224. Molecular and Cellular Biophotonics. 4 Units.**

Principles underlying the application of photonic technologies to biomolecular and cellular systems. Sample technologies Optical Tweezers, Linear and Nonlinear Optical Microscopy and Fluorescence Lifetime and Correlation Methods, and their use to investigate emergent problems in Molecular, Cellular, and Developmental Biology.

Same as CHEM 224.

Restriction: Graduate students only.

**BME 225. Tissue and Organ Biophotonics. 4 Units.**

Principles underlying the application of photonic technologies to tissues, organs, organisms. Sample technologies include Optical Coherence Tomography, Optical Speckle Imaging, Optoacoustic Imaging, Wide-Field Spectroscopic Imaging, Diffuse Optical Spectroscopy. Addressing the use of these technologies to detect/monitor disease and physiological processes.

**BME 230A. Applied Engineering Mathematics I. 4 Units.**

Analytical techniques applied to engineering problems in transport phenomena, process dynamics and control, and thermodynamics.

**BME 230B. Applied Engineering Mathematics II. 4 Units.**

Focuses on biomedical system identification. Includes fundamental techniques of model building and testing such as formulation, solution of governing equations, sensitivity theory, identifiability theory, and uncertainty analysis.

Restriction: Graduate students only.

**BME 232. Introduction to Computational Biology. 4 Units.**

The use of theories and methods based on computer science, mathematics, and physics in molecular biology and biochemistry. Basics in biomolecular modeling. Analysis of sequence and structural data of biomolecules. Analysis of biomolecular functions.

Same as MBB 223.

Restriction: Graduate students only.

Concurrent with BIOL M123 and CS 183 and BME 132.

**BME 233. Dynamic Systems in Biology and Medicine. 4 Units.**

Introduces principles of system theory to analyze biological, biochemical, physiological, and bioengineering systems. Analytical and computational tools are used to model and analyze dynamic systems such as population, neuronal and heart dynamics, biochemical and physiological systems, oxygen diffusion and similar.

Restriction: Graduate students only.

**BME 234. Neuroimaging Data Analysis. 4 Units.**

Knowledge and understanding of recent techniques for the analysis of healthy and pathological structure and function in neuroimaging data.

Restriction: Graduate students only.

**BME 234P. Neuroimaging Data Analysis. 4 Units.**

Knowledge and understanding of recent techniques for the analysis of healthy and pathological structure and function in neuroimaging data.

Restriction: Master of Engineering students only. Graduate students only.

**BME 238. Spectroscopy and Imaging of Biological Systems. 4 Units.**

Principles of spectroscopy; absorption; molecular orbitals; multiphoton transitions; Jablonski diagram; fluorescence anisotropy; fluorescence decay; quenching; FRET; excited state reactions; solvent relaxations; instruments; microscopy: wide field, LSM, TPE; fluorescent probes, fluctuations spectroscopy; optical resolution and super-resolution; CARS and SHG microscopy.

Restriction: Graduate students only.

Concurrent with BME 138.

**BME 240. Introduction to Clinical Medicine for Biomedical Engineering. 4 Units.**

An introduction to clinical medicine for graduate students in biomedical engineering. Lectures and rotations through nephrology, gastroenterology, pulmonary, and critical care cardiology.

Restriction: Graduate students only. Biomedical Engineering Majors only.

**BME 251. Engineering Medical Optics. 4 Units.**

Principles of optics and photonics, integration of optical components into systems and devices, and analysis of physiologic signals obtained from Biophotonics measurements.

Restriction: Graduate students only.

Concurrent with BME 136.

**BME 252. Critical Thinking in Biophotonics. 2 Units.**

Critical thematic review of current research papers in the field of Biophotonics.

Prerequisite: BME 224 or BME 225

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**BME 260. Microfluidics and Lab-On-A-Chip. 4 Units.**

Introduction to microfluidics and state-of-the-art micro Total Analysis Systems (uTAS). Lab-on-a-Chip for biomolecular assays with device design principles for microscale sample preparation, flow transport, biomolecular manipulation, separation and detection, and the technologies for integrating these devices into microsystems.

Restriction: Graduate students only.

Concurrent with BME 147.

**BME 262. Microimplants. 4 Units.**

Essential concepts of biomedical implants at the micro scale. Design, fabrication, and applications of several microimplantable devices including cochlear, retinal, neural, and muscular implants.

Restriction: Graduate students only.

Concurrent with BME 148.

**BME 262P. Microimplants. 4 Units.**

Essential concepts of biomedical implants at the micro scale. Design, fabrication, and applications of several microimplantable devices including cochlear, retinal, neural, and muscular implants.

Restriction: Master of Engineering students only. Graduate students only.

**BME 264. Auditory Science and Technology. 2 Units.**

Advanced topics in auditory science and technology from cochlear mechanics to cochlear implants.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**BME 290. Critical Thinking and Writing. 4 Units.**

Critical thinking and writing are essential ingredients for success in scientific research. Examines examples from the scientific literature to extract principles of good scientific reasoning, experimental design, and writing.

Restriction: Graduate students only.

**BME 295. Special Topics in Biomedical Engineering. 1-4 Units.**

Studies in selected areas of Biomedical Engineering. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**BME 295P. Special Topics in Biomedical Engineering. 4 Units.**

Studies in selected areas of Biomedical Engineering. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Master of Engineering students only. Graduate students only.

**BME 296. Master of Science Thesis Research. 1-16 Units.**

Individual research or investigation conducted in the pursuit of preparing and completing the thesis required for the M.S. in Engineering.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**BME 297. Doctor of Philosophy Dissertation Research. 1-16 Units.**

Individual research or investigation conducted in the pursuit of preparing and completing the dissertation required for the Ph.D. in Engineering.

Repeatability: May be repeated for credit unlimited times.

**BME 298. Seminars in Biomedical Engineering. 2 Units.**

Presentation of advanced topics and reports of current research efforts in biomedical engineering. Designed for graduate students in the Biomedical Engineering program.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Concurrent with BME 197.

**BME 299. Individual Research. 1-16 Units.**

Individual research or investigation under the direction of an individual faculty.

Repeatability: May be repeated for credit unlimited times.

## Business Analytics (BANA)

### Courses

**BANA 200. Foundations of Business Analytics. 2 Units.**

Provides overview of the field of business analytics, and the theory and practice underpinnings of the three MSBA curricular tracks: Data Analytics, Marketing Analytics, and Operations Analytics. Provides students with a working knowledge of the R programming language.

Restriction: Graduate students only. Business Analytics Majors only.

**BANA 201A. Statistics for Data Science. 4 Units.**

Methods of statistical inference, emphasizing applications to administrative and management decision problems. Topics include classical estimation and hypothesis testing, regression, correlation, analysis of variance, decision analysis, and forecasting.

Restriction: Graduate students only. Business Analytics Majors only.

**BANA 201B. Management Science for Analytics. 4 Units.**

An introduction to computer-based models for decision making. Topics include optimization (linear programming, integer programming, network flow models) and computer simulation. Uses spreadsheets extensively, including Excel built-in and add-in packages.

Restriction: Graduate students only. Business Analytics Majors only.

**BANA 205. Foundations of Marketing. 4 Units.**

Introduction to the field of marketing. Objectives include developing familiarity with fundamental concepts, theories, and techniques in marketing, and acquainting students with the type of decisions made by marketing managers, including customer targeting, product, pricing, distribution, promotion, and research.

Restriction: Graduate students only. Business Analytics Majors only.

**BANA 211. MSBA ProSeminar.**

Provides students in the Merage School Master of Science in Business Analytics program with information and practical skills for success in the MSBA program and for business career planning.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Business Analytics Majors only.

**BANA 212. Data and Programming for Analytics. 4 Units.**

Challenges and teaches students how to handle data, from initial data acquisition to final data analysis. Provides students with a working knowledge of the Python programming language.

Prerequisite: Basic familiarity with programming is recommended.

Restriction: Graduate students only. Business Analytics Majors only.

**BANA 241. Business Analytics Internship. 2-4 Units.**

Students apply analytics and big data knowledge obtained from classroom theory through work experiences. Provides knowledge of career opportunities, an understanding of the role analytics plays in business environments, and preparation for the business analytics profession.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Business Analytics Majors only.

**BANA 257. Marketing on the Internet for Business Analytics. 4 Units.**

Examines the impact of the Internet on traditional methods of doing marketing, and explores its existing and future uses. Discusses how to capitalize on and increase the Internet's utility as a tool that can increase marketing effectiveness, efficiency, and competitiveness.

Restriction: Graduate students only.

**BANA 271. Marketing Analytics. 4 Units.**

Introduces students to quantitative marketing analytics methods and teaches them how to apply the methods to business problems of interest. Topics include: resource allocation and ROI, marketing mix analytics, customer analytics, market segmentation and targeting, advertising, promotions, and digital marketing.

Restriction: Graduate students only.

**BANA 273. Machine Learning for Analytics. 4 Units.**

Introduces methods to mine data repositories for business intelligence to facilitate analytical decision-making. Topics include clustering for market segmentation, association rules to discover relationships between different purchase decisions, and Naive-Bayes classification techniques for decision making using decision-trees.

Restriction: Graduate students only. Business Analytics Majors only.

**BANA 275. Natural Language Processing and Applications. 4 Units.**

Focuses on providing students knowledge of advanced techniques for data analytics. Students deepen their understanding of topics including: dimension reduction, text mining and topic modeling, sentiment analysis, collaborative filtering, and causal estimation.

Restriction: Graduate students only.

**BANA 277. Customer and Social Analytics. 4 Units.**

Examines how business managers can leverage Web 2.0 and social media analytics to create value for their organizations and customers. Topics include digital and social strategies; Web and search analytics; display and mobile advertising; social networks and influence; social media.

Restriction: Graduate students only.

**BANA 288. Predictive Analytics. 4 Units.**

Deals with predicting entities (forecasting) and predicting membership of known groups (classification). Blends methodologies of forecasting and data mining, focusing on multiple regression, logistic regression, neural nets, ARIMA, discriminate analysis, and k-nearest neighbors, and applying these methods to managerial problems/decision-making.

Restriction: Graduate students only.



**BANA 290. Special Topics in Business Analytics. 4 Units.**

Studies in selected areas of business analytics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**BANA 294. Big Data Analytics with Hadoop. 4 Units.**

In-depth hands-on exploration of various cutting-edge information technologies used for big data analytics. Focuses on using Hadoop, Sqoop, Pig, and Hive for ETL operations and on understanding the MapReduce algorithm using Apache Mahout for data mining algorithms.

Restriction: Business Analytics Majors only.

**BANA 295. Big Data Management Systems. 4 Units.**

Provides an introductory-level overview to the emerging technologies in database systems. Students gain critical insight into big data challenges, the choices of different systems and technologies available, relative advantages/disadvantages, and unique aspects of different systems.

Restriction: Graduate students only.

**BANA 298A. Business Analytics Capstone Prep. 2 Units.**

Prep course for the required capstone project. Students apply the knowledge and methods acquired through the program's coursework to an applied business analytics problem. Requirements include project selection, submission of project plan, and data collection/analysis.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Business Analytics Majors only.

**BANA 298B. Business Analytics Capstone Project. 4 Units.**

Continuation of the capstone project. Students apply the knowledge and methods acquired through the coursework in the program to an applied business analytics problem. Work includes data analysis, completed research paper, and final presentation.

Prerequisite: BANA 298A

Restriction: Graduate students only. Business Analytics Majors only.

**BANA 299. Individual Study. 1-4 Units.**

Individual study under the direction of a selected faculty member.

Repeatability: May be repeated for credit unlimited times.

## Campus Recreation (CAMPREC)

## Chemical and Biomolecular Engineering (CBE)

### Courses

**CBE 40A. Chemical Processes and Material Balances. 4 Units.**

Introduction to chemical engineering and the industries where chemical engineers play vital roles. Problem-solving skills and techniques. Quantitative calculations and applications using mass and energy balances. Stoichiometric equations, multiple bypasses, and others in process industries.

Prerequisite: MATH 2B and PHYS 7C and (CHEM 1B or CHEM H2B)

Restriction: Chemical Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**CBE 40B. Process Thermodynamics. 3 Units.**

Principles of thermodynamics: definitions, basic concepts, and laws; property relationships; construction of thermodynamic charts and tables; energy balances; phase and chemical equilibria; combined mass and energy balances.

Prerequisite: CBE 40A and (MATH 3A or ICS 6N). CBE 40A with a grade of C- or better

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 40C. Chemical Engineering Thermodynamics. 4 Units.**

Elements of chemical engineering thermodynamics, including equilibrium and stability; equations of state; generalized correlations of properties of materials; properties of ideal and non-ideal mixtures; thermodynamics of real solutions; ideal and non-ideal phase equilibria; chemical equilibria for ideal and non-ideal solutions.

Prerequisite: (EECS 10 or EECS 12 or ICS 31 or MAE 10) and MATH 2D and CBE 40B. CBE 40B with a grade of C- or better

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 100. Introduction to Numerical Methods in Engineering. 3 Units.**

An introduction to the fundamentals of numerical analysis and the computer algorithms in MATLAB for the solution of engineering problems, with emphasis on problems arising in chemical engineering thermodynamics, transport phenomena, and reaction engineering.

Prerequisite: CBE 40C

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 105. Engineering Physical Chemistry. 4 Units.**

Provides an integrated view of both classical and molecular perspectives on thermodynamics, thermodynamic potentials, entropy, and the second law. Students learn how to use statistical mechanics to create a bridge between the quantum mechanical world and the familiar macroscopic one.

Prerequisite: CHEM 1C and CBE 40C and (PHYS 7D or PHYS 7E)

Overlaps with CHEM 132A, CHEM 132B, CHEM 132C.

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 110. Reaction Kinetics and Reactor Design. 4 Units.**

Introduction to quantitative analysis of chemical reactions and chemical reactor design. Reactor operations including batch, continuous stirred tank, and tubular reactor. Homogeneous and heterogeneous reactions.

Prerequisite: CHEM 1C and MATH 3D and CBE 40B and CBE 40C and CBE 100. CBE 40B with a grade of C- or better. CBE 40C with a grade of C- or better

Restriction: Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engineering majors have second consideration for enrollment.

**CBE 120A. Momentum Transfer. 4 Units.**

Fluid statics, surface tension, Newton's law of viscosity, non-Newtonian and complex flows, momentum equations, laminar and turbulent flow, velocity profiles, flow in pipes and around objects, piping systems design, pumps and mixing, and other applications to chemical and related industries.

Prerequisite: CBE 40C and MATH 3D. CBE 40C with a grade of C- or better

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 120B. Heat Transfer. 3 Units.**

Principles of conduction, radiation, and convection of heat; phenomenological rate laws, differential and macroscopic energy balances; heat transfer rates, steady state and unsteady state conduction, convection; applications to chemical and related industries.

Prerequisite: CBE 120A. CBE 120A with a grade of C- or better

Restriction: Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engineering majors have second consideration for enrollment.

**CBE 120C. Mass Transfer. 3 Units.**

Molecular and continuum approaches to diffusion and convection in multi-component mixtures; steady state, quasi-steady state and transient mass transfer; effect of reactions on mass transfer; convective mass transfer; simultaneous mass, heat and momentum transfer; applications to chemical and related industries.

Prerequisite: CBE 120B and CBE 100

Restriction: Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engineering majors have second consideration for enrollment.

**CBE 130. Separation Processes. 4 Units.**

Application of equilibria and mass and energy balances for design of separation processes. Use of equilibrium laws for design of distillation, absorption, stripping, and extraction equipment. Design of multicomponent separators.

Prerequisite: CBE 40B and CBE 40C. CBE 40B with a grade of C- or better. CBE 40C with a grade of C- or better

Restriction: Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engineering majors have second consideration for enrollment.

**CBE 140A. Chemical Engineering Laboratory I. 4 Units.**

Experimental study of thermodynamics, fluid mechanics, and heat and mass transfer. Operation and evaluation of process equipment, data analysis. Materials fee.

Prerequisite: CBE 110 and CBE 120C

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 140B. Chemical Engineering Laboratory II. 4 Units.**

Continuation of the CBE 140A covering mass transfer operations such as distillation, absorption, extraction, etc. Rate and equilibria studies in simple chemical systems with and without reaction. Study of chemical process. Materials fee.

Prerequisite: CBE 130 and CBE 145 and CBE 140A

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 145. Chemical Process Control. 4 Units.**

Dynamic responses and control of chemical process equipment, dynamic modeling of chemical processes, linear system analysis, analyses and design of feedback loops and advanced control systems.

Prerequisite: CBE 110 and CBE 120B and CBE 120C

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 150A. Chemical Engineering Design I. 3 Units.**

Introduction to process design; flow sheets for chemical processes; synthesis of multicomponent separation sequences and reaction paths; synthesis of heat exchange networks; computer-aided design and simulation of processes and components packs.

Prerequisite: CBE 110 and CBE 120C and CBE 130

Restriction: Seniors only. Chemical Engineering Majors only.

**CBE 150B. Chemical Engineering Design II. 3 Units.**

Application of chemical engineering basics to practical design problems; process economics; process safety; environmental impacts; a major team design project with progress reports, oral presentation, and technical report with engineering drawings and economics.

Prerequisite: CBE 150A

Restriction: Seniors only. Chemical Engineering Majors only.

**CBE 160. Engineering Biology. 3 Units.**

First-principle introduction to the modern biochemistry, molecular biology, and cell biology with an engineering language. The goal is to demonstrate that the vastly diverse biological phenomena can be explained by a set of fundamental principles in chemistry, thermodynamics, and kinetics.

**CBE 161. Introduction to Biochemical Engineering. 3 Units.**

Application of engineering principles to biochemical processes. Topics include microbial pathways, energetics and control systems, enzyme and microbial kinetics, and the design and analysis of biological reactors.

Prerequisite: CEMS 110 and (CHEM 1C or CHEM H2C) and MATH 3D

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 163. Kinetics of Biochemical Networks. 4 Units.**

Principles from statistical mechanics, thermodynamics, and chemical kinetics applied to biochemical systems, from fundamental processes such as receptor-ligand binding and enzyme catalysis, to complex cellular functions including signal transduction and gene regulation.

Prerequisite: CBE 120A

Restriction: Chemical Engineering Majors have first consideration for enrollment.

Concurrent with CBE 263.

**CBE 176. Nuclear and Radiochemistry. 4 Units.**

Advanced treatment of nuclear structure, nuclear reactions, and radioactive-decay processes. Introduction to nuclear activation analysis, isotope effects, radiation chemistry, hot-atom chemistry, nuclear age-dating methods, nuclear reactors, and nuclear power.

Prerequisite: (CHEM M3C or CHEM 1C or CHEM H2C) and MATH 2D

Same as CHEM 133.

Overlaps with CHEM 170.

Restriction: Chemistry Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment.

Concurrent with CHEM 233 and CBE 276.

**CBE 181. Polymer Science and Engineering. 4 Units.**

An introduction to physical aspects of polymers, including configuration and conformation of polymer chains and characterization techniques; crystallinity, viscoelasticity, mechanical properties, polymer alloys, processing, and application.

Prerequisite: ENGR 54 and (CBE 110 or MSE 165)

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 183. Surface and Adhesion Science. 4 Units.**

Structure, thermodynamics of, kinetics, and reactions on surfaces. Surface electronic and mechanical properties and characterization of all classes of materials including metals, semiconductors, ceramics, polymers, and soft materials. Adhesion between different materials is also addressed.

Prerequisite: (CBE 110 or MSE 165C) and (MSE 141 or MSE 69)

Same as MSE 176.

Restriction: Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

Concurrent with MSE 276 and CBE 283.

**CBE 187. Semiconductor Device Packaging. 3 Units.**

Introduction to the semiconductor device packaging and assembly process. Electrical, thermal, optical, and mechanical aspects of package design and reliability. Special topics on optoelectronics packaging are covered.

Prerequisite: CBE 40B

Restriction: Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**CBE 195. Special Topics in Chemical Engineering. 1-4 Units.**

Studies in selected areas of Chemical Engineering. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**CBE 198. Group Study. 1-4 Units.**

Group study of selected topics in engineering.

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**CBE 199. Individual Study. 1-4 Units.**

For undergraduate engineering majors in supervised but independent readings, research, or design. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

Repeatability: May be taken for credit for 8 units.

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 199P. Individual Study. 1-4 Units.**

For undergraduate Engineering majors in supervised but independent reading, research, or design. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in The School of Engineering.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**CBE 200. Applied Engineering Mathematics I. 4 Units.**

Analytical techniques applied to engineering problems in transport phenomena, process dynamics and control, and thermodynamics.

Restriction: Graduate students only.

**CBE 210. Reaction Engineering. 4 Units.**

Advanced topics in reaction engineering, reactor stability analysis, diffusional effect in heterogeneous catalysis, energy balance, optimization of reactor operation, dispersed in phase reactors.

Restriction: Graduate students only.

**CBE 220A. Transport Phenomena I. 4 Units.**

Continuum modeling and analysis of heat and mass transfer from an integrated viewpoint. Scaling concepts, relevance of characteristic time- and length-scales, steady- and unsteady-state processes, bounded and unbounded problems, and convective transport, with applications to chemical and biological processes.

Restriction: Graduate students only.

**CBE 220B. Transport Phenomena II. 4 Units.**

Introduces flow of isothermal fluids from a momentum transport viewpoint. Steady- and unsteady-state creeping and laminar flows; viscous and inviscid flows; Navier-Stokes equations; lubrication theory; boundary layer theory; with specific application to complex chemical and biological engineering processes.

Prerequisite: CBE 220A

Restriction: Graduate students only.

**CBE 240. Advanced Engineering Thermodynamics. 4 Units.**

Introduction to modern thermodynamics and applications, with a focus on aspects relevant to chemical and materials engineering. Mathematical tools; equilibrium and stability; microscope rigorous equations of state; molecular-level thermodynamics of real mixtures; and phase and chemical equilibrium.

Restriction: Graduate students only.

**CBE 249. Special Topics in Chemical Engineering. 1-4 Units.**

Studies in selected areas of Chemical Engineering. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**CBE 250. Research Methods and Technical Communication. 4 Units.**

Intended for Ph.D. students to develop critical research skills in creating archival papers, intellectual property and technical proposals, and in analysis of the scientific literature.

Restriction: Graduate students only.

**CBE 261. Molecular Biotechnology. 4 Units.**

Engineering and biological principles important in recombinant cell technology. Host/vector selection; plasmid propagation; optimization of cloned gene expression; metabolic engineering; protein secretion; experimental techniques; modeling of recombinant cell systems.

Restriction: Graduate students only.

**CBE 262. Metabolic Engineering and Synthetic Biology. 4 Units.**

Synthesis of chemicals from renewable carbon and energy sources using.

Restriction: Graduate students only.

**CBE 263. Kinetics of Biochemical Networks . 4 Units.**

Principles from statistical mechanics, thermodynamics, and chemical kinetics applied to biochemical systems, from fundamental processes such as receptor-ligand binding and enzyme catalysis, to complex cellular functions including signal transduction and gene regulation.

Restriction: Graduate students only.

Concurrent with CBE 163.

**CBE 264. Drug Delivery. 4 Units.**

Introduction to design of drug delivery systems. Includes physicochemical and pharmacokinetic considerations in drug formulations, types of therapeutics, routes of administration, biomaterials, and novel drug delivery systems.

**CBE 266. Bioseparation Processes. 4 Units.**

Introduction to design of bioseparation processes. The recovery and purification of biologically produced proteins, chemicals, and particulates are important. Focuses on the use of chemical engineering skills and principles in the analysis and design of biologically-based processes.

Restriction: Graduate students only.

**CBE 276. Nuclear and Radiochemistry. 4 Units.**

Advanced treatment of nuclear structure, nuclear reactions, and radioactive-decay processes. Introduction to nuclear activation analysis, isotope effects, radiation chemistry, hot-atom chemistry, nuclear age-dating methods, nuclear reactors, and nuclear power.

Same as CHEM 233.

Restriction: Graduate students only.

Concurrent with CHEM 133 and CBE 176.

**CBE 277. Detection and Measurement of Radiation. 4 Units.**

Basic principles of detection and measurement of ionizing radiation; both theory and practical aspects of measurement techniques for alpha, beta, gamma, and neutron radiation, properties of different detector materials, electronics and data treatments, and analysis.

Prerequisite: CHEM 233 or CBE 276

Same as CHEM 244.

Restriction: Graduate students only.

**CBE 280. Advanced Polymer Science and Engineering. 4 Units.**

The synthesis, characterization, microstructure, rheology, and properties of polymer materials. Polymers in solution and in the liquid, crystalline and glassy states. Engineering and processing properties, including viscoelasticity and rheology. Forming and processing methods. Environmental issues.

Restriction: Graduate students only.

**CBE 282. Colloid Science and Engineering. 4 Units.**

An introduction to the basic foundations of colloid science, interfacial phenomena, suspensions and complex fluids, and engineering and assembly of colloidal materials.

Restriction: Graduate students only.

**CBE 283. Surface and Adhesion Science. 4 Units.**

Structure, thermodynamics of, kinetics, and reactions on surfaces. Surface electronic and mechanical properties and characterization of all classes of materials including metals, semiconductors, ceramics, polymers, and soft materials. Adhesion between different materials is also addressed.

Same as MSE 276.

Restriction: Graduate students only.

Concurrent with MSE 176 and CBE 183.

**CBE 288. Optoelectronics Packaging. 4 Units.**

Basic and current issues in the packaging of integrated circuits (IC) and fiber-optic devices are discussed.

Restriction: Graduate students only.

**CBE 295. Seminars in Engineering. 1-4 Units.**

Seminars scheduled each year by individual faculty in major field of interest.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**CBE 296. Master of Science Thesis Research. 1-16 Units.**

Individual research or investigation conducted in preparation for the thesis required for the M.S. degree.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CBE 297. Doctor of Philosophy Dissertation Research. 1-16 Units.**

Individual research or investigation conducted in preparation for the dissertation required for the Ph.D. degree.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CBE 298. Seminars in Engineering. 2 Units.**

Presentation of advanced topics and reports of current research efforts in chemical engineering.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CBE 299. Individual Research. 1-16 Units.**

Individual research or investigation under the direction of an individual faculty member.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Chemical Engr and Materials Science (CBEMS)

# Chemistry (CHEM)

## Courses

### **CHEM 1A. General Chemistry. 4 Units.**

General chemistry with applications to life sciences, physical sciences, and engineering. Atomic structure; general properties of the elements; covalent, ionic, and metallic bonding; mass relationships.

Prerequisite or corequisite: MATH 5A or MATH 2A or PHYS 7C or CHEM 1X or CHEM 1P or SAT Mathematics or ACT Mathematics or SAT Subject Chemistry or AP Chemistry or AP Calculus AB or AP Calculus BC. CHEM 1P with a grade of C- or better. SAT Mathematics with a minimum score of 600. ACT Mathematics with a minimum score of 27. SAT Subject Chemistry with a minimum score of 700. AP Chemistry with a minimum score of 3. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 3

Overlaps with CHEM H2A, ENGR 1A, CHEM M2A.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

(II and VA ).

### **CHEM 1B. General Chemistry. 4 Units.**

General chemistry with applications to life sciences, physical sciences, and engineering. Properties of gases, liquids, solids; intermolecular forces; changes of state; properties of solutions; stoichiometry; thermochemistry; and thermodynamics. Course may be offered online.

Prerequisite: CHEM 1A or ENGR 1A or CHEM H2A or AP Chemistry or CHEM M2A. CHEM 1A with a grade of C- or better. ENGR 1A with a grade of C- or better. CHEM H2A with a grade of C- or better. AP Chemistry with a minimum score of 4. CHEM M2A with a grade of C- or better

Overlaps with CHEM H2B.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

(II and Va ).

### **CHEM 1C. General Chemistry . 4 Units.**

General chemistry with applications to life sciences, physical sciences, and engineering. Equilibria, aqueous acid-base equilibria, solubility equilibria, oxidation reduction reactions, electrochemistry; kinetics; special topics.

Corequisite: CHEM 1LC

Prerequisite: CHEM 1B. CHEM 1B with a grade of C- or better

Overlaps with CHEM H2C.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

(II and VA ).

### **CHEM 1LA. General Chemistry Laboratory. 2 Units.**

Training and experience in basic laboratory techniques through experiments related to lecture topics in Chemistry 1A. Materials fee.

Corequisite: CHEM 1A

Overlaps with CHEM H2LA.



**CHEM 1LC. General Chemistry Laboratory. 3 Units.**

Training and experience in basic laboratory techniques. Chemical practice and principles illustrated through experiments related to lecture topics of CHEM 1A-B-C. Materials fee.

Corequisite: CHEM 1C

Prerequisite: CHEM 1B. CHEM 1B with a grade of C- or better

Overlaps with CHEM 1LE, CHEM H2LB, CHEM M2LB.

Restriction: Div of Undergraduate Education students have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Nursing Science Majors have first consideration for enrollment. Pharmaceutical Sciences Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment.

**CHEM 1LD. General Chemistry Laboratory. 3 Units.**

Training and experience in basic laboratory techniques. Chemical practice and principles illustrated through experiments related to lecture topics in CHEM 1A-B-C. Materials fee.

Prerequisite: (CHEM 1C and CHEM 1LC) or CHEM 1LE. CHEM 1C with a grade of C- or better. CHEM 1LC with a grade of C- or better. CHEM 1LE with a grade of C- or better

Overlaps with CHEM H2LB, CHEM M2LB.

Restriction: School of Biological Sciences students only. School of Physical Sciences students only. School of Engineering students only. Program in Nursing Science students only. Pharmaceutical Sciences Majors only. Public Health Sciences Majors only. No credit for CHEM M2LA if taken after CHEM 1LD. Undecided/Undeclared students also have first consideration for enrollment.

**CHEM 1LE. Accelerated General Chemistry Lab. 3 Units.**

Lecture and experiments covering chemical concepts for accelerated students who do not plan to take organic chemistry. Properties of gases, liquids, solutions, and solids; chemical equilibrium and chemical thermodynamics; atomic and molecular structure; chemical kinetics; electrochemistry. Materials fee.

Prerequisite or corequisite: CHEM 1A or ENGR 1A or AP Chemistry. AP Chemistry with a minimum score of 3

Overlaps with CHEM 1LC.

Restriction: School of Engineering students have first consideration for enrollment. Biomedical Computing Majors have first consideration for enrollment.

**CHEM 1P. Preparation for General Chemistry . 4 Units.**

Units of measurement, dimensional analysis, significant figures; elementary concepts of volume, mass, force, pressure, energy, density, temperature, heat, work; fundamentals of atomic and molecular structure; the mole concept, stoichiometry; properties of the states of matter; gas laws; solutions concentrations.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Biomedical Computing Majors have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

**CHEM 1X. General Chemistry Plus. 2 Units.**

Units of chemical measurements, dimensional analysis, significant figures; elementary physicochemical concepts; fundamentals of atomic and molecular structure; molar amounts and stoichiometry; properties of the states of matter; solutions concentrations.

Prerequisite: Students who meet the requirements for taking Chem 1A through their SAT, ACT, or AP test scores are not eligible for enrollment in Chem 1X. Specifically, the students must have ALL of the following advisory prerequisites (the inverse of the Chem 1A prerequisites): S02<600 (score below 600 on the SAT Mathematics Reasoning test) A02<27 (score below 27 on the ACT Mathematics test) Z43<700 (score below 700 on the SAT Chemistry subject exam) AP25<3 (score below 3 on the AP Chemistry exam) AP66<4 (score below 4 on the AP Calculus AB Exam) AP68<3 (score below 3 on the AP Calculus BC Exam) Students who meet Chem 1A eligibility through ALEKS-based training are permitted to enroll in Chem 1X. Chem 1X is open to interested BioEASE students.

Grading Option: Pass/no pass only.

**CHEM H2A. Honors General Chemistry. 4 Units.**

Covers the same material as CHEM 1A-CHEM 1B-CHEM M3C but in greater depth. Additional topics will also be included as time permits.

Corequisite: CHEM H2LA

Prerequisite: AP Chemistry or SAT Subject Chemistry. AP Chemistry with a minimum score of 4. SAT Subject Chemistry with a minimum score of 700

Overlaps with CHEM 1A.

Restriction: Campuswide Honors Collegium students only.

**(II and Va ).**

**CHEM H2B. Honors General Chemistry. 4 Units.**

Covers the same material as CHEM 1A-CHEM 1B-CHEM M3C but in greater depth. Additional topics are also included as time permits.

Corequisite: CHEM H2LB

Prerequisite: CHEM H2A and (CHEM H2LA or CHEM M2LA). CHEM H2A with a grade of C- or better. CHEM H2LA with a grade of C- or better. CHEM M2LA with a grade of C- or better

Overlaps with CHEM 1B.

Restriction: Campuswide Honors Collegium students only.

**(II and VA ).**

**CHEM H2C. Honors General Chemistry. 4 Units.**

Covers the same material as CHEM 1A-CHEM 1B-CHEM M3C but in greater depth. Additional topics are also included as time permits.

Prerequisite: CHEM H2B and (CHEM H2LB or CHEM M2LB). CHEM H2B with a grade of C- or better. CHEM H2LB with a grade of C- or better. CHEM M2LB with a grade of C- or better

Overlaps with CHEM 1C.

Restriction: Campuswide Honors Collegium students only.

**(II and VA ).**

**CHEM H2LA. Honors General Chemistry Laboratory. 3 Units.**

Training and experience in fundamental and analytical laboratory techniques through experiments related to lecture topics in CHEM H2A-CHEM H2B-CHEM H2C. Materials fee.

Corequisite: CHEM H2A

Prerequisite: AP Chemistry or SAT Subject Chemistry. AP Chemistry with a minimum score of 4. SAT Subject Chemistry with a minimum score of 700

Overlaps with CHEM M2LA.

Restriction: Campuswide Honors Collegium students only.

**CHEM H2LB. Honors General Chemistry Laboratory. 3 Units.**

Training and experience in fundamental and analytical laboratory techniques through experiments related to lecture topics in CHEM H2A-CHEM H2B-CHEM H2C. Materials fee.

Corequisite: CHEM H2B

Prerequisite: CHEM H2A and (CHEM H2LA or CHEM M2LA). CHEM H2A with a grade of B or better. CHEM H2LA with a grade of B or better. CHEM M2LA with a grade of B or better

Overlaps with CHEM M2LB.

Restriction: No credit for CHEM 1LC if taken after CHEM H2LB or CHEM M2LB.

**CHEM H2LC. Honors General Chemistry Laboratory. 3 Units.**

Training and experience in fundamental and analytical laboratory techniques through experiments related to lecture topics in CHEM H2A-CHEM H2B-CHEM H2C. Materials fee.

Corequisite: CHEM H2C

Prerequisite: CHEM H2B and (CHEM H2LB or CHEM M2LB). CHEM H2B with a grade of B or better. CHEM H2LB with a grade of B or better. CHEM M2LB with a grade of B or better

**CHEM M2A. Majors General Chemistry Lecture. 4 Units.**

Covers the same material as CHEM 1A but in greater depth. Additional topics are included as time permits.

Prerequisite or corequisite: MATH 5A or MATH 2A or PHYS 7C or CHEM 1X or CHEM 1P or SAT Mathematics or ACT Mathematics or SAT Subject Chemistry or AP Chemistry or AP Calculus AB or AP Calculus BC. CHEM 1P with a grade of C- or better. SAT Mathematics with a minimum score of 600. ACT Mathematics with a minimum score of 27. SAT Subject Chemistry with a minimum score of 700. AP Chemistry with a minimum score of 3. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 3. Placement via a passing score on the ALEKS placement exam is also accepted.

Overlaps with CHEM 1A, CHEM H2A, ENGR 1A.

Restriction: Chemistry Majors have first consideration for enrollment.

(II and Va ).

**CHEM M2B. Majors General Chemistry Lecture. 4 Units.**

Covers the same material as CHEM 1B but in greater depth. Additional topics will also be included as time permits.

Prerequisite: CHEM M2A and CHEM M2LA. CHEM M2A with a grade of C- or better. CHEM M2LA with a grade of C- or better

Overlaps with CHEM H2B, CHEM 1B.

Restriction: Chemistry Majors have first consideration for enrollment.

(II and Va ).

**CHEM M2C. Majors General Chemistry Lecture. 4 Units.**

Covers the same material as CHEM 1C but in greater depth. Additional topics are also included as time permits.

Prerequisite: CHEM M2B and CHEM M2LB. CHEM M2B with a grade of C- or better. CHEM M2LB with a grade of C- or better

Overlaps with CHEM 1C, CHEM H2C.

Restriction: Chemistry Majors have first consideration for enrollment.

(II and Va ).

**CHEM M2LA. Majors General Chemistry Laboratory. 3 Units.**

Training and experience in basic laboratory techniques through experiments related to lecture topics in CHEM 1A-CHEM 1B-CHEM M3C. Materials fee.

Prerequisite or corequisite: CHEM 1A or CHEM M2A or CHEM H2A. CHEM 1A with a grade of C- or better. CHEM M2A with a grade of C- or better. CHEM H2A with a grade of C- or better. High school chemistry.

Overlaps with CHEM H2LA, CHEM 1LD.

Restriction: Chemistry Majors only. No credit for CHEM M2LA if taken after CHEM 1LD.

**CHEM M2LB. Majors General Chemistry Laboratory. 3 Units.**

Training and experience in basic laboratory techniques through experiments related to lecture topics in CHEM 1A-CHEM 1B-CHEM M3C. Materials fee.

Prerequisite or corequisite: (CHEM 1B or CHEM H2B or CHEM M2B) and (CHEM M2A or CHEM H2A) and (CHEM M2LA or CHEM H2LA). CHEM M2A with a grade of C- or better. CHEM H2A with a grade of C- or better. CHEM M2LA with a grade of C- or better. CHEM H2LA with a grade of C- or better

Overlaps with CHEM H2LB.

Restriction: Chemistry Majors only. CHEM 1LC may not be taken for credit if taken after CHEM H2LB or CHEM M2LB.

**CHEM M3C. Majors Quantitative Analytical Chemistry. 4 Units.**

Topics include equilibria, aqueous acid-base equilibria, solubility equilibria, oxidation reduction reactions, electrochemistry, and kinetics with a special emphasis on the statistical treatment of data and analytical methods of chemical analysis.

Corequisite: CHEM M3LC

Prerequisite: (CHEM 1B or CHEM H2B or CHEM M2B) and (CHEM M2LB or CHEM H2LB). CHEM 1B with a grade of C- or better. CHEM H2B with a grade of C- or better. CHEM M2B with a grade of C- or better. CHEM M2LB with a grade of C- or better. CHEM H2LB with a grade of C- or better

Restriction: Chemistry Majors only.

(II and VA ).

**CHEM M3LC. Majors Quantitative Analytical Chemistry Laboratory. 4 Units.**

Foundational principles of analytical chemistry and experimental methods for quantitative analysis of real samples. Materials fee.

Prerequisite: (CHEM 1B or CHEM H2B or CHEM M2B) and (CHEM M2LB or CHEM H2LB). CHEM 1B with a grade of C- or better. CHEM H2B with a grade of C- or better. CHEM M2B with a grade of C- or better. CHEM M2LB with a grade of C- or better. CHEM H2LB with a grade of C- or better

Restriction: Chemistry Majors only.

**CHEM 5. Scientific Mathematical and Computing Skills. 4 Units.**

Introduces students to mathematical skills, including complex numbers, linear algebra, differential equations, multivariable calculus, infinite series, Fourier series, and integral transforms; and computing skills, including plotting, data analysis (statistics and curve fitting), linear algebra, symbolic mathematics, and spectral analysis.

Corequisite: (CHEM 1C or CHEM H2C or CHEM M3C) and MATH 2D.

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 11. New Chemistry Student Seminar. 1 Workload Unit.**

Seminar for students who recently joined the chemistry major. Addresses available tracks in the major, research opportunities in the chemistry department, careers in chemistry, and relevant programs and resources for students.

Grading Option: Workload Credit P/NP Only.

Restriction: Freshmen students, transfer students, and students who recently changed their major to Chemistry have first consideration for enrollment.

**CHEM 12. Chemistry Around Us. 4 Units.**

Addresses ways in which chemistry affects everyday life. Topics include pollution, global warming, water supply/demands, biodiesel fuels, foods we eat, natural/synthetic materials, common drugs, drug design. Learn and apply basic chemistry concepts. Use risk/benefit analysis for optimal solutions.

(II and Va ).

**CHEM 14. Sense and Sensibility in Science. 4 Units.**

Gives an overview of scientific methods and heuristics through group exercises and discussion. Discusses the benefits and limitations of applying rational scientific approaches to real-world examples from philosophy, cognitive and social psychology, game theory, economics, political science, law, and negotiation.

(II and V.A. ).

**CHEM H30A. Critical Analysis of Health Science Literature. 4 Units.**

Focuses on evaluation of scientific literature. Aspects of scientific inquiry include scientific method, scientific research design, statistical analysis, and publication processes. Addresses why scientific inquiry cannot be separated from sociocultural influences and concerns. Examples drawn from research on health-related issues.

Restriction: Campuswide Honors Collegium students only.

(II and Va. ).

**CHEM 51A. Organic Chemistry. 4 Units.**

Fundamental concepts relating to carbon compounds with emphasis on structural theory and the nature of chemical bonding, stereochemistry, reaction mechanisms, and stereoscopic, physical, and chemical properties of the principal classes of carbon compounds.

Prerequisite or corequisite: (CHEM 1C or CHEM H2C or CHEM M3C) and (CHEM 1LD or CHEM H2LB or CHEM M2LB). CHEM 1C with a grade of C- or better. CHEM H2C with a grade of C- or better. CHEM M3C with a grade of C- or better. CHEM 1LD with a grade of C- or better. CHEM H2LB with a grade of C- or better. CHEM M2LB with a grade of C- or better

Overlaps with CHEM H52A.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

**CHEM 51B. Organic Chemistry. 4 Units.**

Fundamental concepts relating to carbon compounds with emphasis on structural theory and the nature of chemical bonding, stereochemistry, reaction mechanisms, and stereoscopic, physical, and chemical properties of the principal classes of carbon compounds.

Prerequisite: CHEM 51A and (CHEM 1LD or CHEM M52LA or CHEM H52LA). CHEM 51A with a grade of C- or better. CHEM 1LD with a grade of C- or better. CHEM M52LA with a grade of C- or better. CHEM H52LA with a grade of C- or better

Overlaps with CHEM H52B.

Restriction: Undeclared Majors have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment.

**CHEM 51C. Organic Chemistry. 4 Units.**

Fundamental concepts relating to carbon compounds with emphasis on structural theory and the nature of chemical bonding, stereochemistry, reaction mechanisms, and stereoscopic, physical, and chemical properties of the principal classes of carbon compounds.

Prerequisite: CHEM 51B and (CHEM 51LB or CHEM M52LB or CHEM H52LB). CHEM 51B with a grade of C- or better. CHEM 51LB with a grade of C- or better. CHEM M52LB with a grade of C- or better. CHEM H52LB with a grade of C- or better

Overlaps with CHEM H52C.

Restriction: Undeclared Majors have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment.

**CHEM 51LB. Organic Chemistry Laboratory. 3 Units.**

Modern techniques of organic chemistry, using selected experiments to illustrate topics introduced in CHEM 51A-CHEM 51B-CHEM 51C. Materials fee.

Corequisite: CHEM 51B

Prerequisite: CHEM 51A and (CHEM 1LD or CHEM H2LB or CHEM M2LB). CHEM 51A with a grade of C- or better. CHEM 1LD with a grade of C- or better. CHEM H2LB with a grade of C- or better. CHEM M2LB with a grade of C- or better

Overlaps with CHEM H52LA, CHEM M52LA.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

**CHEM 51LC. Organic Chemistry Laboratory. 3 Units.**

Modern techniques of organic chemistry, using selected experiments to illustrate topics introduced in CHEM 51A-B-C. Materials fee.

Corequisite: CHEM 51C

Prerequisite: CHEM 51B and CHEM 51LB. CHEM 51B with a grade of C- or better. CHEM 51LB with a grade of C- or better

Overlaps with CHEM H52LB, CHEM M52LB.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

**CHEM 51LD. Organic Chemistry Laboratory. 3 Units.**

Modern techniques of organic chemistry using selected experiments to illustrate topics introduced in CHEM 51A-CHEM 51B-CHEM 51C. Materials fee.

Prerequisite: CHEM 51C and CHEM 51LC. CHEM 51C with a grade of C- or better. CHEM 51LC with a grade of C- or better

Overlaps with CHEM H52LC.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

**CHEM H52LA. Honors Organic Chemistry Laboratory. 3 Units.**

Fundamental techniques of modern experimental organic chemistry. Materials fee.

Corequisite: CHEM 51A

Prerequisite: (CHEM 1C or CHEM H2C or CHEM M3C) and (CHEM M2LB or CHEM H2LB or CHEM 1LD). CHEM 1C with a grade of C- or better.

CHEM H2C with a grade of C- or better. CHEM M3C with a grade of C- or better. CHEM M2LB with a grade of C- or better. CHEM H2LB with a grade of C- or better. CHEM 1LD with a grade of C- or better

Overlaps with CHEM 51LB, CHEM M52LA.

Restriction: Campuswide Honors Collegium students only.

**CHEM H52LB. Honors Organic Chemistry Laboratory. 3 Units.**

Fundamental techniques of modern experimental organic chemistry. Materials fee.

Corequisite: CHEM 51B

Prerequisite: CHEM 51A and CHEM H52LA. CHEM 51A with a grade of C- or better. CHEM H52LA with a grade of C- or better

Overlaps with CHEM M52LB, CHEM 51LC.

**CHEM H52LC. Honors Organic Chemistry Laboratory. 3 Units.**

Fundamental techniques of modern experimental organic chemistry. Materials fee.

Prerequisite: CHEM 51B and CHEM H52LB. CHEM 51B with a grade of C- or better. CHEM H52LB with a grade of C- or better

Overlaps with CHEM 51LD, CHEM M52LC.

**CHEM M52LA. Majors Organic Chemistry Laboratory. 3 Units.**

Modern techniques of organic chemistry, using selected experiments to illustrate topics introduced in CHEM 51A-B-C. Materials fee.

Corequisite: CHEM 51A

Prerequisite: (CHEM 1C or CHEM H2C or CHEM M3C) and (CHEM H2LB or CHEM M2LB or CHEM 1LD). CHEM 1C with a grade of C- or better.

CHEM H2C with a grade of C- or better. CHEM M3C with a grade of C- or better. CHEM H2LB with a grade of C- or better. CHEM M2LB with a grade of C- or better. CHEM 1LD with a grade of C- or better

Overlaps with CHEM H52LA, CHEM 51LB.

Restriction: Chemistry Majors only.

**CHEM M52LB. Majors Organic Chemistry Laboratory. 3 Units.**

Modern techniques of organic chemistry, using selected experiments to illustrate topics introduced in CHEM 51A-B-C. Materials fee.

Corequisite: CHEM 51B

Prerequisite: CHEM 51A and CHEM M52LA. CHEM 51A with a grade of C- or better. CHEM M52LA with a grade of C- or better

Overlaps with CHEM H52LB, CHEM 51LC.

Restriction: Chemistry Majors only.

**CHEM M52LC. Majors Organic Chemistry Laboratory. 3 Units.**

Modern techniques of organic chemistry, using selected experiments to illustrate topics introduced in CHEM 51A-B-C. Materials fee.

Corequisite: CHEM 51C

Prerequisite: CHEM 51B and CHEM M52LB. CHEM 51B with a grade of C- or better. CHEM M52LB with a grade of C- or better

Overlaps with CHEM H52LC, CHEM 51LD.

Restriction: Chemistry Majors only.

**CHEM H90. The Idiom and Practice of Science. 4 Units.**

A series of fundamental and applied problems in the chemical sciences are addressed. Topics may include the periodic table, electronic structure of atoms, chemical bonding, molecular structure, thermodynamics, and kinetics, with applications to energy and the environment, and/or biochemistry.

Restriction: Campuswide Honors Collegium students only.

(II, Va)

**CHEM 100S. Laboratory Safety for Chemists.**

Provide students with the fundamentals of safety involved in chemical laboratory work.

Prerequisite or corequisite: CHEM 51C

Grading Option: Pass/no pass only.

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 101W. Writing in Chemical Sciences. 4 Units.**

Students receive guidance on preparing research papers, proposals, reports, and other forms of scientific writing in chemistry-related fields, on effectively searching for and using chemical information, and on communicating data in poster and platform presentations.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Chemistry Majors have first consideration for enrollment.

(Ib)

**CHEM 107. Inorganic Chemistry. 4 Units.**

Introduction to modern inorganic chemistry. Principles of structure, bonding, and chemical reactivity with application to compounds of the main group and transition elements, including organometallic chemistry.

Prerequisite: CHEM 51C or CHEM H52C

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 107L. Inorganic Chemistry Laboratory. 3 Units.**

Modern techniques of inorganic and organometallic chemistry, including experience with glove box, Schlenk line, and vacuum line methods. Materials fee.

Prerequisite or corequisite: CHEM 107 and CHEM 100S

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 125. Advanced Organic Chemistry. 4 Units.**

Rapid-paced comprehensive treatment of organic chemistry. Focuses on molecular structure, reactivity, stability, scope and mechanisms of organic reactions. Topics include: structure and bonding; theoretical organic chemistry; acidity and basicity; reactive intermediates; pericyclic reactions; stereochemistry; organic synthesis; natural products; organic photochemistry.

Prerequisite: CHEM 51C

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 127. Inorganic Chemistry II. 4 Units.**

Advanced treatment of selected fundamental topics in inorganic chemistry, building on material presented in Chemistry 107. Molecular symmetry with applications to electronic structure and spectroscopy. Reaction kinetics and mechanisms; inorganic synthesis and catalysis; bioinorganic chemistry.

Prerequisite: CHEM 107

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 128. Introduction to Chemical Biology. 4 Units.**

Introduction to the basic principles of chemical biology: structures and reactivity; chemical mechanisms of enzyme catalysis; chemistry of signalling, biosynthesis, and metabolic pathways.

Corequisite: CHEM 128L

Prerequisite: (CHEM 51C or CHEM H52C)

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 128L. Introduction to Chemical Biology Laboratory Techniques. 3 Units.**

Introduction to the basic laboratory techniques of chemical biology: electrophoresis, plasmid preparation, PCR, protein expression, isolation, and kinetics. Materials fee.

Corequisite: CHEM 128

Restriction: Chemistry Majors have first consideration for enrollment.



**CHEM 132A. Chemical Thermodynamics, Kinetics, and Dynamics. 4 Units.**

Energy, entropy, and the thermodynamic potentials. Chemical equilibrium. Chemical kinetics.

Prerequisite or corequisite: MATH 2D and (PHYS 7D or PHYS 7E) and (CHEM 5 or (MATH 3D and (EECS 10 or EECS 12 or MAE 10 or ICS 31)) )

Overlaps with CHEM 131C.

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 132B. Quantum Principles, Spectroscopy, and Bonding. 4 Units.**

Principles of quantum chemistry with applications to the elements of atomic structure, energy levels, and spectroscopy.

Prerequisite: (CHEM 132A or CEMS 45C) and (PHYS 7D or PHYS 7E). CHEM 132A with a grade of C- or better

Overlaps with CHEM 131A.

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 132C. Molecular Structure and Elementary Statistical Mechanics. 4 Units.**

Principles of quantum mechanics with applications to molecular spectroscopy and structure determination, and chemical bonding in simple molecules. Elements of statistical mechanics.

Prerequisite: CHEM 132B

Overlaps with CHEM 131B.

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 133. Nuclear and Radiochemistry. 4 Units.**

Advanced treatment of nuclear structure, nuclear reactions, and radioactive-decay processes. Introduction to nuclear activation analysis, isotope effects, radiation chemistry, hot-atom chemistry, nuclear age-dating methods, nuclear reactors, and nuclear power.

Prerequisite: (CHEM M3C or CHEM 1C or CHEM H2C) and MATH 2D

Same as CBE 176.

Overlaps with CHEM 170.

Restriction: Chemistry Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment.

Concurrent with CHEM 233 and CBE 276.

**CHEM 133L. Nuclear and Radiochemistry Laboratory. 3 Units.**

Practical aspects of production, separation, safe handling, detection, and measurement of radioactive isotopes. Experiments use the UCI nuclear reactor and emphasize uses of radioisotopes in chemistry, engineering, biology, and medicine. Materials fee.

Prerequisite or corequisite: CHEM 133

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 137. Computational Chemistry. 4 Units.**

Short introduction to programming languages and to representative algorithms employed in chemical research. Students have the opportunity to devise and employ their own codes and also to employ codes which are widely used in various fields of chemistry. Materials fee.

Corequisite: CHEM 132C

Prerequisite: CHEM 51C and (CHEM 131A or CHEM 132B)

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 138. Introduction to Computational Organic Chemistry. 4 Units.**

An introduction to the use of computational chemistry to investigate reaction mechanisms, to calculate structures, and to predict properties of molecules. Students have the opportunity to perform calculations employing computational methods which are widely used in various fields of chemistry. Materials fee.

Prerequisite: CHEM 51C

Restriction: Chemistry Majors have first consideration for enrollment.



**CHEM 141. Environmental Chemistry. 4 Units.**

Processes that control the fate of chemicals in the environment. Chemistry of the atmosphere, hydrosphere, and soils, especially as it pertains to pollutants.

Prerequisite: (CHEM 51C or CHEM H52C) and (MATH 2B or AP Calculus BC). AP Calculus BC with a minimum score of 4

**CHEM 145A. Gas-Phase Atmospheric Chemistry. 4 Units.**

Sources, chemistry, sinks, and measurements of key atmospheric gaseous species. Chemistry of photochemical oxidant formation, transformation of key inorganic and organic trace gases, and stratospheric ozone cycling. Applications of atmospheric chemistry models to control strategies.

Prerequisite: CHEM 132A and CHEM 132B and CHEM 132C

Concurrent with CHEM 245A.

**CHEM 145B. Multi-Phase Atmospheric Chemistry. 4 Units.**

Chemical and physical processes leading to the production, aging, and removal of atmospheric particles. Multi-phase processes involving gases, particles, water droplets, and environmental surfaces. Approaches for modeling these processes with applications to control strategies.

Prerequisite: CHEM 145A

Concurrent with CHEM 245B.

**CHEM 150. Computational Chemistry. 4 Units.**

Basic concepts, methods, and techniques in computational chemistry: density functional and wavefunction theory, molecular property calculations, analysis tools, potential energy surfaces, vibrational effects, molecular dynamics simulations.

Prerequisite or corequisite: MATH 3A and (CHEM 132A or PHYS 113A)

Restriction: Chemistry Majors have first consideration for enrollment.

Concurrent with CHEM 250.

**CHEM 150L. Computational Chemistry Laboratory. 4 Units.**

Introduction to the practice of modern computational chemistry through a series of advanced computational experiments.

Prerequisite: CHEM 150 and (CHEM 5 or PHYS 50 or EECS 12)

Restriction: Chemistry Majors have first consideration for enrollment.

Concurrent with CHEM 250L.

**CHEM 152. Advanced Analytical Chemistry. 5 Units.**

In-depth treatment of modern instrumental methods for quantitative analysis of real samples and basic principles of instrument design. Laboratory experiments using spectroscopic, chromatographic, mass spectrometric, and other instrumental methods. Materials fee.

Prerequisite: (CHEM 1C or CHEM M3C or CHEM H2C) and (CHEM M3LC or CHEM H2LC)

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 153. Physical Chemistry Laboratory. 4 Units.**

Introduction to the modern experimental approaches and software tools used in spectroscopy, kinetics, electrochemistry, and other physical chemistry experiments. Basics of interfacing with instruments using LabView. Materials fee.

Corequisite: CHEM 132C

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 156. Advanced Laboratory in Chemistry and Synthesis of Materials. 4 Units.**

Modern synthesis and characterization of organic and inorganic materials including polymers, nanomaterials, and biomaterials. State-of-the-art characterization techniques include gel permeation chromatography, dynamic light scattering, thermal analysis, mechanical analysis, electron and scanning probe microscopy, X-ray diffraction, and porosimetry. Materials fee.

Prerequisite: (CHEM 51C or CHEM H52C) and (CHEM 51LC or CHEM H52LC or CHEM M52LC) and (CHEM 131A or CHEM 132B or PHMS 171)

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 160. Organic Synthesis Laboratory. 4 Units.**

Modern experimental techniques in organic synthesis including experience with thin-layer chromatography, liquid chromatography, and gas chromatography. Modern methods of structure elucidation including FT NMR are employed in the characterization of products. Materials fee.

Prerequisite or corequisite: CHEM 51C and CHEM 100S and (CHEM 51LC or CHEM H52LC or CHEM M52LC)

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 170. Radioisotope Techniques. 4 Units.**

Basic theory and practice of production, separation, safe handling, counting, applications of radioactive isotopes with emphasis on applications in chemistry, biology, and medicine. Materials fee.

Prerequisite: (CHEM 1C or CHEM M3C or CHEM H2C) and (CHEM 1LC or CHEM M3LC or CHEM H2LC)

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 177. Medicinal Chemistry. 4 Units.**

An introduction of the basics of drug activity and mechanisms. Strategies used to identify lead compounds such as natural product chemistry, combinatorial chemistry, molecular modeling, and high-through put screening. Relationship of molecular structure to pharmacological activity.

Prerequisite: CHEM 51A and CHEM 51B and CHEM 51C and (BIOL 98 or CHEM 128)

Same as PHMS 177.

Restriction: Pharmaceutical Sciences Majors have first consideration for enrollment.

**CHEM 177L. Medicinal Chemistry Laboratory. 3 Units.**

An introduction of the basics of drug activity and mechanisms. Strategies used to identify lead compounds such as natural product chemistry, combinatorial chemistry, molecular modeling, and high-through put screening. Relationship of molecular structure to pharmacological activity. Materials fee.

Corequisite: PHRMSCI 177 or CHEM 177.

Prerequisite: CHEM 51A and CHEM 51B and CHEM 51C and BIOL 100 and (BIOL 98 or CHEM 128)

Same as PHMS 177L.

Restriction: Pharmaceutical Sciences Majors have first consideration for enrollment.

**(Ib)****CHEM 180. Undergraduate Research. 4 Units.**

Research for credit arranged with a faculty member to sponsor and supervise work. Student time commitment of 10 to 15 hours per week is expected, and a written research report is required at the end of each quarter.

Prerequisite or corequisite: CHEM 100S

Repeatability: May be repeated for credit unlimited times.

**CHEM 180W. Senior Thesis in Chemistry. 4 Units.**

Students receive guidance on preparing research papers, proposals, reports, and other forms of scientific writing in chemistry-related fields; on effectively searching for and using chemical information; and on communicating data in poster and platform presentations.

Prerequisite: CHEM 180 or CHEM 199 or PHYS 195 or ESS 199 or CEMS 199 or CEE 199 or MAE 199 or BIOL 199 or PUBH 199. CHEM 180 with a grade of A or better. CHEM 199 with a grade of A or better. PHYS 195 with a grade of A or better. ESS 199 with a grade of A or better. CEMS 199 with a grade of A or better. CEE 199 with a grade of A or better. MAE 199 with a grade of A or better. BIOL 199 with a grade of A or better. PUBH 199 with a grade of A or better. Consent of the instructor is also accepted. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Chemistry Majors have first consideration for enrollment.

**(Ib)****CHEM H180A. Honors Research in Chemistry. 4 Units.**

Undergraduate honors research in Chemistry. A student time commitment of 10-15 hours per week is required.

Restriction: Chemistry Honors students only. Campuswide Honors Collegium students only.

**CHEM H180B. Honors Research in Chemistry. 4 Units.**

Undergraduate honors research in Chemistry. A student time commitment of 10-15 hours per week is required.

Prerequisite: CHEM H180A

Restriction: Campuswide Honors Collegium students only.

**CHEM H180C. Honors Research in Chemistry. 4 Units.**

Undergraduate honors research in Chemistry. A student time commitment of 10-15 hours per week is required.

Prerequisite: CHEM H180B

Restriction: Chemistry Honors students only. Chemistry majors participating in the Campuswide Honors Program students only.

**CHEM H181W. Honors Seminar in Chemistry. 2 Units.**

Students will receive guidance in the preparation of oral and written research presentations. A written thesis will be prepared and a formal research seminar will be presented.

Corequisite: CHEM H180C

Prerequisite: CHEM H180A and CHEM H180B. Satisfactory completion of the Lower-Division Writing requirement.

**(Ib)****CHEM 191. Chemistry Outreach Program. 2 Units.**

Involves intensive participation in the UCI Chemistry Outreach Program, which performs Chemistry demonstrations at local high schools.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 6 times.

**CHEM 192. Tutoring in Chemistry. 2 Units.**

Enrollment limited to participants in the Chemistry Peer Tutoring Program.

Repeatability: May be taken for credit 9 times.

Restriction: The first eight may be taken for a letter grade. The remaining ten units must be taken Pass/Not Pass only. NOTE: No more than eight units may be counted toward the 180 units required for graduation. Satisfies no degree requirement other than contribution to the 180-unit total.

**CHEM 193. Research Methods. 4 Units.**

Explores tools of inquiry for developing and implementing science research projects. Students undertake independent projects requiring data collection, analysis, and modeling, and the organization and presentation of results. Additional topics include ethical issues and role of scientific literature.

Prerequisite: BIOL 14 or PS 5

Same as BIOL 108, PHYS 193.

**CHEM 197. Professional Internship. .5-4 Units.**

Internship program that provides students with opportunity to develop professional skills necessary for competitive placement in their chosen chemical-inspired industry. Students gain new and field-specific skills outside the classroom while participating in a supervised internship.

Prerequisite: Enrollment requires completion of an application form. Student selection is made by a selection committee.

Repeatability: May be taken for credit for 13 units.

Restriction: Upper-division students only. Chemistry Majors only.

**CHEM 199. Independent Study in Chemistry. 1-4 Units.**

Independent research with Chemistry faculty. Student time commitment of three to four hours per week per unit is expected, and a written report on the independent study is required at the end of each quarter of enrollment.

Repeatability: Unlimited as topics vary.

**CHEM 200. Conduct of Research . 2 Units.**

Introduces new graduate students to ethical conduct of scientific research, mentoring, and current research in the Department of chemistry.

Repeatability: May be taken for credit 2 times.

**CHEM 201. Organic Reaction Mechanisms I. 4 Units.**

Advanced treatment of basic mechanistic principles of modern organic chemistry. Topics include molecular orbital theory, orbital symmetry control of organic reactions, aromaticity, carbonium ion chemistry, free radical chemistry, the chemistry of carbenes and carbanions, photochemistry, electrophilic substitutions, aromatic chemistry.

Prerequisite: CHEM 132A and CHEM 132B and CHEM 132C

**CHEM 202. Organic Reaction Mechanisms II. 4 Units.**

Topics include more in-depth treatment of mechanistic concepts, kinetics, conformational analysis, computational methods, stereoelectronics, and both solution and enzymatic catalysis.

Prerequisite: CHEM 201

**CHEM 203. Organic Spectroscopy. 4 Units.**

Modern methods used in structure determination of organic molecules. Topics include mass spectrometry; ultraviolet, chiroptical, infrared, and nuclear magnetic resonance spectroscopy.

Prerequisite: (CHEM 51A and CHEM 51B and CHEM 51C) or (CHEM H52A and CHEM H52B and CHEM H52C)

Restriction: Graduate students only.

**CHEM 204. Organic Synthesis I. 4 Units.**

Fundamentals of modern synthetic organic chemistry is developed. Major emphasis is on carbon-carbon bond forming methodology. Topics include carbonyl annulations, cycloadditions, sigmatropic rearrangements, and organometallic methods.

**CHEM 205. Organic Synthesis II. 4 Units.**

Fundamentals of modern synthetic organic chemistry will be developed. Major emphasis this quarter is on natural product total synthesis and retrosynthetic (antithetic) analysis.

Prerequisite: CHEM 204

**CHEM 206. Advanced Data Acquisition and Analysis. 4-6 Units.**

Introduces students to a variety of practical laboratory techniques, including lock-in, boxcar, coincidence counting, noise filtering, PID control, properties of common transducers, computer interfacing to instruments, vacuum technology, laboratory safety, basic mechanical design, and shop skills. Materials fee.

Same as PHYS 206.

Concurrent with PHYS 106.

**CHEM 207. Applied Physical Chemistry. 4 Units.**

Introduction to fundamental concepts in molecular structure and reactivity: theory of bonding, valence and molecular orbitals; structure and reactivity in inorganic chemistry; elements in molecular group theory; nomenclature in organic chemistry; and survey of macromolecules.

Same as PHYS 207.

**CHEM 208. Math Methods. 4 Units.**

Applications of mathematics to physical and chemical problems. Calculus of special functions, complex variables and vectors; linear vector spaces and eigenvalue problems. Differential equations.

Same as PHYS 208.

**CHEM 213. Chemical Kinetics. 4 Units.**

Surveys gas phase and organic reaction mechanisms and their relationship to kinetic rate laws; treats the basic theory of elementary reaction rates. A brief presentation of modern cross-sectional kinetics is included.

Prerequisite: CHEM 132A and CHEM 132B and CHEM 132C

**CHEM 215. Inorganic Chemistry I. 4 Units.**

Principles of modern inorganic chemistry with applications to chemical systems of current interest. Inorganic phenomena are organized into general patterns which rationalize observed structures, stabilities, and physical properties.

Prerequisite: CHEM 107 and CHEM 132A and CHEM 132B and CHEM 132C

Restriction: Graduate students only.

**CHEM 216. Organometallic Chemistry. 4 Units.**

Synthesis and reactivity of organometallic complexes with an emphasis on mechanisms. Topics include bonding and fluxional properties; metal-carbon single and multiple bonds; metal  $\pi$ -complexes. Applications to homogenous catalysis and organic synthesis are incorporated throughout the course.

Prerequisite: CHEM 107 or CHEM 215

**CHEM 217. Physical Inorganic Chemistry. 4 Units.**

General principles of the spectroscopy and magnetism of inorganic compounds. Characterization of inorganic complexes by infrared, near-infrared, visible, ultraviolet, NMR, EPR, EXAFS, and Mossbauer spectroscopies. Some necessary group theory developed.

Prerequisite: CHEM 215

**CHEM 218. Metallobiochemistry . 4 Units.**

A review of the biochemistry of metallic elements emphasizing: methods for studying metals in biological systems; the chemical basis for nature's exploitation of specific elements; structures of active sites; mechanisms; solid-state structures and devices; metals in medicine.

Prerequisite or corequisite: CHEM 131C or CHEM 132C

Same as MBB 248.

**CHEM 219. Chemical and Structural Biology. 4 Units.**

A survey of the organic chemistry underlying biological function. Introduction to chemical genetics, receptor-ligand interactions, small molecule agonists and antagonists, combinatorial synthesis, high throughput assays, molecular evolution, protein and small molecule design.

Restriction: Graduate students only.

**CHEM 221A. Fundamentals of Molecular Biophysics. 4 Units.**

An overview of the principles and concepts in molecular biophysics. Topics covered include energy and entropy in biology, non-equilibrium reaction kinetics, random walks and molecular diffusion, molecular forces in biology.

Prerequisite: Undergraduate courses in physical chemistry and biochemistry.

Repeatability: May be taken for credit 3 times.

**CHEM 223. Biological Macromolecules. 4 Units.**

Introduction to nucleic acid and protein structure, dynamics, and function. Topics include analytical methods, molecular evolution, folding, and catalysis.

Same as PHMS 223.

**CHEM 224. Molecular and Cellular Biophotonics. 4 Units.**

Principles underlying the application of photonic technologies to biomolecular and cellular systems. Sample technologies Optical Tweezers, Linear and Nonlinear Optical Microscopy and Fluorescence Lifetime and Correlation Methods, and their use to investigate emergent problems in Molecular, Cellular, and Developmental Biology.

Same as BME 224.

Restriction: Graduate students only.

**CHEM 225. Polymer Chemistry: Synthesis and Characterization of Polymers. 4 Units.**

Structure of synthetic and natural polymers. Survey of modern polymer synthetic methods. Molecular weight and molecular weight distribution. Chain conformation and stereochemistry. Introduction to polymer characterization, chain models, and solution behavior.

Prerequisite: Undergraduate courses in organic and physical chemistry.

**CHEM 228. Electromagnetism. 4 Units.**

Maxwell's equations, electrodynamics, electromagnetic waves and radiation, wave propagation in media, interference and quantum optics, coherent and incoherent radiation, with practical applications in interferometry, lasers, waveguides, and optical instrumentation.

Same as PHYS 228.

**CHEM 229A. Computational Methods. 4 Units.**

Mathematical and numerical analysis using Mathematica and C programming, as applied to problems in physical science.

Same as PHYS 229A.

Concurrent with PHYS 100.

**CHEM 230. Classical Mechanics and Electromagnetic Theory. 4 Units.**

Fundamentals of classical mechanics and electromagnetic theory are developed with specific application to molecular systems. Newtonian, Lagrangian, and Hamiltonian mechanics are developed. Boundary value problems in electrostatics are investigated. Multipole expansion and macroscopic media are discussed from a molecular viewpoint.

Prerequisite: CHEM 132A and CHEM 132B and CHEM 132C

**CHEM 231A. Fundamentals of Quantum Mechanics. 4 Units.**

The postulates of quantum mechanics are discussed and applied to a variety of model problems.

Prerequisite: CHEM 131A and CHEM 131B and CHEM 131C

**CHEM 231B. Applications of Quantum Mechanics. 4 Units.**

Approximate methods for solving atomic and molecular structure problems are developed, and the application of quantum mechanics to spectroscopy is introduced.

Prerequisite: CHEM 231A

**CHEM 231C. Molecular Spectroscopy. 4 Units.**

Theory and techniques of spectroscopy as used for the study of molecular and condensed phase properties. Coherent time domain spectroscopies are covered.

Prerequisite: CHEM 231B

**CHEM 232A. Thermodynamics and Introduction to Statistical Mechanics. 4 Units.**

A detailed discussion from an advanced point of view of the principles of classical thermodynamics. The fundamentals of statistical mechanics. Topics include an introduction to ensemble theory, Boltzmann statistics, classical statistical mechanics, and the statistical mechanics of ideal gas systems.

Prerequisite: CHEM 131A and CHEM 131B and CHEM 131C

**CHEM 232B. Advanced Topics in Statistical Mechanics. 4 Units.**

Continued discussion of the principles of statistical mechanics. Applications to topics of chemical interest including imperfect gases, liquids, solutions, and crystals. Modern techniques such as the use of autocorrelation function methods.

Prerequisite: CHEM 232A

**CHEM 232C. Non-Equilibrium Statistical Mechanics. 4 Units.**

Phenomenology of material processes, including: kinetic theories of transport and continuum, linear response theory, critical phenomena of phase transition, self-assembly, and nucleation.

**CHEM 233. Nuclear and Radiochemistry. 4 Units.**

Advanced treatment of nuclear structure, nuclear reactions, and radioactive-decay processes. Introduction to nuclear activation analysis, isotope effects, radiation chemistry, hot-atom chemistry, nuclear age-dating methods, nuclear reactors, and nuclear power.

Same as CBE 276.

Restriction: Graduate students only.

Concurrent with CHEM 133 and CBE 176.

**CHEM 237. Mathematical Methods in Chemistry. 4 Units.**

Survey of essential math methods in chemistry. Topics may include series and limits, complex analysis, Fourier and Laplace transforms, linear algebra and operators (theory and algorithms), differential equations, and probability concepts for stochastic processes.

**CHEM 241. Current Issues Related to Air Quality, Climate, and Energy. 4 Units.**

Current issues related to the atmosphere, climate, and air quality in the context of energy conversion and sustainability. Topics include transportation systems; building design; impacts on humans and ecosystems; modeling and meteorology; economics; and application to public policies.

Prerequisite: MAE 261 or CHEM 245 or ESS 240

Same as MAE 260.

Restriction: Graduate students only.

**CHEM 242A. Physical and Geometrical Optics. 4 Units.**

Focuses on the practical aspects of optics and optical engineering, starting at the fundamentals. Topics include geometrical optics, ray tracing, polarization optics, interferometers, and diffractive optics.

Restriction: Graduate students only.

Concurrent with PHYS 134A.

**CHEM 243. Advanced Instrumental Analysis. 4 Units.**

Theory and applications of modern advanced instrumental methods of analysis. Includes data acquisition, storage, retrieval, and analysis; Fourier transform methods; vacuum technologies; magnetic sector; quadrupole and ion trap mass spectrometry; surface science spectroscopic methods; lasers and optics.

Prerequisite: CHEM 152 and CHEM 132C. CHEM 152 with a grade of B or better. CHEM 132C with a grade of B or better

**CHEM 244. Detection and Measurement of Radiation. 4 Units.**

Basic principles of detection and measurement of ionizing radiation; both theory and practical aspects of measurement techniques for alpha, beta, gamma, and neutron radiation, properties of different detector materials, electronics and data treatments, and analysis.

Prerequisite: CHEM 233 or CBE 276

Same as CBE 277.

Restriction: Graduate students only.

**CHEM 245A. Gas-Phase Atmospheric Chemistry. 4 Units.**

Sources, chemistry, sinks, and measurements of key atmospheric gaseous species. Chemistry of photochemical oxidant formation, transformation of key inorganic and organic trace gases, and stratospheric ozone cycling. Applications of atmospheric chemistry models to control strategies.

Prerequisite: CHEM 132A and CHEM 132B and CHEM 132C

Concurrent with CHEM 145A.

**CHEM 245B. Multi-Phase Atmospheric Chemistry. 4 Units.**

Chemical and physical processes leading to the production, aging, and removal of atmospheric particles. Multi-phase processes involving gases, particles, water droplets, and environmental surfaces. Approaches for modeling these processes with applications to control strategies.

Prerequisite: CHEM 245A

Concurrent with CHEM 145B.

**CHEM 245C. Special Topics in Atmospheric Chemistry. 4 Units.**

The subjects covered vary from year to year.

Prerequisite: CHEM 245B

Repeatability: Unlimited as topics vary.

**CHEM 246. Separations and Chromatography. 4 Units.**

Introduction to modern separation techniques such as gas chromatography, high-performance liquid chromatography, supercritical fluid chromatography, capillary electrophoresis, and field flow fractionation. Applications of these separation strategies are discussed.

**CHEM 247. Current Problems in Analytical Chemistry. 4 Units.**

Surveys current research challenges in analytical chemistry. Topics include electrochemistry, chromatography, spectroscopy, and mass spectrometry.

**CHEM 248. Electrochemistry. 4 Units.**

Fundamentals of electrochemistry including thermodynamics and the electrochemical potential, charge transfer kinetics, and mass transfer. Methods based on controlled potential and controlled current are described; the effects of slow heterogeneous kinetics and the perturbation caused by homogeneous chemistry are discussed.

**CHEM 249. Analytical Spectroscopy. 4 Units.**

Advanced treatment of spectroscopic techniques and instrumentation. Atomic and molecular absorption, emission, and scattering processes and their application to quantitative chemical analysis are outlined. Puts different spectroscopic techniques in perspective and demonstrates most appropriate applications to analytical problems.

**CHEM 250. Computational Chemistry. 4 Units.**

Basic concepts, methods, and techniques in computational chemistry: density functional and wavefunction theory, molecular property calculations, analysis tools, potential energy surfaces, vibrational effects, molecular dynamics simulations.

Restriction: Graduate students only.

Concurrent with CHEM 150.

**CHEM 250L. Computational Chemistry Laboratory. 4 Units.**

Introduction to the practice of modern computational chemistry through a series of advanced computational experiments.

Prerequisite: CHEM 250

Restriction: Graduate students only.

Concurrent with CHEM 150L.

**CHEM 251. Special Topics in Organic Chemistry. 1-4 Units.**

Advanced topics in organic chemistry.

Repeatability: Unlimited as topics vary.

**CHEM 252. Special Topics in Physical Chemistry. 1-4 Units.**

Advanced topics in physical chemistry. Materials fee.

Repeatability: Unlimited as topics vary.

**CHEM 253. Special Topics in Inorganic Chemistry. 4 Units.**

Advanced topics in inorganic chemistry.

Prerequisite: CHEM 215

Repeatability: Unlimited as topics vary.

**CHEM 254. Special Topics in Computational and Theoretical Chemistry. 4 Units.**

Subjects covered vary from year to year.

Repeatability: Unlimited as topics vary.

**CHEM 263. Materials Chemistry . 4 Units.**

An introduction to crystalline solids, descriptive crystal chemistry, solid-state synthesis and characterization techniques, x-ray and electron diffraction, phase diagrams, electronic band structure of extended solids, semi conductors, and nanoscale inorganic materials.

**CHEM 266. Current Topics in Chemical, Applied, and Materials Physics. 1 Unit.**

The subjects covered vary from year to year. Connection between fundamental principles and implementations in practice in science, industry, and technology.

Repeatability: May be repeated for credit unlimited times.

Same as PHYS 266.

**CHEM 267. Photochemistry. 4 Units.**

Photochemical and photovoltaic processes in molecules and semiconductors; quantum mechanics; statistical thermodynamics; kinetics; and experimental techniques relevant to photon absorption and emission; photochemical charge separation, recombination, and transport of electrons and ions; and interfacial redox chemistry.

Restriction: Seniors only. Graduate students only.

**CHEM 268. NMR Spectroscopy . 4 Units.**

Students learn the theoretical basis of solid-state or solution NMR (alternate times), including the basics of pulse sequence design. Extensive literature reading is required.

Prerequisite: CHEM 231A

Repeatability: May be taken for credit 2 times.



**CHEM 273. Technical Communication Skills. 2 Units.**

Development of effective communication skills, oral and written presentations, through examples and practice.

Grading Option: Satisfactory/unsatisfactory only.

Same as PHYS 273.

**CHEM 280. Research. 2-12 Units.**

Supervised original research toward the preparation of a Ph.D dissertation or M.S. thesis.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CHEM 290. Seminar. 1 Unit.**

Weekly seminars and discussions on general and varied topics of current interest in chemistry.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CHEM 291. Research Seminar. 4 Units.**

Detailed discussion of research problems of current interest in the Department. Format, content, and frequency of the course are variable.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**CHEM 292. Graduate Symposium. 2 Units.**

Students present public seminars on literature-based research topics in contemporary chemistry. Topics to be chosen by student and approved by instructor.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**CHEM 299. Independent Study. 1-4 Units.**

Independent research with Chemistry faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CHEM 399. University Teaching. 1-4 Units.**

Required of and limited to Teaching Assistants.

Repeatability: May be repeated for credit unlimited times.

## Chicano/Latino Studies (CHC/LAT)

### Courses

**CHC/LAT 61. Introduction to Chicano/Latino Studies I. 4 Units.**

An introduction to the study of the historical foundations of the Chicano/Latino experience. Addresses such topics as empire, migration, immigrant settlement, economic integration, race, gender, and the formation of group identities.

(III, VII)

**CHC/LAT 62. Introduction to Chicano/Latino Studies II. 4 Units.**

Provides an introduction to the arts, literature, and culture of Chicano/Latino communities. Analyzes representations of and cultural production in Chicano/Latino communities through such media as folklore, literature, art, film, architecture, dance theatre, performance, music, poetry, mass media, and language.

(III, VII)

**CHC/LAT 63. Introduction to Chicano/Latino Studies III. 4 Units.**

Examines contemporary public policy issues in Chicano/Latino communities. Each offering addresses at least three of the following themes: migration, immigrant incorporation, identity construction, language policy, health policy, politics, sexuality, gender, labor, class, and education.

(III and VII ).

**CHC/LAT 64. Introduction to Race and Ethnicity in Political Science. 4 Units.**

Examines major theories that attempt to explain the roles of race and ethnicity in U.S. politics.

Same as POL SCI 61A.

(III and VII ).

**CHC/LAT 65. Ethnic and Immigrant America. 4 Units.**

Focusing on Asian, Latino, and Black immigrant groups, examines the second generation's experience of straddling two cultures and growing up American. Covers topics such as assimilation, bilingualism, race relations, education, bicultural conflicts, interracial marriage, and multiracial identities.

Same as SOCIOL 68A.

(VII)

**CHC/LAT H80. Latina/o Childhoods: Comparative Approaches to the Study of Children and Youth. 4 Units.**

Students in this seminar compare the experiences of Latina/o children to other young people in the U.S. and around the world, analyzing the historical, political, economic, and sociocultural factors that have differently structured the life stage we understand as "childhood."

Restriction: Campuswide Honors Collegium students only.

(III)

**CHC/LAT 101. Research in the Latino Community. 4 Units.**

Students engage in firsthand research in the local Orange County environment. Students identify a research problem, conduct a literature review, develop questions and/or hypotheses, appropriate methods, and write a proposal.

Prerequisite: Two courses from CHC/LAT 61 or CHC/LAT 62 or CHC/LAT 63 and two courses from CHC/LAT 110-189.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment.

**CHC/LAT 102W. Chicano/Latino Research Seminar. 4 Units.**

Taught as a writing and research seminar in Chicano/Latino Studies. Student develops own project; engages in peer editing; drafts, writes, and presents paper at Spring research conference. Prior course work in Chicano/Latino Studies helpful, i.e., CHC/LAT 61, 62, 63.

Prerequisite: CHC/LAT 101. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Chicano/Latino Studies Majors only.

(Ib)

**CHC/LAT 110. Topics in Chicano Literature and Culture. 4 Units.**

Studies in selected areas of Chicano/Latino Studies. Topics addressed vary each quarter. Taught in English.

Repeatability: May be taken for credit 4 times as topics vary.

Same as SPANISH 140.

**CHC/LAT 118. Anthropology of Food. 4 Units.**

Examines how food communicates ideas about ethnocentrism, disgust, privilege, gender, race, labor, social identities and hierarchies, globalization, power, and the 'Western diet' and its health consequences.

Same as ANTHRO 134H.

**CHC/LAT 120. Peoples and Cultures of Latin America. 4 Units.**

Surveys the prehistory of Latin America and its indigenous cultures, emphasizing the impact of colonial rule, capitalism, and twentieth-century transformations. Emphasis on communities from several countries. In some years, emphasis on comparisons between the Latin American and Caribbean experiences.

Same as INTL ST 177J, ANTHRO 162A.

(VIII)

**CHC/LAT 121. Latina/Latino Pop: Latina/Latino Popular Culture. 4 Units.**

With a focus on the politics of language and space/place, prepares students to critically analyze sites of Latina/Latino popular culture including: music, film, performance, sports, media, and varied subcultures.

Same as HISTORY 151D.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. History Majors have first consideration for enrollment.

**CHC/LAT 123. Immigration, Nation, and Media. 4 Units.**

Examines media shapes and reflects public opinion on immigration and its representation of immigrants, citizens, and ideas about the nation, and who belongs and who is a potential threat; as well as the relationship between scholars and journalists.

Same as ANTHRO 125U, SPPS 101A.

**CHC/LAT 124W. Immigrant Emotionality. 4 Units.**

Explores the emotional universe created by the Latin American immigrant experience, and guides students in the creation of a literary work based on an investigation into, or reflection on that experience.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**CHC/LAT 129. Special Topics in Literature, Arts, Media, Culture. 1-4 Units.**

Studies in selected areas of Chicano/Latino Studies. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment.

**CHC/LAT 132A. Chicana/Chicano History: Pre-Colonial to 1900. 4 Units.**

Examines social history of the southwest region from antiquity to 1900. Discusses major questions, theory and research methods pertinent to Chicanas/Chicanos. Themes include: indigenous empires, conquest, colonialism, social stratification, ideology, marriage, sexuality, industrial capitalism, accommodation and resistance.

Same as HISTORY 151A.

**CHC/LAT 132B. Chicana/Chicano History: Twentieth Century. 4 Units.**

Examines social history of the Southwest with emphasis on Mexican-origin people. Discusses major questions, theory and research methods pertinent to Chicana/Chicano history. Themes explored include: immigration, xenophobia, class struggle, leadership, generational cohorts, unionization, education, barrioization, ethnicity, patriarchy, sexuality.

Same as HISTORY 151B.

**CHC/LAT 134. U.S. Latino Literature and Cultures. 4 Units.**

Focuses on aspects of literature, art, cultural production, and history of the multifaceted Latino cultures that have developed within the United States. Focuses on one group, such as Caribbean Americans, Chicanos, Central Americans, or a comparative perspective of several groups.

Same as SPANISH 110C.

**CHC/LAT 135. Latinas in the Twentieth Century U.S.. 4 Units.**

Latinas in the U.S. from 1900 to present, offering a diversity of their cultures, regional histories, sexualities, generations, and classes.

Same as HISTORY 151C.

**CHC/LAT 139. Special Topics in Chicano/Latino History. 1-4 Units.**

Studies in selected areas of Chicano/Latino History. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Chicano/Latino Studies Majors only.

**CHC/LAT 147. Comparative Minority Politics. 4 Units.**

Examines the political experiences of Blacks, Latinos, and Asian Americans in the United States from roughly 1950 to the present. Focuses on how each group has pursued political empowerment via both conventional political channels and social movements.

Same as AFAM 151, ASIANAM 132, POL SCI 124C.

**CHC/LAT 148. Racial and Ethnic Relations in the United States. 4 Units.**

Examines central questions and issues in the field of race and ethnicity; the emergence, maintenance, and consequences of the ethnic and racial stratification system in the United States; the future of racial and ethnic relations; and relevant public policy issues.

Same as SOCIOL 167A.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**CHC/LAT 148W. Racial and Ethnic Relations in the United States. 4 Units.**

Examines central questions and issues in the field of race and ethnicity; the emergence, maintenance, and consequences of the ethnic and racial stratification system in the United States; the future of racial and ethnic relations; and relevant public policy issues.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as SOCIOL 167AW.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**(Ib)****CHC/LAT 150. U.S. Intervention in Latin America. 4 Units.**

Explores political, economic, social, and cultural ties that bind Latin America to the United States. Focuses on U.S. intervention and Latin American response from early nineteenth century to present day. Case studies include Mexico, Guatemala, Cuba, Chile, and Central America.

Same as POL SCI 142J, INTL ST 177D, HISTORY 166.

**CHC/LAT 150A. Sex and Conquest in Latin America. 4 Units.**

Competing ideas of masculinity and femininity, sexual violence, sexual identities, and gendered hierarchies informed how the Spanish engaged in military and religious domination of Mexican and Andean communities, as well as the forms of native resistance throughout colonial Latin America.

Same as ANTHRO 140, HISTORY 160, GEN&SEX 171A.

**CHC/LAT 151. Latinos in U.S. Politics. 4 Units.**

Comparing the political issues facing Latino groups by examining their migration histories, voting behavior, nonelectoral participation, and policy issues. Latino issues are examined on the national, state, and local levels, including formal representation, immigration, affirmative action, and language policy.

Same as POL SCI 124B.

**(VII)****CHC/LAT 151B. Revolution in Latin America. 4 Units.**

Presents a comparative analysis of the causes, development, and consequences of selected revolutionary movements, focusing on outbreaks in Mexico, Bolivia, Cuba, Chile, Nicaragua, and Grenada. Explores topics of state formation, economic nationalism, social justice, ethnicity, and role of international affairs.

Same as SOC SCI 173N, HISTORY 166D, INTL ST 177C.

**CHC/LAT 152A. Race, Ethnicity, and Social Control. 4 Units.**

Provides a historical and sociological survey of racial and ethnic group relations in contexts of crime control, emphasizing the roles of racial ideology, structural racism, and social movements in shaping these dynamic relations, and their significance to American liberal democracy.

Same as CRM/LAW C116.

**CHC/LAT 152B. Community, Social Justice, and Health Equity Research for Action. 4 Units.**

Focuses on community as a unit of identity, community, well-being, and social justice perspectives and initiatives to promote community health. Addresses community change and improvements in community well-being, with a focus on health equity research for action.

Prerequisite: PUBHLTH 1 or PUBHLTH 2 or CHC/LAT 61 or CHC/LAT 62 or CHC/LAT 63

Same as PUBHLTH 115.

**CHC/LAT 153. Cross-Cultural Research on Urban Gangs. 4 Units.**

Taking an urban policy approach, examines the background and contemporary traditions of gangs in several ethnic groups including African-, Asian-, and Mexican-Americans. Cross-cultural exploration of the varied facets of gang life. The major social-control institutions affecting them.

Same as CRM/LAW C156.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment. Chicano/Latino Studies Majors have first consideration for enrollment.

**(VII)****CHC/LAT 154. Latino Metropolis. 4 Units.**

Explores the processes of Latino urbanization in the United States and the spatialization of Latino identities, particularly in the context of Southern California with selected comparisons drawing from other cities.

Same as UPPP 172.

**(VII)****CHC/LAT 155. Culture Change and the Mexican People. 4 Units.**

Reviews culture contact and colonization, innovation diffusion, acculturation, assimilation, culture conflict and marginality, modernization, urbanization, legal transformations. Mexico and the Southwestern U.S. are reviewed through several centuries to better appreciate the indigenous base of the Mexican people.

Same as CRM/LAW C172.

**CHC/LAT 156W. Chicano/Latinos and Labor. 4 Units.**

Explores theories that explain the occupational pathways and workplace experiences of Latinos in various work sectors. Investigates jobs such as migrant labor, child street vendors, Latina/Latino professionals, and Latinos migrating to the U.S. South that work in poultry processing plants.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

**(Ib)****CHC/LAT 157. Cuban Society and Revolution. 4 Units.**

Explores the causes, development, and legacy of the 1959 Revolution. Themes include economic dependency, democracy, race, gender, culture, and the always volatile relations between Cuba and the United States.

Same as POL SCI 153G, HISTORY 166C, INTL ST 177E.

**CHC/LAT 158. Feminisms of Color. 4 Units.**

Surveys the development of Chicana feminist thought and practice. Focuses on historical contemporary writings by and about Chicana feminists. Draws from interdisciplinary scholarship in order to survey the diversity of Chicana feminisms.

**(VII)****CHC/LAT 159. Special Topics in Society, Labor, Politics, Law, Gender, Race, Ethnicity. 1-4 Units.**

Studies in selected areas of Chicano/Latino Studies. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Chicano/Latino Studies Majors only.

**CHC/LAT 161. Transnational Migration. 4 Units.**

Examines the movement of people across national borders, governmentality and the role of state practices to control populations, and issues of citizenship, belonging, and identity. Examples are drawn from the United States, Europe, Latin America, Asia, and Africa.

Same as ANTHRO 125X, INTL ST 117A.

**(VIII)**

**CHC/LAT 162A. Urban America . 4 Units.**

Students examine the historical, social, political, and economic factors that contributed to the construction of the American urban context, one that is poverty concentrated and racially/ethnically segregated. Students also critically assess the consequence of growing up in America's urban neighborhoods.

Same as SOC SCI 163A, UPPP 104.

**CHC/LAT 163. U.S. Immigration Policy. 4 Units.**

Examines selected immigration policy debates since the nineteenth century, rationale and consequences of immigration law since 1965, problems of administration, implementation and enforcement, impact of immigration policy on foreign relations, and contemporary debate regarding the future of U.S. policy.

Same as POL SCI 126C.

**(VII)****CHC/LAT 164A. Undocumented Immigrant Experiences. 4 Units.**

Examines the experiences of undocumented immigrants and the policies that structure their educational, economic, social, and political participation.

Same as ASIANAM 130, CRM/LAW C187, SOCIOL 177C.

**(III and VII ).****CHC/LAT 166. Chicano Movement. 4 Units.**

Explores the history of Mexicans in the U.S. with particular attention paid to their integration into the U.S. capitalist economy. Examines this economic history and the Chicano movement, 'El Movimiento,' within the wide context of socio-economic change.

Same as UPPP 177.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**CHC/LAT 167. Latinos in a Global Society. 4 Units.**

Examines interconnections between diverse Latino groups in the U.S. and the effects of globalization on their social, cultural, and political realities. Topics include immigration, demographics, socioeconomic differentiation, familial relations, political protest/resistance, law and policy, and links to 'homeland' issues.

Same as SOC SCI 173L.

**(VII)****CHC/LAT 168. Chicano/Latino Social Psychology. 4 Units.**

Examines theories, research, and major issues of relevance to understanding social psychological processes in Chicano/Latino populations. Topics include social development, cultural orientations, gender and sexuality, close relationships, happiness and well-being, stereotyping, prejudice and discrimination, and mental and physical health.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as PSCI 192Q.

Restriction: Psychological Science Majors have first consideration for enrollment. Chicano/Latino Studies Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**(VII)****CHC/LAT 169. Special Topics in Globalization, Transnationalism, Immigration, U.S.-Mexico Border. 1-4 Units.**

Studies in selected areas of Chicano/Latino Studies. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**CHC/LAT 170. Chicano/Latino Families. 4 Units.**

Introduction to the research, literature, and issues surrounding the topic of Chicano/Latino families including cultural history, contemporary issues, organization of family, traditions, lifestyles, values, beliefs, generational differences, gender issues, ethnic identity, evolution of demographic patterns, current economic and political standings.

Same as SOC SCI 165, PSCI 166S, PSYCH 174H.

**CHC/LAT 176. Race, Gender, and Science. 4 Units.**

Perfect for pre-health, science and social science majors wanting to appreciate how science and society interact. Race and gender as biological and socio-cultural constructs are examined. Questions explored: What is disease? What is science? What are social and biological differences.

Same as ANTHRO 128B.

**(VII)****CHC/LAT 178A. Medical Anthropology. 4 Units.**

Introduces students to cross-cultural perspectives and critical theories in anthropological studies of medicine. Special attention is given to diverse ways of understanding bodies, illnesses, and therapeutic practices in our changing world.

Same as ANTHRO 134A.

**(VIII)****CHC/LAT 179. Special Topics in Health, Medicine, and Psychosocial Dynamics. 1-4 Units.**

Studies in selected areas of Chicano/Latino Studies. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment.

**CHC/LAT 183. Multicultural Education in K-12 Schools. 4 Units.**

Provides a theoretical and empirical overview of educational issues affecting low-income immigrant and U.S. born minority student populations in an increasingly diverse and changing society.

Same as EDUC 124.

**(VII)****CHC/LAT 189. Special Topics in Educational Policy and Issues. 1-4 Units.**

Studies in selected areas of Chicano/Latino Studies. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: May be repeated for credit unlimited times.

**CHC/LAT H190A. Honors Research Preparation. 4 Units.**

Students write a proposal describing their research question, the relevant background literature, and the method of data collection and analysis. Field work for the project may begin this quarter.

Restriction: Chicano/Latino Studies Honors students only.

**CHC/LAT H190B. Honors Field Research. 4 Units.**

Students begin or continue their research for their senior honors thesis.

Prerequisite: CHC/LAT H190A

**CHC/LAT H190C. Honors Thesis. 4 Units.**

Student drafts a senior honor thesis (typically) with the following sections: problem statement, literature review, description of the methods, results, and conclusions.

Prerequisite: CHC/LAT H190A and CHC/LAT H190B

**CHC/LAT H190W. Honors Thesis. 4 Units.**

Student drafts a senior honor thesis (typically) with the following sections: problem statement, literature review, description of the methods, results, and conclusions.

Prerequisite: CHC/LAT H190A and CHC/LAT H190B. Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**CHC/LAT 198. Directed Group Study. 1-4 Units.**

Directed study with Chicano/Latino faculty.

Repeatability: May be repeated for credit unlimited times.

**CHC/LAT 199. Independent Study. 1-4 Units.**

Independent research with Chicano/Latino faculty.

Repeatability: May be repeated for credit unlimited times.

**CHC/LAT 200A. Theoretical Issues in Chicano/Latino Research. 4 Units.**

Introduction to theoretical issues in the scholarship in Chicano/Latino Studies. Theories from social sciences, humanities, critical theory. Topics: immigration, identity, gender and sexuality, globalization, transnationalism, social, political, and economic integration, race theory, labor market participation, social history, cultural productions.

**CHC/LAT 210A. Cultural and Historical Precedents for Latinos and Medical Care. 2 Units.**

Introduction to the history of Latinos, focusing on relevant pre-Columbian, colonial, and modern social and cultural developments, including issues of race, gender, sexuality, religious beliefs, and health beliefs and practices.

Grading Option: In Progress (Letter Grade with S/U).

**CHC/LAT 210B. Cultural and Historical Precedents for Latinos and Medical Care. 2 Units.**

Introduction to the history of Latinos, focusing on relevant pre-Columbian, colonial, and modern social and cultural developments, including issues of race, gender, sexuality, religious beliefs, and health beliefs and practices.

Prerequisite: CHC/LAT 210A

Restriction: CHC/LAT 210A-210B and CHC/LAT 212 may not both be taken for credit.

**CHC/LAT 211A. Latinos/Latinas and Medical Care: Contemporary Issues. 2 Units.**

Introduction to medical anthropological and social science perspectives on Latinos/Latinas in relation to a number of health and medically-related issues, i.e., immigration, gender, reproduction, culture, social structure, political economy, sexuality, utilization of medical services, and health beliefs.

Same as PUBHLTH 211A.

**CHC/LAT 211B. Latinos/Latinas and Medical Care: Contemporary Issues. 2 Units.**

Introduction to medical anthropological and social science perspectives on Latinos/Latinas in relation to a number of health and medically-related issues, i.e., immigration, gender, reproduction, culture, social structure, political economy, sexuality, utilization of medical services, and health beliefs.

Prerequisite: CHC/LAT 211A

Same as PUBHLTH 211B.

**CHC/LAT 215. Transnational Migration. 4 Units.**

Examines borders and boundaries as material and semiotic constructs. Drawing upon an array of literatures, but loosely situated in U.S. geo/biopolitics, explores transformative troublings of places, spaces, borders, and bodies of all sorts.

Same as SOC SCI 254A, ANTHRO 235A.

Restriction: Graduate students only.

**CHC/LAT 217. Ethnography. 4 Units.**

Explores the theory and practice of ethnography with a focus on anthropology, the discipline most associated with ethnography. Students are exposed to the theoretical underpinnings of ethnographic work, traditional and innovative practices, and sample ethnographies.

Same as ANTHRO 230F, CRM/LAW C222.

Restriction: Graduate students only.



**CHC/LAT 222. Theorizing Illegality and the Experiences of Undocumented Immigrants. 4 Units.**

Examines theories of illegality and citizenship, historical and contemporary undocumented immigrant experiences, and methodological concerns in this area of study.

Same as SOCIOL 282.

Restriction: Graduate students only.

**CHC/LAT 223. Ethnic America. 4 Units.**

Examines critically the meaning and measurement of ethnicity, race, and nation in sociological theory and research. Theories of ethnicity are explored, along with empirical studies of the construction of ethnic and pan-ethnic identities in historical and contemporary contexts.

Same as SOCIOL 234.

Restriction: Graduate students only.

**CHC/LAT 224. Immigrant America. 4 Units.**

The study of the causes and consequences of international migration has become one of the most vital fields of sociological theory and research. Examines principal theoretical perspectives and empirical research on contemporary immigration flows and the processes of incorporation.

Same as SOCIOL 264.

Restriction: Graduate students only.

**CHC/LAT 225. Crimmigration. 4 Units.**

Examines the criminalization of immigration, with an emphasis on U.S. enforcement procedures and outcomes. Analyzes the devolution of federal immigration law to local authorities, the rise in immigrant detention and deportation, and the militarization of the U.S.-Mexico border.

Same as SOCIOL 268, CRM/LAW C258.

Restriction: Graduate students only.

**CHC/LAT 251. Models of Practice and Intervention at the Community Level. 4 Units.**

Examines and critiques current models, frameworks, theories for.

Prerequisite: CHC/LAT 200A or PUBHLTH 246

Same as PUBHLTH 251.

Restriction: Graduate students only.

**CHC/LAT 289. Special Topics in Chicano/Latino Studies. 1-4 Units.**

Current research in Chicano/Latino Studies.

Repeatability: May be repeated for credit unlimited times.

**CHC/LAT 290. Dissertation Research. 1-12 Units.**

Dissertation research with Chicano/Latino faculty.

Repeatability: May be taken for credit 10 times.

Restriction: Graduate students only.

**CHC/LAT 299. Independent Study. 1-12 Units.**

Independent study with Chicano/Latino Studies faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

# Chinese (CHINESE)

## Courses

### CHINESE 1A. Fundamental Mandarin Chinese. 5 Units.

Natural approach emphasizing four fundamental skills: listening, speaking, reading and writing. Specifically designed for students with no previous experience in any dialect of Chinese. Conducted in Mandarin Chinese using the Pinyin system of Romanization, traditional and simplified Chinese characters.

Prerequisite: Placement into CHINESE 1A is also accepted.

Overlaps with CHINESE S1AB, CHINESE 1MA, CHINESE 1DA.

Restriction: CHINESE 1A and CHINESE 1DA and CHINESE 1MA and CHINESE S1AB may not be taken for full credit.

### CHINESE 1B. Fundamental Mandarin Chinese. 5 Units.

Natural approach emphasizing four fundamental skills: listening, speaking, reading and writing. Specifically designed for students with no previous experience in any dialect of Chinese. Conducted in Mandarin Chinese using the Pinyin system of Romanization, traditional and simplified Chinese characters.

Prerequisite: CHINESE 1A. CHINESE 1A with a grade of C or better. Placement into CHINESE 1B is also accepted.

Overlaps with CHINESE S1AB, CHINESE S1BC, CHINESE 1MB, CHINESE 1DB.

Restriction: CHINESE 1B and CHINESE 1DB and CHINESE 1MB and CHINESE S1AB and CHINESE S1BC may not be taken for full credit.

### CHINESE 1C. Fundamental Mandarin Chinese. 5 Units.

Natural approach emphasizing four fundamental skills: listening, speaking, reading and writing. Specifically designed for students with no previous experience in any dialect of Chinese. Conducted in Mandarin Chinese using the Pinyin system of Romanization, traditional and simplified Chinese characters.

Prerequisite: CHINESE 1B or CHINESE S1AB. CHINESE 1B with a grade of C or better. CHINESE S1AB with a grade of C or better. Placement into CHINESE 1C is also accepted.

Overlaps with CHINESE 1DC, CHINESE 1MC, CHINESE S1BC.

Restriction: CHINESE 1C and CHINESE 1DC and CHINESE 1MC and CHINESE S1BC may not be taken for full credit.

## (VI)

### CHINESE 1MA. Fundamentals of Mandarin Chinese - Mandarin Background Track. 5 Units.

Natural approach emphasizing four fundamental skills: listening, speaking, reading and writing. Specifically designed for students with previous background in Mandarin Chinese. Conducted in Mandarin Chinese using the Pinyin system of Romanization, traditional and simplified Chinese characters.

Prerequisite: Placement into CHINESE 1MA.

Overlaps with CHINESE 1DA, CHINESE 1A, CHINESE S1AB.

Restriction: CHINESE 1MA and CHINESE 1DA and CHINESE 1A and CHINESE S1AB may not be taken for full credit.

### CHINESE 1MB. Fundamentals of Mandarin Chinese - Mandarin Background Track. 5 Units.

Natural approach emphasizing four fundamental skills: listening, speaking, reading and writing. Specifically designed for students with previous background in Mandarin Chinese. Conducted in Mandarin Chinese using the Pinyin system of Romanization, traditional and simplified Chinese characters.

Prerequisite: CHINESE 1MA. CHINESE 1MA with a grade of C or better. Placement into CHINESE 1MB is also accepted.

Overlaps with CHINESE 1B, CHINESE 1DB, CHINESE S1AB, CHINESE S1BC.

Restriction: CHINESE 1MB and CHINESE 1DB and CHINESE 1B and CHINESE S1AB and CHINESE S1BC may not be taken for full credit.

**CHINESE 1MC. Fundamentals of Mandarin Chinese - Mandarin Background Track. 5 Units.**

Natural approach emphasizing four fundamental skills: listening, speaking, reading and writing. Specifically designed for students with previous background in Mandarin Chinese. Conducted in Mandarin Chinese using the Pinyin system of Romanization, traditional and simplified Chinese characters.

Prerequisite: CHINESE 1MB. CHINESE 1MB with a grade of C or better. Placement into CHINESE 1MC is also accepted.

Overlaps with CHINESE 1C, CHINESE 1DC, CHINESE S1BC.

Restriction: CHINESE 1MC and CHINESE 1DC and CHINESE 1C and CHINESE S1BC may not be taken for full credit.

**(VI)****CHINESE S1AB. Fundamentals of Mandarin Chinese. 7.5 Units.**

First half of first-year Mandarin Chinese in an intensive setting using natural approach with emphasis on listening, speaking, reading, and writing.

Prerequisite: Placement into CHINESE 1A or CHINESE 1B or CHINESE 1MA or CHINESE 1MB.

Overlaps with CHINESE 1A, CHINESE 1B, CHINESE 1MA, CHINESE 1MB.

**CHINESE S1BC. Fundamentals of Mandarin Chinese. 7.5 Units.**

Second half of first-year Mandarin Chinese in an intensive setting using natural approach with emphasis on listening, speaking, reading, and writing.

Prerequisite: CHINESE S1AB or CHINESE 1B or CHINESE 1DB or CHINESE 1MB. CHINESE S1AB with a grade of C or better. CHINESE 1B with a grade of C or better. CHINESE 1DB with a grade of C or better. CHINESE 1MB with a grade of C or better. Placement into CHINESE 1C or CHINESE 1DC or CHINESE 1MC is also accepted.

Overlaps with CHINESE 1C, CHINESE 1B, CHINESE 1DB, CHINESE 1DC, CHINESE 1MB, CHINESE 1MC.

Restriction: CHINESE S1BC, CHINESE 1B, CHINESE 1C, CHINESE 1DB or CHINESE 1DC, CHINESE 1MB or CHINESE 1MC and may not be taken for full credit.

**(VI)****CHINESE 2A. Intermediate Mandarin Chinese. 5 Units.**

Both authentic and pedagogically-prepared materials are used to further develop students' ability to communicate in culturally, socially, and linguistically appropriate manners. Taught in Chinese using Pinyin romanization system and both traditional and simplified forms of Chinese.

Prerequisite: CHINESE 1C or CHINESE S1BC or CHINESE 1MC. CHINESE 1C with a grade of C or better. CHINESE S1BC with a grade of C or better. CHINESE 1MC with a grade of C or better. Placement into CHINESE 2A is also accepted.

Overlaps with CHINESE 2DA, CHINESE 2MA.

**(VIII)****CHINESE 2B. Intermediate Mandarin Chinese. 5 Units.**

Both authentic and pedagogically-prepared materials are used to further develop students' ability to communicate in culturally, socially, and linguistically appropriate manners. Taught in Chinese using Pinyin romanization system and both traditional and simplified forms of Chinese.

Prerequisite: CHINESE 2A. CHINESE 2A with a grade of C or better. Placement into CHINESE 2B is also accepted.

Overlaps with CHINESE 2DB, CHINESE 2MB.

Restriction: CHINESE 2B and CHINESE 2DB and CHINESE 2MB may not be taken for full credit.

**(VIII)****CHINESE 2C. Intermediate Mandarin Chinese. 5 Units.**

Both authentic and pedagogically-prepared materials are used to further develop students' ability to communicate in culturally, socially, and linguistically appropriate manners. Taught in Chinese using Pinyin romanization system and both traditional and simplified forms of Chinese.

Prerequisite: CHINESE 2B. CHINESE 2B with a grade of C or better. Placement into CHINESE 2C is also accepted.

Overlaps with CHINESE 2DC, CHINESE 2MC.

Restriction: CHINESE 2C and CHINESE 2DC and CHINESE 2MC may not be taken for full credit.

**(VIII)**

**CHINESE 2MA. Intermediate Mandarin Chinese - Mandarin Background Track. 5 Units.**

Authentic and pedagogically prepared materials are used to further develop communication in culturally, socially, and linguistically appropriate manners for students with initial experience in Mandarin Chinese. Conducted in Mandarin using the Pinyin Romanization system, traditional and simplified Chinese characters.

Prerequisite: CHINESE 1MC or CHINESE S1BC. CHINESE 1MC with a grade of C or better. CHINESE S1BC with a grade of C or better. Placement into CHINESE 2MA is also accepted.

Overlaps with CHINESE 2A, CHINESE 2DA.

Restriction: CHINESE 2MA and CHINESE 2DA and CHINESE 2A may not be taken for full credit.

**(VIII)****CHINESE 2MB. Intermediate Mandarin Chinese - Mandarin Background Track . 5 Units.**

Authentic and pedagogically prepared materials are used to further develop communication in culturally, socially, and linguistically appropriate manners for students with initial experience in Mandarin Chinese. Conducted in Mandarin using the Pinyin Romanization system, traditional and simplified Chinese characters.

Prerequisite: CHINESE 2MA. CHINESE 2MA with a grade of C or better. Placement into CHINESE 2MB is also accepted.

Overlaps with CHINESE 2B, CHINESE 2DB.

Restriction: CHINESE 2MB and CHINESE 2DB and CHINESE 2B may not be taken for full credit.

**(VIII)****CHINESE 2MC. Intermediate Mandarin Chinese - Mandarin Background Track . 5 Units.**

Authentic and pedagogically prepared materials are used to further develop communication in culturally, socially, and linguistically appropriate manners for students with initial experience in Mandarin Chinese. Conducted in Mandarin using the Pinyin Romanization system, traditional and simplified Chinese characters.

Prerequisite: CHINESE 2MB. CHINESE 2MB with a grade of C or better. Placement into CHINESE 2MC is also accepted.

Overlaps with CHINESE 2C, CHINESE 2DC.

Restriction: CHINESE 2MC and CHINESE 2DC and CHINESE 2C may not be taken for full credit.

**(VIII)****CHINESE 3A. Advanced Mandarin Chinese. 4 Units.**

A continuation of CHINESE 2A-CHINESE 2B-CHINESE 2C emphasizing conceptualization, self-expression and academic skills in Chinese. Authentic texts from modern Chinese prose and newspapers are used. Taught in Mandarin Chinese using both traditional and simplified forms of Chinese characters.

Prerequisite: CHINESE 2C or CHINESE 2DC or CHINESE 2MC. CHINESE 2C with a grade of C or better. CHINESE 2DC with a grade of C or better. CHINESE 2MC with a grade of C or better. Placement into CHINESE 3A is also accepted.

**(VIII)****CHINESE 3B. Advanced Mandarin Chinese. 4 Units.**

A continuation of CHINESE 2A-CHINESE 2B-CHINESE 2C emphasizing conceptualization, self-expression, and academic skills in Chinese. Authentic texts from modern Chinese prose and newspapers are used. Taught in Mandarin Chinese using both traditional and simplified forms of Chinese characters.

Prerequisite: CHINESE 3A. CHINESE 3A with a grade of C or better

**(VIII)****CHINESE 3C. Advanced Mandarin Chinese. 4 Units.**

A continuation of CHINESE 2A-CHINESE 2B-CHINESE 2C emphasizing conceptualization, self-expression, and academic skills in Chinese. Authentic texts from modern Chinese prose and newspapers are used. Taught in Mandarin Chinese using both traditional and simplified forms of Chinese characters.

Prerequisite: CHINESE 3B. CHINESE 3B with a grade of C or better

**(VIII)**

**CHINESE 10. Peer Tutoring Program . 1 Workload Unit.**

Tutoring Program in which advanced Chinese students provide assistance to students at a lower level. One hour of tutoring per week.

Grading Option: Workload Credit P/NP Only.

Repeatability: May be taken for credit 4 times.

**CHINESE 40. Topics in Professional Chinese. 4 Units.**

Designed for students with native or near native fluency in Chinese. Develops students' language learning to professional levels with cultural and contextual knowledge and with formal communication and presentation skills.

Prerequisite: CHINESE 3C. CHINESE 3C with a grade of C or better. Native speakers also accepted.

Repeatability: May be taken for credit 3 times as topics vary.

**(VIII)****CHINESE 100A. Classical Chinese. 4 Units.**

Introduction to classical Chinese grammar and vocabulary with emphasis on reading basic texts.

Prerequisite: CHINESE 3C or JAPANESE 3C or KOREAN 3C

**CHINESE 100B. Classical Chinese. 4 Units.**

Introduction to classical Chinese grammar and vocabulary with emphasis on reading basic texts.

Prerequisite: CHINESE 3C or JAPANESE 3C or KOREAN 3C

**CHINESE 100C. Classical Chinese. 4 Units.**

Introduction to classical Chinese grammar and vocabulary with emphasis on reading basic texts.

Prerequisite: CHINESE 3C or JAPANESE 3C or KOREAN 3C

**CHINESE 101A. Fourth-Year Mandarin Chinese. 4 Units.**

Continued emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation through intensive study and analysis of specific literary texts.

Prerequisite: CHINESE 3C

**CHINESE 101B. Fourth-Year Mandarin Chinese. 4 Units.**

Continued emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation through intensive study and analysis of specific literary texts.

Prerequisite: CHINESE 3C

**CHINESE 101C. Fourth-Year Mandarin Chinese. 4 Units.**

Continued emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation through intensive study and analysis of specific literary texts.

Prerequisite: CHINESE 3C

**CHINESE 115. Topics in Chinese Literature: Advanced Texts. 4 Units.**

Designed for students with near-fluency in reading Chinese. Readings may include both literary and philosophical work by important writers, but the emphasis is on literary texts and writings that interpret those texts.

Prerequisite: Consent of instructor required to enroll.

Repeatability: Unlimited as topics vary.

**CHINESE 199. Independent Study. 1-4 Units.**

Investigation of special topics through directed reading in Chinese. Paper required.

Repeatability: May be taken for credit for 12 units.

**CHINESE 201. Readings in Traditional Chinese Narrative and Prose. 4 Units.**

Close reading of selected premodern prose texts such as historical narratives, novels, short stories, and essays.

Prerequisite: CHINESE 101C

Repeatability: Unlimited as topics vary.

**CHINESE 202. Readings in Traditional Chinese Poetry. 4 Units.**

Close readings of selected premodern poetic texts.

Prerequisite: CHINESE 100C

Repeatability: Unlimited as topics vary.

**CHINESE 203. Readings in Modern Chinese Literature. 4 Units.**

Close readings of selected modern literary texts.

Prerequisite: CHINESE 101C

Repeatability: Unlimited as topics vary.

**CHINESE 204. Readings in Chinese Literary and Cultural Theory. 4 Units.**

Close readings of selected texts in premodern criticism and theory.

Prerequisite: CHINESE 100C

Repeatability: Unlimited as topics vary.

**CHINESE 211A. Studies in Traditional Chinese Narrative and Prose. 4 Units.**

Two-quarter seminar in traditional Chinese narrative and prose, with topics varying from year to year.

Prerequisite: CHINESE 100C

Repeatability: Unlimited as topics vary.

**CHINESE 211B. Studies in Traditional Chinese Narrative and Prose. 4 Units.**

Two-quarter seminar in traditional Chinese narrative and prose, with topics varying from year to year.

Prerequisite: CHINESE 211A

Repeatability: Unlimited as topics vary.

**CHINESE 212A. Studies in Traditional Chinese Poetry. 4 Units.**

Two-quarter seminar in traditional Chinese poetry, with topics varying from year to year.

Prerequisite: CHINESE 100C

Repeatability: Unlimited as topics vary.

**CHINESE 212B. Studies in Traditional Chinese Poetry. 4 Units.**

Two-quarter seminar in traditional Chinese poetry, with topics varying from year to year.

Prerequisite: CHINESE 212A

Repeatability: Unlimited as topics vary.

**CHINESE 213A. Studies in Modern Chinese Literature. 4 Units.**

Two-quarter seminar in modern Chinese literature, with topics varying from year to year. Research paper required.

Prerequisite: CHINESE 100C

Repeatability: Unlimited as topics vary.

**CHINESE 213B. Studies in Modern Chinese Literature. 4 Units.**

Two-quarter seminar in modern Chinese literature, with topics varying from year to year. Research paper required.

Prerequisite: CHINESE 213A

Repeatability: Unlimited as topics vary.

**CHINESE 214. Studies in Chinese Literature and Cultural Theory. 4 Units.**

Seminar in Chinese literature and cultural theory, with topics varying from year to year. Research paper required.

Prerequisite: CHINESE 100C or CHINESE 101C

Repeatability: Unlimited as topics vary.

**CHINESE 230. Topics in Chinese Literature and Culture. 4 Units.**

Seminar in Chinese literature and culture, with topics varying from year to year. Research paper required.

Prerequisite: CHINESE 100C or CHINESE 101A

Repeatability: Unlimited as topics vary.

**CHINESE 290. Independent Study. 4 Units.**

Directed research on topic determined in consultation with faculty member. A term paper or project is required.

Repeatability: May be repeated for credit unlimited times.

**CHINESE 299. Dissertation Research. 4-12 Units.**

Dissertation research with Chinese faculty.

Prerequisite: Advancement to Ph.D. candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Civil and Environmental Engineering (ENGRCEE)

### Courses

**ENGRCEE 11. Methods II: Probability and Statistics. 4 Units.**

Modeling and analysis of engineering problems under uncertainty. Engineering applications of probability and statistical concepts and methods.

(Design units: 0)

Prerequisite: (ENGRCEE 20 or EECS 10 or EECS 12 or ENGRMAE 10 or I&C SCI 31) and MATH 3A

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 20. Introduction to Computational Problem Solving. 4 Units.**

Introduction to computer programming within a numerical computing environment (MATLAB or similar) including types of data representation, graphical display of data, and development of modular programs with application to engineering analysis and problem solving.

(Design units: 1)

Corequisite: MATH 3A

Overlaps with BME 60B.

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 21. Computational Problem Solving. 4 Units.**

Engineering analysis and problem solving using MATLAB (or similar), including matrix algebra, solving systems of linear and nonlinear equations, numerical integration of ordinary differential equations (ODEs) and coupled ODEs, and analysis of numerical errors.

(Design units: 1)

Corequisite: MATH 3D

Prerequisite: (ENGRCEE 20 or BME 60B) and (MATH 3A or I&C SCI 6N)

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 30. Statics. 4 Units.**

Addition and resolution of forces, distributed forces, equivalent system of forces centroids, first moments, moments and products on inertia, equilibrium of rigid bodies, trusses, beams, cables. Course may be offered online.

(Design units: 0)

Corequisite: MATH 2D

Prerequisite: MATH 2D and PHYSICS 7C

Same as ENGR 30, ENGRMAE 30.

Restriction: School of Engineering students have first consideration for enrollment.

**ENGRCEE 60. Contemporary and Emerging Environmental Challenges. 4 Units.**

Introduces contemporary and emerging environmental challenges, illustrates links between human behavior, environmental policy, and engineering practices, examines policy options in the context of current institutions, and introduces tools and frameworks to reach sound economic, social, and environmental solutions.

(Design units: 0)

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**(III)****ENGRCEE 80. Dynamics. 4 Units.**

Introduction to the kinematics and dynamics of particles and rigid bodies. The Newton-Euler, Work/Energy, and Impulse/Momentum methods are explored for ascertaining the dynamics of particles and rigid bodies. An engineering design problem using these fundamental principles is also undertaken.

(Design units: 0.5)

Prerequisite: MATH 2D and PHYSICS 7C

Same as ENGR 80, ENGRMAE 80.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 81A. Civil Engineering Practicum I. 3 Units.**

Introduction to civil engineering through presentations on structural, environmental, water, and transportation systems. Introduction to graphics. Graphical visualization and communication using hand and computer sketching. Fundamentals of Computer Aided Design (CAD) using AutoCad. Laboratory sessions. Materials fee.

(Design units: 2)

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 81B. Civil Engineering Practicum II. 3 Units.**

Principles of surveying; fundamentals of Geographic Information Systems (GIS); introduction to the state-of-the-art and future areas of the profession, including applications of advanced technology and computers; Introduction to visualization and communication of design concepts; laboratory sessions. Materials fee.

(Design units: 1)

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 110. Methods III: Modeling, Economics, and Management. 4 Units.**

Analysis, modeling, and management of civil engineering systems. Statistics and system performance studies, probabilistic models and simulation, basic economics and capital investments, project elements and organization, managerial concepts and network technique, project scheduling. Emphasis on real-world examples. Laboratory sessions.

(Design units: 1)

Prerequisite: ENGRCEE 11

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.



**ENGRCEE 111. Methods IV: Systems Analysis and Decision-Making. 4 Units.**

Analysis and optimization for decision-making in civil and infrastructural systems. Topics include linear programming formulations and solution algorithms, network models, and logistical models. Emphasis is on project-level and managerial decision-making and selection from alternative designs.

(Design units: 1)

Prerequisite: (MATH 3A or I&C SCI 6N) and MATH 3D

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 114. GIS for Civil and Environmental Engineering. 4 Units.**

GIS for CEE provides an introduction to Geographic Information Systems (GIS) and their various applications in civil and environmental engineering. Topics include GIS data formats, data queries, spatial and attribute data, spatial data analysis, coordinate systems, and raster data analysis.

Concurrent with ENGRCEE 214.

**ENGRCEE 121. Transportation Systems I: Analysis and Design. 4 Units.**

Introduction to analysis and design of fundamental transportation system components, basic elements of geometric and pavement design, vehicle flow and elementary traffic, basic foundations of transportation planning and forecasting. Laboratory sessions.

(Design units: 2)

Prerequisite: ENGRCEE 11 and ENGRCEE 81A

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 122. Transportation Systems II: Operations and Control. 4 Units.**

Introduction to fundamentals of urban traffic engineering, including data collection, analysis, and design. Traffic engineering studies, traffic flow theory, traffic control devices, traffic signals, capacity and level of service analysis of freeways and urban streets. Laboratory sessions.

(Design units: 2)

Prerequisite: ENGRCEE 11 and ENGRCEE 121

Restriction: Civil Engineering Majors have first consideration for enrollment.

Concurrent with ENGRCEE 229A.

**ENGRCEE 123. Transportation Systems III: Planning and Forecasting. 4 Units.**

Theoretical foundations of transportation planning, design, and analysis methods. Theory and application of aggregate and disaggregate models for land use development, trip generation, destination, mode, and route choice. Transportation network analysis. Planning, design, and evaluation of system alternatives.

(Design units: 2)

Corequisite: ENGRCEE 110

Prerequisite: ENGRCEE 121

Restriction: Civil Engineering Majors have first consideration for enrollment.

Concurrent with ENGRCEE 223.

**ENGRCEE 124. Transportation Systems IV: Freeway Operations and Control. 4 Units.**

Fundamentals of traffic on urban freeways, including data collection analysis, and design. Traffic engineering studies, traffic flow theory, freeway traffic control devices, capacity, and level of service analysis of freeways and highways. Laboratory sessions.

(Design units: 2)

Prerequisite: ENGRCEE 121

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 125. Transportation and the Environment. 4 Units.**

Analysis of the impacts of motor vehicle transportation on the environment. Introduction to life cycle analysis applied to transportation. Basic economic tools for transportation externalities. Transportation planning, urban form, health, and the environment. Transportation sustainability.

(Design units: 0)

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 130. Soil Mechanics. 4 Units.**

Mechanics of soils, composition and classification of soils, compaction, compressibility and consolidation, shear strength, seepage, bearing capacity, lateral earth pressure, retaining walls, piles.

(Design units: 0)

Corequisite: ENGRCEE 130L

Prerequisite: ENGRCEE 150 and ENGRCEE 170

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 130L. Soil Mechanics Laboratory. 1 Unit.**

Laboratory procedures of soil testing for engineering problems. Materials fee.

(Design units: 0)

Corequisite: ENGRCEE 130

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 149. Introduction to Earthquake Engineering. 4 Units.**

Plate tectonics. Structural dynamics. Earthquake magnitude, intensity, and frequency. Seismic damage to structures. Earthquake load prediction including response spectra, normal mode, and direct integration techniques. The basis of building code earthquake load requirements for buildings.

(Design units: 2)

Prerequisite: ENGRCEE 11 and ENGRCEE 20 and ENGRCEE 151A

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 150. Mechanics of Materials. 4 Units.**

Stresses and strains, strain-stress diagrams, axial deformations, torsion, bending and shear stresses in beams, shear force and bending moment diagrams, combined stresses, principal stresses, Mohr's circle, deflection of beams, columns.

(Design units: 1)

Prerequisite: ENGRCEE 30 or ENGRMAE 30 or ENGR 30. ENGRCEE 30 with a grade of C- or better

Overlaps with ENGR 150, ENGRMAE 150.

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 150L. Mechanics of Materials Laboratory. 1 Unit.**

Experimental methods and fundamentals for mechanics of materials analysis. Materials fee.

(Design units: 0)

Prerequisite or corequisite: (ENGRCEE 30 or ENGRMAE 30 or ENGR 30) and ENGRCEE 150. ENGRCEE 30 with a grade of C- or better

Overlaps with ENGRMAE 150L.

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 151A. Structural Analysis. 4 Units.**

Fundamentals of structural analysis and loading. Deformation of statically determinate and indeterminate structures. Influence lines. Structural systems.

(Design units: 0)

Prerequisite: ENGRCEE 150 or ENGRMAE 150. ENGRCEE 150 with a grade of C- or better

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 151B. Structural Timber Design. 4 Units.**

Design of timber structures. Beams, columns, beam-columns, roof, and connections.

(Design units: 3)

Prerequisite: ENGRCEE 151A

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 151C. Reinforced Concrete Design. 4 Units.**

Ultimate strength design. Design of reinforced concrete beam sections. Design for shear and deflection. Design of columns. Design of isolated and combined footings. Laboratory sessions. Materials fee.

(Design units: 3)

Prerequisite: ENGRCEE 151A

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 152. Computer Methods in Structural Analysis and Design. 4 Units.**

Matrix techniques for indeterminate framed structures. Computer implementation using the stiffness method. Software packages for design of reinforced concrete, steel, and/or timber structures.

(Design units: 2)

Prerequisite: ENGRCEE 151C

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 155. Structural Steel Design. 4 Units.**

Design in steel of tension members, beams, columns, welded and bolted connections; eccentrically loaded and moment resistant joints; plate girders. Plastic design; load and resistance factor design. Composite construction; introduction to computer-aided design.

(Design units: 4)

Prerequisite: ENGRCEE 151A

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 156. Foundation Design. 4 Units.**

Applications of soil mechanics principles to the analysis and design of shallow foundations, retaining walls, pile foundations, and braced cuts. Design criteria: bearing capacity, working loads and tolerable settlements, structural integrity of the foundation element. Damage from construction operations.

(Design units: 3)

Prerequisite: ENGRCEE 130 and ENGRCEE 151C

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 160. Environmental Processes. 4 Units.**

Introduction to environmental processes in air and water, mass balances, and transport phenomena. Fundamentals of water-quality engineering including water and wastewater treatment.

(Design units: 1)

Prerequisite: (CHEM 1B or CHEM H2B) and ENGRCEE 170

Restriction: Civil Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 162. Introduction to Environmental Chemistry. 4 Units.**

Basic concepts from general, physical, and analytical chemistry as they relate to environmental engineering. Particular emphasis on the fundamentals of equilibrium and kinetics as they apply to acid-base chemistry, gas solubility, and redox reactions. Laboratory sessions. Materials fee.

(Design units: 0)

Prerequisite: (ENGR 1A or CHEM 1A or CHEM H2A) and (CHEM 1B or CHEM H2B) and (CHEM 1LC or CHEM 1LE or CHEM H2LB or CHEM M2LB) and (CHEM 51A or CHEM H52A)

Restriction: Chemical Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 163. Wastewater Treatment Process Design. 4 Units.**

Design of biological treatment processes. Topics include attached and suspended growth, aeration, anaerobic systems, process control, and economics. Design projects included. Materials fee.

(Design units: 4)

Prerequisite: ENGRCEE 160

Restriction: Civil Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 164. Carbon and Energy Footprint Analysis. 4 Units.**

Process design for wastewater treatment. Mass- and energy-balance analysis applied to water and wastewater treatment systems. Case studies include analysis of water supply, treatment, reclamation, and reuse.

(Design units: 2)

Prerequisite: ENGRCEE 160

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

Concurrent with ENGRCEE 264.

**ENGRCEE 165. Physical-Chemical Treatment Processes. 4 Units.**

Theory and dynamics of physical and chemical separation processes in water and wastewater treatment. Topics include coagulation, sedimentation, filtration, gas-transfer, membrane separations, and adsorption.

(Design units: 2)

Prerequisite: ENGRCEE 160 and (ENGRMAE 91 or CBE 40C)

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

Concurrent with ENGRCEE 265.

**ENGRCEE 169. Environmental Microbiology for Engineers. 4 Units.**

Fundamental and applied principles of microbiology. Structures and functions of microorganisms, the microbiology of water, wastewater and soil used in environmental engineering, and the impact of microorganisms on human and environmental health.

(Design units: 0)

Prerequisite: ENGRCEE 160

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 170. Introduction to Fluid Mechanics. 4 Units.**

Thermodynamic and mechanical fluid properties; fluid statics; control volume and differential approaches for mass, momentum, and energy; dimensional analysis and similarity.

(Design units: 1)

Corequisite: MATH 2E and ENGRCEE 20

Prerequisite: PHYSICS 7C

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 171. Water Resources Engineering. 4 Units.**

Principles governing the analysis and design of water resource systems including pressurized pipelines, pipe networks, channels, and ground water. Coverage of fluid mass, momentum and energy conservation, flow resistance, and related laboratory measurements in different systems. Materials fee.

(Design units: 2)

Prerequisite: ENGRCEE 170

Restriction: Chemical Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 172. Groundwater Hydrology. 4 Units.**

Topics include conservation of fluid mass, storage properties of porous media, matrix compressibility, boundary conditions, flow nets, well hydraulics, groundwater chemistry, and solute transport. Design projects and computer applications included.

(Design units: 2)

Prerequisite: ENGRCEE 170 or ENGRMAE 130A or CBE 120A

Restriction: Civil Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

Concurrent with ENGRCEE 272.

**ENGRCEE 173. Watershed Modeling. 4 Units.**

Basic principles of hydrologic modeling are practiced. Concepts of watershed delineation, land use change impact, design studies, and GIS tools are discussed. Focus on the USACE (HEC) software tools (HEC-HMS, and HEC-RAS) along with their associated GIS interfaces.

(Design units: 1)

Prerequisite: ENGRCEE 170 and ENGRCEE 176

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

Concurrent with ENGRCEE 273.

**ENGRCEE 176. Hydrology. 4 Units.**

Elements of the hydrologic cycle including precipitation, infiltration, evapotranspiration, ground water, and runoff. Unit Hydrograph theory and routing methods. Introduction to precipitation/runoff relationship and watershed modeling. Statistical methods and flood frequency analysis.

(Design units: 2)

Prerequisite: ENGRCEE 170 or ENGRMAE 130A

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

Concurrent with ENGRCEE 276.

**ENGRCEE 178. Fluid Mechanics of Open Channels. 4 Units.**

Fundamentals of fluid motion in open channels. Navier-Stokes equations and one-dimensional momentum and energy principles. Topics include rapidly varied flow, flow resistance and turbulence, gradually varied flow, unsteady flow, and computational methods for channel flow modeling.

(Design units: 1)

Prerequisite: (ENGRCEE 20 or BME 60B or ENGRMAE 10) and (ENGRCEE 170 or ENGRMAE 130A or CBEMS 125A)

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 181A. Senior Design Practicum I. 2 Units.**

Team designs land development project including infrastructural, environmental, circulation aspects. Focus on traffic impact studies, design of roads, geometry, signals, geotechnical and hydrological analysis, design of structural elements, economic analysis. Oral/Written interim and final design reports. Laboratory sessions.

(Design units: 1)

Prerequisite: ENGRCEE 81A and ENGRCEE 81B and ENGRCEE 110 and (ENGRCEE 121 or ENGRCEE 151C or ENGRCEE 162 or ENGRCEE 171). ENGRCEE 181A and ENGRCEE 181B and ENGRCEE 181C must be taken in the same academic year.

Restriction: Seniors only. Civil Engineering Majors only. Environmental Engineering Majors only.

**ENGRCEE 181B. Senior Design Practicum II. 2 Units.**

Team designs land development project including infrastructural, environmental, circulation aspects. Focus on traffic impact studies, design of roads, geometry, signals, geotechnical and hydrological analysis, design of structural elements, economic analysis. Oral/Written interim and final design reports. Laboratory sessions.

(Design units: 2)

Corequisite: ENGRCEE 130

Prerequisite: ENGRCEE 181A. CEE 181A and ENGRCEE 181B and ENGRCEE 181C must be taken in the same academic year.

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Seniors only. Civil Engineering Majors only. Environmental Engineering Majors only.

**ENGRCEE 181C. Senior Design Practicum III. 2 Units.**

Team designs land development project including infrastructural, environmental, circulation aspects. Focus on traffic impact studies, design of roads, geometry, signals, geotechnical and hydrological analysis, design of structural elements, economic analysis. Oral/Written interim and final design reports. Laboratory sessions.

(Design units: 2)

Prerequisite: ENGRCEE 181B. ENGRCEE 181A and CEE 181B and ENGRCEE 181C must be taken in the same academic year.

Restriction: Seniors only. Civil Engineering Majors only. Environmental Engineering Majors only.

**ENGRCEE 195. Special Topics in Civil and Environmental Engineering. 1-4 Units.**

Studies in selected areas of Civil and Environmental Engineering. Topics addressed vary each quarter.

(Design units: 1-4)

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ENGRCEE 198. Group Study. 1-4 Units.**

Group study of selected topics in Civil and Environmental Engineering.

(Design units: 1-4)

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**ENGRCEE 199. Individual Study. 1-4 Units.**

For undergraduate Engineering majors in supervised but independent reading, research, or design. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Repeatability: May be taken for credit for 8 units.

**ENGRCEE 199P. Individual Study. 1-4 Units.**

Supervised independent reading, research, or design for undergraduate Engineering majors. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**ENGRCEE 214. GIS for Civil and Environmental Engineering. 4 Units.**

GIS for CEE provides an introduction to Geographic Information Systems (GIS) and their various applications in civil and environmental engineering. Topics include GIS data formats, data queries, spatial and attribute data, spatial data analysis, coordinate systems, raster data analysis.

Concurrent with ENGRCEE 114.

**ENGRCEE 220A. Travel Demand Analysis I. 4 Units.**

Fundamentals of transportation systems analysis. Theoretical aspects of travel demand. Travel behavior. Modeling of performance characteristics and costs of transportation modes. In-depth presentation of travel demand modeling techniques. Development of travel choice models including mode, route, and destination choice. Equilibrium.

Restriction: Graduate students only.

**ENGRCEE 220B. Travel Demand Analysis II. 4 Units.**

Methods of discrete choice analysis and their applications in the modeling of transportation systems. Emphasis on the development of a sound understanding of theoretical aspects of discrete choice modeling that are useful in many applications in travel demand analysis.

Prerequisite: ENGRCEE 220A

Restriction: Graduate students only.

**ENGRCEE 220C. Travel Demand Analysis III: Activity-based Approaches. 4 Units.**

The methodological underpinnings of activity-based travel demand modeling. Presents methodologies within the context of a generalization of discrete choice modeling approaches, emphasizing the distinctions that separate these two approaches and presenting appropriate mathematical and statistical tools to address these distinctions.

Prerequisite: ENGRCEE 220A

Restriction: Graduate students only.

**ENGRCEE 221A. Transportation Systems Analysis I. 4 Units.**

Introduction to mathematical methods and models to address logistics and urban transportation problems. Techniques include stochastic models, queueing theory, linear programming, and introductory non-linear optimization.

Restriction: Graduate students only.

**ENGRCEE 221B. Transportation Systems Analysis II. 4 Units.**

Advanced mathematical methods and models to address logistics and urban transportation problems. Topics include network flows, advanced optimization techniques, network models, and heuristic algorithms.

Prerequisite: ENGRCEE 221A

Restriction: Graduate students only.

**ENGRCEE 222. Transit Systems Planning. 4 Units.**

Planning methods for public transportation in urban areas. Technological and operating characteristics of vehicles, facilities, and systems. Short-range planning techniques: data collection and analysis, demand analysis, mode choice, operational strategies, financial analysis. Design of systems to improve performance.

Restriction: Graduate students only.

**ENGRCEE 223. Transportation Systems III: Planning and Forecasting. 4 Units.**

Theoretical foundations of transportation planning, design, and analysis methods. Theory and application of aggregate and disaggregate models for land use development, trip generation, destination, mode, and route choice. Transportation network analysis. Planning, design, and evaluation of system alternatives.

Restriction: Graduate students only.

Concurrent with ENGRCEE 123.

**ENGRCEE 224A. Transportation Data Analysis I. 4 Units.**

Statistical analysis of transportation data sources. Analysis of categorical and ordinal data. Regression and advanced multivariate analysis methods such as discriminant analysis, canonical correlation, and factor analysis. Sampling techniques, sample error and bias, survey instrument design.

Restriction: Graduate students only.

**ENGRCEE 225B. Transportation Planning Models II. 4 Units.**

Design and application of comprehensive transportation models. Network development, demand modeling, and equilibrium assignment. Model calibration, validation, prediction, and evaluation. Regional modeling, site impact analysis, and circulation studies. Design of transportation alternatives.

Prerequisite: ENGRCEE 223

Restriction: Graduate students only.

**ENGRCEE 226A. Traffic Flow Theory I. 4 Units.**

Traffic measurement and fundamental speed-density-flow relationships. Kinematic models. Shock waves. Statistical-kinetic theory of traffic. Introductory car-following principles and stability. Gap acceptance. Platoon dispersion. Two-fluid model. Queueing process. Multi-regime and catastrophe models. Higher-order continuum models. Microscopic and macroscopic simulation.

Restriction: Graduate students only.

**ENGRCEE 226B. Traffic Flow Theory II. 4 Units.**

Advanced mathematical analysis of vehicular flow. Detailed treatise on car-following models. Fourier and Laplace analysis of stability problems. Perturbation analysis. Derivation of macroscopic traffic flow relationships from microscopic considerations. Advanced hydrodynamic theory.

Prerequisite: ENGRCEE 226A

Restriction: Graduate students only.

**ENGRCEE 228A. Urban Transportation Networks I. 4 Units.**

Analytical approaches and algorithms to the formulation and solution of the equilibrium assignment problem for transportation networks. Emphasis on user equilibrium (UE) comparison with system optimal, mathematical programming formulation, supply functions, estimation. Estimating origin-destination matrices, network design problems.

Prerequisite: ENGRCEE 220A

Restriction: Graduate students only.

**ENGRCEE 228B. Urban Transportation Networks II. 4 Units.**

Advanced analysis, optimization, and modeling of transportation networks. Topics include advanced static and dynamic traffic assignment algorithms, linear and nonlinear multi-commodity network flow optimization, network simplex, and network control problems.

Prerequisite: ENGRCEE 221A and ENGRCEE 228A

Restriction: Graduate students only.

**ENGRCEE 229A. Traffic Systems Operations and Control I. 4 Units.**

Introduction to operation, control, and analysis of arterial and freeway traffic systems. Control concepts, traffic stream principles, detectors, local controllers, system masters, traffic signal and ramp metering timing principles, traffic measurement technologies, traffic delay principles.

Restriction: Graduate students only.

Concurrent with ENGRCEE 122.



**ENGRCEE 229B. Traffic Systems Operations and Control II. 4 Units.**

Advanced topics related to operation, control, and analysis of arterial and freeway traffic systems. Control concepts, traffic stream principles, detectors, local controllers, system masters, traffic signal and ramp metering timing principles.

Prerequisite: ENGRCEE 229A

Restriction: Graduate students only.

**ENGRCEE 231. Foundation Engineering. 4 Units.**

Essentials for design and analysis of structural members that transmit superstructure loads to the ground. Topics include subsurface investigations, excavation, dewatering, bracing, footing, mat foundations, piles and pile foundations, caissons and cofferdams, other special foundations.

Restriction: Graduate students only.

**ENGRCEE 232. Geotech Earthquake Engineering. 4 Units.**

In-situ and laboratory determination of dynamic soil properties, liquefaction of soil, cyclic softening of clays, seismic compression and settlement analyses, ground improvement methods, seismic slope stability, introduction to soil structure interaction.

Restriction: Graduate students only.

**ENGRCEE 240. High Performance Materials. 4 Units.**

Part I: Linear and nonlinear fracture mechanics, methodology, real-world case studies; Part II: Composite material toughening, underlying micromechanics, materials engineering towards microstructure tailoring and new material design approaches; Part III: Emerging high-performance engineering materials for safety, energy and the environment.

Restriction: Graduate students only.

**ENGRCEE 242. Advanced Strength of Materials. 4 Units.**

Beams on elastic foundations. Combined axial and lateral loads. Curved beams. Unsymmetric bending. Shear center. Stresses and strains. Basic equations for theory of elasticity. Energy principles. Theory of torsion. Combined bending and torsion.

Restriction: Graduate students only.

**ENGRCEE 243. Mechanics of Composite Materials. 4 Units.**

Stress-strain relationship for orthotropic materials; invariant properties of an orthotropic lamina; biaxial strength theory for an orthotropic lamina; mechanics of materials approach to stiffness; elasticity approach to stiffness; classical lamination theory; strength of laminates; statistical theory of fatigue damage.

Restriction: Graduate students only.

**ENGRCEE 247. Structural Dynamics. 4 Units.**

Vibration of discrete and continuous mass elastic systems. Isolation and transmissibility. Dynamic recording instruments. Introduction to nonlinear theory of vibration. Response of structures to earthquake, traffic, and wind loads. Response spectra concepts. Normal mode analysis. Numerical integration techniques.

Restriction: Graduate students only.

**ENGRCEE 249. Earthquake Engineering. 4 Units.**

Earthquake magnitude, intensity, and frequency. Seismic damage to structures. Earthquake load prediction including response spectra, normal mode, and direct integration techniques. The basis of building code earthquake load requirements for buildings. Seismic response of special structures. Lifeline engineering.

Restriction: Graduate students only.

**ENGRCEE 250. Finite Element Method in Structural Engineering. 4 Units.**

Finite element concepts in structural engineering including variational formulations, shape functions, elements assembly, convergence and computer programming. Stiffness of truss, beam, and frame members, two- and three-dimensional solids, plate and shell elements. Static, vibration, stability, and inelastic analysis.

Restriction: Graduate students only.

**ENGRCEE 252. Multiscale Modeling of Materials and Structures. 4 Units.**

Introduction to modeling materials and structures across length.

Restriction: Graduate students only.

**ENGRCEE 254. Advanced Reinforced Concrete Behavior and Design. 4 Units.**

Flexural strength of reinforced concrete elements. Flexural ductility of unconfined and confined members with axial loads. Shear and torsional behaviors. Strength of reinforced concrete ductile frames and shear walls. Reinforced concrete detailing.

Restriction: Graduate students only.

**ENGRCEE 255. Advanced Behavior and Design of Steel Structures. 4 Units.**

Advanced principles of structural steel design. Analysis and design of beam-column members, braced and unbraced frames for buildings, and plate girders. Review of seismic design provisions. Design of connections.

Restriction: Graduate students only.

**ENGRCEE 258. Earthquake Resistant Structural Design. 4 Units.**

Objectives of seismic design. Cyclic load-distortion characteristics of typical structural elements. Desirable structural form. Ductility and methods of achieving it. Use of energy dissipators. Project involving design of multistory, multibay rigid-jointed plane frame.

Restriction: Graduate students only.

**ENGRCEE 260. Desalination. 4 Units.**

Introduction of state of technology, costs and benefits, environmental issues, and implementation issues related to desalination. Emphasis on membrane processes and biofouling prevention.

Restriction: Graduate students only.

**ENGRCEE 261. Applied Environmental Microbiology. 4 Units.**

Microbes in the environment and their impact on human interactions. Microbiological application in solving environmental engineering problems.

Restriction: Graduate students only.

**ENGRCEE 262. Environmental Chemistry II. 4 Units.**

Advanced concepts from physical and organic chemistry as they relate to environmental engineering. Emphasis on equilibrium and kinetics as they apply to redox reactions, coordination, absorption, gas phase reactions, and ion exchange.

Restriction: Graduate students only.

**ENGRCEE 263. Advanced Biological Treatment Processes. 4 Units.**

Analysis of biological processes in natural and engineered systems. Biological treatment processes, both aerobic and anaerobic, with emphasis on suspended growth systems including design consideration. Containment degradation or control covered. Includes laboratory on molecular tools used in wastewater treatment.

Restriction: Graduate students only.

**ENGRCEE 264. Carbon and Energy Footprint Analysis. 4 Units.**

Process design for wastewater treatment. Mass- and energy- balance analysis applied to water and wastewater treatment systems. Case studies include analysis of water supply, treatment, reclamation, and reuse.

Restriction: Graduate students only.

Concurrent with ENGRCEE 164.

**ENGRCEE 265. Physical-Chemical Treatment Processes. 4 Units.**

Theory and dynamics of physical and chemical separation processes in water and wastewater treatment. Topics include coagulation, sedimentation, filtration, gas transfer, membrane separations, and absorption.

Restriction: Graduate students only.

Concurrent with ENGRCEE 165.

**ENGRCEE 266. Drinking Water and Wastewater Biotechnology. 4 Units.**

Water and wastewater microbiology. Engineering principles, molecular aspects, and overview of microorganisms of importance to public health. Topics include aerobic and anaerobic wastewater treatment and disinfection of pathogens in water, wastewaters, and biosolids.

Restriction: Graduate students only.

**ENGRCEE 267. Energy, Climate Change, and Urban Air Quality. 4 Units.**

An introduction to the connection between energy, climate change, and urban air quality. It will focus on air quality and climate implications of energy choices, bringing light to the most important and time-relevant issues.

Restriction: Graduate students only.

**ENGRCEE 269. Beach Dynamics. 4 Units.**

Coastal erosion in California, human and natural influences on southern California beaches, and present-day challenges. Littoral cells and sediment budgets. Water wave theory. Littoral sediment transport and shoreline change modeling. Shoreline stabilization using green and gray infrastructure.

Restriction: Graduate students only.

**ENGRCEE 270. Flood Risk and Modeling. 4 Units.**

Global and national trends in flooding and related impacts including disasters; flood risk management; theory and numerical methods for flood inundation modeling; flood risk communication strategies including flood hazard visualizations.

**ENGRCEE 271. Flow in Unsaturated Porous Media. 4 Units.**

Fluid flow in the unsaturated zone (zone of aeration) of the subsurface. Soil-water physics, flow in regional groundwater systems, miscible displacement, mathematical modeling techniques.

Restriction: Graduate students only.

**ENGRCEE 272. Groundwater Hydrology. 4 Units.**

Topics include conservation of fluid mass, storage properties of porous media, matrix compressibility, boundary conditions, flow nets, well hydraulics, groundwater chemistry, and solute transport. Includes introduction to advanced topics in porous media. Design projects and computer applications included.

Restriction: Graduate students only.

Concurrent with ENGRCEE 172.

**ENGRCEE 273. Watershed Modeling. 4 Units.**

Basic principles of hydrologic modeling are practiced. Concepts of watershed delineation, land use change impact, design studies, and GIS tools are discussed. Focus on the USACE (HEC) software tools (HEC-HMS and HEC-RAS) along with their associated GIS interfaces.

Restriction: Graduate students only.

Concurrent with ENGRCEE 173.

**ENGRCEE 274. Climate Data Analysis. 4 Units.**

Trend analysis; statistical indices for diagnosing and detecting changes in extremes; nonstationary processes; extreme value analysis; multivariate extreme value methods; tail dependence estimation; uncertainties in observed and projected changes in climate extremes.

**ENGRCEE 275. Topics in Coastal Engineering. 4 Units.**

Linear wave theory. Wave properties: particle kinematics, energy propagation, shoaling, refraction, reflection, diffraction, and breaking. Wave statistics and spectra. Selected topics from: design of coastal structures; harbor engineering; littoral transport and shoreline morphology; and hydrodynamics of estuaries.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ENGRCEE 276. Hydrology. 4 Units.**

Elements of the hydrologic cycle including precipitation, infiltration, evapotranspiration, ground water, and runoff. Unit Hydrograph theory and routing methods. Introduction to precipitation/runoff relationship and watershed modeling. Statistical methods and flood frequency analysis. Discussion section covers advanced topics.

Restriction: Graduate students only.

Concurrent with ENGRCEE 176.

**ENGRCEE 277. Hydrologic Transport Fundamentals. 4 Units.**

Process description, mathematical and numerical modeling of transport processes in surface and ground water. Topics include advection, molecular diffusion, Taylor dispersion, mechanical dispersion in porous media, shear flow dispersion in channels, and turbulent jets and plumes.

Restriction: Graduate students only.

**ENGRCEE 279. Environmental Transport Modeling. 4 Units.**

Computational modeling of multi-dimensional flow and scalar transport problems in surface and ground water. Topics include mathematical model formulation, numerical method selection, serial and parallel implementation, model verification and validation.

Restriction: Graduate students only.

**ENGRCEE 281. Structural Reliability. 4 Units.**

Applications of probability theory to reliability analysis of engineering structures. Theory of structural reliability. Estimation of static random loads. Reliability analysis of structural components and system. Monte Carlo simulation.

Restriction: Graduate students only.

**ENGRCEE 283. Mathematical Methods in Engineering Analysis. 4 Units.**

Matrices; vector calculus; eigenvalue problems; Fourier analysis; partial differential equations; special functions; numerical analysis; finite difference method.

**ENGRCEE 289. Analysis of Hydrologic Systems. 4 Units.**

Application of systems theory in hydrologic, land surface, biogeochemical modeling. Design, identification, and calibration of conceptual models. Principles of dynamic systems, modeling approaches, theory of linear systems, mathematical concepts of differential calculus, theoretical concepts of parameter estimation and optimization theory.

**ENGRCEE 290. Merging Models and Data. 4 Units.**

Introduction to optimization and data assimilation methods for model calibration and uncertainty quantification. Local, global and multi-method search. Bayesian analysis using Monte Carlo simulation with Random Walk Metropolis, and adaptive samplers. Filtering methods for recursive inference. Illustration using environmental models.

Restriction: Graduate students only.

**ENGRCEE 291. Hydrologic Remote Sensing. 4 Units.**

Introduction to principles of remote sensing and application in hydrology. Review of sensor systems, thermal and multispectral image processing, and image classification. Examples from remote sensing of hydrologic processes such as precipitation, soil moisture, and vegetation are covered.

Prerequisite: ENGRCEE 276

Restriction: Graduate students only.

**ENGRCEE 292. Wavelets in Hydrology, Engineering, and Geoscience. 4 Units.**

Multiscale analysis of hydrologic, engineering, and earth system processes; energy decomposition in the time-frequency domain via wavelets; applications to fluid flows, climate and mechanical signals for feature extraction, trend analysis, coherent structures, and upscaling/downscaling.

Restriction: Graduate students only.

**ENGRCEE 295. Seminars in Engineering. 1-4 Units.**

Seminars scheduled each year by individual faculty in major field of interest.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ENGRCEE 296. Master of Science Thesis Research. 1-16 Units.**

Individual research or investigation conducted in preparation of the thesis required for the M.S. degree in Engineering.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ENGRCEE 297. Doctor of Philosophy Dissertation Research. 1-16 Units.**

Individual research or investigation conducted in preparation for the dissertation required for the Ph.D. degree in Engineering.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ENGRCEE 298. Special Topics in Civil Engineering. 1-4 Units.**

Presentation of advanced topics and special research areas in civil engineering.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ENGRCEE 299. Individual Research. 1-16 Units.**

Individual research or investigation under the direction of an individual faculty member.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Classics (CLASSIC)

### Courses

**CLASSIC 10. Scientific and Specialized Terminology. 4 Units.**

A study of English terms derived from Greek and Latin and important to contemporary medicine, science, and other professions, with emphasis on development of word-building skills. No prior knowledge of Greek or Latin required.

**CLASSIC 36A. The Formation of Ancient Greek Society: Early Greece. 4 Units.**

A survey of ancient Greek civilization from its origins in the Bronze Age to the mid-Archaic period. Examines political and social history, as well as literature, art, religion, and archaeological remains.

Same as HISTORY 36A.

(IV)

**CLASSIC 36B. The Formation of Ancient Greek Society: Late Archaic and Classical Greece. 4 Units.**

A survey of ancient Greek civilization from the Late Archaic period to the Classical period. Focuses on major institutions and cultural phenomena as seen through the study of ancient Greek literature, history, archaeology, and religion.

Same as HISTORY 36B.

(IV)

**CLASSIC 36C. The Formation of Ancient Greek Society: Fourth-Century and Hellenistic Greece. 4 Units.**

A survey of ancient Greek civilization from the fourth century BCE through to the Hellenistic period. Focuses on major institutions and cultural phenomena as seen through the study of ancient Greek literature, history, archaeology, and religion.

Same as HISTORY 36C.

(IV)

**CLASSIC 37A. The Formation of Ancient Roman Society: Origins to Roman Republic. 4 Units.**

A survey of the development of Roman civilization from its eighth century BCE beginnings to the civil wars of the first century BCE. Examines political and social history, as well as literature, art, architecture, and religion.

Same as HISTORY 37A.

(IV)

**CLASSIC 37B. The Formation of Ancient Roman Society: Roman Empire. 4 Units.**

A survey of Roman civilization from Augustus's consolidation of power following the civil wars of the first century BCE to the crisis of the third century CE. Includes social history, literature, art, architecture, and religion.

Same as HISTORY 37B.

(IV)

**CLASSIC 37C. The Formation of Ancient Roman Society: The Fall of Rome. 4 Units.**

A survey of Roman civilization from the crisis of the third century CE to the so-called "fall of Rome" in 476 CE. Examines political and social history, as well as literature, art, architecture, and religion.

Same as HISTORY 37C.

(IV)

**CLASSIC 45A. Classical Mythology: The Gods. 4 Units.**

An overview of the main myths of the gods of the ancient Greeks and Romans and their influence in contemporary and later literature and art. Includes readings from both ancient and modern sources.

(IV)

**CLASSIC 45B. Classical Mythology: The Heroes. 4 Units.**

An overview of the main myths of the heroes of the ancient Greeks and Romans and their influence in contemporary and later literature and art. Includes readings from both ancient and modern sources.

(IV)

**CLASSIC 45C. Classical Mythology: Ancient and Modern Perspectives of Classical Mythology. 4 Units.**

Detailed examination of key Greek and Roman myths, their interpretations, and the influence they have exerted on literature, art, and popular culture in subsequent periods.

(IV)

**CLASSIC 99. Special Studies in Classics. 1-4 Units.**

Lower-division level independent research with Classics faculty.

Repeatability: May be repeated for credit unlimited times.

**CLASSIC 140. Classics and History: The Ancient World. 4 Units.**

Selected topics in society and culture of the Graeco-Roman world. Readings in translation.

Repeatability: Unlimited as topics vary.

**CLASSIC 150. Classical Mythology. 4 Units.**

Selected myths and legends as used in Classical literature, and their modern interpretations.

**CLASSIC 160. Topics in Classical Literature in English Translation. 4 Units.**

Studies in selected areas of Classical literature. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**CLASSIC 160W. Topics in Classical Literature in English Translation. 4 Units.**

Studies in selected areas of Classical literature. Topics addressed vary each quarter.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

(Ib)

**CLASSIC 166. Topics in Classical Reception. 4 Units.**

Studies in selected areas of Classical reception. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**CLASSIC 170. Topics in Classical Civilization. 4 Units.**

Studies in selected areas of Classical civilization. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**CLASSIC 176. International Studies and the Classics. 4 Units.**

Develops a broader understanding of the formation of different cultures and countries of Classical times and their impact on the modern world.

Repeatability: Unlimited as topics vary.

**CLASSIC 192A. Senior Capstone. 2 Units.**

Under the guidance of a faculty mentor, majors design and execute a senior project. This project may be a research paper, dramatic production, school curriculum, etc. All projects must be approved by the faculty mentor.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Grading Option: In Progress (Letter Grade with P/NP).

**CLASSIC 192B. Senior Capstone. 4 Units.**

Under the guidance of a faculty mentor, majors design and execute a senior project. This project may be a research paper, dramatic production, school curriculum, etc. All projects must be approved by the faculty mentor.

Prerequisite: CLASSIC 192A. Satisfactory completion of the Lower-Division Writing requirement.

**CLASSIC 198. Directed Group Study. 4 Units.**

Special topics in Classical studies through directed reading and research.

Repeatability: May be repeated for credit unlimited times.

**CLASSIC 199. Independent Study in Classics. 1-4 Units.**

Independent research with Classics faculty.

Repeatability: May be repeated for credit unlimited times.

**CLASSIC 280. Independent Study. 4-12 Units.**

Supervised independent research. Subject varies.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CLASSIC 290. Research in Classics. 4-12 Units.**

Research under Classics faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CLASSIC 299. Dissertation Research. 4-12 Units.**

Dissertation research with Classics faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CLASSIC 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Cognitive Sciences (COGS)

### Courses

**COGS 14P. Python for Cognitive Science and Neuroscience Research. 4 Units.**

Introduces Python for data analysis and modeling encountered in cognitive science and neuroscience. Topics include data structures, execution control, graphic visualization, and interaction with sound and display interfaces. Application in statistical analysis, model simulation, and stimulus presentation and experimental control.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**COGS 109. Cognitive Sciences Research Seminar. 4 Units.**

Read and discuss examples of the primary research leading to the concepts covered in Psychology Fundamentals. Focuses on how this research is conducted and how inferences from it are drawn.

Prerequisite or corequisite: PSYC 9A

Restriction: Cognitive Sciences Majors only.

**COGS 110. Quantitative Methods for Cognitive Sciences Research. 4 Units.**

Basics of quantitative methods used in cognitive sciences research focusing on linear algebra, Fourier analysis, multivariate statistics, and signal detection theory. Examples drawn from models and methods used in cognitive sciences research with practical examples.

Prerequisite: MATH 2B and STAT 7 and (PSYC 114M or ICS 31)

Restriction: Cognitive Sciences majors only.

## Community and Environmental Medicine (CEM)

## Comparative Literature (COM LIT)

### Courses

**COM LIT 3. Just Reading: Developing the Reading Experience . 4 Units.**

Develops the reading experience apart from writing. Develops tools for sustained attention in reading practice across a wide range of genres and media from across the globe. Students learn to appreciate elements of reading experience such as attention and perplexity.

(IV and VIII ).

**COM LIT 8. Travels in Comparative Literature. 4 Units.**

Readings in English and in English translation on such topics as love, war, cities, travel writing, politics, fantasy and science fiction, violence.

Repeatability: Unlimited as topics vary.

(IV)

**COM LIT 9. Introduction to Multiculturalism. 4 Units.**

Various themes and forms of literary and cultural production within a multicultural framework, including African American, Asian American, Chicano/Latino, and Native American literatures and cultures.

Repeatability: Unlimited as topics vary.

(IV, VII)

**COM LIT 10. Topics in World Literature. 4 Units.**

Introduction to texts from across the globe and from different historical periods. Readings in English and English translation.

Repeatability: Unlimited as topics vary.

(IV and VIII ).

**COM LIT 60A. World Literature. 4 Units.**

An introduction to the comparative study of literatures and cultures in a global context. Studies literary texts and other media across the borders of various cultures, historical periods, and traditions. All texts are read in English translation.

(IV and VIII ).

**COM LIT 60B. Reading with Theory. 4 Units.**

Introduction to theory and methods of literary and cultural criticism in a global context. Students read theoretical approaches to literature, culture, and ideas. Marx and Freud, e.g., may be studied alongside readings in narrative poetry, film, song lyrics, novel.

(IV, VIII)



**COM LIT 60C. Cultural Studies. 4 Units.**

Introduces students to a variety of cultural practices (literature, blogs, films, radio, comics) from across the globe. Focuses on the ways that context, genre, and medium (e.g., written, visual, oral) affect how these practices are produced, circulated, and received.

(IV, VIII)

**COM LIT 100A. Nations, Regions, and Beyond. 4 Units.**

Intensive study of national and regional cultural and literary traditions from across the globe, among them the literary and cultural production of the Middle East, Africa, Europe, the Americas, and Asia.

Repeatability: Unlimited as topics vary.

**COM LIT 101W. An Introduction to Translation Studies. 4 Units.**

Focuses on theories of translation and on how these theories help students understand the role of translation in the world. Students develop a critical vocabulary for discussing translation in multiple linguistic traditions and complete a final translation project.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**COM LIT 102. Comparative Studies in Literature and Theory. 4 Units.**

In-depth discussion of special topics.

Repeatability: Unlimited as topics vary.

**COM LIT 102W. Comparative Studies in Literature and Theory. 4 Units.**

In-depth discussion of special topics.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

(Ib)

**COM LIT 105. Topics in Comparative Multiculturalism. 4 Units.**

Treats the literatures and cultures of one or more minority groups in California and the United States, including African Americans, Asian Americans, Chicano/Latinos, and Native Americans, and their relations to other national literatures.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Repeatability: May be repeated for credit unlimited times.

**COM LIT 107. Colonialisms and Postcolonialisms. 4 Units.**

Explores topics such as colonialism and race, decolonization, pre- and postcoloniality, globalization, and the cultural dynamics of colonization and subjectivity.

Repeatability: Unlimited as topics vary.

**COM LIT 108. Diasporic Literatures and Cultures. 4 Units.**

Literatures, cultures, and histories of diasporic groups, e.g., literature of the Persian diaspora; cinema of the African diaspora.

Repeatability: Unlimited as topics vary.

**COM LIT 120. Philosophy, Culture, and Literature. 4 Units.**

Discusses contemporary and historical philosophical questions and figures--for example, existentialism or debates about artificial intelligence--in interaction with culture and literature.

Repeatability: Unlimited as topics vary.

**COM LIT 121. Narrative, Pattern, and Text. 4 Units.**

Explores textual patterns, structures, and effects. May include topics such as novel, hypertext, genre, reader responses, intertextuality.

Repeatability: Unlimited as topics vary.

**COM LIT 122. Rhetorical Approaches to Literature. 4 Units.**

Studies the art and politics of rhetoric and persuasion in connection with cultural works from various times and places, for example, classical political speeches, Internet journalism.

Repeatability: Unlimited as topics vary.

**COM LIT 123. Literatures in Dialogue. 4 Units.**

Studies how texts interact across time and space in a global context. Uses concepts of influence, imitation, and parody, to ask, for example, how the Homeric epics can help us understand Caribbean novels and U.S. movies such as *Troy*.

Repeatability: Unlimited as topics vary.

**COM LIT 130. Gender, Sexuality, Race, Class. 4 Units.**

Discusses the roles of differences such as race, class, gender, and sexuality in society, culture, and literature across the globe, covering topics such as theoretical and literary representations of queer sexuality, gender performance, critical race theory.

Repeatability: Unlimited as topics vary.

**COM LIT 131. Psychoanalysis and Culture. 4 Units.**

Discusses major psychoanalytic writings of Freud and others in connection with questions of culture.

Repeatability: Unlimited as topics vary.

**COM LIT 132. Discourse, Ideologies, and Politics. 4 Units.**

Compares ideologies and systems, e.g., nationalism and fundamentalism, as they affect literature and culture in a global context.

Repeatability: Unlimited as topics vary.

**COM LIT 140. Critical Cultural Studies. 4 Units.**

Introduces a variety of ways of understanding cultural phenomena in relation to different power structures. These cultural phenomena may include comics, film, literature, sports, music, festivals, telling stories, or eating out.

Repeatability: Unlimited as topics vary.

**COM LIT 141. Topics in Popular Culture . 4 Units.**

Critical analyses of popular culture such as comics, oral narratives, films, TV, and music in an international framework.

Repeatability: Unlimited as topics vary.

**COM LIT 142. The Metropolis and Other Cultural Geographies. 4 Units.**

Examines the relationship between space and culture; cultural production in the city, suburb, and/or countryside; spaces in texts and artifacts (film, literature, comics, photographs) in a global context.

Repeatability: Unlimited as topics vary.

**COM LIT 143. Literature, Arts, and Media. 4 Units.**

Explores literature and other arts and media in a global context. May include film and electronic media, fine arts, oral cultures, architecture, in an international framework.

Repeatability: Unlimited as topics vary.

**COM LIT 144. Literature, History, and Society. 4 Units.**

Explores the relationship between literary texts and their historical and social contexts in an international framework. Courses may address, for example, literary and cultural expressions in social revolutions or the way literary texts talk back to medicine, religion, and anthropology.

Repeatability: Unlimited as topics vary.

**COM LIT 150. Literature in Translation. 4 Units.**

The study of literary works in one or more genres in English translation. May be a comparative study of works from several different original languages or a concentration on works from a single cultural/linguistic tradition.

Repeatability: Unlimited as topics vary.

**COM LIT 160. World Cinema . 4 Units.**

Comparative analysis of contemporary film in languages other than English.

Repeatability: May be taken for credit 2 times as topics vary.

**COM LIT 190W. Advanced Seminar in Comparative Literature and Theory. 4 Units.**

Capstone seminar for the Comparative Literature major. Deepens understanding of the field through investigation of a special topic and a substantial research and writing project.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: School of Humanities students only.

(Ib)

**COM LIT 199. Independent Study in Comparative Literature. 1-4 Units.**

To be taken only when the materials to be studied lie outside the normal run of departmental offerings.

Repeatability: May be repeated for credit unlimited times.

**COM LIT 200A. History of Comparative Literature and Introduction to Methods and Theories of CL. 4 Units.**

Seminar designed to introduce graduate students in Comparative Literature to the discipline of Comparative Literature. Issues and theories of comparative literary and cultural study are covered. Strongly recommended for first and second year students before the M.A. exam and review.

Restriction: Graduate students only.

**COM LIT 200B. Theories of Translation. 4 Units.**

The reproduction, translation, and transfer of literary and cultural, ideological and political, and symbolic codes and texts have long been the object of study in Comparative Literature. Addresses the diverse ways in which expressive systems interact and intersect.

Repeatability: Unlimited as topics vary.

**COM LIT 200C. Theories of Globalization, Inter-Nationalism, and Postcolonialism. 4 Units.**

Addresses both theories and the complex history of literary and cultural expression in a national, trans-, inter-, and post-national, global frame. Topics may include: globalism and nationhood, theories of citizenship and political subjecthood, postcolonial literature and theory.

Repeatability: Unlimited as topics vary.

**COM LIT 210. Comparative Studies . 4 Units.**

Studies in selected areas of Comparative Literature. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**COM LIT 220. Translation Workshop. 2-4 Units.**

Trains students in the methodologies and practice of translation. Students focus on the translating process in a series of case studies and individual projects.

Repeatability: May be taken for credit for 8 units.

**COM LIT 280A. Professionalization Seminar. 2 Units.**

The first of two required professionalization seminars in Comparative Literature. Intended for second and third year students and covers preparation for the M.A. and Ph.D. exams, conference presentations, teaching and classroom management, and publishing journals.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**COM LIT 280B. Professionalization Seminar. 2 Units.**

The second of two required professionalization seminars in Comparative Literature. Intended for fourth and fifth year students and covers course design, applying for grants, dissertation prospectus and support, and the job application process.

Prerequisite: COM LIT 280A. COM LIT 280A with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**COM LIT 290. Reading and Conference. 4-12 Units.**

Studies in selected areas. Topics addressed vary each quarter.

Repeatability: May be repeated for credit unlimited times.

**COM LIT 291. Guided Reading Course. 4 Units.**

Studies in selected areas. Topics addressed vary each quarter.

Repeatability: May be repeated for credit unlimited times.

**COM LIT 292. Teaching Practicum . 2 Units.**

Graduate students develop their pedagogical practices by accompanying a professor teaching a UCI undergraduate class. Meets individually with the professor to discuss relevant pedagogical practices, syllabus design, lecturing, assessment, classroom management, etc. Actively participates in one teaching component.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**COM LIT 299. Dissertation Research. 4-12 Units.**

A units-only course for students in the dissertation phase.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**COM LIT 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Computer Science (COMPSCI)

### Courses

**COMPSCI 103. Advanced Programming and Problem Solving with C++. 4 Units.**

Advanced programming language concepts for more complex, higher performance software design. Builds depth of programming skills in C++ as a foundation for upper-division courses and projects. Focuses on strengthening programming, debugging, and problem solving skills.

Prerequisite: I&C SCI 45C

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 111. Digital Image Processing. 4 Units.**

Introduction to the fundamental concepts of digital signal and image processing as applicable in areas such as multimedia, graphics, AI, data mining, databases, vision, or video games. Topics include image representation, space- and frequency-domain transformations, filters, segmentation, and compression.

Prerequisite: (I&C SCI 46 or CSE 46) and I&C SCI 6D and (MATH 3A or I&C SCI 6N). I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better. I&C SCI 6D with a grade of C or better. MATH 3A with a grade of C or better. I&C SCI 6N with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 112. Computer Graphics. 4 Units.**

Introduction to the fundamental principles of 3D computer graphics including polygonal modeling, geometric transformations, visibility algorithms, illumination models, texturing, and rasterization. Use of an independently-learned 3D graphics API to implement these techniques.

Prerequisite: (I&C SCI 45C or CSE 45C) and (MATH 3A or I&C SCI 6N). I&C SCI 45C with a grade of C or better. CSE 45C with a grade of C or better. MATH 3A with a grade of C or better. I&C SCI 6N with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 113. Computer Game Development. 4 Units.**

Introduction to the principles of interactive 2D and 3D computer game development. Concepts in computer graphics, algorithms, software engineering, art and graphics, music and sound, story analysis, and artificial intelligence are presented and are the basis for student work.

Prerequisite: COMPSCI 112 or COMPSCI 171 or IN4MATX 121 or ART 106B or I&C SCI 163 or I&C SCI 166

Same as IN4MATX 125.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 114. Projects in Advanced 3D Computer Graphics. 4 Units.**

Projects in advanced 3D graphics such as illumination, geometric modeling, visualization, and animation. Topics include physically based and global illumination, solid modeling, curved surfaces, multiresolution modeling, image-based rendering, basic concepts of animation, and scientific visualization.

Prerequisite: COMPSCI 112 and (I&C SCI 45C or CSE 45C). I&C SCI 45C with a grade of C or better. CSE 45C with a grade of C or better.

Recommended: COMPSCI 161 or CSE 161 or COMPSCI 164 or COMPSCI 165.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 115. Computer Simulation. 4 Units.**

Discrete event-driven simulation; continuous system simulation; basic probability as pertaining to input distributions and output analysis; stochastic and deterministic simulation; static and dynamic system simulation.

Prerequisite: I&C SCI 6B and (I&C SCI 6N or MATH 3A) and (STATS 67 or STATS 7) and STATS 120A and I&C SCI 51 and IN4MATX 43. I&C SCI 6B with a grade of C or better. I&C SCI 6N with a grade of C or better. MATH 3A with a grade of C or better. STATS 67 with a grade of C or better. STATS 7 with a grade of C or better. STATS 120A with a grade of C or better. I&C SCI 51 with a grade of C or better. IN4MATX 43 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 116. Computational Photography and Vision. 4 Units.**

Introduces the problems of computer vision through the application of computational photography. Specific topics include photo-editing (image warping, compositing, hole filling), panoramic image stitching, and face detection for digital photographs.

Prerequisite: I&C SCI 6D and (MATH 6G or MATH 3A or I&C SCI 6N) and MATH 2B and (I&C SCI 46 or CSE 46). I&C SCI 6D with a grade of C or better. MATH 6G with a grade of C or better. MATH 3A with a grade of C or better. I&C SCI 6N with a grade of C or better. MATH 2B with a grade of C or better. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 117. Project in Computer Vision. 4 Units.**

Students undertake construction of a computer vision system. Topics include automatically building 3D models from photographs, searching photo collections, robot navigation, and human motion tracking.

Prerequisite: I&C SCI 6D and (MATH 3A or I&C SCI 6N) and MATH 2B and (I&C SCI 46 or CSE 46) and (COMPSCI 112 or COMPSCI 116 or COMPSCI 171 or COMPSCI 178). I&C SCI 6D with a grade of C or better. MATH 3A with a grade of C or better. I&C SCI 6N with a grade of C or better. MATH 2B with a grade of C or better. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 121. Information Retrieval. 4 Units.**

An introduction to information retrieval including indexing, retrieval, classifying, and clustering text and multimedia documents.

Prerequisite: (I&C SCI 45C or I&C SCI 45J) and (STATS 7 or STATS 67). I&C SCI 45C with a grade of C or better. I&C SCI 45J with a grade of C or better

Same as IN4MATX 141.

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**COMPSCI 122A. Introduction to Data Management. 4 Units.**

Introduction to the design of databases and the use of database management systems (DBMS) for applications. Topics include entity-relationship modeling for design, relational data model, relational algebra, relational design theory, and Structured Query Language (SQL) programming.

Prerequisite: I&C SCI 33 or CSE 43 or EECS 114. I&C SCI 33 with a grade of C or better. CSE 43 with a grade of C or better

Same as EECS 116.

Restriction: Computer Science Engineering Majors have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment.

**COMPSCI 122B. Project in Databases and Web Applications. 4 Units.**

Introduces students to advanced database technologies and Web applications. Topics include database connectivity (ODBC/JDBC), extending databases using stored procedures, database administration, Web servers, Web programming languages (Java servlets, XML, Ajax, and mobile platforms).

Prerequisite: (COMPSCI 122A or EECS 116) and I&C SCI 45J

Overlaps with COMPSCI 137, IN4MATX 124.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 122C. Principles of Data Management. 4 Units.**

Covers fundamental principles underlying data management systems. Content includes key techniques including storage management, buffer management, record-oriented file system, access methods, query optimization, and query processing.

Prerequisite: COMPSCI 122A and (I&C SCI 53 or COMPSCI 143A)

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 222.

**COMPSCI 122D. Beyond SQL Data Management. 4 Units.**

Survey of modern data management and analysis technologies beyond relational (SQL) database management. Topics include semistructured data, NoSQL databases, big data analysis, and text search/query engines. Additional topics vary and may include data frames, streaming data, and/or time-series data.

Prerequisite: I&C SCI 46 and I&C SCI 51 and (COMPSCI 122A or EECS 116)

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**COMPSCI 125. Next Generation Search Systems. 4 Units.**

Discusses concepts and techniques related to all aspects of search systems. After considering basic search technology and the state-of-art systems, rapidly developing techniques for multimedia search, local search, event-search, and video-on-demand are explored.

Prerequisite: I&C SCI 31 or CSE 41 or I&C SCI 32A

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 225.

**COMPSCI 131. Parallel and Distributed Computing. 4 Units.**

Parallel and distributed computer systems. Parallel programming models. Common parallel and distributed programming issues. Specific topics include parallel programming, performance models, coordination and synchronization, consistency and replication, transactions, fault tolerance.

Prerequisite: (I&C SCI 53 and I&C SCI 53L) or COMPSCI 143A

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 132. Computer Networks. 4 Units.**

Computer network architectures, protocols, and applications. Internet congestion control, addressing, and routing. Local area networks. Multimedia networking.

Prerequisite: EECS 55 or STATS 67

Same as EECS 148.

Restriction: Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 133. Advanced Computer Networks. 4 Units.**

Fundamental principles in computer networks are applied to obtain practical experience and skills necessary for designing and implementing computer networks, protocols, and network applications. Various network design techniques, simulation techniques, and UNIX network programming are covered.

Prerequisite: COMPSCI 132 or EECS 148

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 134. Computer and Network Security. 4 Units.**

Overview of modern computer and networks security, attacks, and countermeasures. Authentication, identification, data secrecy, data integrity, authorization, access control, computer viruses, network security. Also covers secure e-commerce and applications of public key methods, digital certificates, and credentials.

Prerequisite: I&C SCI 6D and (I&C SCI 33 or CSE 43) and (COMPSCI 122A or EECS 116 or COMPSCI 132 or COMPSCI 143A)

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 137. Internet Applications Engineering. 4 Units.**

Concepts in Internet applications engineering with emphasis on the Web. Peer-to-Peer and Interoperability. Topics include HTTP and REST, Remote Procedure/Method Calls, Web Services, data representations, content distribution networks, identity management, relevant W3C/IETF standards, and relevant new large-scale computing styles.

Prerequisite: (COMPSCI 132 or EECS 148) and I&C SCI 45J

Same as IN4MATX 124.

Overlaps with COMPSCI 122B.

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 141. Concepts in Programming Languages I. 4 Units.**

In-depth study of several contemporary programming languages stressing variety in data structures, operations, notation, and control. Examination of different programming paradigms, such as logic programming, functional programming and object-oriented programming; implementation strategies, programming environments, and programming style.

Prerequisite: (I&C SCI 51 or CSE 31 or EECS 31) and (I&C SCI 46 or CSE 46). I&C SCI 51 with a grade of C or better. CSE 31 with a grade of C or better. EECS 31 with a grade of C or better. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better

Same as IN4MATX 101.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 142A. Compilers and Interpreters. 4 Units.**

Introduction to the theory of programming language processors covering lexical analysis, syntax analysis, semantic analysis, intermediate representations, code generation, optimization, interpretation, and run-time support.

Prerequisite: CSE 141 or COMPSCI 141 or IN4MATX 101

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.



**COMPSCI 142B. Language Processor Construction. 4 Units.**

Project course which provides working laboratory experience in construction and behavior of compilers and interpreters. Students build actual language processors and perform experiments which reveal their behaviors.

Prerequisite: COMPSCI 142A or CSE 142

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 143A. Principles of Operating Systems. 4 Units.**

Principles and concepts of process and resource management, especially as seen in operating systems. Processes, memory management, protection, scheduling, file systems, and I/O systems are covered. Concepts illustrated in the context of several well-known systems.

Prerequisite: (I&C SCI 46 or CSE 46) and (I&C SCI 51 or EECS 31 or CSE 31)

Overlaps with EECS 111.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 143B. Project in Operating System Organization. 4 Units.**

Detailed specification and design of critical components of an actual operating system including a memory manager, a process server, and a file/IO subsystem. Hardware/software tradeoffs. Emphasis on logical organization of system and communication.

Prerequisite: COMPSCI 143A

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 145. Embedded Software. 4 Units.**

Principles of embedded computing systems: embedded systems architecture, hardware/software components, system software and interfacing, real-time operating systems, hardware/software co-development, and communication issues. Examples of embedded computing in real-world application domains. Simple programming using an embedded systems development environment.

Corequisite: COMPSCI 145L

Prerequisite: (CSE 46 or I&C SCI 46) and (I&C SCI 51 or EECS 31 or CSE 31)

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 145L. Embedded Software Laboratory. 2 Units.**

Laboratory section to accompany COMPSCI 145.

Corequisite: COMPSCI 145

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 146. Programming in Multitasking Operating Systems. 4 Units.**

User- and systems-level programming of modern Internet-connected, multi-user, multitasking operating systems. Shells, scripting, filters, pipelines, programmability, extensibility, concurrency, inter-process communication. Concrete examples of a modern operating system (such as, but not necessarily, Unix programmed in C) are used.

Prerequisite: (I&C SCI 46 or CSE 46) and I&C SCI 51. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better. I&C SCI 51 with a grade of C or better. Recommended: COMPSCI 143A.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 147. Internet of Things (IoT) Software and Systems. 4 Units.**

Introduction to the Internet of Things (IoT) from a systems and software perspective. IoT ecosystem including sensors, embedded CPUs, networking protocols, software, cloud services, and security and privacy requirements. IoT use cases, system design, and programming project.

Prerequisite: I&C SCI 33 or CSE 43

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.



**COMPSCI 151. Digital Logic Design. 4 Units.**

Boolean algebra. Design/analysis of combinational and sequential systems using SSI/MSI/LSI modules. Number systems. Error detecting and correction codes. Arithmetic algorithms. Hardware/ firmware implementation of algorithms.

Prerequisite: (I&C SCI 33 or CSE 43) and I&C SCI 51 and I&C SCI 6B and I&C SCI 6D. I&C SCI 33 with a grade of C or better. CSE 43 with a grade of C or better. I&C SCI 51 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 152. Computer Systems Architecture. 4 Units.**

Design of computer elements; ALU, control unit, and arithmetic circuits. Memory hierarchy and organization. Caches. Function unit sharing and pipelining. I/O and interrupt processing. RTL and behavioral modeling using hardware description languages. Microprocessor organization and implementation techniques.

Prerequisite: COMPSCI 151

Overlaps with I&C SCI 160, EECS 112.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 153. Logic Design Laboratory. 4 Units.**

Introduction to standard integrated circuits. Construction and debugging techniques. Design of digital systems using LSI and MSI components. Practical use of circuits in a laboratory environment, including implementation of small digital systems such as arithmetic modules, displays, and timers.

Prerequisite: COMPSCI 151

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 154. Computer Design Laboratory. 4 Units.**

Underlying primitives of computer instruction sets. Principles of microprogramming. Microprogramming. Microprograms written for one or more systems. Typical microprogramming applications discussed and implemented or simulated.

Prerequisite or corequisite: COMPSCI 151

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 161. Design and Analysis of Algorithms. 4 Units.**

Techniques for efficient algorithm design, including divide-and-conquer and dynamic programming, and time/space analysis. Fast algorithms for problems applicable to networks, computer games, and scientific computing, such as sorting, shortest paths, minimum spanning trees, network flow, and pattern matching.

Prerequisite: (I&C SCI 46 or CSE 46) and I&C SCI 6B and I&C SCI 6D and MATH 2B. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Software Engineering Majors have first consideration for enrollment. Data Science Majors have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment. Computer Science Majors have first consideration for enrollment. Business Information Management, Computer Game Science, and Informatics majors have second right of consideration.

**COMPSCI 162. Formal Languages and Automata. 4 Units.**

Formal aspects of describing and recognizing languages by grammars and automata. Parsing regular and context-free languages. Ambiguity, nondeterminism. Elements of computability; Turing machines, random access machines, undecidable problems, NP-completeness.

Prerequisite: (I&C SCI 46 or CSE 46) and MATH 2B and I&C SCI 6B and I&C SCI 6D. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better

Same as LSCI 102.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment. Language Science Majors have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 163. Graph Algorithms. 4 Units.**

Algorithms for solving fundamental problems in graph theory. Graph representations, graph traversal, network flow, connectivity, graph layout, matching problems.

Prerequisite: COMPSCI 161 or CSE 161

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 265.

**COMPSCI 164. Computational Geometry and Geometric Modeling. 4 Units.**

Algorithms and data structures for computational geometry and geometric modeling, with applications to game and graphics programming. Topics: convex hulls, Voronoi diagrams, algorithms for triangulation, motion planning, and data structures for geometric searching and modeling of 2D and 3D objects.

Prerequisite: I&C SCI 46 or CSE 46. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 165. Project In Algorithms And Data Structures. 4 Units.**

Design, implementation, execution, and analysis of algorithms for problems such as sorting, searching, data compression, and data encryption. Time-space-structure trade-offs.

Prerequisite: COMPSCI 161 or CSE 161. Recommended: I&C SCI 45C OR CSE 45C.

**COMPSCI 166. Quantum Computation and Information. 4 Units.**

Basic models for quantum computation and their foundations in quantum mechanics. Quantum complexity classes and quantum algorithms, including algorithms for factoring and quantum simulation. Introduction to quantum information theory and quantum entanglement.

Prerequisite: (I&C SCI 6N or MATH 3A) and COMPSCI 161

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 167. Introduction to Applied Cryptography. 4 Units.**

An introduction to the essential aspects of applied cryptography, as it is used in practice. Topics include classical cryptography, block ciphers, stream ciphers, public-key cryptography, digital signatures, one-way hash functions, basic cryptographic protocols, and digital certificates and credentials.

Prerequisite: COMPSCI 161 or CSE 161

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 169. Introduction to Optimization. 4 Units.**

A broad introduction to optimization. Unconstrained and constrained optimization. Equality and inequality constraints. Linear and integer programming. Stochastic dynamic programming.

Prerequisite: (I&C SCI 6N or MATH 3A) and (STATS 67 or (STATS 7 and STATS 120A))

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 268.

**COMPSCI 171. Introduction to Artificial Intelligence. 4 Units.**

Different means of representing knowledge and uses of representations in heuristic problem solving. Representations considered include predicate logic, semantic nets, procedural representations, natural language grammars, and search trees.

Prerequisite or corequisite: ((STATS 7 and STATS 120A) or STATS 67) ( and (I&C SCI 46 or CSE 46) and MATH 2B)

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 172B. Neural Networks and Deep Learning . 4 Units.**

Neural network and deep learning from multiple perspectives. Theory of parallel distributed processing systems, algorithmic approaches for learning from data in various manners, applications to difficult problems in AI from computer vision, to natural language understanding, to bioinformatics and chemoinformatics.

Prerequisite: (STATS 120A and STATS 120B) or MATH 121A or COMPSCI 178 or COMPSCI 273A

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 274C.

**COMPSCI 172C. Artificial Intelligence Frontiers: Technical, Ethical, and Societal. 4 Units.**

Explores the frontiers of artificial intelligence and related technologies with a focus on the underlying ethical, legal, and societal challenges and opportunities they create. Encourages critical thinking about these issues.

Prerequisite: COMPSCI 171 and COMPSCI 172B. Recommended: COMPSCI 178

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 274D.

**COMPSCI 175. Project in Artificial Intelligence. 4 Units.**

Construction of a working artificial intelligence system. Evaluation of capabilities of the system including impact of knowledge representation.

Prerequisite: COMPSCI 171 and COMPSCI 178

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 177. Applications of Probability in Computer Science. 4 Units.**

Application of probability to real-world problems in computer science. Typical topics include analysis of algorithms and graphs, probabilistic language models, network traffic modeling, data compression, and reliability modeling.

Prerequisite: MATH 2B and STATS 67 and I&C SCI 6B and I&C SCI 6D and (MATH 3A or I&C SCI 6N)

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 178. Machine Learning and Data-Mining. 4 Units.**

Introduction to principles of machine learning and data-mining applied to real-world datasets. Typical applications include spam filtering, object recognition, and credit scoring.

Prerequisite: I&C SCI 6B and I&C SCI 6D and (I&C SCI 6N or MATH 3A) and MATH 2B and (STATS 67 or (STATS 7 and STATS 120A))

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 179. Algorithms for Probabilistic and Deterministic Graphical Models. 4 Units.**

Graphical model techniques dealing with probabilistic and deterministic knowledge representations. Focuses on graphical models such as constraint networks, Bayesian networks, and Markov networks that have become a central paradigm for knowledge representation and reasoning in AI and general computer science.

Prerequisite: COMPSCI 171

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 183. Introduction to Computational Biology. 4 Units.**

The use of theories and methods based on computer science, mathematics, and physics in molecular biology and biochemistry. Basics in biomolecular modeling. Analysis of sequence and structural data of biomolecules. Analysis of biomolecular functions.

Prerequisite: MATH 2D or MATH 3A or STATS 7 or STATS 8

Same as BME 132, BIO SCI M123.

Concurrent with MOL BIO 223 and BME 232.

**COMPSCI 184A. Artificial Intelligence in Biology and Medicine. 4 Units.**

Introduction to computational methods in molecular biology, aimed at those interested in learning about this interdisciplinary area. Covers computational approaches to understanding and predicting the structure, function, interactions, and evolution of DNA, RNA, proteins, and related molecules and processes.

Prerequisite: I&C SCI 6N or MATH 3A

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 284A.

**COMPSCI 184C. Computational Systems Biology. 4 Units.**

Computational inference and modeling of gene regulation networks, signal transduction pathways, and the effects of regulatory networks in cellular processes, development, and disease. Introduction of required mathematical, computational, and data handling tools.

Prerequisite: COMPSCI 184A

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 284C.

**COMPSCI 190. Special Topics in Information and Computer Science. 4 Units.**

Studies in selected areas of Information and Computer Science. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**COMPSCI H198. Honors Research. 4 Units.**

Directed independent research in computer science for honors students.

Repeatability: May be repeated for credit unlimited times.

Restriction: Campuswide Honors Collegium students only. Bren School of ICS Honors students only. Upper-division students only.

**COMPSCI 199. Individual Study. 2-5 Units.**

Individual research or investigation with Computer Science faculty.

Repeatability: May be repeated for credit unlimited times.

**COMPSCI 200S. Seminar in Computer Science Research. 1 Unit.**

Graduate colloquium series. Includes weekly talks by notable computer scientists.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**COMPSCI 201. Foundations of Cryptographic Protocols. 4 Units.**

Explores fundamental cryptographic tools, including encryption, signatures, and identification schemes. Students are introduced to the provable security paradigm of modern cryptography, focusing on understanding of security properties provided by cryptographic tools, and on proving security (or insecurity) of cryptographic constructions.

Prerequisite: COMPSCI 260 or COMPSCI 263

**COMPSCI 201P. Introduction to Computer Security. 4 Units.**

Introduction to computer security, including systems, technology, and management. Topics include authorization, authentication, data integrity, malware, operating systems security, network security, web security, and basic cryptography.

Prerequisite: Knowledge of Python or C++ programming is required.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 202. Applied Cryptography. 4 Units.**

Design and analysis of algorithms for applied cryptography. Topics include symmetric and asymmetric key encryption, digital signatures, one-way hash functions, digital certificates and credentials, and techniques for authorization, non-repudiation, authentication, identification, data integrity, proofs of knowledge, and access control.

Prerequisite: COMPSCI 260 and COMPSCI 263

**COMPSCI 202P. Applied Cryptography . 4 Units.**

Design and analysis of algorithms for applied cryptography. Topics include symmetric and asymmetric key encryption, digital signatures, one-way hash functions, digital certificates and credentials, and techniques for authorization, non-repudiation, authentication, identification, data integrity, proofs of knowledge, and access control.

Restriction: Graduate students only.

**COMPSCI 203. Network and Distributed Systems Security. 4 Units.**

Modern computer and networks security: attacks and countermeasures, authentication, identification, data secrecy, data integrity, authorization, access control, computer viruses, network security. Group communication and multicast security techniques. Covers secure e-commerce and applications of public key methods, digital certificates, and credentials.

Prerequisite: EECS 148 or COMPSCI 132

Same as NET SYS 240.

**COMPSCI 203P. Network Security. 4 Units.**

Introduction to network security, including network threats and attacks, as well as defenses against such attacks. Topics include network infrastructure security, mobile and Wi-Fi security, spam, phishing, firewalls, anonymity, secure email, secure and private cloud computing, and web security.

Prerequisite: COMPSCI 201P or COMPSCI 202P

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 204. Usable Security and Privacy. 4 Units.**

Introduces usability problems in security and privacy methods, tools, and software. Overviews prominent examples of both failures and successes in usable security and privacy. Surveys state-of-the-art techniques and evaluation methodologies.

Same as IN4MATX 237.

Overlaps with IN4MATX 231, COMPSCI 203.

Restriction: Informatics Majors have first consideration for enrollment. Computer Science Majors have first consideration for enrollment. Undergraduate degree in CompSci or Informatics is strongly recommended.

**COMPSCI 205. Computer and Systems Security . 4 Units.**

Lecture and discuss latest security research in software, OS, protocols, mobile devices, machine learning, sensors, and emerging IoT/CPS systems such as smart home and smart transportation. Students perform research projects and gain hands-on experience evaluating and designing secure systems.

Prerequisite: COMPSCI 134 and COMPSCI 142A and COMPSCI 143A

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Graduate students only.

**COMPSCI 206. Principles of Scientific Computing. 4 Units.**

Overview of widely used principles and methods of numerical and scientific computing, including basic concepts and computational methods in linear algebra, optimization, and probability.

Prerequisite: Basic courses in multivariate calculus, linear algebra, and probability.

Overlaps with STATS 230.

**COMPSCI 206P. Principles of Scientific Computing. 4 Units.**

Overview of widely used principles and methods of numerical and scientific computing, including basic concepts and computational methods in floating-point, linear algebra, optimization, simulation, modeling, and probability/statistics as it relates to model evaluation.

Prerequisite: Basic knowledge of multivariate calculus, linear algebra, and familiarity with MATLAB.

Restriction: Graduate students only.

**COMPSCI 210P. Computer Graphics and Visualization . 4 Units.**

Interactive 3D graphics rendering pipeline, illumination and shading, ray tracing, texture-, bump-, mip-mapping, hidden surface removal, anti-aliasing, multiresolution representations, volume rendering techniques, iso-surface extraction.

Prerequisite: Familiarity with linear algebra is required.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 211A. Visual Computing. 4 Units.**

Fundamentals of image processing (convolution, linear filters, spectral analysis), vision geometry (projective geometry, camera models and calibration, stereo reconstruction), radiometry (color, shading, illumination, BRDF), and visual content synthesis (graphics pipeline, texture- bump-, mip-mapping, hidden surface removal, anti-aliasing).

**COMPSCI 211B. Computer Graphics and Visualization. 4 Units.**

Interactive 3D graphics rendering pipeline, illumination and shading, ray tracing, texture-, bump-, mip-mapping, hidden surface removal, anti-aliasing, multiresolution representations, volume rendering techniques, iso-surface extraction.

Prerequisite: COMPSCI 211A

**COMPSCI 211P. Visual Computing . 4 Units.**

Develops a comprehensive understanding of fundamentals of image processing (convolution, linear filters, spectral analysis), vision geometry (projective geometry, camera models and calibration, stereo reconstruction), radiometry (color, shading, illumination, BRDF), visual content synthesis (graphics pipeline, texture- bump-, mip-mapping, hidden surface, anti-aliasing).

Prerequisite: Undergraduate-level familiarity with Linear algebra (matrices and operations), eigenvalue, eigenvectors, linear regression; basic of algorithms; programming in C/C++

Restriction: Graduate students only.

**COMPSCI 212. Multimedia Systems and Applications. 4 Units.**

Organization and structure of modern multimedia systems; audio and video encoding/compression; quality of service concepts; scheduling algorithms for multimedia; resource management in distributed and multimedia systems; multimedia protocols over high-speed networks; synchronization schemes; multimedia applications; and teleservices.

Prerequisite: COMPSCI 143A and COMPSCI 161. B.S. degree in Computer Science is also accepted. Recommended: COMPSCI 131 and COMPSCI 132 and COMPSCI 133.

**COMPSCI 213. Introduction to Visual Perception. 4 Units.**

Introduction to the process of human visual perception. Offers the physiological and psychophysical approach to understand vision, introducing concepts of perception of color, depth, movement. Examples of quantification and application of these models in computer vision, computer graphics, multimedia, HCI.

Prerequisite: MATH 121A

**COMPSCI 216. Image Understanding. 4 Units.**

The goal of image understanding is to extract useful semantic information from image data. Course covers low-level image and video processing techniques, feature descriptors, segmentation, objection recognition, and tracking.

Prerequisite: I&C SCI 6D and (I&C SCI 6N or MATH 6G or MATH 3A) and MATH 2B and I&C SCI 46

**COMPSCI 217. Light and Geometry in Computer Vision. 4 Units.**

Examines the issues of light transport and multiview geometry in computer vision. Applications include camera calibration, 3D understanding, stereo reconstruction, and illumination estimation.

Prerequisite: I&C SCI 6D and (I&C SCI 6N or MATH 6G or MATH 3A) and MATH 2B and I&C SCI 46 and COMPSCI 211A

**COMPSCI 221. Information Retrieval, Filtering, and Classification. 4 Units.**

Algorithms for the storage, retrieval, filtering, and classification of textual and multimedia data. The vector space model, Boolean and probabilistic queries, and relevance feedback. Latent semantic indexing; collaborative filtering; and relationship to machine learning methods.

Prerequisite: COMPSCI 161 and COMPSCI 171 and (I&C SCI 6N or MATH 3A or MATH 6G)

Same as SWE 225.

Restriction: Graduate students only.

**COMPSCI 222. Principles of Data Management. 4 Units.**

Covers fundamental principles underlying data management systems. Content includes key techniques including storage management, buffer management, record-oriented file system, access methods, query optimization, and query processing.

Prerequisite: COMPSCI 122A and (I&C SCI 53 or COMPSCI 143A)

Concurrent with COMPSCI 122C.

**COMPSCI 222P. Principles of Data Management. 4 Units.**

Covers fundamental principles underlying data management systems. Understanding and implementation of key techniques including storage management, buffer management, record-oriented file system, access methods, query optimization, and query processing.

Prerequisite: C++ programming skills, understanding of Data Structures and Algorithms

Restriction: Graduate students only.

**COMPSCI 223. Transaction Processing and Distributed Data Management. 4 Units.**

Covers fundamental principles underlying transaction processing including database consistency, concurrency control, database recovery, and fault-tolerance. Includes transaction processing in centralized, distributed, parallel, and client-server environments.

Prerequisite: COMPSCI 222 and COMPSCI 131

**COMPSCI 225. Next Generation Search Systems. 4 Units.**

Discusses concepts and techniques related to all aspects of search systems. After considering basic search technology and the state-of-art systems, rapidly developing techniques for multimedia search, local search, event-search, and video-on-demand are explored.

Prerequisite: I&C SCI 21 or CSE 21 or IN4MATX 41 or I&C SCI 31 or CSE 41

Restriction: Upper-division students only. Graduate students only.

Concurrent with COMPSCI 125.

**COMPSCI 230. Distributed Computer Systems. 4 Units.**

Principles of distributed computing systems. Topics covered include message-passing, remote procedure calls, distributed shared memory synchronization, resource and process/thread management, distributed file systems, naming and security.

**COMPSCI 230P. Distributed Computer Systems . 4 Units.**

Principles of distributed computing systems. Topics covered include message-passing, remote procedure calls, distributed shared memory synchronization, resource and process/thread management, distributed file systems, naming and security.

Restriction: Graduate students only.

**COMPSCI 231P. Parallel and Distributed Computing for Professionals . 4 Units.**

Covers a wide variety of concepts related to the design and application of high-performance concurrent computing systems, including architectural features, communications networks and models, parallel program development for numerical and non-numerical applications, programming models, and more.

Restriction: Master of Computer Science Degree students only. Graduate students only.



**COMPSCI 232. Computer and Communication Networks. 4 Units.**

Network architecture of the Internet, telephone networks, cable networks, and cell phone networks. Network performance models. Network performance models. Advanced concepts and implementations of flow and congestion control, addressing, internetworking, forwarding, routing, multiple access, streaming, and quality-of-service.

Prerequisite: EECS 148 or COMPSCI 132

Same as EECS 248A, NET SYS 201.

Restriction: Graduate students only.

**COMPSCI 232P. Computer and Communication Networks . 4 Units.**

Internet architecture, protocols, and services. Advanced concepts of IP and TCP, including addressing, internetworking, forwarding, routing, and implementations of flow and congestion control. Internet services such as Network Address Translation and Domain Name Servers. Overview of Local Area Networks.

Restriction: Graduate students only.

**COMPSCI 233. Networking Laboratory. 4 Units.**

A laboratory-based introduction to basic networking concepts such as addressing, sub-netting, bridging, ARP, and routing. Network simulation and design. Structured around weekly readings and laboratory assignments.

Prerequisite: EECS 148 or COMPSCI 132

Same as NET SYS 202.

**COMPSCI 234. Advanced Networks. 4 Units.**

Design principles of networked systems, advanced routing and congestion control algorithms, network algorithms, network measurement, management, security, Internet economics, and emerging networks.

Prerequisite: NET SYS 201 or COMPSCI 232 or EECS 248A

Same as NET SYS 210.

**COMPSCI 236. Wireless and Mobile Networking. 4 Units.**

Introduction to wireless networking. The focus is on layers 2 and 3 of the OSI reference model, design, performance analysis, and protocols. Topics covered include: an introduction to wireless networking, digital cellular, next generation cellular, wireless LANs, and mobile IP.

Prerequisite: EECS 148 or COMPSCI 132

Same as NET SYS 230.

**COMPSCI 237. Middleware for Networked and Distributed Systems. 4 Units.**

Discusses concepts, techniques, and issues in developing distributed systems middleware that provides high performance and Quality of Service for emerging applications. Also covers existing standards (e.g., CORBA, DCOM, Jini, Espeak) and their relative advantages and shortcomings.

Prerequisite: An undergraduate-level course in operating systems and networks.

Same as NET SYS 260.

**COMPSCI 238. Advanced Operating Systems. 4 Units.**

Focuses on advanced and graduate-level topics in operating systems. Presents important recent developments in operating systems, topics not covered in undergraduate operating systems courses. This includes novel operating system designs and techniques to improve existing ones.

Prerequisite: COMPSCI 143A

**COMPSCI 238P. Operating Systems. 4 Units.**

In-depth organization of the core operating system abstraction and its implementation (virtual memory, kernel and user mode, system calls, threads, context switches, interrupts, inter-process communication, hardware interface, etc.) and a range of recent developments in de-facto industry standard operating systems.

Prerequisite: Working knowledge of C and the Linux environment.

Restriction: School of Info & Computer Sci students only. Master of Computer Science Degree students only. Graduate students only.



**COMPSCI 241. Advanced Compiler Construction. 4 Units.**

Advanced study of programming language implementation techniques: optimizations such as common sub-expression elimination, register allocation, and instruction scheduling. Implementation of language features such as type-directed dispatch, garbage collection, dynamic linking, and just-in-time code generation.

Prerequisite: COMPSCI 142A

**COMPSCI 242. Parallel Computing. 4 Units.**

Definition of parallel processing systems. Theory and application of arrays, trees, and hypercubes. Computational models, applications: sorting, integer arithmetic, matrix operations, Fast Fourier Transform, and others. Interconnection networks: a framework for the description, analysis, and construction of hypercube-derived networks.

**COMPSCI 242P. Compilers and Interpreters. 4 Units.**

Provides in-depth study of compilers and interpreters which are the primary forms of programming language processing in computing.

Prerequisite: Knowledge of C++ programming is required.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 243. High-Performance Architectures and Their Compilers. 4 Units.**

Emphasis on the development of automatic tools (i.e., compilers/environments) for the efficient exploitation of parallel machines, and the trade-offs between hardware and software in the design of supercomputing and high-performance machines.

**COMPSCI 244. Introduction to Embedded and Ubiquitous Systems. 4 Units.**

Embedded and ubiquitous system technologies including processors, DSP, memory, and software. System interfacing basics; communication strategies; sensors and actuators, mobile and wireless technology. Using pre-designed hardware and software components. Design case studies in wireless, multimedia, and/or networking domains.

Prerequisite: I&C SCI 51 and COMPSCI 152 and COMPSCI 161 and (I&C SCI 6N or MATH 3A or MATH 6G or I&C SCI 6D). B.S. degree in Computer Science is also accepted.

Same as IN4MATX 244.

**COMPSCI 244P. Introduction to the Internet of Things. 4 Units.**

Develops a comprehensive understanding of the hardware and software technology, the communication protocols, and the security and privacy requirements underlying the Internet of Things ecosystem, particularly those using computing elements (processors, DSPs/ ASIPs), sensors, and accessing cloud services.

Prerequisite: Undergraduate-level familiarity with fundamentals of integrated circuit blocks, processors, optimization/algorithm design, and some programming experience.

Restriction: Graduate students only.

**COMPSCI 245. Software for Embedded Systems. 4 Units.**

Embedded computing elements, device interfaces, time-critical IO handling. Embedded software design under size, performance, and reliability constraints. Software timing and functional validation. Programming methods and compilation for embeddable software. Embedded runtime systems. Case studies of real-time software systems.

Prerequisite: I&C SCI 51 and COMPSCI 152 and COMPSCI 161 and (I&C SCI 6N or MATH 3A or MATH 6G or I&C SCI 6D). B.S. degree in Computer Science is also accepted.

**COMPSCI 246. Dependability, Validation, and Testing of Embedded Systems. 4 Units.**

Embedded system building blocks, including IP cores. Dependability and Resilience. Co-simulation. Formal verification using model checking. Verification environments. Test challenges in core integration: compliance, feature, random, and collision testing. Core access and test integration. Interface-based verification and standards.

Prerequisite: B.S. degree in Computer Science or basic courses in algorithms and data structures, calculus, discrete math, linear algebra, symbolic logic.

**COMPSCI 247. Complex Software Systems: Project Course. 4 Units.**

Building complex systems software systems, such as Database Management Systems, Operating Systems, and Optimizing Compilers. Such systems often involve low-level programming and intricate performance optimizations. Students learn how to build such a system.

Prerequisite or corequisite: COMPSCI 222 or COMPSCI 238 or COMPSCI 241

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**COMPSCI 248A. Introduction to Ubiquitous Computing. 4 Units.**

The 'disappearing computer' paradigm. Differences to the desktop computing model: applications, interaction in augmented environments, security, alternate media, small operating systems, sensors, and embedded systems design. Evaluation by project work and class participation.

Same as IN4MATX 241.

**COMPSCI 250A. Computer Systems Architecture. 4 Units.**

Study of architectural issues and their relation to technology and software: design of processor, interconnections, and memory hierarchies.

Prerequisite: COMPSCI 152

**COMPSCI 250B. Modern Computer Systems. 4 Units.**

Fundamental concepts and recent advances in computer systems architecture necessary to achieve high performance and efficiency on systems available today. Topics span modern processor features, accelerators, storage and network architectures, as well as architecture-optimized software.

Prerequisite: Required: Undergraduate-level understanding of computer architecture concepts.

Overlaps with COMPSCI 243.

**COMPSCI 250P. Computer Systems Architecture . 4 Units.**

Study of architectural issues and their relation to technology and software: design of processor, interconnections, and memory hierarchies.

Prerequisite: Undergraduate-level familiarity with fundamentals of integrated circuit blocks, processors, and optimization/algorithm design, and some programming experience.

Restriction: Graduate students only.

**COMPSCI 252. Introduction to Computer Design. 4 Units.**

The methodology and use of CAD tools for computer design, accomplished by a lab in which students practice design using commercially available silicon compilers and other tools.

Prerequisite: COMPSCI 151 and COMPSCI 152

**COMPSCI 253. Analysis of Programming Languages. 4 Units.**

Concepts in modern programming languages, their interaction, and the relationship between programming languages and methods for large-scale, extensible software development. Empirical analysis of programming language usage.

Same as SWE 212.

**COMPSCI 253P. Advanced Programming and Problem Solving. 4 Units.**

Provides in-depth preparation for industry interviews requiring demonstration of problem solving and programming skills. Emphasis is on understanding problem statements, considering edge cases, developing effective test cases, designing correct solutions, explaining these clearly, and implementing a solution correctly.

Corequisite: COMPSCI 260P

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 259S. Seminar in Design Science. 2 Units.**

Current research and research trends in design science. Forum for presentation and criticism by students of research work in progress.

Repeatability: May be taken for credit 18 times.

**COMPSCI 260. Fundamentals of the Design and Analysis of Algorithms. 4 Units.**

Covers fundamental concepts in the design and analysis of algorithms and is geared toward non-specialists in theoretical computer science. Topics include: deterministic and randomized graph algorithms, fundamental algorithmic techniques like divide-and-conquer strategies and dynamic programming, and NP-completeness.

Prerequisite: COMPSCI 161

**COMPSCI 260P. Fundamentals of Algorithms with Applications. 4 Units.**

Covers fundamental concepts in the design and analysis of algorithms and is geared toward practical application and implementation. Topics include greedy algorithms, deterministic and randomized graph algorithms, models of network flow, fundamental algorithmic techniques, and NP-completeness.

Restriction: Graduate students only.

**COMPSCI 261. Data Structures. 4 Units.**

An in-depth treatment of data structures and their associated management algorithms including resource complexity analysis.

Prerequisite: I&C SCI 46 and COMPSCI 161

**COMPSCI 261P. Data Structures with Applications . 4 Units.**

Data structures and their associated management algorithms, including their applications and analysis.

Restriction: Graduate students only.

**COMPSCI 262. Computational Complexity. 4 Units.**

Advanced course in computational models and complexity classes. Covers the fundamentals of Turing Machines, Decidability, and NP-completeness. Includes discussion of more advanced topics including polynomial hierarchy, randomized complexity classes, #P-completeness and hardness of approximation.

Prerequisite: COMPSCI 162

**COMPSCI 262P. Text Processing and Pattern Matching. 4 Units.**

Techniques for pattern matching and parsing character strings. Topics include substring searching, finite state machines, regular expressions, and context-free grammars, as well as applications in lexical analyzers, compilers, word processors, malware detectors, and search engines.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 263. Analysis of Algorithms. 4 Units.**

Analysis of correctness and complexity of various efficient algorithms; discussion of problems for which no efficient solutions are known.

Prerequisite: COMPSCI 161 and COMPSCI 261

**COMPSCI 264. Quantum Computation and Information. 4 Units.**

Basic models for quantum computation and their foundations in quantum mechanics. Quantum complexity classes and quantum algorithms, including algorithms for factoring and quantum simulation. Introduction to quantum information theory and quantum entanglement.

Prerequisite: Basic courses in linear algebra and algorithms.

**COMPSCI 265. Graph Algorithms. 4 Units.**

Graph definitions, representation methods, graph problems, algorithms, approximation methods, and applications.

Prerequisite: COMPSCI 161 and COMPSCI 261

Concurrent with COMPSCI 163.

**COMPSCI 266. Computational Geometry. 4 Units.**

An overview of some of the basic problems in computational geometry and of some algorithmic and data-structuring techniques appropriate to their solution.

Prerequisite: COMPSCI 161 and COMPSCI 261

**COMPSCI 267P. Data Compression. 4 Units.**

An introduction to the theory and practice of modern data compression techniques. Topics include codes, coding, modeling, text compression, lossless and lossy image compression standards and systems, audio compression.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 268. Introduction to Optimization. 4 Units.**

A broad introduction to optimization. Unconstrained and constrained optimization. Equality and inequality constraints. Linear and integer programming. Stochastic dynamic programming.

Prerequisite: STATS 67 or (STATS 7 and STATS 120A) and (I&C SCI 6N or MATH 3A)

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

Concurrent with COMPSCI 169.

**COMPSCI 268P. Introduction to Optimization Modeling . 4 Units.**

A broad introduction to optimization methods and their applications. Unconstrained and constrained optimization. Direct, first, and second order methods. Use of optimization software libraries. Equality and inequality constraints, optimal conditions, and methods. Applications to modeling in computer science, engineering.

Restriction: Graduate students only.

**COMPSCI 269S. Seminar in the Theory of Algorithms and Data Structures. 2 Units.**

Current research and research trends in the Theory of algorithms and data structures.

Repeatability: May be taken for credit 18 times.

**COMPSCI 271. Introduction to Artificial Intelligence. 4 Units.**

The study of theories and computational models for systems which behave and act in an intelligent manner. Fundamental subdisciplines of artificial intelligence including knowledge representation, search, deduction, planning, probabilistic reasoning, natural language parsing and comprehension, knowledge-based systems, and learning.

**COMPSCI 271P. Introduction to Artificial Intelligence. 4 Units.**

The study of theories and computational models for systems which behave and act in an intelligent manner. Fundamental sub-disciplines of artificial intelligence, including knowledge representation, search, deduction, planning, probabilistic reasoning, natural language parsing and comprehension, knowledge-based systems, and learning.

Restriction: Graduate students only.

**COMPSCI 272. Statistical Natural Language Processing. 4 Units.**

Statistical models, machine learning algorithms, and computational tasks involved in natural language processing. Focuses on approaches that learn these models from data, and covers applications such as information extraction, dialog systems, machine translation, and question answering.

Prerequisite: COMPSCI 171 and COMPSCI 178

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Graduate students only.

**COMPSCI 273A. Machine Learning. 4 Units.**

Computational approaches to learning algorithms for classifications, regression, and clustering. Emphasis is on discriminative classification methods such as decision trees, rules, nearest neighbor, linear models, and naive Bayes.

Prerequisite: COMPSCI 271 and COMPSCI 206

**COMPSCI 273P. Machine Learning and Data Mining . 4 Units.**

Introduction to principles of machine learning and data-mining. Learning algorithms for classifications, regression, and clustering. Emphasis is on discriminative classification methods such as decision trees, rules, nearest neighbor, linear models, and naive Bayes.

Prerequisite: Python programming knowledge is required.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 274A. Probabilistic Learning: Theory and Algorithms. 4 Units.**

An introduction to probabilistic and statistical techniques for learning from data, including parameter estimation, density estimation, regression, classification, and mixture modeling.

Prerequisite: COMPSCI 206

**COMPSCI 274B. Learning in Graphical Models. 4 Units.**

Models for data analysis are presented in the unifying framework of graphical models. The emphasis is on learning from data but inference is also covered. Real world examples are used to illustrate the material.

Prerequisite: COMPSCI 274A

**COMPSCI 274C. Neural Networks and Deep Learning. 4 Units.**

Neural network and deep learning from multiple perspectives. Theory of parallel distributed processing systems, algorithmic approaches for learning from data in various manners, applications to difficult problems in AI from computer vision, to natural language understanding, to bioinformatics and chemoinformatics.

Prerequisite: (STATS 120A and STATS 120B) or MATH 121A or COMPSCI 178 or COMPSCI 273A

Overlaps with COMPSCI 274A, COMPSCI 277, COMPSCI 276, COMPSCI 278, COMPSCI 274B, COMPSCI 273A.

Concurrent with COMPSCI 172B.

**COMPSCI 274D. Artificial Intelligence Frontiers: Technical, Ethical, and Societal. 4 Units.**

Explores the frontiers of artificial intelligence and related technologies with a focus on the underlying ethical, legal, and societal challenges and opportunities they create. Encourages critical thinking about these issues.

Prerequisite: Recommended: COMPSCI 172B and COMPSCI 178.

Restriction: Graduate students only.

Concurrent with COMPSCI 172C.

**COMPSCI 274E. Deep Generative Models. 4 Units.**

Discusses probabilistic approaches to deep learning such as generative models and their applications in computer vision, NLP, the natural sciences, and other fields. Coursework may include both homework and project components.

Prerequisite: COMPSCI 178 or COMPSCI 273A or STATS 120B. Recommended: Advanced machine learning or graphical models courses such as COMPSCI 274A or COMPSCI 274B or CS 273C or COMPSCI 276.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Graduate students only.

**COMPSCI 274P. Neural Networks and Deep Learning. 4 Units.**

Introduction to principles of machine learning and neural networks. Architecture design. Feedforward and recurrent networks. Learning models and algorithms. Applications to data analysis and prediction problems in areas such as machine vision, natural language processing, biomed, and finance.

Prerequisite: COMPSCI 271P. COMPSCI 271P with a grade of B or better. Knowledge of Python programming is required.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 276. Reasoning in Probabilistic Graphical Models. 4 Units.**

Focuses on algorithms for probabilistic reasoning using graphical models such as Bayesian Networks and Markov Networks that encode knowledge as local probabilistic relations. Tasks include finding most likely scenarios over a subset of variables, or updating posterior probability, given observations.

Prerequisite: A basic course in probability.

**COMPSCI 278. Probability Models. 4 Units.**

Advanced probability, discrete time Markov chains, Poisson processes, continuous time Markov chains. Queuing or simulation as time permits.

Prerequisite: STATS 120A

Concurrent with STATS 121.

**COMPSCI 284A. Artificial Intelligence in Biology and Medicine. 4 Units.**

Introduction to computational methods in molecular biology, aimed at those interested in learning about this interdisciplinary area. Covers computational approaches to understanding and predicting the structure, function, interactions, and evolution of DNA, RNA, proteins, and related molecules and processes.

Prerequisite: A Basic course in algorithms or a basic course in molecular biology.

Concurrent with COMPSCI 184A.

**COMPSCI 284C. Computational Systems Biology. 4 Units.**

Computational inference and modeling of gene regulation networks, signal transduction pathways, and the effects of regulatory networks in cellular processes, development, and disease. Introduction of required mathematical, computational, and data handling tools.

Prerequisite: COMPSCI 284A or (BIO SCI 99 and MATH 2D)

Concurrent with COMPSCI 184C.

**COMPSCI 285. Mathematical and Computational Biology . 4 Units.**

Analytical and numerical methods for dynamical systems, temporal-spatial dynamics, steady state, stability, stochasticity. Application to life sciences: genetics, tissue growth and patterning, cancers, ion channels gating, signaling networks, morphogen gradients. Probabilistic methods.

Prerequisite: MATH 227A

Same as MATH 227C.

**COMPSCI 290. Research Seminar. 2 Units.**

Forum for presentation and criticism by students of research work in progress. Presentation of problem areas and related work. Specific goals and progress of research.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**COMPSCI 294P. Keystone Professional Writing and Communication for Computer Science Careers. 4 Units.**

Well-developed written and oral communication skills relevant to computer science professionals including oral presentations, short descriptive writing assignments, and one longer writing assignment related to a research replication project.

Restriction: Graduate students only.

**COMPSCI 295. Special Topics in Information and Computer Science . 4 Units.**

Studies in selected areas of Information and Computer Science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**COMPSCI 295P. Keystone Project for Computer Science. 4 Units.**

Design and development of a software system or a hardware component of a system based on knowledge of advanced computer science principles. Students implement at least a working prototype and test this using relevant input data.

Restriction: Graduate students only.

**COMPSCI 296. Elements of Scientific Writing. 4 Units.**

Introduces the concepts and principles of good scientific writing, demonstrates them by examples drawn from the literature, and uses a hands-on approach to apply them to documents being written by the participants.

Grading Option: Satisfactory/unsatisfactory only.

**COMPSCI 296P. Capstone Professional Writing and Communication for Computer Science Careers . 4 Units.**

Written and oral communication for computer science and IT careers. Production of the detailed design and development document for the concurrent capstone design class and refinement of written documents and oral communications skills needed for a successful job search.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 297P. Capstone Design Project for Computer Science . 4 Units.**

Design and development of app, software system, or hardware component of system based on students' prior knowledge of advanced computer science principles. Implement at least a working prototype and test this using relevant use cases and/or input data.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 298. Thesis Supervision. 2-12 Units.**

Individual research or investigation conducted in preparation for the M.S. thesis option or the dissertation requirements for the Ph.D. program.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Information and Computer Science majors only.

**COMPSCI 298P. Computer Science Practicum. 1-4 Units.**

Internship in which students work individually at an outside organization to gain experience with the challenges involved in technology-related work.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: School of Info & Computer Sci students only. Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 299. Individual Study. 1-12 Units.**

Individual research or investigation with Computer Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Information and Computer Science majors only.

**COMPSCI 299P. Individual Study. 4-8 Units.**

Supervised individual study in computer science.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 4 times.

Restriction: Master of Computer Science Degree students have first consideration for enrollment. Graduate students only.

## Computer Science and Engineering (CSE)

### Courses

**CSE 90. Systems Engineering and Technical Communications . 2 Units.**

Introduces systems engineering concepts, including specifications and requirements, hardware and software design, integration, testing, and documentation. Emphasizes organization and writing of reports and effective presentations.

Restriction: Computer Science Engineering Majors have first consideration for enrollment.

**CSE 112. Electronic Devices and Circuits. 4 Units.**

A first course in the design of Very Large Scale Integrated (VLSI) systems. Introduction to CMOS technology; MOS transistors and CMOS circuits. Analysis and synthesis of CMOS gates. Layout design techniques for building blocks and systems. Introduction to CAD tools.

(Design units: 4)

Prerequisite: PHYS 7D and (CSE 70A or EECS 70A)

Overlaps with EECS 119, EECS 170D.

Restriction: Computer Science Engineering Majors have first consideration for enrollment.

**CSE 199. Individual Study. 1-4 Units.**

Supervised independent reading, research, or design for undergraduate Engineering majors. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Repeatability: May be taken for credit for 8 units.

## Criminology, Law and Society (CRM/LAW)

### Courses

**CRM/LAW C7. Introduction to Criminology, Law and Society . 4 Units.**

Introduces characteristics of the U.S. criminal justice system, including responses to crime, components of the system, and current challenges to the system. Examines structure and function of police and courts, criminal procedure, and sentencing and incarceration policies.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

(III)



**CRM/LAW C10. Fundamentals of Criminology, Law and Society . 4 Units.**

Introduces three interdisciplinary literatures: criminology, socio-legal studies, and justice studies. Focuses on theoretical and empirical work addressing law making, law breaking, and legal systems.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

(III)

**CRM/LAW H80. The Properties of Property. 4 Units.**

Develops an understanding and critique of private property. Draws from interdisciplinary sources to explore the foundations of private property, the institutions that support it over time, and possible alternatives to it.

Restriction: Campuswide Honors Collegium students only.

(III)

**CRM/LAW C100. Special Topics in Criminology, Law and Society. 4 Units.**

Course content varies with interest of the instructor.

Repeatability: Unlimited as topics vary.

**CRM/LAW C101. American Law. 4 Units.**

Introduction to substantive and procedural law governing private dispute resolution, including common law (tort, property, contracts), lawsuits (civil procedure), and alternative dispute resolution; emphasis on the socio-legal ramifications of private disputes, particularly the modern tort system and tort reform movement.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C102. Introduction to the Comparative Study of Legal Cultures. 4 Units.**

Traces the anthropological and comparative cultural study of law from the nineteenth century to the present; briefly surveys the diversity of recorded legal cultures and critically examines key concepts which have been used to describe and classify them.

Same as INTL ST 124A.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**CRM/LAW C103. US Legal Thought. 4 Units.**

Evolution of legal thought in socio-historical context from 19th century to present; emphasizes the rise and fall of legal classicism and modern socio-legal critiques, including the law and society movement, critical legal studies, feminist legal theory, and critical race studies.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C104. Sociology of Law. 4 Units.**

Examines law creation and law enforcement in their social and political context. Discusses the major theories of law and the modern state, and presents case studies in order to evaluate the strengths and weaknesses of these theoretical perspectives.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C105. Psychology and the Law. 4 Units.**

Psychological assumptions of the American legal system and mental health aspects of provision of criminal justice services. Civil commitment, insanity defense, competence to stand trial, jury selection, eyewitness identification. Use of police, courts, correctional institutions in prevention of behavior disorder.

Same as PSCI 193E.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment.

**CRM/LAW C106. Crime and Public Policy. 4 Units.**

Explores nature and dimensions of crime in America and uses and limits of various strategies to control it. Topics include growth of imprisonment, the problem of domestic violence, the death penalty, gun control, and the potential of crime prevention programs.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.



**CRM/LAW C107. Deviance. 4 Units.**

Perspectives on deviance and criminality in behavior, institution, community, and myth. The suitability of contemporary theories of deviant behavior.

Same as SOCIOL 156, PSYCH 177D.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**CRM/LAW C108. Criminological Theory. 4 Units.**

Explores the question of crime causation from a number of theoretical perspectives in the social sciences. Schools of thought examined include utilitarianism, positivism, human ecology, social structural approaches, social process (learning) theories, labeling, and radical-critical (political) perspectives.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C109. Juvenile Delinquency. 4 Units.**

Patterns of delinquent behavior, theories that explain behavior, current research aimed at enhancing exploratory power. Attempts to prevent and control delinquency are put in historical perspective. Development of the current juvenile justice system and evolution of modern juvenile law.

Same as PSCI 193B.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment.

**CRM/LAW C110. Community Context of Crime. 4 Units.**

Examines the social context of high-crime communities, with special emphasis on the problems of poverty, joblessness, economic inequality, and racial discrimination. Assesses debates on the causes of these problems, and on the most effective policies to combat them.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C111. Theories of Punishment. 4 Units.**

Survey of the various schools of thought regarding formal punishment theory. The purposes of legal sanctions are examined, including those of deterrence, rehabilitation, retribution, and incapacitation. Considers problems in realizing formal goals of punishment in practice.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C112. Legal Sanctions and Social Control. 4 Units.**

Examination of criminal sanctions as mechanisms of social control. Includes the nature, function, and organization of courts as sanction generating institutions, and problems associated with punishing white-collar and corporate illegalities.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C113. Gender and Social Control. 4 Units.**

Examines the legal system's use of sex as an organizing characteristic, focusing particularly on sameness and difference feminism, and tracing the evolution of equal treatment of men and women in the areas of constitutional rights, employment, education, and military service.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C114. Miscarriages of Justice. 4 Units.**

Systematically describes, explains, and analyzes the causes and consequences of the wrongful accusation, prosecution, incarceration, and sometimes even execution, of the innocent in the American criminal justice system.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C115. Prisons, Punishment, and Corrections. 4 Units.**

A review of how the U.S. punishes and rehabilitates convicted law violators. The conflicts among the major purposes of sentencing—rehabilitation, deterrence, incapacitation—are discussed, as well as the effects of different sanctions on public safety, offender rehabilitation, and justice system costs.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C116. Race, Ethnicity, and Social Control. 4 Units.**

Provides a historical and sociological survey of racial and ethnic group relations in contexts of crime control, emphasizing the roles of racial ideology, structural racism, and social movements in shaping these dynamic relations, and their significance to American liberal democracy.

Same as CHC/LAT 152A.

**CRM/LAW C117. Imprisonment and Reentry. 4 Units.**

Offers an overview of imprisonment and reentry in the contemporary United States. Examines the development of the prison in the United States and explores changes in its composition, structure, and purpose over time.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C118. Domestic Violence. 4 Units.**

General perspectives about domestic violence and theoretical accounts about what causes such behavior.

Same as SOCECOL 118.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C119. Violence in Intimate Relationships. 4 Units.**

Responses to various forms of domestic violence, such as intimate partner violence and child abuse. Covers barriers to reporting to the police, and prosecutors and courts. Human services, such as safety planning for victims, treatment programs, and restorative justice approaches.

Corequisite:

Same as SOCECOL 119.

**CRM/LAW C120. Law and Inequality. 4 Units.**

Various aspects of the law as related to three specific areas of inequality: immigration and immigrants, race, and gender. The role of law as a tool of social reform and limitations of the legal system historically in resolving inequality issues.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C122. Constitutional Law. 4 Units.**

Examines the evolution of civil liberties and individual rights in the United States, focusing on how Constitutional Amendments and U.S. Supreme Court decision-making have shaped the ongoing political and legal struggles over issues such as privacy, abortion, and free speech.

Overlaps with POL SCI 174A.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C123. Family Law. 4 Units.**

Examines legal issues surrounding marriage, cohabitation, divorce, child custody and support, adoption, and the rights of parents and children in the family context. The findings of social science research are used to illuminate the legal issues.

Same as PSCI 193F.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C124. Mental Health and the Justice System. 4 Units.**

Covers the history of criminalization of persons with mental illness; challenges and needs; civil and outpatient commitment; law enforcement responses; mentally ill in jails and prisons; community supervision strategies; and reentry strategies for offenders with mental illness.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C127. Hate Crimes. 4 Units.**

Examines the causes, manifestations, and consequences of hate crimes and the larger social context within which they occur. The politics and dynamics of intergroup violence born of bigotry and manifested as discrimination; social policy designed to control bias-motivated violence.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C128. Environmental Law and Policy . 4 Units.**

Environmental law as a combination of traditional legal principles and newly created statutes, rules, and decisions applied to environmental protection. Investigates roles of courts, legislature, executive branch and administrative agencies, and private citizens attempting to regulate environmental quality.

Same as UPPP 133.

Restriction: Criminology, Law and Society Majors only. Planning, Policy, and Design Majors only.

**CRM/LAW C130. Seminar on Gangs. 4 Units.**

An overview of gangs, including the nature and definition of gangs; types of gangs; diversity of membership; theoretical explanations; criminal behavior; drug use and sales; law enforcement responses; gangs in correctional institutions; intervention and prevention strategies; and public policy issues.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C131. Organized Crime and American Society. 4 Units.**

Examination of the phenomenon of American organized crime from a sociological perspective. Explanation of methods by which organized crime is tolerated at various levels of society. Emphasis on ways in which 'underworld' interests interact with legitimate economic and political institutions.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C132. Forensic Science, Law, and Society. 4 Units.**

Examines use of 'forensic science' to resolve issues arising in criminal cases including crime scene analysis, DNA testing, fingerprints, trace evidence comparisons, profiling, lie detectors, other forensic techniques; evaluation, statistical characterization, and legal admissibility of evidence; regulation of forensic laboratories.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C133. Homicide and Suicide. 4 Units.**

Examines similarities and differences among homicide and suicide, two major causes of death.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C134. Victimless Crimes. 4 Units.**

Examines major theoretical, empirical, and policy-oriented research related to the design, implementation, and analysis of government intervention, through the criminal sanction, in the spheres of vice and morality.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C135. Mass Incarceration and Social Inequality in America. 4 Units.**

Explores the origins and consequences of mass incarceration; extraordinarily high incarceration rates within particular demographic groups above and beyond historical levels in the U.S. Theoretical explanations for, and current policy debates around, mass incarceration are covered.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C136. Forensic Psychology: Advanced Seminar. 4 Units.**

Focuses on the psychology of criminal offending, particularly violent behavior. Examines violence, sexual offending, and mental disorder related to crime with regard to clinical assessment and treatment; mental health services within forensic institutions.

Prerequisite: (PSCI 9 or PSCI 11C or PSYCH 7A or PSYCH 9C) and PSCI 102C and (PSCI 178S or CRM/LAW C149)

Same as PSCI 156C, PSYCH 177F.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C139. Police and Change. 4 Units.**

Organizational efforts to modify police conduct are addressed by focusing on the history of policing in the United States including training, education, and the contributions of women.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C140. Surveillance and Society. 4 Units.**

Explores the development and deployment of surveillance technologies in contemporary society. The social and legal impact of surveillance technologies, in such areas as crime control, privacy, trust, community, democracy, and the war on terror.

Restriction: Criminology, Law and Society Majors only.

**CRM/LAW C142. White-Collar Crime. 4 Units.**

Examines criminal activity in business and corporate enterprise, organizations, and the professions. Theories regarding the causes and control of white-collar and corporate crime are covered as well as the numerous definitions of these terms.

Same as SOCIOL 142.

Restriction: Sociology Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C144. Criminal Law. 4 Units.**

Deals specifically with the substantive nature of criminal law and its historical development. Focuses on understanding the development of fundamental doctrinal principles upon which criminal law is based, including mens rea, actus reus, homicide, causation, group criminality, and exculpation.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C145. Government Crime. 4 Units.**

Examines the legal, organizational, and political issues involved in the generation and control of government lawlessness. Readings present historical and theoretical perspectives in the abuse of government authority and the ability of the legal system to control such behavior.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C149. Violence in Society. 4 Units.**

Current theory and research on aggression; anger and violence as problems in individual and social functioning. Process and functions of anger examined with regard to normal behavior and psychopathology. The determinants, prevalence, and implications of violence in society are analyzed.

Prerequisite: PSCI 9 or PSCI 11C or PSYCH 7A or PSYCH 9C

Same as PSCI 178S.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment.

**CRM/LAW C150. The Legal Profession. 4 Units.**

Role of the legal profession in modern society, the diverse professional roles lawyers play, the American legal profession compared with that of other societies. 'Litigation explosion,' ethical problems, interactions between lawyers and other professionals, training and socialization of new lawyers.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C156. Cross-Cultural Research on Urban Gangs. 4 Units.**

Taking an urban policy approach, examines the background and contemporary traditions of gangs in several ethnic groups including African-, Asian-, and Mexican-Americans. Cross-cultural exploration of the varied facets of gang life. The major social-control institutions affecting them.

Same as CHC/LAT 153.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment. Chicano/Latino Studies Majors have first consideration for enrollment.

**(VII)****CRM/LAW C160. Forensic Psychology . 4 Units.**

Forensic psychology is the interface between clinical psychology and the law. Emphasizes clinically relevant legal topics (insanity defense; competency to stand trial) and includes critical thinking about issues that arise when psychologists are involved in legal proceedings.

Prerequisite: PSCI 9 or PSCI 11B or PSCI 11C

Same as PSCI 161C.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C162. Crime Hotspots. 4 Units.**

Criminological theories of local public safety hazards or hotspots are introduced. Spatial statistics are developed for different types of hotspots. Hotspot policing theories are introduced and research on the effectiveness of policing strategies is reviewed.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C163. Ethics and Politics of Justice. 4 Units.**

Theoretical perspective on how ethics and politics relate to criminal justice through an introduction to moral philosophy; consideration of specific theories of punishment and justice; and consideration of practical and empirical illustrations of the intersection of ethics, politics, and justice.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C164. Social Control of Delinquency. 4 Units.**

Assumes familiarity with theories of delinquency, the juvenile justice system, and elements of juvenile law. Explores socio-historical origins and evolution of juvenile justice, current research and policy on delinquency prevention and treatment, and future directions of law, policy, and practice.

Prerequisite: Recommended: CRM/LAW C109.

Same as PSCI 193C.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C165. The Death Penalty. 4 Units.**

Examines why the U.S. continues to have a death penalty when so many other countries have abandoned it. Arguments for and against the death penalty are covered.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C167. Crime Measurement. 4 Units.**

The strengths and weaknesses of three crime measures (police reports, victim surveys, and offender self-reports) are illustrated through analyses of research articles. Common measurement problems are analyzed with a focus on reliability and validity.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C168. Extreme Punishment . 4 Units.**

Explores the history and law of America's Eighth Amendment prohibition against cruel and unusual punishment, examining the death penalty, long prison sentences, harsh confinement conditions, and other punishments. Students debate practical, legal, and moral arguments for and against these punishments.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C169W. Advanced Research Methods. 4 Units.**

For students planning to conduct senior research projects or apply to graduate school in social research fields. Topics include reviewing literature, preparing a research proposal, protecting human subjects, citing scholarly work, building measures, estimating sample size, interview and presentation skills.

Prerequisite: SOCECOL 10 and SOCECOL 13. Satisfactory completion of the Lower-Division Writing requirement.

Same as SOCECOL 111W, PSCI 111W, UPPP 114W.

**(Ib)****CRM/LAW C172. Culture Change and the Mexican People. 4 Units.**

Reviews culture contact and colonization, innovation diffusion, acculturation, assimilation, culture conflict and marginality, modernization, urbanization, legal transformations. Mexico and the Southwestern U.S. are reviewed through several centuries to better appreciate the indigenous base of the Mexican people.

Same as CHC/LAT 155.

**CRM/LAW C173. Maritime Piracy, Law and Society. 4 Units.**

Explores the historical and contemporary images and reality of pirates and piracy since the 16th century across the globe through an analysis of primary sources, key historiographical and legal debates, and criminological theories.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C174. Immigration and Crime. 4 Units.**

Examines immigration and crime in the global context, highlighting immigrants as criminals and victims; immigration and crime control; immigrants' perceptions of the criminal justice system; public discourse and public perception on immigration and crime; and human rights issues.

**CRM/LAW C175. Issues in Policing. 4 Units.**

Lectures and readings focus on the history and strategies of policing, measuring the quality of policing, and police misconduct. Strategies for enhancing the quality of policing for controlling misconduct are covered.

**CRM/LAW C176. Classics in Crime Cinema. 4 Units.**

A multidimensional understanding of crime films and how they shape public thinking about crime and criminals.

Restriction: CRM/LAW C176 and CRM/LAW C20 may not be taken for credit.

**CRM/LAW C177. Eyewitness Testimony. 4 Units.**

Faulty eyewitness testimony is a major cause of wrongful convictions. Covers the fast-growing topic of eyewitness testimony and memory for real-world events, both how psychologists study eyewitness capacity, and how the legal system has dealt with eyewitness issues.

Prerequisite: SOCECOL 10

Same as PSCI 193G.

Restriction: Seniors only. Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

Concurrent with CRM/LAW C263.

**CRM/LAW C178. Critical Race Theory. 4 Units.**

Introduction to Critical Race Theory and key American cases on racial inequality. Using this literature, examines the possibilities and pitfalls of legal claims of race, gender, and sexuality discrimination in the age of colorblindness.

Same as AFAM 157.

Restriction: Upper-division students only.

**CRM/LAW C179. Race and Incarceration. 4 Units.**

Examines the racial politics of mass incarceration through historical, empirical, theoretical, and legal frameworks. Focuses on race, gender, and sexual differences to develop a critique on policing, incarceration, and other forms of punishment.

**CRM/LAW C180. Power, Constructions of Deviance, and Social Control . 4 Units.**

Examines the forms and limits of power in the construction of social deviants. Theories of state power are covered to understand the prison system as a contemporary driver of social inequality. The collateral consequences of mass incarceration are discussed.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment.

**CRM/LAW C182. Illegal Economics. 4 Units.**

How illegal firms function in illegal markets, why individuals participate in these groups and markets, and what federal, state, and local governments do to disrupt organized illegal activity.

Same as ECON 146A.

Restriction: Business Economics Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C183. Controversies, Courts, Cultures: The Anthropology of Law. 4 Units.**

Assesses the contributions anthropology has made to legal scholarship, reviewing historical and contemporary themes. Considers both comparative questions of law's norms, structures, and practices around the globe, and the specific insights anthropology offers about contemporary U.S. law.

Same as ANTHRO 127.

**(III)****CRM/LAW C186. Social Media and The Law. 4 Units.**

Examines legal and policy issues raised by the rise of social media. Surveys how social networking platforms and other emerging technologies impact the right to privacy, public perceptions of judicial systems, and the law generally.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C187. Undocumented Immigrant Experiences. 4 Units.**

Examines the experiences of undocumented immigrants and the policies that structure their educational, economic, social, and political participation.

Same as ASIANAM 130, CHC/LAT 164A, SOCIOL 177C.

(III and VII ).

**CRM/LAW C190. Applied Statistics in Social and Behavioral Research. 4 Units.**

Covers statistical techniques used to describe and make generalizations about phenomena represented by data. Hands-on experience in data analysis and interpretation using statistical software (SPSS, STATA) is emphasized. Topics include data visualization, ANOVA, multiple regression, and categorical data analyses.

Prerequisite: SOCECOL 13

Same as PSCI 190, SOCECOL 190, UPPP 190.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**CRM/LAW C191. Law and Modernity. 4 Units.**

The rise and spread of Enlightenment legal traditions, social contract theory, individual rights, ideologies of 'liberty, equality, fraternity'; contradictions of liberal law, its understandings of 'primitive' and 'civilized'; pervasive myths of property, difference, race, and rights. Reading- and writing-intensive.

Same as ANTHRO 127A.

**CRM/LAW C196. Research Seminar in Criminology, Law and Society. 4 Units.**

Special topics research seminar. Content varies with interest of instructor. Capstone research opportunity with Criminology, Law and Society faculty members.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. Anthropology Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C201. Research Methods. 4 Units.**

An introduction to techniques of inductive methodologies, including qualitative interviewing and participant observation, and deductive methodologies, including survey research and experimental and quasi-experimental design. Provides a sound overview of research methodology with tools to pursue specific methods in greater depth.

Restriction: Graduate students only.

**CRM/LAW C202. Research Methods II. 4 Units.**

Covers qualitative approaches (interview strategies, varieties of ethnography, archival and historical methods, etc.) and quantitative approaches (survey methods, experimental designs, secondary data sets, comparative and international data, etc.), and concludes with mixed-method approaches.

Prerequisite: CRM/LAW C201. CRM/LAW C201 with a grade of B or better

Restriction: Graduate students only.

**CRM/LAW C203A. Qualitative Methods Practicum. 4 Units.**

Designed to deepen students' familiarity with qualitative research strategies and to guide them through the initial stages of their Second Year Project requirement, such as the development of an original research proposal and/or a research instrument.

Prerequisite: CRM/LAW C202. CRM/LAW C202 with a grade of B or better

Restriction: Graduate students only.

**CRM/LAW C203B. Quantitative Methods Practicum. 4 Units.**

Deepens familiarity with quantitative research and provides a foundation for the second-year paper, e.g., initial models for data analysis and/or a replication study. Students evaluate what assumptions are necessary for credible inference in different evaluation approaches.

Prerequisite: CRM/LAW C202. CRM/LAW C202 with a grade of B or better

Restriction: Graduate students only.



**CRM/LAW C207. Land-Use Law. 4 Units.**

Investigates legal and institutional frameworks for development control. Review of constitutional issues implicated in land-use regulation. Traces development control historically and analyzes contemporary approaches to land-use control which reflect environmental and economic development concerns.

Same as UPPP 207.

Restriction: Graduate students only.

**CRM/LAW C210. Introduction to Criminology, Law and Society. 4 Units.**

Familiarizes students with the interrelated fields of criminology, law and society studies, and criminal justice studies. Organized around three well-established interdisciplinary literatures: criminology, sociolegal studies, and criminal justice studies.

Restriction: Graduate students only. Criminology, Law and Society Majors only.

**CRM/LAW C211. Legal Institutions and Society. 4 Units.**

Acquaints students with the institutions of U.S. legal system and its operations, as well as with the constitutional framework undergirding this system, and defines the relationship between U.S. citizens and government at a variety of levels.

Restriction: Graduate students only.

**CRM/LAW C212. Police, Courts, and Corrections. 4 Units.**

Focuses on basic policy issues in the administration of the criminal justice system. The key elements of the criminal justice system are police, courts, and corrections. Prepares students for continued study of these organizations.

Restriction: Graduate students only.

**CRM/LAW C213. Crime and Social Deviance. 4 Units.**

Examines the major social scientific perspectives on criminal and deviant behavior. Specific deviant and criminal activities are described and explained using established theoretical frameworks.

Restriction: Graduate students only.

**CRM/LAW C214. Research Methods. 4 Units.**

Structures research methodology, the approach to developing and evaluating knowledge of the sciences for use in criminal justice professional activities. Special emphasis on differentiating scientific approaches from pseudo-science.

Restriction: Graduate students only.

**CRM/LAW C215. Applied Statistics. 4 Units.**

Provides a basis for the use of fundamental statistical analysis techniques for solving public policy and management problems through a series of assignments, examinations, and online discussions and demonstrations.

Restriction: Graduate students only.

**CRM/LAW C216. Public Policy, Crime, and Criminal Justice. 4 Units.**

Increases understanding of crime, violence, and the criminal justice system. Assesses the state of knowledge on key policy issues of our time. Discusses the contribution of communities, schools, employment, drugs, guns, and alcohol to crime and violence.

Restriction: Graduate students only.

**CRM/LAW C217. Leadership. 4 Units.**

Introduces concepts, ideas, and theories about leadership and its operation. Explores leadership concepts through interviews with leaders from the community and fellow classmates.

Restriction: Graduate students only.

**CRM/LAW C218. Social Problems, Law, and Policy. 4 Units.**

Capstone course for M.A.S. program in Criminology, Law and Society. Students choose a social problem related to crime, criminal justice, and law; relate the problem to legal and social issues; and devise a plan of action to research the problem.

Restriction: Graduate students only. Criminology, Law and Society Majors only.



**CRM/LAW C219. Hate Crime. 4 Units.**

Examines the causes, manifestations, and consequences of hate crimes, as well as the larger social context within which they occur, are reacted to, and seem to be proliferating.

Restriction: Graduate students only.

**CRM/LAW C221. Sentencing and Corrections. 4 Units.**

Reviews U.S. attempts to punish and rehabilitate convicted law violators. Conflicts among major purposes of sentencing (rehabilitation, deterrence, incapacitation, and retribution) are discussed, as well as effects of different sanctions on public safety, offender rehabilitation, and justice system costs.

Restriction: Graduate students only.

**CRM/LAW C222. Ethnography. 4 Units.**

Explores the theory and practice of ethnography with a focus on anthropology, the discipline most associated with ethnography. Students are exposed to the theoretical underpinnings of ethnographic work, traditional and innovative practices, and sample ethnographies.

Same as ANTHRO 230F, CHC/LAT 217.

Restriction: Graduate students only.

**CRM/LAW C224. Organizational Perspectives on the Legal System. 4 Units.**

Familiarizes students with organization theory and research as ways to make sense of, navigate, and act on the legal system. Acquaints students with major frameworks in organization theory and their application to the system of legal organizations.

Restriction: Graduate students only.

**CRM/LAW C226. Causal Methods for Policy Analysis. 4 Units.**

Provides students with hands-on experience using existing data to estimate the impact of policy and law on individual behavior or aggregate social outcomes. Covers different econometric strategies used to identify causal effects in the absence of an experiment.

Restriction: Graduate students only.

**CRM/LAW C228. Criminology: Micro Approaches. 4 Units.**

Introduces students to the dominant theories in modern criminology, their theoretical antecedents and extensions, major empirical tests and implications for programs, policy and practice, and focuses on micro-level, individual theories of crime causation. Formerly Criminology, Law and Society C233A.

**CRM/LAW C229. Criminology: Macro Approaches. 4 Units.**

Introduces students to the dominant theories in modern criminology, their theoretical antecedents and extensions, major empirical tests and implications for programs, policy and practices, and addresses macro-level theories of crime causation. Formerly Criminology, Law and Society C233B.

**CRM/LAW C231. Crime and Gender . 4 Units.**

Examines the legal, political, social, economic, and policy implications of making gender (primarily) and race (secondarily) the focus in the study of crime, criminal law, and the criminal justice system.

Restriction: Graduate students only.

**CRM/LAW C232. Juvenile Delinquency. 4 Units.**

Examines the major theoretical perspectives regarding the onset, persistence, and desistance of juvenile delinquency, and examines empirical evidence for each perspective.

Restriction: Graduate students only.

**CRM/LAW C234. Anthropology of Law. 4 Units.**

Law has been a key site of anthropological inquiry since the discipline's nineteenth-century origins. Course introduces and critically assesses the contributions anthropology has made to sociolegal lytic trends.

Restriction: Graduate students only.

**CRM/LAW C238. White-Collar Crime. 4 Units.**

Examines the illegal behavior of individuals who commit crimes in the course of their employment. Special attention will be paid to ways in which power and organizational structure affect the behavior of the white-collar offenders.

Restriction: Graduate students only.

**CRM/LAW C239A. Law and Society I. 4 Units.**

Provides an introduction to the law and society field from its origins in social scientific, legal, and philosophical scholarship during the eighteenth, nineteenth, and early-twentieth centuries. Formerly Criminology, Law, and Society C239.

Restriction: Graduate students only.

**CRM/LAW C239B. Law and Society II. 4 Units.**

Building on Law and Society I, addresses contemporary issues in the field from mid-twentieth century to the present with emphasis on the degree to which the field's foundational assumptions are being challenged, refined, or confirmed through current research.

Prerequisite: CRM/LAW C239A

Restriction: Graduate students only.

**CRM/LAW C240A. Socio-Legal Workshop.**

Designed to foster intellectual discussion, encourage practice and skill-building in providing feedback, and build substantive knowledge of legal scholarship, this workshop is for both law and doctoral students across campus who are interested in interdisciplinary approaches to studying law.

Grading Option: In Progress (Letter Grade with S/U).

Restriction: Graduate students only.

**CRM/LAW C240B. Socio-Legal Workshop.**

Designed to foster intellectual discussion, encourage practice and skill-building in providing feedback, and build substantive knowledge of legal scholarship, this workshop is for both law and doctoral students across campus who are interested in interdisciplinary approaches to studying law.

Prerequisite: CRM/LAW C240A

Grading Option: In Progress (Letter Grade with S/U).

Restriction: Graduate students only.

**CRM/LAW C240C. Socio-Legal Workshop. 4 Units.**

Designed to foster intellectual discussion, encourage practice and skill-building in providing feedback, and build substantive knowledge of legal scholarship, this workshop is for both law and doctoral students across campus who are interested in interdisciplinary approaches to studying law.

Prerequisite: CRM/LAW C240B. CRM/LAW C240B with a grade of B or better

Restriction: Graduate students only.

**CRM/LAW C242. Crime Hotspots. 4 Units.**

Focuses on the criminological theory of hotspots, beginning with the "when, where, and why" questions and ending with the practical policing strategies that have been developed to mitigate hotspot public safety hazards.

Restriction: Graduate students only.

**CRM/LAW C248. Geographic Information Systems. 4 Units.**

Prepares students to become proficient in the basic GIS functionality including visualization, data management, and spatial analysis.

Restriction: Graduate students only.

**CRM/LAW C250. Preventing Errors of Justice. 4 Units.**

Examines the types of errors that are made in the U.S. criminal justice system and how we might prevent these errors, including failures to convict guilty offenders as well as wrongful convictions of the innocent.

Restriction: Graduate students only.

**CRM/LAW C252. Issues in Environmental Law and Policy. 4 Units.**

Treatment of legal and policy strategies for promoting environmental protection and deterring environmental degradation within the context of other societal objectives. Topical approach with a focus on problems of special interest to criminologists and to environmental policy specialists.

Same as UPPP 252.

Restriction: Graduate students only.

**CRM/LAW C253. Cybercrime, Cybersecurity, and Society. 4 Units.**

Introduces students to the world of cybercrime in the age of globally networked digital, and information and communication technologies (ICT). Presents a socio-legal approach to the study of cybercrime, cybersecurity, and how it relates to society.

Restriction: Graduate students only. Criminology, Law and Society M.A.S. students only.

**CRM/LAW C254. Immigration in the US: Economic, Fiscal, and Social Outcomes. 4 Units.**

The changing patterns of immigration in the U.S. and the role that immigrants play in our society. In particular, the economic and social outcomes of immigration, as well as the relationship between immigration, crime, and criminal justice policy.

Restriction: Graduate students only. Criminology, Law and Society Majors only.

**CRM/LAW C255. Public Policy. 4 Units.**

Explores different approaches to public policy analysis, the diverse conceptions of the goals and objectives that should be served by policy, and the appropriate role of the policy analyst. Policy consequences are traced to indirect and subtle incentives and disincentives.

Same as UPPP 221, POL SCI 221A.

Restriction: Graduate students only.

**CRM/LAW C258. Crimmigration. 4 Units.**

Examines the criminalization of immigration, with an emphasis on U.S. enforcement procedures and outcomes. Analyzes the devolution of federal immigration law to local authorities, the rise in immigrant detention and deportation, and the militarization of the U.S.-Mexico border.

Same as CHC/LAT 225, SOCIOL 268.

Restriction: Graduate students only.

**CRM/LAW C260A. Race and Justice Studies Proseminar .**

A year-long proseminar conducted by a team of instructors specializing in race and justice studies. Conceived as a reading and peer mentor group focusing on intellectual and professional development. Required for students pursuing the Race and Justice Studies emphasis.

Grading Option: In Progress (Letter Grade with S/U).

Restriction: Graduate students only.

**CRM/LAW C260B. Race and Justice Studies Proseminar.**

A year-long proseminar conducted by a team of instructors specializing in race and justice studies. Conceived as a reading and peer mentor group focusing on intellectual and professional development. Required for students pursuing the Race and Justice Studies emphasis.

Prerequisite: CRM/LAW C260A

Grading Option: In Progress (Letter Grade with S/U).

Restriction: Graduate students only.

**CRM/LAW C260C. Race and Justice Studies Proseminar. 4 Units.**

A year-long proseminar conducted by a team of instructors specializing in race and justice studies. Conceived as a reading and peer mentor group focusing on intellectual and professional development. Required for students pursuing the Race and Justice Studies emphasis.

Prerequisite: CRM/LAW C260B

Restriction: Graduate students only.

**CRM/LAW C261. Race and Justice Studies Writing Seminar . 4 Units.**

A required writing-intensive seminar conducted by an instructor affiliated with the Race and Justice Studies emphasis. Students with manuscripts on relevant topics will read and critique peer manuscripts, and revise manuscripts toward completion of articles, dissertation chapters, and other publications.

Prerequisite: CRM/LAW C260C

Same as HUMAN 261, SOC SCI 253K.

Restriction: Graduate students only.

**CRM/LAW C262. Special Topics in Race and Justice Studies. 4 Units.**

A seminar focused on special issues in race and justice studies.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**CRM/LAW C263. Eyewitness Testimony. 4 Units.**

Examines the evidence that shows that faulty eyewitness memory is the major cause of wrongful convictions. Explores what the legal system thinks of eyewitness testimony and how the legal system has dealt with eyewitness issues.

Same as PSCI P263.

Restriction: Graduate students only.

**CRM/LAW C265. Memory and the Law. 4 Units.**

Examines the controversial topic of repressed memory, or perception and memory of real-world events.

Same as PSCI P265.

Restriction: Graduate students only.

**CRM/LAW C266. Psychology and the Law. 4 Units.**

Overview of how psychology is applied to the civil and criminal justice systems, how case law shapes this application, and how legal decisions affect the direction of psychological research. Interdisciplinary approach to research in psychology, law, and/or criminology.

Same as PSCI P266.

Restriction: Graduate students only.

**CRM/LAW C268. Contemporary Issues in Crime and Justice. 4 Units.**

Intensive reading and discussion of several recent works that raise critical issues for criminology and criminal justice policy, with a special emphasis on issues of inequality, diversity, and social justice.

Restriction: Graduate students only.

**CRM/LAW C275. Special Topics in Criminology, Law and Society. 4 Units.**

Topics covered vary with interests of instructor.

Repeatability: Unlimited as topics vary.

**CRM/LAW C280A. Professionalization Proseminar.**

Focuses on two areas that are key to scholarly and professional success in graduate school but are rarely discussed in a structured setting: 1) publishing in peer-reviewed academic journals; and 2) preparing for the academic job market.

Grading Option: In Progress (Letter Grade with S/U).

Restriction: Graduate students only.

**CRM/LAW C280B. Professionalization Proseminar.**

Focuses on two areas that are key to scholarly and professional success in graduate school but are rarely discussed in a structured setting: 1) publishing in peer-reviewed academic journals; and 2) preparing for the academic job market.

Prerequisite: CRM/LAW C280A

Grading Option: In Progress (Letter Grade with S/U).

Restriction: Graduate students only.

**CRM/LAW C280C. Professionalization Proseminar. 4 Units.**

Focuses on two areas that are key to scholarly and professional success in graduate school but are rarely discussed in a structured setting: 1) publishing in peer-reviewed academic journals; and 2) preparing for the academic job market.

Prerequisite: CRM/LAW C280B

Restriction: Graduate students only.

**CRM/LAW C296. Doctoral Dissertation Research and Writing. 2-12 Units.**

Dissertation research with Criminology, Law and Society faculty.

Prerequisite: Advancement to candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**CRM/LAW C298. Directed Study. 2-4 Units.**

Directed study with Criminology, Law and Society faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CRM/LAW C299. Independent Study . 2-8 Units.**

Independent research with Criminology, Law and Society faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Criticism (CRITISM)

### Courses

**CRITISM 200A. Political Economy: Methods and Critique. 4 Units.**

Introduction to canonical texts in Marxism coupled with an examination of the questions of race, gender, ethnicity, and sexuality that distend the calculus of the canon's assumptive logic. May be taken after CLT&THY 200B.

Same as CLT&THY 200A.

Restriction: Graduate students only.

**CRITISM 220B. Studies in Literary Theory and Its History. 4 Units.**

Introduction to criticism and aesthetics for beginning graduate students. Readings from continental, English, and American theorists.

Same as HUMAN 220B.

Restriction: Graduate students only.

**CRITISM 240. Advanced Theory Seminar. 4 Units.**

Studies in selected areas of Criticism Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

## Culture and Theory (CLT&THY)

### Courses

**CLT&THY 200A. Political Economy: Methods and Critique. 4 Units.**

Introduction to canonical texts in Marxism coupled with an examination of the questions of race, gender, ethnicity, and sexuality that distend the calculus of the canon's assumptive logic. May be taken after CLT&THY 200B.

Same as CRITISM 200A.

Restriction: Graduate students only.

**CLT&THY 200B. Libidinal Economy: Methods and Critique. 4 Units.**

Introduction to canonical texts in psychoanalysis coupled with an examination of the questions of race, gender, ethnicity, and sexuality that distend the calculus of the canon's assumptive logic. May be taken before CLT&THY 200A.

Restriction: Graduate students only.

**CLT&THY 200C. Theory from Below. 4 Units.**

Introduction to systems of thought understudied or undervalued in academic canons--for instance, systems constituted in communities' practices or theories that do not seek permanence or generality.

Prerequisite: CLT&THY 200A and CLT&THY 200B

Restriction: Graduate students only.

**CLT&THY 241. Ethics, Erotics, and Will: Gendered Black Politics, Sexualized Racisms, and the Humanities. 4 Units.**

Introduces doctoral students to an interdisciplinary conversation about black queer sexuality and black heteropatriarchy. Uses disciplinary formations as a tool for understanding knowledge formations about the shifting relations that constitute sexuality, gender, and racial blackness.

Restriction: Graduate students only.

**CLT&THY 242. Afro-Pessimism and the Status of the Subject. 4 Units.**

Afro-Pessimism theorizes the Black as a being against which all other beings become legible as human subjects. Focuses on either the subject of psychoanalysis or the subject of capital accumulation in their explorations of the antagonism between Blackness.

Restriction: Graduate students only.

**CLT&THY 280. Independent Study. 4 Units.**

Limited to students who have not yet received the M.A. degree.

Repeatability: May be repeated for credit unlimited times.

**CLT&THY 289. Topics in Culture and Theory. 4 Units.**

Seminars on various topics in Culture and Theory.

Repeatability: Unlimited as topics vary.

**CLT&THY 298. Directed Reading. 4-12 Units.**

Directed readings on a specific topic agreed upon by students and their instructors. Limited to students who have completed their M.A. degree and are preparing for their qualifying exam.

Prerequisite: Completion of the M.A. degree.

Repeatability: May be repeated for credit unlimited times.

**CLT&THY 299. Dissertation Research. 4-12 Units.**

Dissertation research in Culture and Theory.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Dance (DANCE)

### Courses

**DANCE 2. Dance Health and Injury Prevention. 4 Units.**

An overview of factors that affect the health of dancers. Includes evaluation of general health measures and prevention and management of common dance injuries.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 3. Scientific Concepts of Health. 4 Units.**

Introduction to the scientific foundations of health, emphasizing those pertaining to success in college and lifetime wellness. Includes principles of cardiorespiratory, musculoskeletal, flexibility, and nutritional fitness. A variety of learning experiences are offered to apply science to real life.

(II)

**DANCE 14. Social Dance. 2 Units.**

Contemporary and historical forms. Current ballroom, disco, and Western square dance forms; Latin ballroom dances; dances from the 20s, 30s, and 40s.

Grading Option: Pass/no pass only.

**DANCE 21A. Music for Dancers. 4 Units.**

Emphasis on the development of musical skills most pertinent to the dancer: vocabulary, notational literacy, rhythmic and melodic acuity, score reading, and fundamental analysis; working with live accompaniment.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 30A. Studio Workshop in Ballet I. 2 Units.**

Beginning ballet: fundamentals and principles of classical ballet with an emphasis on technique.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**DANCE 30B. Studio Workshop in Ballet I. 2 Units.**

Beginning ballet: fundamentals and principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 30A

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**DANCE 30C. Studio Workshop in Ballet I. 2 Units.**

Beginning ballet: fundamentals and principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 30A and DANCE 30B

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**DANCE 34. Men's Studio Workshop in Ballet. 2 Units.**

Emphasis on men's traditional ballet, techniques, and movements.

Prerequisite: DANCE 30A and DANCE 30B and DANCE 30C

Repeatability: May be repeated for credit unlimited times.

**DANCE 40A. Studio Workshop in Modern I. 2 Units.**

Fundamentals of modern dance: principles of modern tradition developed from Graham, Humphrey, and Wigman.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**DANCE 40B. Studio Workshop in Modern I. 2 Units.**

Fundamentals of modern dance: principles of modern tradition developed from Graham, Humphrey, and Wigman.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**DANCE 40C. Studio Workshop in Modern I. 2 Units.**

Fundamentals of modern dance: principles of modern tradition developed from Graham, Humphrey, and Wigman.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**DANCE 50A. Studio Workshop on Jazz I. 2 Units.**

Fundamentals of jazz: principles of jazz dance and contemporary forms incorporating the personal point of view of the instructor.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**DANCE 50B. Studio Workshop on Jazz I. 2 Units.**

Fundamentals of jazz: principles of jazz dance and contemporary forms incorporating the personal point of view of the instructor.

Prerequisite: DANCE 50A

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**DANCE 50C. Studio Workshop on Jazz I. 2 Units.**

Fundamentals of jazz: principles of jazz dance and contemporary forms incorporating the personal point of view of the instructor.

Prerequisite: DANCE 50B

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**DANCE 52A. Workshop in Tap I. 2 Units.**

Beginning tap: principles of rhythm and basic tap steps.

Repeatability: May be taken for credit 2 times.

**DANCE 52B. Workshop in Tap I. 2 Units.**

Beginning tap: principles of rhythm and basic tap steps.

Prerequisite: DANCE 52A

Repeatability: May be taken for credit 2 times.

**DANCE 52C. Workshop in Tap I. 2 Units.**

Beginning tap: principles of rhythm and basic tap steps.

Prerequisite: DANCE 52B

Repeatability: May be taken for credit 2 times.

**DANCE 60A. Choreography. 4 Units.**

Beginning-to-intermediate study of principles of dance composition. May include composition assignments for stage and video. By audition, works may be shown quarterly in public studio performances.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 60B. Choreography. 4 Units.**

Beginning-to-intermediate study of principles of dance composition. May include composition assignments for stage and video. By audition, works may be shown quarterly in public studio performances.

Prerequisite: DANCE 60A

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 60C. Choreography. 4 Units.**

Beginning-to-intermediate study of principles of dance composition. May include composition assignments for stage and video. By audition, works may be shown quarterly in public studio performances.

Prerequisite: DANCE 60A and DANCE 60B

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 80. Introduction to Ballet and Modern Dance. 4 Units.**

Survey of nineteenth and twentieth-century ballet, modern dance, and theatre dance.

Overlaps with DANCE 90B, DANCE 90C, DANCE 90A.

Restriction: Non-major only.

(IV, VIII)



**DANCE 81. American Ballet and Modern Dance since 1900. 4 Units.**

A survey of American ballet and modern dance in the twentieth and twenty-first centuries. Lectures are supplemented by video.

Overlaps with DANCE 90C.

Restriction: Non-major only. Dance 81 and Dance 90C may not both be taken for credit.

(IV)

**DANCE 82. Topics in World Dance. 4 Units.**

Various topics in world dance studies focusing on historical, social, and cultural contexts.

Repeatability: May be repeated for credit unlimited times.

(VIII)

**DANCE 83. Dance in Feature Film. 4 Units.**

Dance in film musicals and commercial dance films, concentrating especially on films from the 1930s through the 1970s.

(IV)

**DANCE 85. What Dance Does: From Ballet to Hip-Hop. 4 Units.**

Explores the way dance reflects culture and embodies new ideas. Examples for viewing and analysis come from ballet (with roots in Europe) and hip-hop (with roots in the African diaspora). Themes include gender, perceived racial difference, identity.

(IV)

**DANCE 90A. Dance History I. 4 Units.**

Global perspectives. Topics and histories of dance and movement practices from various parts of the world.

Overlaps with DANCE 80.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

(IV and VIII ).

**DANCE 90B. Dance History II. 4 Units.**

The history of dance in the western tradition from the Renaissance through the 19th century.

Prerequisite: DANCE 90A

Overlaps with DANCE 80.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

(IV and VIII ).

**DANCE 90C. Dance History III. 4 Units.**

The history of dance in the western tradition in the the 20th and 21st centuries.

Prerequisite: DANCE 90B

Overlaps with DANCE 80, DANCE 81.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

(IV ).

**DANCE 100. Kinesiology for Dance. 4 Units.**

The study of the production of dance movement by the musculoskeletal system. Anatomical and dynamic analysis of dance movement.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 103. Pilates. 2 Units.**

Basics of technique emphasizing alignment, breath control, correction of muscular imbalances.

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 104. Pilates Reformer. 2 Units.**

Utilizes the Universal Reformer apparatus, aiding the student in core stabilization, correcting muscular imbalances, increasing flexibility, and improving strength.

Prerequisite: DANCE 103

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 110. World Dance . 2 Units.**

Studio workshop of dances and movement sources of specified countries or areas.

Repeatability: May be taken for credit 6 times as topics vary.

**DANCE 125A. Teaching of Dance. 4 Units.**

Pedagogy. The methods and theory of teaching dance forms.

Prerequisite: DANCE 133A and DANCE 133B and DANCE 133C and DANCE 143A and DANCE 143B and DANCE 143C

Restriction: Upper-division students only. Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 127A. Costume Design for Dance. 4 Units.**

Costume design and construction specific to the body in motion. Theoretical study and practical execution.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 130A. Pointe Class. 2 Units.**

Beginning and intermediate pointe work; principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 132A and DANCE 132B and DANCE 132C

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 132A. Studio Workshop in Ballet II. 2 Units.**

Intermediate ballet and beginning pointe work; principles of classical ballet with an emphasis on technique.

Prerequisite: (DANCE 30A and DANCE 30B and DANCE 30C) or audition. Prerequisites are for non-Dance majors only.

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 132B. Studio Workshop in Ballet II. 2 Units.**

Intermediate ballet and beginning pointe work; principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 132A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 132C. Studio Workshop in Ballet II. 2 Units.**

Intermediate ballet and beginning pointe work; principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 132A and DANCE 132B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 133A. Advanced Studio Workshop in Ballet III. 2 Units.**

Advanced intermediate ballet and pointe work; principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 132C. DANCE 132C with a grade of B+ or better. Placement by audition is also accepted.

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 133B. Advanced Studio Workshop in Ballet III. 2 Units.**

Advanced intermediate ballet and pointe work; principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 133A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 133C. Advanced Studio Workshop in Ballet III. 2 Units.**

Advanced intermediate ballet and pointe work; principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 133A and DANCE 133B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 134A. Advanced Studio Workshop in Ballet IV. 4 Units.**

Advanced ballet, pointe work, and performance styles: principles of classical ballet.

Prerequisite: DANCE 133A and DANCE 133B and DANCE 133C. DANCE 133C with a grade of B+ or better. Placement by audition is also accepted.

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 134B. Advanced Studio Workshop in Ballet IV. 4 Units.**

Advanced ballet, pointe work, and performance styles: principles of classical ballet.

Prerequisite: DANCE 134A

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 134C. Advanced Studio Workshop in Ballet IV. 4 Units.**

Advanced ballet, pointe work, and performance styles: principles of classical ballet.

Prerequisite: DANCE 134A and DANCE 134B

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 135A. Advanced Studio Workshop in Ballet V. 4 Units.**

Advanced ballet, pointe work, and performance styles: principles of classical ballet.

Prerequisite: DANCE 134A and DANCE 134B and DANCE 134C. DANCE 134C with a grade of B+ or better. Placement by audition is also accepted.

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 135B. Advanced Studio Workshop in Ballet V. 4 Units.**

Advanced ballet, pointe work, and performance styles: principles of classical ballet.

Prerequisite: DANCE 135A

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 135C. Advanced Studio Workshop in Ballet V. 4 Units.**

Advanced ballet, pointe work, and performance styles: principles of classical ballet.

Prerequisite: DANCE 135A and DANCE 135B

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 137. Repertory . 2 Units.**

Rehearsal and performance of repertoire from established ballet, modern, or jazz choreographers.

Prerequisite: (DANCE 133A and DANCE 133B and DANCE 133C) or (DANCE 143A and DANCE 143B and DANCE 143C)

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 139. Partnering. 2 Units.**

Principles of partnering techniques in various dance performance styles.

Prerequisite: DANCE 133A and DANCE 133B and DANCE 133C and DANCE 143A and DANCE 143B and DANCE 143C

Repeatability: May be taken for credit 4 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 142A. Studio Workshop in Modern II. 2 Units.**

Introduction to the principles of motion, including the use of breath, gravity, spatial awareness, and time values.

Prerequisite: DANCE 40A and DANCE 40B and DANCE 40C. Prerequisites are for non-Dance majors only.

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 142B. Studio Workshop in Modern II. 2 Units.**

Introduction to the principles of motion, including the use of breath, gravity, spatial awareness, and time values.

Prerequisite: DANCE 142A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 142C. Studio Workshop in Modern II. 2 Units.**

Introduction to the principles of motion, including the use of breath, gravity, spatial awareness, and time values.

Prerequisite: DANCE 142A and DANCE 142B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 143A. Advanced Studio Workshop in Modern III. 2 Units.**

Builds on fundamentals of Dance 142A-B-C and introduces performance techniques.

Prerequisite: DANCE 142C. DANCE 142C with a grade of B+ or better

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 143B. Advanced Studio Workshop in Modern III. 2 Units.**

Builds on the fundamentals of DANCE 142A-DANCE 142B-DANCE 142C and introduces performance techniques.

Prerequisite: DANCE 143A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 143C. Advanced Studio Workshop in Modern III. 2 Units.**

Builds on fundamentals of DANCE 142A-DANCE 142B-DANCE 142C and introduces performance techniques.

Prerequisite: DANCE 143A and DANCE 143B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 144A. Advanced Studio Workshop in Modern IV. 2 Units.**

Synthesis of fundamentals and performance technique. Aims to bring students to the preprofessional level.

Prerequisite: DANCE 143C. DANCE 143C with a grade of B+ or better

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 144B. Advanced Studio Workshop in Modern IV. 2 Units.**

Synthesis of fundamentals and performance technique. Aims to bring students to the preprofessional level.

Prerequisite: DANCE 144A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 144C. Advanced Studio Workshop in Modern IV. 2 Units.**

Synthesis of fundamentals and performance technique. Aims to bring students to the preprofessional level.

Prerequisite: DANCE 144A and DANCE 144B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 152A. Intermediate Studio Workshop in Jazz II. 2 Units.**

Intermediate jazz: principles of jazz dance and contemporary forms incorporating the personal views of the instructor.

Prerequisite: Prerequisites for non-Dance majors: DANCE 50A and DANCE 50B and DANCE 50C.

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 152B. Intermediate Studio Workshop in Jazz II. 2 Units.**

Intermediate jazz: principles of jazz dance and contemporary forms incorporating the personal views of the instructor.

Prerequisite: DANCE 152A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 152C. Intermediate Studio Workshop in Jazz II. 2 Units.**

Intermediate jazz: principles of jazz dance and contemporary forms incorporating the personal views of the instructor.

Prerequisite: DANCE 152A and DANCE 152B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 153A. Advanced Studio Workshop in Jazz III. 2 Units.**

Advanced jazz: principles of jazz dance and contemporary forms incorporating the personal views of the instructor.

Prerequisite: DANCE 152C. DANCE 152C with a grade of B+ or better

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 153B. Advanced Studio Workshop in Jazz III. 2 Units.**

Advanced jazz: principles of jazz dance and contemporary forms incorporating the personal views of the instructor.

Prerequisite: DANCE 153A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 153C. Advanced Studio Workshop in Jazz III. 2 Units.**

Advanced jazz: principles of jazz dance and contemporary forms incorporating the personal views of the instructor.

Prerequisite: DANCE 153A and DANCE 153B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 154A. Advanced Jazz: Performance Techniques IV. 2 Units.**

Advanced jazz emphasizing performance techniques.

Prerequisite: DANCE 153C. DANCE 153C with a grade of B+ or better

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 154B. Advanced Jazz: Performance Techniques IV. 2 Units.**

Advanced jazz emphasizing performance techniques.

Prerequisite: DANCE 154A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 154C. Advanced Jazz: Performance Techniques IV. 2 Units.**

Advanced jazz emphasizing performance techniques.

Prerequisite: DANCE 154A and DANCE 154B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only.

**DANCE 160. Improvisation. 2 Units.**

Structured and experiential improvisation to heighten the personal intuitive processes, the kinesthetic sense, spatial and temporal awareness, and to encourage insights into the potential movement resources of the individual for performance and choreography. Course encourages freedom of exploration.

Repeatability: May be taken for credit 2 times.

**DANCE 162A. Choreography II. 4 Units.**

Directed choreographic projects for stage or video integrating the elements of stagecraft. In process or completed works may be shown quarterly in public studio or stage performances.

Prerequisite: DANCE 60A and DANCE 60B and DANCE 60C. Audition required.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 162B. Choreography II. 4 Units.**

Directed choreographic projects for stage or video integrating the elements of stagecraft. In process or completed works may be shown quarterly in public studio or stage performances.

Prerequisite: DANCE 162A. Audition required.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 162C. Choreography II. 4 Units.**

Directed choreographic projects for stage or video integrating the elements of stagecraft. In process or completed works may be shown quarterly in public studio or stage performances.

Prerequisite: DANCE 162A and DANCE 162B. Audition required.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 163. Dance and Video Technology. 4 Units.**

Introduction to video and audio documentation of dance performance. Integrating dance performance within the film aesthetic. Techniques and technologies of video cameras, formats, editing, and projection. Overview of video compression and DVD authoring.

Prerequisite: DANCE 60A

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 164. Screendance. 4 Units.**

Overview of dance for film and choreography for the camera. Aesthetics of creating dance for the screen. Approaches for delivery of dance films to an audience, including projection, DVD, Web, and mobile devices. A final dance film project is required.

Prerequisite: DANCE 163

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 165. Choreographic Projects. 1-4 Units.**

Supervised choreographic projects for workshop productions.

Prerequisite: Audition required.

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 170. Dance Performance. 1-4 Units.**

Rehearsal and performance in a faculty-choreographed production.

Prerequisite: Audition required.

Repeatability: May be repeated for credit unlimited times.

**DANCE 171. Dance Workshop. 1-4 Units.**

Rehearsal and performance in a student-choreographed production.

Prerequisite: Audition required.

Repeatability: May be repeated for credit unlimited times.

**DANCE 172. Master of Fine Arts Concert. 1-4 Units.**

Rehearsal and performance in a graduate student-choreographed production.

Prerequisite: Audition required.

Repeatability: May be repeated for credit unlimited times.

**DANCE 174. UCI Dance Ensemble Performance. 1-4 Units.**

Performance with the UCI Dance Ensemble.

Repeatability: May be taken for credit 6 times.

Restriction: Sophomores only. Upper-division students only.

**DANCE 176. UCI Jazz Dance Ensemble. 2-4 Units.**

Rehearsal and performance in theatrical jazz dance, designed to provide an experience in assimilating various styles of jazz dance and in refining dance performance techniques. Students will master aspects of dance company promotion.

Prerequisite: DANCE 152A and DANCE 152B and DANCE 152C

Repeatability: May be taken for credit 6 times.

Restriction: Sophomores only. Upper-division students only.

**DANCE 178. Performance Laboratory. 2 Units.**

Rehearsal and performance of graduate student-choreographed dance works for the M.F.A. thesis.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**DANCE 179. UCI Etude Ensemble. 4 Units.**

Repertory and performances by undergraduate Dance majors. Concert presentations on and off campus. Faculty directed, student/faculty choreographed.

Prerequisite: Audition required.

Repeatability: May be taken for credit 9 times.

Restriction: Sophomores only. Upper-division students only.



**DANCE 180C. Laban Studies. 4 Units.**

Laban movement analysis.

Prerequisite: DANCE 21A

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 185W. Critical Issues in Dance. 4 Units.**

Critical thinking and writing about dance, with a section on dance criticism and a major emphasis on persuasive writing about significant issues in the dance world.

Prerequisite: DANCE 90A and DANCE 90B and DANCE 90C. Satisfactory completion of the lower-division writing requirement.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**(Ib)****DANCE 193. Selected Topics in Dance. 1-4 Units.**

Directed group studies of topics in dance.

Repeatability: May be taken for credit 3 times as topics vary.

**DANCE 194. Topics Vary. 4 Units.**

Seminar in Dance Studies. Variable topics related to gender, race, politics, and dance writing, and criticism, with attention to linking dance practices to the wider world.

Prerequisite: DANCE 90A and DANCE 90B and DANCE 90C

Repeatability: Unlimited as topics vary.

**DANCE 195. Arts Management. 4 Units.**

Designed for students interested in the developmental and management of nonprofit arts organizations. Examines the organizational structure and areas of operation such as marketing, fundraising, budgeting, production, and administration.

Repeatability: May be taken for credit 2 times.

**DANCE 197. Independent Study. 1-4 Units.**

Individual independent projects in experimental laboratory, library, field, performance, under instructor's direction. Students can receive conceptual, creative, and theoretical instruction in the successful completion of a written report or performance.

Repeatability: May be repeated for credit unlimited times.

**DANCE 199. Senior Thesis. 4 Units.**

Directed research or creative activity for senior Dance majors. Research consists of a substantial essay on dance history, research in dance science, or the creation of original or reconstructed choreography.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 201. Seminar in Kinesiology for Dance. 4 Units.**

Introduction to the anatomical, biomechanical, and physiological principles of dance movement.

Prerequisite: DANCE 100

**DANCE 222. Musical Resources. 4 Units.**

Detailed study of music as it relates to dance. Historical overview of musical form, style, and other elements. Analysis of various affinities between music and dance. Practical applications.

**DANCE 225. Seminar in the Teaching of Dance Techniques. 4 Units.**

Principles and theories of teaching dance techniques. Supervised presentation and teaching of technique class.

**DANCE 231A. Graduate Studio: Ballet. 2 Units.**

Advanced ballet, pointe work, and performance style: principles of the classical ballet with an emphasis on technique.

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 231B. Graduate Studio: Ballet. 2 Units.**

Advanced ballet, pointe work, and performance style: principles of the classical ballet with an emphasis on technique.

Prerequisite: DANCE 231A

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 231C. Graduate Studio: Ballet. 2 Units.**

Advanced ballet, pointe work, and performance style: principles of the classical ballet with an emphasis on technique.

Prerequisite: DANCE 231B

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 241A. Graduate Studio: Modern. 2 Units.**

Advanced modern dance: synthesis of fundamentals and performance technique. Aims to bring students to the preprofessional level.

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 241B. Graduate Studio: Modern. 2 Units.**

Advanced modern dance: synthesis of fundamentals and performance technique. Aims to bring students to the preprofessional level.

Prerequisite: DANCE 241A

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 241C. Graduate Studio: Modern. 2 Units.**

Advanced modern dance: synthesis of fundamentals and performance technique. Aims to bring students to the preprofessional level.

Prerequisite: DANCE 241B

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 251A. Graduate Studio: Jazz. 2 Units.**

Principles of jazz dance and contemporary forms, incorporating the personal views of the instructor.

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 251B. Graduate Studio: Jazz. 2 Units.**

Principles of jazz dance and contemporary forms, incorporating the personal views of the instructor.

Prerequisite: DANCE 251A

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 251C. Graduate Studio: Jazz. 2 Units.**

Principles of jazz dance and contemporary forms, incorporating the personal views of the instructor.

Prerequisite: DANCE 251B

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 252A. Graduate Studio: Tap. 2 Units.**

An overview of tap concentrating on the development of various technique forms using basic and intermediate principles.

Repeatability: May be taken for credit 4 times.

**DANCE 252B. Graduate Studio: Tap. 2 Units.**

An overview of tap concentrating on the development of various technique forms using basic and intermediate principles.

Prerequisite: DANCE 252A

Repeatability: May be taken for credit 4 times.

**DANCE 252C. Graduate Studio: Tap. 2 Units.**

An overview of tap concentrating on the development of various technique forms using basic and intermediate principles.

Prerequisite: DANCE 252B

Repeatability: May be taken for credit 4 times.

**DANCE 261A. Graduate Studio in Choreography. 4 Units.**

Graduate work in dance composition emphasizing the individual aesthetic. Assignments in movement discovery, solo and group forms, with the main emphasis on independent work.

Repeatability: May be repeated for credit unlimited times.

**DANCE 261B. Graduate Studio in Choreography. 4 Units.**

Graduate work in dance composition emphasizing the individual aesthetic. Assignments in movement discovery, solo and group forms, with the main emphasis on independent work.

Prerequisite: DANCE 261A

Repeatability: May be repeated for credit unlimited times.

**DANCE 264. Screendance. 4 Units.**

Overview of dance for film and choreography for the camera. Aesthetics of creating dance for the screen. Approaches for delivery of dance films to an audience, including projection, DVD, Web, and mobile devices. A final dance film project is required.

Prerequisite: DANCE 281

**DANCE 281. Dance and Video Technology. 4 Units.**

Introduction to video and audio documentation of dance performance. Integrating dance performance within the film aesthetic. Techniques and technologies of video cameras, formats, editing, and projection. Overview of video compression and DVD authoring.

**DANCE 282. Seminar in Movement Analysis. 4 Units.**

Theories of movement analysis and nonverbal communication applied to dance.

**DANCE 283. Critical Issues in Dance. 4 Units.**

Reading, writing, discussing, and presenting key issues that relate to dance studies. Basics of dance analysis and criticism. Special emphasis on effective ways of defining, clarifying, and arguing for points of view.

Prerequisite: DANCE 284

**DANCE 284. Bibliography and Research. 4 Units.**

Understanding the field of dance studies, available resources, research methods, and academic formats in preparation for thesis writing.

**DANCE 285. Graduate Projects. 4 Units.**

Projects may be educational, choreographic, scientific, historical, or philosophical in scope and must have faculty advisor approval.

Repeatability: May be taken for credit 6 times.

**DANCE 286. Thesis. 4 Units.**

Substantial research in a topic approved by the student's graduate committee. Results of the research must be written in approved thesis style.

Repeatability: May be taken for credit 6 times.

**DANCE 287. Graduate Lectures in Dance. 1-4 Units.**

A series of lectures and discussions of announced topics in dance. Content may be from history, ethnology, notation, medicine, music, or other areas in the field.

Repeatability: Unlimited as topics vary.

**DANCE 296. Proseminar in Dance History. 4 Units.**

Discussion seminar with emphasis on reading and thinking about problems in dance history; presentation of oral and written reports.

Repeatability: May be taken for credit 2 times as topics vary.

**DANCE 297. Directed Reading. 1-4 Units.**

Topic to be approved by instructor. Paper required.

Repeatability: May be repeated for credit unlimited times.

**DANCE 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Dance Majors only.

## Dermatology (DERM)

## Developmental and Cell Biology (DEV BIO)

### Courses

**DEV BIO 200A. Research in Developmental and Cell Biology. 2-12 Units.**

Independent research with Developmental and Cell Biology faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**DEV BIO 200B. Research in Developmental and Cell Biology. 2-12 Units.**

Independent research with Developmental and Cell Biology faculty.

Prerequisite: DEV BIO 200A

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**DEV BIO 200C. Research in Developmental and Cell Biology . 2-12 Units.**

Independent research with Developmental and Cell Biology faculty.

Prerequisite: DEV BIO 200B

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**DEV BIO 200R. Research in Developmental & Cell Biology for First-year Students. 2-12 Units.**

Independent research within the laboratories of graduate training faculty in the Department of Developmental and Cell Biology for first-year Ph.D. students.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

**DEV BIO 203A. Graduate Tutorial in Developmental and Cell Biology. 4 Units.**

Advanced study in areas not represented by formal courses. May involve individual or small group study through discussion, reading, and composition. Time and subject matter arranged individually.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**DEV BIO 203B. Graduate Tutorial in Developmental and Cell Biology. 4 Units.**

Advanced study in areas not represented by formal courses. May involve individual or small group study through discussion, reading, and composition. Time and subject matter arranged individually.

Prerequisite: DEV BIO 203A

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**DEV BIO 203C. Graduate Tutorial in Developmental and Cell Biology. 4 Units.**

Advanced study in areas not represented by formal courses. May involve individual or small group study through discussion, reading, and composition. Time and subject matter arranged individually.

Prerequisite: DEV BIO 203B

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**DEV BIO 206A. Developmental and Cell Biology Journal Club. 2 Units.**

Advanced study of various topics in cell biology.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**DEV BIO 206B. Developmental and Cell Biology Journal Club. 2 Units.**

Advanced study of various topics in cell biology.

Prerequisite: DEV BIO 206A

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**DEV BIO 206C. Developmental and Cell Biology Journal Club. 2 Units.**

Advanced study of various topics in cell biology.

Prerequisite: DEV BIO 206B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**DEV BIO 207. Mouse Developmental Genetics. 4 Units.**

Introduction to using the mouse in contemporary biomedical research. The biology and development of the laboratory mouse, methods for manipulation of the mouse genome and embryos, and examples of application of these methods to understand mammalian development and homeostasis.

Same as BIOCHEM 215.

Restriction: Graduate students only.

**DEV BIO 212. Topics in Systems Biology. 2 Units.**

Studies in selected areas of Systems Biology.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**DEV BIO 214. Principles of Genomics. 4 Units.**

A survey course of the principal subfields of genomics and their applications to biological and health sciences that will cover genome assembly and annotation, genome structure, comparative genomics, population genomics, functional genomics, and medical genomics.

Same as MOL BIO 244.

Restriction: Graduate students only.

**DEV BIO 231B. Cell Biology. 4 Units.**

A broadly based course including topics in extracellular matrix, cytoskeleton, organelle biogenesis, receptor-mediated endocytosis, signal transduction, cell cycle, and developmental biology.

Concurrent with BIO SCI D154.

**DEV BIO 232. Systems Cell and Developmental Biology. 4 Units.**

Introduces concepts needed to understand cell and developmental biology at the systems level, i.e., how the parts (molecules) work together to create a complex output. Emphasis on using mathematical/computational modeling to expand/modify insights provided by intuition.

Same as BME 213.

Restriction: Graduate students only.

**DEV BIO 245. Stem Cell Biology. 4 Units.**

The basic characteristics and development roles of embryonic, adult, and cancer stem cells in the human body and in model systems and the use of experimental and genetic methods to analyze and manipulate their properties.

Restriction: Graduate students only.

**DEV BIO 290A. Colloquium in Developmental and Cell Biology. 2 Units.**

Contemporary research problems. Research students, faculty, and other invited speakers introduce research and review topics.

Restriction: Graduate students only.

**DEV BIO 290B. Colloquium in Developmental and Cell Biology. 2 Units.**

Contemporary research problems. Research students, faculty, and other invited speakers introduce research and review topics.

Prerequisite: DEV BIO 290A

Restriction: Graduate students only.

**DEV BIO 290C. Colloquium in Developmental and Cell Biology. 2 Units.**

Contemporary research problems. Research students, faculty, and other invited speakers introduce research and review topics.

Prerequisite: DEV BIO 290B

Restriction: Graduate students only.

**DEV BIO 292A. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**DEV BIO 292B. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Prerequisite: DEV BIO 292A

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**DEV BIO 292C. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Prerequisite: DEV BIO 292B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**DEV BIO 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Drama (DRAMA)

### Courses

**DRAMA 10. Introduction to Theatre. 4 Units.**

An interactive introduction to the world of theatre that serves to develop an appreciation of theatrical arts, to establish an awareness of landmarks within the performance history, and to create an understanding of the collaborative roles and departments that exist.

(IV)

**DRAMA 11. The Rock and Roll Spectacle Show. 4 Units.**

A thorough overview to the development and cultural significance of the Rock 'n' Roll Spectacle show. Focus on historical and recent developments of the spectacle show, trends in the aesthetics of the field, and various sub-genres.

(IV)

**DRAMA 14. Performing Rock 'N' Roll. 4 Units.**

Explores major movements in the history of rock 'n' roll in terms of performance, not virtuosity necessarily of the performers as musicians, rather as performances of aesthetics in modes of embodied ideology, iconoclastic spectacle, mixed media fashion, and subcultural formation.

**DRAMA 15. Performance Now. 4 Units.**

Exposes students to what is most current in the world of performance and theatre. Begins with a series of lectures on the idea of performance, and the various theories that frame it.

Restriction: Music Theatre Majors have first consideration for enrollment. Drama Majors have first consideration for enrollment.

(IV)

**DRAMA 16. Performing Culture. 4 Units.**

Culture, aesthetics, and ideology (combined in the concept 'subculture') work to fashion social identities. Using theories and methodologies of performance studies, with an emphasis on American culture, this course explores why and how culture is reinforced through performance.

(IV)

**DRAMA 20A. Culture in Performance. 4 Units.**

A three-quarter foundation series exploring the rich depth of theatre, drama, and other genres of performance across a wide variety of worldwide forms, for performer and audience.

(IV)

**DRAMA 20B. Culture in Performance. 4 Units.**

A three-quarter foundation series exploring the rich depth of theatre, drama, and other genres of performance across a wide variety of worldwide forms, for performer and audience.

(IV)

**DRAMA 20C. Culture in Performance. 4 Units.**

A three-quarter foundation series exploring the rich depth of theatre, drama, and other genres of performance across a wide variety of worldwide forms, for performer and audience.

(IV)

**DRAMA 30A. Acting. 4 Units.**

Focuses on Stanislavski-based terminology and technique through theatre exercises and improvisation. The first part of a one-year series in basic acting technique and discipline.

Repeatability: May be taken for credit 2 times.

Restriction: Music Theatre Majors have first consideration for enrollment. Drama Majors have first consideration for enrollment.

**DRAMA 30B. Acting. 4 Units.**

Focuses on scene work and character development. The second part of a one-year series in basic acting technique and discipline.

Prerequisite: DRAMA 30A

Repeatability: May be taken for credit 2 times.

Restriction: Music Theatre Majors have first consideration for enrollment. Drama Majors have first consideration for enrollment.

**DRAMA 30C. Acting. 4 Units.**

Focuses on monologues, auditions, callbacks, and the profession of acting. The third part of a one-year series in basic acting technique and discipline.

Prerequisite: DRAMA 30A and DRAMA 30B

Repeatability: May be taken for credit 2 times.

Restriction: Music Theatre Majors have first consideration for enrollment. Drama Majors have first consideration for enrollment.

**DRAMA 34. Movement for Actors. 4 Units.**

A studio course in fundamentals of stretch, strength, and alignment; exploring spatial awareness and physical control through mime isolations, techniques, and related improvisation.

Repeatability: May be taken for credit 3 times.

**DRAMA 35. Speech for the Theatre. 4 Units.**

An introductory course in voice and speech for actors, combining the body-based approach to voice developed by Fitzmaurice, and speech work of Knight and Thompson. Designed for the needs of actors and is not a public speaking course.

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 40A. Development of Drama. 4 Units.**

The development of Western Drama, concentrating on the drama's intellectual, social, and artistic foundations. About 10 plays and supplementary critical material are read each quarter. Greek Drama through Shakespeare.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors have first consideration for enrollment. Drama Majors have first consideration for enrollment.

(IV and VIII ).



**DRAMA 40B. Development of Drama. 4 Units.**

The development of Western Drama, concentrating on the drama's intellectual, social, and artistic foundations. About 10 plays and supplementary critical material are read each quarter. Restoration Drama through Ibsen.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors have first consideration for enrollment. Drama Majors have first consideration for enrollment.

(IV and VIII ).

**DRAMA 40C. Development of Drama. 4 Units.**

The development of Western Drama, concentrating on the drama's intellectual, social, and artistic foundations. About 10 plays and supplementary material are read each quarter. Contemporary Drama. Post Naturalistic theatre.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors have first consideration for enrollment. Drama Majors have first consideration for enrollment.

(IV and VIII ).

**DRAMA 50A. Introduction to Costume Design. 4 Units.**

Introduction to the process and procedures employed by the costume designer for the theatre. The elements of design are discussed in the context of character development, historical period, and style. Exercises extend to drawing, rendering, and investigation of human proportions.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 50B. Introduction to Scenic Design. 4 Units.**

Introduction to the principles and practice of scenic design. Weekly problems include research into various periods and styles of production with an emphasis on the conceptual idea. Perspective drawing, rendering, and model building are covered in studio exercises and assignments.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 50C. Introduction to Lighting Design. 4 Units.**

Introduction to the principles, theories, and equipment employed by the lighting designer for the stage. Areas of investigation include history, technology, and script analysis. Detailed studio attention is given to the theory and practice of design.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 50D. Introduction to Sound Design. 4 Units.**

Principles, theories, equipment use, and terminology employed by the sound designer for the stage. Areas of study include history, technology, and script analysis. Focuses on the theory and practice of design.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 50E. Introduction to Stage Management. 4 Units.**

A basic study of theatrical, dance, and opera stage management practices, forms, and methods, from first script reading to closing night. Opportunity to observe professionals at work in regional and touring situations as available.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 60. Topics in Advanced Stage Management. 4 Units.**

Nurtures a greater appreciation for the stage manager and his or her process, and supports students who are interested in pursuing a career in professional stage management.

Repeatability: May be taken for credit 3 times as topics vary.

**DRAMA 65. Music Theatre Workshop I. 2 Units.**

Basic vocal technique and characterization of musical theatre repertoire explored.

Prerequisite: Audition required.

Repeatability: May be taken for credit 2 times.

**DRAMA 80. Directing I . 4 Units.**

Introduction to comprehensive directing process from pre-production to opening. Focus on fundamental skills: analysis, staging, action, actor coaching, and elements of design. Skills applied to scripted theatrical material. Develop a language for commenting on theatrical production. Attending and critiquing productions.

Prerequisite: DRAMA 30A and DRAMA 30B

**DRAMA 100. University Theatre . 4 Units.**

Rehearsal and performance in a faculty-directed.

Prerequisite: Audition required.

Repeatability: May be repeated for credit unlimited times.

**DRAMA 101A. Theatre Production: Costume. 1-6 Units.**

The production courses are offered to give students the opportunity to participate in departmental productions. Students engage in the production and construction of designed work as well as its applied execution during performance.

Repeatability: May be taken for credit for 24 units.

Restriction: May be taken for credit for a maximum of 24 units provided productions change.

**DRAMA 101B. Theatre Production: Scenic. 1-6 Units.**

The production courses are offered to give students the opportunity to participate in departmental productions. Students engage in the production and construction of designed work as well as its applied execution during performance.

Repeatability: May be taken for credit for 24 units.

Restriction: May be taken for credit for a maximum of 24 units provided productions change.

**DRAMA 101C. Theatre Production: Lighting. 1-6 Units.**

The production courses are offered to give students the opportunity to participate in departmental productions. Students engage in the production and construction of designed work as well as its applied execution during performance.

Repeatability: May be taken for credit for 24 units.

Restriction: May be taken for credit for a maximum of 24 units provided productions change.

**DRAMA 101D. Theatre Production: Stage Management. 1-8 Units.**

The production courses are offered to give students the opportunity to participate in departmental productions. Students engage in the production and construction of designed work as well as its applied execution during performance.

Repeatability: May be taken for credit 24 times.

Restriction: May be taken for credit for a maximum of 24 units provided productions change.

**DRAMA 101E. Theatre Production: Audio. 1-6 Units.**

The production courses are offered to give students the opportunity to participate in departmental productions. Students engage in the production and construction of designed work as well as its applied execution during performance.

Repeatability: May be taken for credit for 24 units.

Restriction: May be taken for credit for a maximum of 24 units provided productions change.

**DRAMA 101S. Theatre Production: Theatre Management. 1-6 Units.**

The production courses are offered to give students the opportunity to participate in departmental productions. Students engage in the production and construction of designed work as well as its applied execution during performance.

Repeatability: May be taken for credit for 24 units.

Restriction: May be taken for credit for a maximum of 24 units provided productions change.

**DRAMA 103. Lectures in Dramatic Literature. 4 Units.**

Courses include Medieval and Tudor Drama, Elizabethan and Jacobean Drama, Shakespeare, Restoration and Eighteenth Century Drama, Modern British Drama, Modern American Drama, Tragedy, and Comedy.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 103W. Lectures in Dramatic Literature. 4 Units.**

Courses include Medieval and Tudor Drama, Elizabethan and Jacobean Drama, Shakespeare, Restoration and Eighteenth-Century Drama, Modern British Drama, Modern American Drama, Tragedy, and Comedy.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 109. Special Topics in Theory and Criticism. 4 Units.**

Discussion of recent major trends and ideas in critical theory, concentrating on in-depth readings and lectures in particular facets of theory and criticism: Derrida, Butler, Lacan, Deleuze, and others.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 109W. Special Topics in Theory and Criticism. 4 Units.**

Discussion of recent major trends and ideas in critical theory, concentrating on in-depth readings and lectures in particular facets of theory and criticism: Derrida, Butler, Lacan, Deleuze, and others.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**(Ib)****DRAMA 110. Special Topics in Classical Dramas . 4 Units.**

Designed to introduce students to various classical traditions-early Greek and Roman theatres, to be sure, but also, by way of comparison, the classical traditions of non-European cultures.

Prerequisite: DRAMA 40A and DRAMA 40B and DRAMA 40C. Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 110W. Special Topics in Classical Dramas. 4 Units.**

Designed to introduce students to various classical traditions-early Greek and Roman theatres, to be sure, but also, by way of comparison, the classical traditions of non-European cultures.

Prerequisite: DRAMA 40A or DRAMA 40B or DRAMA 40C. Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**(Ib)**

**DRAMA 112. Special Topics in Early Modern and Neoclassical Theatre. 4 Units.**

Investigates aspects of European theatre and culture in the sixteenth, seventeenth, and eighteenth centuries; individual courses may focus on specific topics within this broad expanse.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 112W. Special Topics in Early Modern and Neoclassical Theatre. 4 Units.**

Investigates aspects of European theatre and culture in the sixteenth, seventeenth, and eighteenth centuries; individual courses may focus on specific topics within this broad expanse.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**(Ib)****DRAMA 116. Special Topics in Nineteenth-Century Dramas. 4 Units.**

Looks at the various trends and conventions of theatres in the nineteenth century, both Euro-American and beyond, paying special attention to the culture and political milieu within which these various traditions appeared.

Prerequisite: DRAMA 40A and DRAMA 40B and DRAMA 40C. Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 116W. Special Topics in Nineteenth-Century Dramas. 4 Units.**

Looks at the various trends and conventions of theatres in the nineteenth century, both Euro-American and beyond, paying special attention to the culture and political milieu within which these various traditions appeared.

Prerequisite: DRAMA 40A and DRAMA 40B and DRAMA 40C. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**(Ib)****DRAMA 118. Special Topics in Modern and Contemporary Drama. 4 Units.**

An investigation into the many forms and permutations of modern (1880-1945), and contemporary (since 1945) drama, paying special attention to the historical and philosophical interpretations of text and performance.

Prerequisite: DRAMA 40A and DRAMA 40B and DRAMA 40C. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 118W. Special Topics in Modern and Contemporary Drama . 4 Units.**

An investigation into the many forms and permutations of modern (1880-1945), and contemporary (since 1945) drama, paying special attention to the historical and philosophical interpretations of text and performance.

Prerequisite: DRAMA 40A and DRAMA 40B and DRAMA 40C. Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**(Ib)**

**DRAMA 121. Introduction to Asian Theatre. 4 Units.**

An introduction to some of the major traditional theatrical forms and dramatic texts from India, China, and Japan. Other than dramatic texts (in English translation), attention is also paid to theory, history, and performance styles of traditional Asian theatre.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 122. Asian American Theatre. 4 Units.**

An introduction to the history and development of Asian American theatre and drama. Besides play analysis, special attention is also paid to the history and politics of Asian American identity and experience, as well as to aspects of theatrical performance.

Prerequisite: DRAMA 40A and DRAMA 40B and DRAMA 40C

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 123. Multicultural Theatres. 4 Units.**

A study of the history, culture, aesthetics, and literature of various traditional performing arts and their connections to the contemporary multicultural society.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 126. African American Film and Drama. 4 Units.**

A critical investigation of films and plays written by African Americans, with emphasis on dramaturgical and cinematic strategies, individual and collective representation, and the legacy of African American political struggle.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 126W. African American Film and Drama. 4 Units.**

A critical investigation of films and plays written by African Americans, with emphasis on dramaturgical and cinematic strategies, individual and collective representation, and the legacy of African American political struggle.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Restriction: Music Theatre Majors only. Drama Majors only.

**(Ib)****DRAMA 129. Advanced Topics in Performance. 4 Units.**

Addresses particular issues in theatre and performance that typically lie outside of regular course offerings. May address such issues as the theatre of the Avant Garde, performing gender, transversality and performance, body art, installation and performance art, among other topics.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 129W. Advanced Topics in Performance. 4 Units.**

Addresses particular issues in theatre and performance that typically lie outside of regular course offerings. May address such issues as the theatre of the Avant Garde, performing gender, transversality and performance, body art, installation and performance art, among other topics.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**(Ib)****DRAMA 130. Intermediate Acting. 4 Units.**

Rehearsal and presentation of scenes from contemporary material. Focus on connection with scene partner, playing actions, and text analysis. Introduction to the credibility and theatricality of characterization and style.

Prerequisite: DRAMA 30A and DRAMA 30B and DRAMA 30C with an average grade of B or better. For transfer students: one year of beginning acting with an average grade of B or better.

Repeatability: May be taken for credit 2 times.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 132A. Writing for Performance. 4 Units.**

Completion of a full-length play or its equivalent; discussion of student writing and of relevant literary texts.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 134. Studio for Advanced Movement for Actors. 4 Units.**

Studio course in conditioning and partnering techniques to the practice of contact improvisation. Contact improvisation is explored and applied in scene study.

Prerequisite: DRAMA 34. DRAMA 34 with a grade of B or better

Repeatability: May be taken for credit 3 times.

**DRAMA 135. Master Classes in Acting. 1-4 Units.**

Advanced acting in specialized areas including acting for the camera: situation comedy, commercials; auditioning and industry preparation; Shakespeare; Molière; Chekov; improvisation; advanced movement and voice and speech for the actor; self-starting; stage combat; repertory acting, singing; comedy; clowning; and masks.

Prerequisite: DRAMA 130. DRAMA 130 with a grade of B or better

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 136. Music Theatre Acting. 4 Units.**

An acting class exclusive to the students in the B.F.A. in Music Theatre program.

Prerequisite: DRAMA 30A and DRAMA 30B and DRAMA 30C

Repeatability: May be taken for credit 4 times.

Restriction: Music Theatre Majors only.

**DRAMA 142. Music Theatre Workshop II. 4 Units.**

A workshop in audition technique and song interpretation.

Prerequisite: Audition required.

Repeatability: May be taken for credit 4 times.

**DRAMA 143A. Music Theatre Workshop III. 4 Units.**

Scene study and song repertoire examined by era for the advanced Music Theatre student. 1800s-1940.

Prerequisite: DRAMA 142. Audition required.

**DRAMA 143B. Music Theatre Workshop III. 4 Units.**

Scene study and song repertoire examined by era for the advanced Music Theatre student. 1940s-1970s.

Prerequisite: DRAMA 142. Audition required.

**DRAMA 143C. Music Theatre Workshop III. 4 Units.**

Scene study and song repertoire examined by era for the advanced Music Theatre student. 1970's-present.

Prerequisite: DRAMA 142. Audition required.

**DRAMA 144. Music Theatre Workshop IV. 4 Units.**

A performance class concentrating on role building. Work culminates with in-class performances of abbreviated versions of musicals.

Prerequisite: For B.F.A. students: DRAMA 143A, DRAMA 143B, DRAMA 143C, and audition. For Drama graduate students: audition required.

Repeatability: May be taken for credit 4 times.

Restriction: Graduate students only. Music Theatre Majors only. Drama Majors only.

**DRAMA 145. Music Theatre Singing. 1 Unit.**

Private weekly voice lessons for the advanced Music Theatre student.

Corequisite: DRAMA 143A

Repeatability: May be taken for credit 9 times.

Restriction: Music Theatre Majors only.

**DRAMA 146. NYSP-Preparation. 4 Units.**

Class preparation for the New York Satellite Program (NYSP) - an immersion experience in New York City for the musical theatre performer.

Prerequisite: Admission is by audition and the following prerequisites: DRAMA 30C and two quarters of DRAMA 148A, DRAMA 148B, or DRAMA 148C (if the 148 prerequisite is not complete at the time of auditions, student must enroll during the fall and winter quarters in the same year as the trip to New York); senior Drama majors must have successfully completed DRAMA 40C and DRAMA 120C; non-Drama majors must have sophomore standing or higher and must carefully plan their course schedule as many spring quarter classes cannot be taken while part of the NYSP.

Repeatability: May be taken for credit 2 times.

**DRAMA 148A. History of American Musical Theatre. 4 Units.**

A survey of the influential artists who produce, write, direct, and perform on America's musical stages. Surveys 1700s-1940s.

Restriction: Drama Majors only. Music Theatre Majors only.

Concurrent with DRAMA 248A.

**DRAMA 148B. History of American Musical Theatre. 4 Units.**

A survey of the influential artists who produce, write, direct, and perform on America's musical stages. Surveys 1940s-1970s.

Restriction: Drama Majors only. Music Theatre Majors only.

Concurrent with DRAMA 248B.

**DRAMA 148C. History of American Musical Theatre. 4 Units.**

A survey of the influential artists who produce, write, direct, and perform on America's musical stages. Surveys 1970s to present day.

Restriction: Drama Majors only. Music Theatre Majors only.

Concurrent with DRAMA 248C.

**DRAMA 149. Music Proficiency for Actors. 2 Units.**

A musicianship class introducing basic musical terminology, theory, and sight singing skills.

Repeatability: May be taken for credit 2 times.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 150. Costume Production Techniques. 4 Units.**

Studio instruction in pattern making, draping, millinery, and construction techniques.

Prerequisite: DRAMA 50A

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 157. Lighting Composition. 4 Units.**

Provides an opportunity for students to pursue stage lighting composition in a studio atmosphere. Laboratory practice includes weekly exercises in style and genre. Emphasis is placed on the realization of conceptual ideas.

Prerequisite: DRAMA 50C

Repeatability: May be repeated for credit unlimited times.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 158. Topics in Theatre Design. 4 Units.**

Examines the various functions of scenery and costume: locale, historical period, mood, and atmosphere, with special assignments in each area. Discussion of problems in scenic metaphors and visualization, emphasizing techniques of planning and presentation (e.g., floor plans, models, and rendering).

Prerequisite: DRAMA 50A or DRAMA 50B

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 159. Proseminar in Theatre Design. 4 Units.**

Topics in theatre design.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 164A. History of Costume. 4 Units.**

A study of the development of dress and the influence of cultural factors on clothing from the time of Egyptians to Early Baroque.

Prerequisite: DRAMA 50A

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 164B. History of Costume. 4 Units.**

A study of the development of dress and the influence of cultural factors on clothing from late Baroque to World War I.

Prerequisite: DRAMA 50A

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 176. Script and Score. 4 Units.**

A form and analysis seminar discussing the libretto and score of landmark musicals.

Prerequisite: Two courses from DRAMA 148A or DRAMA 148B or DRAMA 148C.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 177. Song Repertoire. 2 Units.**

A song coaching class culminating in a song recital or showcase. Each quarter will feature a different composer, lyricist, or musical style.

Repeatability: May be taken for credit 6 times.

Restriction: Music Theatre Majors only.

**DRAMA 180. Contemporary Dramatic Criticism and Theory. 4 Units.**

Reading and analysis of theories and critical approaches to contemporary theatre: Brecht, Artaud, and others who have contributed to the form and idea of the modern theatre. Writing of assigned exercises in dramatic criticism.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 180W. Contemporary Dramatic Criticism and Theory. 4 Units.**

Reading and analysis of theories and critical approaches to contemporary theatre: Brecht, Artaud, and others who have contributed to the form and idea of the modern theatre. Writing of assigned exercises in dramatic criticism.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only. Music Theatre Majors only.

(Ib)



**DRAMA 182A. Dance Technique, Level I. 4 Units.**

Advanced beginner and intermediate dance training including musical theatre, ballet, jazz and contemporary modern techniques and repertoire. Body conditioning is also a major component of the course.

Prerequisite: DRAMA 65 or DRAMA 142. Audition required.

Repeatability: May be taken for credit 4 times.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 182B. Dance Technique, Level I. 4 Units.**

Advanced beginner and intermediate dance training including musical theatre, ballet, jazz and contemporary modern techniques and repertoire. Body conditioning is also a major component of the course.

Prerequisite: (DRAMA 65 or DRAMA 142) and DRAMA 182A. Audition required.

Repeatability: May be taken for credit 4 times.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 183A. Dance Technique, Level II. 4 Units.**

Intermediate and advanced dance training including musical theatre, ballet, jazz and contemporary modern techniques and repertoire. Body conditioning is also a major component of the course.

Prerequisite: DRAMA 65 or DRAMA 142. Audition required.

Repeatability: May be taken for credit 4 times.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 183B. Dance Technique, Level II. 4 Units.**

Intermediate and advanced dance training including musical theatre, ballet, jazz and contemporary modern techniques and repertoire. Body conditioning is also a major component of the course.

Prerequisite: (DRAMA 65 or DRAMA 142) and DRAMA 183A. Audition required.

Repeatability: May be taken for credit 4 times.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 184. Directing II. 4 Units.**

The principles of stage directing, covering the director's functions in the areas of interpretation, composition, coaching, and styling a theatrical production. Directing exercises and projects; the final project is the preparation of a hypothetical proposal for a play production.

Prerequisite: DRAMA 30A and DRAMA 30B and DRAMA 40A and DRAMA 40B and DRAMA 40C and DRAMA 80

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 185. Advanced Directing. 4 Units.**

A seminar in directorial organization and research. Student prepares a textual and dramaturgical analysis, a production timetable, and a hypothetical production book of an assigned play.

Prerequisite: DRAMA 184

Repeatability: May be repeated for credit unlimited times.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 190. NYSP-Acting. 1-4 Units.**

New York Satellite Program acting classes taught by guest faculty in New York.

Prerequisite: DRAMA 146

Repeatability: May be taken for credit 2 times.

**DRAMA 191. NYSP - Dance. 4 Units.**

New York Satellite Program dance classes in ballet, tap, jazz, and musical theatre styles taught by guest faculty in New York.

Prerequisite: DRAMA 146

Repeatability: May be taken for credit 2 times.

**DRAMA 192. NYSP - Singing. 4 Units.**

New York Satellite Program private and group lessons in musical theatre singing taught by guest faculty in New York.

Prerequisite: DRAMA 146

Repeatability: May be taken for credit 2 times.

**DRAMA 193. NYSP - Performance. 4 Units.**

New York Satellite Program rehearsals and public, staged readings of original musicals in New York.

Prerequisite: DRAMA 146

Repeatability: May be taken for credit 2 times.

**DRAMA 194. NYSP-UCI Residency. 4 Units.**

New York Satellite Program follow-up classes and performances back on Irvine campus upon the return from New York.

Prerequisite: DRAMA 146

Repeatability: May be taken for credit 2 times.

**DRAMA 195. Music Theatre Dance - Special Topics. 1-4 Units.**

Advanced dance classes in specialized areas including the dance styles of a choreographer (de Mille, Fosse, Robbins, Tune, Stroman), genre (tap, ballroom, jazz, swing, hip-hop), or in musical theatre choreography.

Prerequisite: DRAMA 182A or DRAMA 182B or DRAMA 183A or DRAMA 183B. Audition required.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 198. Director Class Project. 1-8 Units.**

For students who are involved in the Director Class Projects at UCI as actors, directors, designers, stage managers and their assistants. M.F.A. Directors and the Head of Directing (HoD) supervise the projects.

Grading Option: Pass/no pass only.

Repeatability: Unlimited as topics vary.

**DRAMA H198. Honors Director Class Project. 1-4 Units.**

For graduate student actors and undergraduate directors who are candidates for Honors in Directing and involved in the Director Class Projects. The Head of Directing (HoD) supervises these students.

Repeatability: Unlimited as topics vary.

**DRAMA 199. Project in Theatre . 1-4 Units.**

Independent theatre projects with Drama faculty.

Repeatability: Unlimited as topics vary.

**DRAMA 200. Graduate Studio: Acting. 4 Units.**

Work in graduate studio taken in tandem with graduate studios in stage voice (DRAMA 201), stage speech (DRAMA 202), and stage movement (DRAMA 203).

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 201. Graduate Studio: Voice. 1 Unit.**

Graduate studio in vocal production for actors.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 202. Graduate Studio: Speech. 1 Unit.**

Graduate studio in speech for actors.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 203. Graduate Studio: Movement. 2 Units.**

Work in graduate studio: stage movement taken in tandem with nine graduate studios in acting (DRAMA 200), voice (DRAMA 201), speech (DRAMA 202), and voice/movement dynamics (DRAMA 206).

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 206. Graduate Studio: Voice/Movement Dynamics. 2 Units.**

Daily conditioning exercises.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 211. Graduate Studio: Directing. 4 Units.**

Graduate studio in directing.

Repeatability: Unlimited as topics vary.

Restriction: Drama graduate students only.

**DRAMA 219. Graduate Master Class. 1-4 Units.**

Various topics such as Shakespeare, comedy, Molière, improvisation, Kabuki, television acting.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 220. Seminar in Dramatic Literature. 4 Units.**

Topics in Dramatic Literature.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 225. Seminar on Theatre Pedagogy. 4 Units.**

A seminar on the major teaching systems in the dramatic arts with particular attention to professional arts training. Required prior to applying for Teaching Assistantships in studio areas.

Restriction: Drama graduate students only.

**DRAMA 240. Graduate Projects . 1-4 Units.**

Various projects depending on student's concentration (acting, design, musical theatre, directing).

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Drama and Theatre Majors only. Drama Majors only.

**DRAMA 241. Singing Pedagogy . 2 Units.**

Learning how to teach voice lessons and coach musical theatre singing. Experiences include both private voice lessons and observing the lessons given to the B.F.A./Music Theatre students.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate Music Direction students only.

**DRAMA 242. Conducting . 2 Units.**

Private conducting instruction to develop freedom of movement/expression, baton technique, ear training, and tempo memory for both rehearsal and performance situations in musical theatre.

Repeatability: May be taken for credit 9 times.

Restriction: Graduate Music Directors only.

**DRAMA 243. Script and Score . 4 Units.**

A form and analysis seminar discussing the libretto and score of landmark musicals.

Restriction: Graduate students only. Music Majors only.

Concurrent with DRAMA 176.

**DRAMA 244. Dramaturgy: Theory and Methods. 4 Units.**

Examines the practice, place, and theory of dramaturgy. Explores plays in terms of how they work: dramatic form and structure, historical context, and more. Study includes dramaturgy as a theatrical practice.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 246A. Musical Scene Study I. 4 Units.**

Musically directing scenes from musicals of various time periods. Features works from the late 19th and early 20th centuries, including songwriters Gilbert and Sullivan, Irving Berlin, George Gershwin, Rodgers and Hart, and Cole Porter.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate Music Director students only.

**DRAMA 246B. Musical Scene Study II. 4 Units.**

Musically directing scenes from musicals of various time periods. Features works from the middle of the 20th century including songwriters Rodgers and Hammerstein, Lerner and Loewe, Julie Styne, Kander and Ebb, and Jerry Herman.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate Music Directors only.

**DRAMA 246C. Musical Scene Study III. 4 Units.**

Musically directing scenes from musicals of various time periods. Features works from the late 20th and early 21st centuries including songwriters Stephen Sondheim, Andrew Lloyd Webber, Stephen Schwartz, Flaherty and Ahrens, and Jeanine Tesori.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate Music Directors only.

**DRAMA 247. Musicals Abridged . 4 Units.**

Musically directing abridged versions of musicals from various time periods and genres.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate Music Directors only.

**DRAMA 248A. History of American Music Theatre. 4 Units.**

A survey of the influential artists who produce, write, direct, and perform on America's musical stages. Surveys 1700s-1940s.

Restriction: Graduate students only.

Concurrent with DRAMA 148A.

**DRAMA 248B. History of American Musical Theatre. 4 Units.**

A survey of the influential artists who produce, write, direct and perform on America's musical stages. Surveys 1940s-1970s.

Restriction: Graduate students only.

Concurrent with DRAMA 148B.

**DRAMA 248C. History of American Musical Theatre. 4 Units.**

A survey of the influential artists who produce, write, direct and perform on America's musical stages. Surveys 1970s to present day.

Concurrent with DRAMA 148C.

**DRAMA 249. Graduate Music Direction. 4 Units.**

Various musical direction activities including the vocal direction, accompanying, and conducting of musical theatre performances.

Repeatability: May be taken for credit 9 times.

Restriction: Graduate students only. Music Majors only.

**DRAMA 251A. Foundations of Theatre. 4 Units.**

Seeks to create greater understanding in the roots and theories of theatrical models, aesthetics, action vs. reaction of differing thoughts in theatrical doctrine, and art, architecture, music, and fashion that contributed to the style and practice of theatre.

Restriction: Drama graduate students only.

**DRAMA 251B. Foundations of Theatre. 4 Units.**

Seeks to create greater understanding in the roots and theories of theatrical models, aesthetics, action vs. reaction of differing thoughts in theatrical doctrine, and art, architecture, music, and fashion that contributed to the style and practice of theatre.

Restriction: Drama graduate students only.

**DRAMA 251C. Foundations of Theatre. 4 Units.**

Seeks to create greater understanding in the roots and theories of theatrical models, aesthetics, action vs. reaction of differing thoughts in theatrical doctrine, and art, architecture, music, and fashion that contributed to the style and practice of theatre.

Restriction: Drama graduate students only.

**DRAMA 254. Graduate Stage Management. 4 Units.**

Studio exercises and projects in stage management.

Repeatability: May be repeated for credit unlimited times.

Restriction: Drama Majors only.

**DRAMA 255. Graduate Design Seminar. 4 Units.**

Projects, lectures, and critical discussion in costume, scenery, lighting, and sound design.

Restriction: Drama Majors only.

**DRAMA 256. Survival and Professional Practice in Design. 4 Units.**

Provides an in-depth examination of business skills needed to survive as a theatrical designer. Required 'Bridge' course in the Design MFA programs, relevant to all disciplines.

Restriction: Drama graduate students only.

**DRAMA 257A. Costume Thesis Project. 4 Units.**

Development of thesis project with focus on organization, research, timeline, and execution.

Prerequisite: DRAMA 240

Restriction: Drama graduate students only.

**DRAMA 257B. Scenic Thesis Project. 4 Units.**

Development of thesis project with focus on organization, research, timeline, and execution.

**DRAMA 257E. Thesis Writing Project-Stage Management. 4 Units.**

Development of thesis topic with focus on organization, research, timeline, and execution.

Prerequisite: 12 units of DRAMA 254.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Drama graduate students only.

**DRAMA 258. Drawing for Designers. 2 Units.**

A multi-skill level course in drawing technique focusing on skills essential to stage designers including line, proportion, perspective and creating dynamic compositions. Focus will primarily be in figure drawing but may include still-life, landscape, and architectural drawings. Materials fee.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 9 times.

**DRAMA 259. Theatre Colloquium. 1 Unit.**

Exposes students to a wider range of theatrical practitioners, theories, and topics through guest lecturers, special projects, and cross-disciplinary dialogue.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 260A. Digital Costume Rendering. 4 Units.**

A studio course in costume rendering for the theatre using computer image manipulation. Instruction in compositing and painting techniques and performance design conventions.

**DRAMA 260B. Digital Textile Design and Printing. 4 Units.**

A studio course in textile design using digital printing and embossing techniques. Instruction in state-of-the-art software and output manipulation for artistic expression.

**DRAMA 261. Digital Design: Drawing/Painting/Rendering. 4 Units.**

A studio course in scenic or costume rendering for the theatre using the computer for drawing/painting through the use of the digital pen/tablet.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 262. Digital Design: 2D/3D Modeling. 4 Units.**

A studio course in CAD's 2D drafting and 3D modeling capabilities for theatrical design. Instruction in state-of-the-art software for 2D and 3D object creation and theatrical presentation conventions.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 263. Digital Design: 3D Rendering. 4 Units.**

A studio course in theatrical design through 3d modeling on computer and use of state-of-the-art rendering software. Instruction emphasizes collaborative design process through the use of scenic designer/lighting designer teams for all projects.

Prerequisite: DRAMA 262

Restriction: Graduate students only. Drama and Theatre Majors only. Drama Majors only.

**DRAMA 264. Lighting Graphics. 4 Units.**

A studio course in the various graphic methods employed by lighting designers in the theatre. Projects include manual and CAD techniques for Light Plot and Paperwork creation.

Prerequisite: DRAMA 262

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 265. Digital Design: 2D CAD. 4 Units.**

A studio course in theatrical design and architectural lighting design on the computer. Instruction in state-of-the-art software for 2D object creation. Theatrical and architectural standards implemented in performance design.

Prerequisite: DRAMA 262

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 266. Digital Design: Digital Audio Systems. 4 Units.**

Comprehensive tutorial on digital audio including hard disk recording, editing, data compression, and ethernet audio distribution. Focus is on recording, editing, and delivery of audio as used by the sound designer in the digital domain.

Restriction: Drama graduate students only.

**DRAMA 267. Digital Design: Creating Sounds from Scratch. 4 Units.**

The process of analyzing sounds for their core timbral components and using that data to create new sounds - from realistic to fantastic - by means of digital manipulation.

Prerequisite: DRAMA 266

Restriction: Drama Majors only.

**DRAMA 271. Conceptual Sound Design. 4 Units.**

An intensive, project-based seminar for exploring relationships between sound and sight. Synesthesia, creative intent vs. audience perception, and sound/movement are typical of the many topics to be explored. A series of creative projects are assigned and critiqued in peer review.

Prerequisite: DRAMA 266

Restriction: Drama Majors only.

**DRAMA 272. Musical Theatre Sound/Concert Sound. 4 Units.**

A concept-to-opening study of the process of designing sound systems for musicals and live/touring sound. Special attention given to the paperwork and documentation required to package, build, and mix these shows.

Restriction: Drama Majors only.

**DRAMA 277. Critical Listening. 4 Units.**

Exploration of the many variables that affect (and effect) the audio chain. Perceiving and understanding these parameters unlocks the art of controlling sound and stylizing cues. Also includes the process of equalizing/aligning sound systems and the art of audio mastering.

Prerequisite: DRAMA 266

Restriction: Drama Majors only.

**DRAMA 279. Advanced Sound Design. 4 Units.**

An in-depth investigation into sound design for the theatre. Special emphasis is placed on text analysis, design conception, content creation, content delivery, and design organization. Class projects include creating paper designs and paperwork for different texts.

**DRAMA 280A. Techniques in Costume Design. 4 Units.**

Student exercises in the techniques and implementation of costume design.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only.

**DRAMA 280B. Techniques in Scenery Design. 4 Units.**

Student exercises in the techniques and implementation of scenic design.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only.

**DRAMA 280C. Techniques in Lighting Design. 4 Units.**

Student exercises in the techniques and implementation of lighting design.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only.

**DRAMA 280D. Techniques in Sound Design. 4 Units.**

Student exercises in the techniques and implementation of sound design.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only.

**DRAMA 282. Stage Electronics/Introduction to Show Control. 4 Units.**

Using computers and dedicated hardware to cue, control or automate sound, scenery, and lighting for live performance and themed entertainment applications.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 290. Dramatic Literature and Theatre History Prior to 1900. 4 Units.**

Studies in selected areas of dramatic literature and theatre history prior to 1900. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**DRAMA 291. Dramatic Literature and Theatre History, 1900 to Present. 4 Units.**

Studies in selected areas of dramatic literature and theatre history, 1900 to present. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**DRAMA 292. Cultural and Critical Theory. 4 Units.**

Studies in selected areas of cultural and critical theory. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**DRAMA 293. Directed Studies. 4-12 Units.**

Directed study with Drama faculty.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

**DRAMA 294. Dissertation Research. 4-12 Units.**

Dissertation research with Drama faculty.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**DRAMA 295. Professional Internship. 1-12 Units.**

An arranged internship at the South Coast Repertory Theatre, or other equity theatre company, for qualifying M.F.A. students. A stipend and equity points are provided by the theatre company.

Repeatability: May be repeated for credit unlimited times.

Restriction: Drama graduate students only.

**DRAMA 297. Dramaturgy Practicum. 4 Units.**

Requires doctoral students to identify two plays from the Drama Department's season to work as dramaturges. Students write a Dramaturgy Booklet recording their research and interactions with director, actors, and the design team. Students will work with doctoral faculty.

Restriction: Graduate students only. Drama and Theatre Majors only.

**DRAMA 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.



# Earth System Science (EARTHSS)

## Courses

### **EARTHSS 1. Introduction to Earth System Science. 4 Units.**

Covers the origin and evolution of the Earth, its atmosphere, and oceans, from the perspective of biogeochemical cycles, energy use, and human impacts on the Earth system.

(II and VA ).

### **EARTHSS 3. Oceanography. 4 Units.**

Examines circulation of the world oceans and ocean chemistry as it relates to river, hydrothermal vent, and atmospheric inputs. Geological features, the wide variety of biological organisms, and global climate changes, such as greenhouse warming, are also studied.

(II, Va)

### **EARTHSS 5. The Atmosphere. 4 Units.**

The composition and circulation of the atmosphere with a focus on explaining the fundamentals of weather and climate. Topics include solar and terrestrial radiation, clouds, and weather patterns.

(II and VA ).

### **EARTHSS 7. Physical Geology. 4 Units.**

Introduction to Earth materials and processes. Topics include rocks and minerals, plate tectonics, volcanoes, earthquakes, Earth surface processes, Earth resources, geologic time, and Earth history. Laboratory work involves hands-on study of geologic materials, maps, and exercises pertaining to geologic processes. Materials fee.

(II and VA ).

### **EARTHSS 15. Introduction to Global Climate Change. 4 Units.**

Introduction of scientific, technological, environmental, economic, and social aspects underlying the threat and understanding of global climate change. Human and natural drivers of climate. Impacts of climate on natural, managed, and human systems, including their vulnerability and ability to adapt.

(II and (VA or VIII) ).

### **EARTHSS 17. Hurricanes, Tsunamis, and Other Catastrophes. 4 Units.**

Introduction to the basic science and state of predictability of various natural catastrophic events including earthquakes, volcanic eruptions, tsunamis, landslides, floods, hurricanes, fires, and asteroid impacts and their interactions and implications with human society in the U.S. and globally.

Overlaps with PUBHLTH 90.

(II and (VA or VIII) ).

### **EARTHSS 19. Introduction to Modeling the Earth System. 4 Units.**

Simulate the Earth's system using computer models. Covers the interaction of the air, land, and ocean, and explores how changes to one part of the environment affect the complete Earth system. Utilizes technological tools to understand scientific principles.

(II, Vb)

### **EARTHSS 21. On Thin Ice: Climate Change and the Cryosphere. 4 Units.**

Introduction of the basic science that governs the cryosphere and its interaction with the climate system. Covers some of the significant economic, sociological, and political consequences of the recent melting of the cryosphere driven by anthropogenic climate change.

(II and (VA or VIII) ).

### **EARTHSS 23. Air Pollution: From Urban Smog to Global Change . 4 Units.**

Air pollution occurs on regional to global scales. A wide range of air pollution sources and physical, chemical, and meteorological sciences behind air pollution are introduced. The consequences of air pollution to our society are also discussed.

(II and (VA or VIII) ).

### **EARTHSS 27. The Sustainable Ocean. 4 Units.**

An introduction to sustainability as it relates to marine resources and conservation. Topics include the scientific basis of our understanding of marine ecosystems, and the political, social, and cultural principles that govern resource protection.

(II and VIII ).

**EARTHSS H30B. Environmental Issues Affecting the Sustainability of Societies I. 4 Units.**

Focuses on several environmental challenges facing the world today, and explores the problem, possible solutions, and their scientific, technical, and social constraints. Models for systems, their assumptions, predictive uncertainty, and interpretation, play a large role.

Prerequisite: CHEM H30A. CHEM H30A with a grade of C or better

Overlaps with EARTHSS 15.

Restriction: Campuswide Honors Collegium students only.

(II and Vb ).

**EARTHSS H30C. Environmental Issues Affecting the Sustainability of Societies II. 4 Units.**

Focuses on how we can use Earth's resources, e.g., food and water, in a more sustainable way, exploring their scientific, technical, and social constraints.

Prerequisite: EARTHSS H30B. EARTHSS H30B with a grade of C or better

Restriction: Campuswide Honors Collegium students only.

(III)

**EARTHSS 40A. Earth System Chemistry. 4 Units.**

To understand the cycling of matter on Earth, we need to learn about the chemistry of elements and molecules in the environment. Introduces students to the understanding of how chemical principles apply in context to their everyday lives.

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment.

(II and VA ).

**EARTHSS 40B. Earth System Biology. 4 Units.**

Earth System Science is a highly interdisciplinary field that requires knowledge of various components of the Earth as a system, including the biosphere. Students are introduced to several fundamental principles of biology, from the smallest cells to the largest ecosystems.

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment.

(II)

**EARTHSS 40C. Earth System Physics. 4 Units.**

Covers the fundamental physical forces and laws that affect the Earth system, such as electromagnetic radiation and energy transfer, atmospheric and ocean dynamics. Also covers aspects of physics related to environmental issues, such as electricity generation and transmission.

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment.

(II and VA ).

**EARTHSS 45. New Student Seminar. 1 Unit.**

Weekly meetings led by faculty, current students, and staff, to provide information on the Department of Earth System Science, campus resources, and special programs and opportunities. Designed for students who recently joined the Earth System Science and Environmental Science majors.

Grading Option: Pass/no pass only.

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment. New students only (freshman, transfer, and change of major).

**EARTHSS 51. Land Interactions. 4 Units.**

The role of terrestrial processes in the Earth system. Provides an introduction to ecosystem processes that regulate the cycling of energy, water, carbon, and nutrients. Analysis of the impact of human activities. Materials fee.

Corequisite: CHEM 1C

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 53. Ocean Biogeochemistry. 4 Units.**

Overview of oceanography for those interested in Earth System Science. Focus is on physical, chemical, and biological processes that drive biogeochemical cycling in the oceans. Coastal systems are also reviewed, with an emphasis on California waters.

Prerequisite: CHEM 1C

Restriction: Earth System Science Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment.

**EARTHSS 55. Earth's Atmosphere. 4 Units.**

Composition, physics, and circulation of Earth's atmosphere with an emphasis on explaining the role of atmospheric processes in shaping the climate system. Topics include atmospheric composition, the global energy balance, radiative transfer and climate, atmospheric circulation, and climate sensitivity.

Prerequisite or corequisite: (MATH 2B or MATH 5B) and (PHYSICS 3B or PHYSICS 7C)

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 70A. Sustainable Energy Systems. 4 Units.**

Addresses how modern energy services can be provided sustainably and the challenges and barriers that must be overcome. Major environmental issues are discussed, such as climate change, air pollution, and resource demands.

Prerequisite or corequisite: EARTHSS 40C or PHYSICS 3C or PHYSICS 7E

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 70B. Sustainable Food and Water Systems. 4 Units.**

Explores the biophysical underpinnings of food production, the history of agricultural development, and a range of environmental issues facing agricultural systems, including water management, climate change, and land use.

Prerequisite or corequisite: EARTHSS 40B or (BIO SCI 93 and BIO SCI 94)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 100. Special Topics in Earth System Science. 1-4 Units.**

Devoted to current topics in the field of Earth System Science. Topics addressed vary each quarter.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Repeatability: May be taken for credit for 12 units as topics vary.

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 101. Paleoclimatology. 4 Units.**

Explores past changes in Earth's climate. Topics include tools and techniques used to reconstruct past climate from natural archives; records and mechanisms of past climate changes throughout Earth history; and lessons learned from the paleo-record for prediction of future climate.

Prerequisite: EARTHSS 51 and EARTHSS 53 and EARTHSS 55

Restriction: Earth System Science Majors have first consideration for enrollment.

Concurrent with EARTHSS 201.

**EARTHSS 112. Global Climate Change and Impacts. 4 Units.**

Observations over the 20th century show extensive changes in atmospheric composition, climate and weather, and biological systems that have paralleled industrial growth. Evidence of globally driven changes in these biogeochemical systems is studied, including projected impacts over the 21st century.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 114. Earth System Science Laboratory and Field Methods. 4 Units.**

Introduction to methods used to measure exchange of gases and energy between the atmosphere and terrestrial ecosystems. Laboratories include data acquisition and isotopic and chromatographic analysis. Field measurements at UCI's Marsh Reserve include microclimate, hydrology, trace-gas exchange, and plant growth. Materials fee.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 115. Aquatic Field Methods. 4 Units.**

Students design sampling plans, conduct field research techniques, and carry out data analyses that are relevant to aquatic field research. Aquatic field sites covered in the course include marine, estuarine, and fluvial systems. Materials fee.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 116. Introduction to Environmental Data Science. 4 Units.**

Analysis and interpretation of geophysical data, including functional fitting, probability density functions, and multidimensional time-series methods, with applications in atmospheric, oceanic, and biogeochemical sciences.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 118. Analysis, Modeling, and Visualization of Multidimensional Environmental Data. 4 Units.**

Students learn programming and numerical methods in Python with applications in Earth System Science and ecology. Topics include regression, uncertainty and significance, the development of simple box models, and the visualization of multi-dimensional climate and satellite datasets.

Prerequisite: I&C SCI 31 or EARTHSS 116

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 122. Atmospheric Dynamics. 4 Units.**

Fluid dynamical processes that determine the large-scale flow of the atmosphere and ocean. Most important are interactions between the density stratification and the Coriolis force associated with Earth's rotation. Topics include circulation, vorticity, planetary waves, and their role in climate.

Prerequisite: EARTHSS 55 and (PHYSICS 7C or PHYSICS 3B)

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 124. Weather Analysis. 4 Units.**

Provides an overview of weather systems in midlatitudes and tropics. The fundamental dynamics possible for these weather systems are described. Elementary weather analysis and forecasting techniques are introduced.

Prerequisite: EARTHSS 55

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 130. Physical Oceanography. 4 Units.**

Physical processes that determine the distribution of water properties such as salt and temperature. Fluid-dynamical underpinnings of physical oceanography. Wave motions. The wind-driven and thermohaline circulation. Similarities and differences between ocean and atmosphere dynamics.

Prerequisite: (PHYSICS 7C or PHYSICS 3B) and EARTHSS 53

Restriction: Earth System Science Majors have first consideration for enrollment.

**EARTHSS 132. Terrestrial Hydrology. 4 Units.**

Comprehensive treatment of modern conceptual and methodological approaches to hydrological science. Combines qualitative understanding of hydrological processes with quantitative representation, approaches to measurement, and treatment of uncertainty. Components of the hydrological cycle and their linkages within the coupled Earth system.

Prerequisite: (EARTHSS 51 and EARTHSS 55) or (EARTHSS 40C and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 133. Soil: It's the Good Dirt. 4 Units.**

An introduction to the critical role soils play in sustaining land ecosystems and humans. Covers how soils form and how human actions contribute to the pollution and loss but also the health and productivity of soils.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors only. Environmental Science Majors only. Earth System Science Majors only.

**EARTHSS 134. Fundamentals of GIS for Environmental Science. 4 Units.**

Introduction to Geographic Information Systems (GIS). Topics include fundamentals of cartography, creating/editing GIS data, linking spatial and tabular data, georeferencing, map projections, geospatial analysis, spatial statistics, and the development of GIS models. Examples from hydrology, ecology, and geology.

Prerequisite: (EARTHSS 51 and EARTHSS 53) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 138. Satellite Remote Sensing for Earth System Science. 4 Units.**

Satellite remote sensing data are increasingly used to study the Earth system. Provides an overview of the principles behind remote sensing, and the types of satellite data available for study of the oceans, land, and atmosphere.

Prerequisite: (EARTHSS 51 and EARTHSS 53) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 140. Advanced Geology. 4 Units.**

Introduces students to the geological processes which have formed and continue to shape the Earth. Topics include geological time, minerals and the rock cycle, plate tectonics and associated geological hazards, earth resources, and earth surface processes. Materials fee.

Prerequisite: EARTHSS 51 or EARTHSS 70B

Overlaps with EARTHSS 7.

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 142. Atmospheric Chemistry. 4 Units.**

Chemistry of the troposphere and stratosphere. Topics include processes controlling the lifetime and reaction pathways of chemicals in the atmosphere, the role of the atmosphere in biogeochemical cycles, and interactions between atmospheric chemistry and the physical climate system.

Prerequisite: (CHEM 1C or CHEM H2C or CHEM M3C) and (PHYSICS 3C or PHYSICS 7E) and (MATH 2B or MATH 5B or AP Calculus BC). AP Calculus BC with a minimum score of 4

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 144. Marine Geochemistry and Biogeochemistry. 4 Units.**

Processes controlling the major and minor element composition of seawater and element distributions in the ocean. Gas exchange, carbon dioxide system, stable isotopes, radionuclides as tracers and chronometers, particle fluxes, organic geochemistry, sediment geochemistry, global cycles of biogeochemically important elements.

Prerequisite: EARTHSS 53 or CHEM 51C

Restriction: School of Physical Sciences students have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 146. Consequences of Air Pollution. 4 Units.**

From public health to the global climate system, this course explores the impacts of air pollution from the beginning of human history to current and emerging issues. Scientific concepts behind air pollution and solutions are discussed.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 40C and EARTHSS 70A)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 148. Marine Ecosystems and Global Change. 4 Units.**

Presents an overview of marine ecosystem structure, diversity, and processes in the context of global change, including the impacts of climate warming, ocean acidification, marine fisheries, and anthropogenic additions of nutrients and pollutants.

Prerequisite: EARTHSS 53 or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

Concurrent with EARTHSS 248.

**EARTHSS 154. Ecosystem Services. 4 Units.**

Covers what ecosystem services are, how to classify them, what the impacts of land degradation are on ecosystem services, how to quantify and value them, and the importance of mainstreaming ecosystem services in decision-making.

Prerequisite: (EARTHSS 70A and EARTHSS 70B) or (EARTHSS 51 and EARTHSS 53 and EARTHSS 55)

Same as BIO SCI E146.

**EARTHSS 156. The Future of Forests. 4 Units.**

Introduces students to the determinants of global forest distribution; ecosystem services associated with forest functioning; threats to forests resulting from climate and land-use change; and, opportunities for conserving natural forests in the near future.

Prerequisite: (EARTHSS 70A and EARTHSS 70B) or (EARTHSS 51 and EARTHSS 53 and EARTHSS 55)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 158. Research Methods for Sustainable Systems Analysis. 4 Units.**

Develops students' analytical skills that are necessary to engage and assess the sustainability of coupled human and natural systems and effectively communicate their findings.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B). Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment. Global Sustainability Minors have first consideration for enrollment.

**EARTHSS 162. The Impact of Climate Change on California's Landscape. 4 Units.**

Overview of anticipated impacts of climate change on California's landscape. Includes projections of future climate; anticipated impacts on ecology, hydrology, wildfire, coastal environment, and agriculture; and efforts to reduce greenhouse gas emissions or adapt to climate change through land management.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 164. Ecosystem Ecology. 4 Units.**

A mechanistic perspective on ecosystem processes. Covers ecosystem development, element cycling, and interactions with plants and microbes. The role of ecosystems in environmental change is also addressed.

Prerequisite: BIO SCI E106 or EARTHSS 51 or EARTHSS 60A or CHEM 51C

Same as BIO SCI E118.

Restriction: Earth System Science Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Ecology and Evolutionary Biol Majors have first consideration for enrollment.

Concurrent with EARTHSS 264.

**EARTHSS 168. Physiological Plant Ecology. 4 Units.**

An examination of the interactions between plants and their environment. Emphasis on the underlying physiological mechanisms of plant function, adaptations and responses to stress, and the basis of the distribution of plants and plant assemblages across the landscape.

Prerequisite: EARTHSS 51 or BIO SCI 94 or (EARTHSS 60A and EARTHSS 60C)

Same as BIO SCI E127.

Restriction: Biological Sciences Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 171. Microbial Biogeochemistry. 4 Units.**

Develops an understanding of microorganisms in the context of their environment, environmental impact, and role in the global cycles of C,N,P, etc. Focuses on tools used to evaluate microbial diversity and function, and applications of microbial ecology.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors only. Environmental Science Majors only. Earth System Science Majors only.

**EARTHSS 176W. Marine Conservation, Policy, and Society. 4 Units.**

Conservation of marine ecosystems is important yet challenging due to competing physical, ecological, social, and regulatory issues. Students explore the principles of marine conservation, the scientific basics of marine ecosystems, and political and social processes involved with resource protection.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B). Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

(Ib)

**EARTHSS 177W. Documenting and Understanding Earth System Change. 4 Units.**

Students select a time series of key environmental interest as the focus for their writing. They become familiar with common writing practices for the Earth Sciences, and exercise their ability to use the scientific method to produce reports.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B). Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Environmental Science and Policy Majors only. Environmental Science Majors only. Earth System Science Majors only.

(Ib)

**EARTHSS 179. Climate Solutions. 4 Units.**

Focuses on carbon neutrality and climate stability, addressing.

Same as ENGRMAE 119, UPPP 111.

Restriction: Upper-division students only.



**EARTHSS 190A. Senior Seminar on Global Sustainability I. 2 Units.**

Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum is also required. Seminar utilized to analyze forum presentations. Prepare bibliography.

Same as BIO SCI 191A, SOCECOL 186A.

Restriction: Seniors only. Global Sustainability Minors have first consideration for enrollment.

**EARTHSS 190B. Senior Seminar on Global Sustainability II. 2 Units.**

Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum is also required. Seminar utilized to analyze forum presentations. Prepare research proposal.

Prerequisite: BIO SCI 191A or SOCECOL 186A or EARTHSS 190A

Same as BIO SCI 191B, SOCECOL 186B.

Restriction: Seniors only.

**EARTHSS 190CW. Writing/Senior Seminar on Global Sustainability III. 4 Units.**

Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum also is required. Seminar utilized to analyze Forum presentations and to prepare senior research paper. Prepare/write research paper under direction of faculty member.

Prerequisite: BIO SCI 191B or EARTHSS 190B or SOCECOL 186B. BIO SCI 191B or EARTHSS 190B or SOCECOL 186B. Satisfactory completion of the Lower-Division Writing requirement.

Same as BIO SCI 191CW, SOCECOL 186CW.

Restriction: Seniors only.

**(Ib)****EARTHSS 191. Introduction to Research in Earth System Science. 1 Unit.**

Weekly presentations by Earth System Science faculty describing ongoing research in their laboratories. Students are introduced to the range of research topics and methods in Earth System Science and to the research opportunities available within the Department.

Prerequisite: (EARTHSS 60A and EARTHSS 60B) or (EARTHSS 51 and EARTHSS 53)

Grading Option: Pass/no pass only.

Restriction: Earth & Atmospheric Sciences Minors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 192. Careers in Earth System Science. 1 Unit.**

A weekly seminar course designed to help students transition to post-graduation career paths. Topics include designing effective resumes, applying to graduate school, and seeking employment. Also includes presentations by faculty, business, and government leaders describing potential environmental science career trajectories.

Grading Option: Pass/no pass only.

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 197. Independent Study in Earth System Science. .5-4 Units.**

Field study, educational outreach, or other independent projects under faculty direction. Interested students should arrange with an ESS faculty member to supervise and support an independent study project. A written summary is required at the end of each quarter.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 12 units.



**EARTHSS 198W. Senior Thesis in Earth System Science. 4 Units.**

Students receive guidance on the effective oral and written communication of research results. Students prepare and present a seminar, a poster, and a written thesis describing their research in Earth System Science.

Prerequisite: Two quarters of EARTHSS 199. Satisfactory completion of the Lower-Division Writing requirement.

Overlaps with EARTHSS H198.

(Ib)

**EARTHSS H198. Honors Thesis in Earth System Science. 4 Units.**

Students receive guidance on effective written and oral communication of research results. Students prepare and present a seminar, poster, and written thesis describing their honors research in Earth System Science. Submission of the thesis and successful completion of this course will also satisfy the UCI upper-division writing requirement.

Prerequisite: ESS 199A and ESS 199B

Restriction: Consent of instructor to enroll and Prerequisite required

(Ib)

**EARTHSS 199. Undergraduate Research. 1-4 Units.**

For undergraduates with majors in science or engineering. Interested students should arrange with an ESS faculty member to supervise and support a research project. A written summary is required at the end of each quarter.

Repeatability: May be taken for credit for 12 units.

**EARTHSS H199A. Honors Research in Earth System Science. 4 Units.**

Undergraduate honors research in Earth System Science. A student commitment of 10-15 hours a week is expected, and a written report is required at the end of the quarter.

Restriction: Earth System Science Honors students only. Campuswide Honors Collegium students only.

**EARTHSS H199B. Honors Research in Earth System Science. 4 Units.**

Undergraduate honors research in Earth System Science. A student commitment of 10-15 hours a week is expected, and a written report is required at the end of the quarter.

Restriction: Earth System Science Honors students only. Campuswide Honors Collegium students only.

**EARTHSS H199C. Honors Research in Earth System Science. 4 Units.**

Undergraduate honors research in Earth System Science. A student commitment of 10-15 hours a week is expected, and a written report is required at the end of the quarter.

Restriction: Earth System Science Honors students only. Campuswide Honors Collegium students only.

**EARTHSS 200. Global Physical Climatology. 4 Units.**

A descriptive overview of Earth's climate system and energy budget. Large-scale circulations, key physical processes, and climate sensitivity of the atmosphere, ocean, land surface, and cryosphere.

Restriction: Graduate students only.

**EARTHSS 201. Paleoclimatology . 4 Units.**

Explores past changes in Earth's climate. Topics include tools and techniques used to reconstruct past climate from natural archives; records and mechanisms of past climate changes throughout Earth history; and lessons learned from the paleo-record for predication of future climate.

Restriction: Graduate students only.

Concurrent with EARTHSS 101.

**EARTHSS 202. Climate Change. 4 Units.**

Explores past, present, and projected changes in Earth's climate. Topics include paleoclimate records and mechanisms of natural climate variability at a range of timescales (orbital to seasonal); General Circulation Models; and IPCC observations and projections of future climate change.

Restriction: Graduate students only.

**EARTHSS 204. Humans in the Earth System. 4 Units.**

Focuses on the human systems of energy and food production which have the greatest effects on the Earth system. Assess the physical mechanisms and feedbacks of human-nature interactions and consider approaches of mitigation, interventions, and adaptation.

Restriction: Graduate students only. Earth System Science Majors only.

**EARTHSS 212. Geoscience Modeling and Data Analysis. 4 Units.**

Computer-based course. Fundamental statistical techniques needed to analyze Earth system data and models. Basic numerical techniques to solve Earth system models. Focuses on linear and non-linear ordinary differential equations, as well as simple partial differential equations.

Restriction: Graduate students only.

**EARTHSS 215. Cryosphere. 4 Units.**

A global perspective of the major components of the cryosphere. Includes current extent and trends, mass balance, energetics, and physical processes. Quantitative assessment of current state, in situ and remote observations, and interactions with climate.

Restriction: Graduate students only.

**EARTHSS 224. Ocean Processes. 4 Units.**

Introduction to the physics, chemistry, and biology of the oceans. Offers a mechanistic perspective of the structure and functioning of marine ecosystems, nutrient cycles, and role of ecosystem dynamics in local and global biogeochemistry.

Restriction: Graduate students only.

**EARTHSS 225. Marine Biogeochemistry. 4 Units.**

Overview of ocean biology and biogeochemistry, with a focus on lower trophic levels and the roles of biota in the marine biogeochemical cycles of key elements.

Restriction: Doctor of Philosophy Degree students have first consideration for enrollment. Graduate students only. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 226. Land Surface Processes. 4 Units.**

A mechanistic perspective of the structure and functioning of terrestrial ecosystems. Includes processes such as nutrient cycling, biogeochemical cycling, mass balance, energetics, terrestrial hydrology, and water cycle.

Restriction: Graduate students only.

**EARTHSS 228. Geophysical Fluid Dynamics. 4 Units.**

Introduces fluid dynamical processes that determine the large-scale flow of the atmosphere and ocean, with particular emphasis on the interactions between the stable density stratification and the Coriolis force associated with Earth's rotation.

Restriction: Graduate students only.

**EARTHSS 230. Physical Oceanography. 4 Units.**

Physical processes that determine the distribution of water properties such as salt and temperature. Fluid-dynamical underpinnings of physical oceanography. Wave motions. The wind-driven and thermohaline circulation. Similarities and differences between ocean and atmosphere dynamics.

Prerequisite: MATH 2D and PHYSICS 7A and PHYSICS 7B and PHYSICS 7E

Restriction: Graduate students only.

**EARTHSS 238. Satellite Remote Sensing for Earth System Science. 4 Units.**

Satellite remote sensing data are increasingly used to study the Earth system. Provides an overview of the principles behind remote sensing, and the types of satellite data available for study of the oceans, land, and atmosphere.

**EARTHSS 240. Atmospheric Chemistry and Physics. 4 Units.**

Examines the physical/chemical processes which determine the structure and composition of Earth's atmosphere and its role in the climate system.

Restriction: Graduate students only.

**EARTHSS 242. Advanced Atmospheric Chemistry. 4 Units.**

Chemistry of the troposphere and stratosphere. Topics include: processes controlling the lifetime and reaction pathways of chemicals in the atmosphere, the role of the atmosphere in biogeochemical cycles, and interactions between atmospheric chemistry and the physical climate system.

Restriction: Graduate students only.

**EARTHSS 244. Introduction to Atmospheric Dynamics. 4 Units.**

Covers fundamentals of atmospheric dynamics including thermodynamics, quasi-geostrophy, the weak-temperature gradient of the tropics, and the turbulent boundary layer.

Restriction: Graduate students only.

**EARTHSS 248. Marine Ecosystems and Global Change. 4 Units.**

Presents an overview of marine ecosystem structure, diversity, and processes in the context of global change, including the impacts of climate warming, ocean acidification, marine fisheries, and anthropogenic additions of nutrients and pollutants.

Prerequisite: EARTHSS 224

Restriction: Graduate students only.

Concurrent with EARTHSS 148.

**EARTHSS 252. Environmental Isotope Geochemistry. 4 Units.**

Covers the fundamentals of stable, radioactive, and radiogenic isotope variability in the Earth System. Focuses on theory, measurement techniques, biogeochemistry, hydrology, ecology, and climate related applications.

Restriction: Graduate students only.

Concurrent with EARTHSS 152.

**EARTHSS 256. Paleoclimatology and Paleocceanography. 4 Units.**

Explores past changes in Earth's climate. Topics include tools and techniques used to reconstruct past climate from natural archives; records and mechanisms of past climate changes throughout Earth history; and lessons learned from the paleo-record for prediction of future climate.

Restriction: Graduate students only.

**EARTHSS 264. Ecosystem Ecology . 4 Units.**

A mechanistic perspective on ecosystem processes. Covers ecosystem development, element cycling, and interactions with plants and microbes. The role of ecosystems in environmental change is also addressed.

Prerequisite: CHEM 51C

Concurrent with EARTHSS 164 and BIO SCI E118.

**EARTHSS 266. Global Biogeochemical Cycles. 4 Units.**

Global biogeochemical cycling of the elements. Topics include global cycling of carbon, nitrogen, oxygen, and sulfur; impact of human activities on biogeochemical processes.

Restriction: Graduate students only.

**EARTHSS 280A. Special Topics in Earth System Science. 1-4 Units.**

Each quarter is devoted to current topics in the field of Earth System Science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**EARTHSS 280B. Special Topics in Earth System Science. 1-4 Units.**

Each quarter is devoted to current topics in the field of Earth System Science. Topics addressed vary each quarter.

Prerequisite: EARTHSS 280A

Repeatability: Unlimited as topics vary.

**EARTHSS 280C. Special Topics in Earth System Science. 1-4 Units.**

Each quarter is devoted to current topics in the field of Earth System Science. Topics addressed vary each quarter.

Prerequisite: EARTHSS 280B

Repeatability: Unlimited as topics vary.

**EARTHSS 282C. Special Topics in Climate. 1-4 Units.**

Each quarter is devoted to in-depth analysis of an important and rapidly developing area in the field of climate dynamics. Topics addressed vary each quarter.

Prerequisite: EARTHSS 282B

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EARTHSS 286A. Special Topics in Biogeochemistry. 1-4 Units.**

Each quarter is devoted to in-depth analysis of a subarea in biogeochemistry which is undergoing rapid development. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EARTHSS 286B. Special Topics in Biogeochemistry. 1-4 Units.**

Each quarter is devoted to in-depth analysis of a subarea in biogeochemistry which is undergoing rapid development. Topics addressed vary each quarter.

Prerequisite: EARTHSS 286A

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EARTHSS 286C. Special Topics in Biogeochemistry. 1-4 Units.**

Each quarter is devoted to in-depth analysis of a subarea in biogeochemistry which is undergoing rapid development. Topics addressed vary each quarter.

Prerequisite: EARTHSS 286B

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EARTHSS 288C. Special Topics in Ecosystems. 1-4 Units.**

Each quarter is devoted to current topics relating to Ecosystems. Topics addressed vary each quarter.

Prerequisite: EARTHSS 288B

Repeatability: Unlimited as topics vary.

**EARTHSS 290. Seminar. 1 Unit.**

Weekly seminars and discussions on topics of general and current interest in Earth System Science. Topics addressed vary each quarter.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EARTHSS 298. Practicum in Earth System Science. 4 Units.**

Designed to introduce first-year graduate students to research. Students explore research opportunities and develop a proposal for a summer research project under the direction of a faculty mentor.

Restriction: Graduate students only.

**EARTHSS 299. Research. 2-12 Units.**

Supervised original research in areas of Earth System Science.

Repeatability: May be repeated for credit unlimited times.

**EARTHSS 399. University Teaching. 1-4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## East Asian Studies (EAS)

### Courses

**EAS 15C. Introductory Topics in Chinese Literature. 4 Units.**

Introduces students to major themes in Chinese literature and culture through the close reading, discussion, and analysis of selected texts in English translation.

Repeatability: Unlimited as topics vary.

Restriction: Korean Literature and Culture Majors only. Chinese Studies Majors only. Japanese Language Literature Majors only. East Asian Cultures Majors only.

**EAS 15J. Introductory Topics in Japanese Literature. 4 Units.**

Introduces students to major themes in Japanese literature and culture through the close reading, discussion, and analysis of selected texts in English translation.

Repeatability: Unlimited as topics vary.

Restriction: Korean Literature and Culture Majors only. Chinese Studies Majors only. Japanese Language Literature Majors only. East Asian Cultures Majors only.

**EAS 15K. Introductory Topics in Korean Literature. 4 Units.**

Introduces students to major themes in Korean literature and culture through the close reading, discussion, and analysis of selected texts in English translation.

Repeatability: Unlimited as topics vary.

Restriction: Korean Literature and Culture Majors only. Chinese Studies Majors only. Japanese Language Literature Majors only. East Asian Cultures Majors only.

**EAS 20. Topics in Asian Religions . 4 Units.**

An introduction to Asian religions (Hinduism, Buddhism, Confucianism, Taoism, Shamanism) including both elite doctrinal aspects and forms of more popular religiosity.

Repeatability: May be taken for credit 3 times as topics vary.

(IV and VIII ).

**EAS 40. Topics in East Asian Popular Culture. 4 Units.**

Selected topics in the popular cultural traditions of East Asia designed to introduce students both to problems in situating culture in a specific time and place and to contemporary theories of popular culture and their application to East Asian contexts.

Repeatability: Unlimited as topics vary.

(IV and VIII ).

**EAS 55. Introduction to East Asian Cultures . 4 Units.**

Interdisciplinary courses organized each year around a broad theme designed to introduce students to the cultures of East Asia. Topical organization of courses addresses issues that have been of importance historically and are reshaping East Asia today.

Repeatability: May be taken for credit 3 times as topics vary.

(IV and VIII ).

**EAS H84. Traveling East/West. 4 Units.**

Traveling East/West presents a wide range of travel writings by Chinese, Indian, and Euro-American authors in which they contemplate the complexities of cross-cultural encounters and how knowledge about others and knowledge of ourselves are closely intertwined.

Same as HUM H84.

Restriction: Campuswide Honors Collegium students only.

**(IV)****EAS 110. Topics in Chinese Literature and Society. 4 Units.**

Studies in Chinese texts in their social and cultural context(s). Conducted in English.

Repeatability: May be taken for credit 3 times as topics vary.

**EAS 116. Topics in East Asian Religions. 4 Units.**

Selected topics in the religions of East Asia, e.g., Buddhism, Daoism, Shintô, Christianity, popular religions.

Repeatability: May be taken for credit 3 times as topics vary.

**EAS 117. Topics in East Asian Philosophy. 4 Units.**

Selected topics in the philosophies of East Asia, e.g., Yoga, Buddhism, Vedanta, Confucianism, Taoism, and Shinto.

Repeatability: Unlimited as topics vary.

**EAS 120. Topics in Japanese Literature and Society. 4 Units.**

Studies in Japanese texts in their social and cultural context(s). Conducted in English.

Repeatability: May be taken for credit 3 times as topics vary.

**EAS 123. Structure of Japanese. 4 Units.**

An overview of the linguistic features of modern Japanese. Provides students with a systematic introduction to the nature and characteristics of the language.

Same as LSCI 165B.

**EAS 126. Topics in East Asian Linguistics. 4 Units.**

In-depth examination of selected topics in the linguistics of East Asian languages, including Chinese, Japanese, Korean, and Vietnamese.

Repeatability: May be taken for credit 3 times as topics vary.

**EAS 130. Topics in Korean Society and Culture. 4 Units.**

Studies of the social and cultural forces that affect the lives of the Koreans, including those in the United States. Considers traditional values and contemporary issues within a historical framework.

Repeatability: May be taken for credit 3 times as topics vary.

**EAS 140. Topics in Korean Literature and Society. 4 Units.**

Studies in Korean texts in their social and cultural context(s). Conducted in English.

Repeatability: May be taken for credit 3 times as topics vary.

**EAS 150. Topics in East Asian Literature in Translation. 4 Units.**

East Asian literary works in translation. Taught in English.

Repeatability: Unlimited as topics vary.

**EAS 155. Topics in Cultural Studies in East Asia. 4 Units.**

Interdisciplinary and theoretical introduction to issues in cultural studies that are pertinent to the study of East Asia. All readings in English.

Repeatability: Unlimited as topics vary.

**EAS 160. Topics in East Asian Cinema. 4 Units.**

Study of East Asian cinema from historical, theoretical, and comparative perspectives. Taught in English.

Repeatability: Unlimited as topics vary.

**EAS 170. Topics in Gender in East Asia . 4 Units.**

Explores the construction of gender in East Asian cultures and literatures. Pays close attention to the specificity of historical, cultural, and literary contexts of East Asia as it investigates various theoretical and critical perspectives on gender and sexuality.

Repeatability: Unlimited as topics vary.

**EAS 190. Junior-Senior Colloquium. 4 Units.**

Specialized courses dealing with primary sources; required reports and papers. Each colloquium reflects the instructor's intellectual interest and is conducted as a discussion group. Limited to 15 students.

Repeatability: May be taken for credit 3 times as topics vary.

Restriction: Upper-division students only. Korean Literature and Culture Majors only. Chinese Studies Majors only. Japanese Language Literature Majors only. East Asian Cultures Majors only.

**EAS 192W. Junior-Senior Seminar. 4 Units.**

Analysis of a literary or cultural topic or problem through research and writing of two short and one long research paper for a minimum of 4,000 total words. Seminar follows EAS 190; related to the colloquium's subject.

Prerequisite: EAS 190. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 3 times as topics vary.

**(Ib)****EAS 199. Independent Study. 1-4 Units.**

Investigation of special topics through directed reading in translation. Paper required.

Repeatability: May be taken for credit for 12 units.

**EAS 216. Topics in East Asian Religions . 4 Units.**

Selected topics in the religions of East Asia, e.g., Buddhism, Daoism, Shintô, Islam, shamanism.

Repeatability: May be taken for credit 3 times as topics vary.

**EAS 220. Topics in East Asian Cultural Studies. 4 Units.**

Seminar, with topics varying from year to year. Research paper required.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EAS 225. Topics in East Asian Applied Linguistics. 4 Units.**

In-depth examination of selected topics in applied linguistics, with a particular emphasis on language acquisition and language pedagogy.

Repeatability: May be taken for credit 3 times as topics vary.

Concurrent with EALL 125.

**EAS 260. Topics in East Asian Cinema. 4 Units.**

An examination of the possibilities of East Asian cinematic narrative. Possible topics: cinematic history; cinema in popular culture; comparisons with literary texts; major auteurs. Emphasis on technical as well as on thematic aspects. Includes readings in film theory.

Prerequisite: EAS 160

Repeatability: Unlimited as topics vary.

**EAS 290. Independent Study. 2-4 Units.**

Directed research on topic determined in consultation with faculty member. A term paper or project is required.

Repeatability: May be repeated for credit unlimited times.

**EAS 299. Dissertation Research. 4-12 Units.**

Dissertation research for students who are advanced to doctoral candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**EAS 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Ecology and Evolutionary Biology (ECO EVO)

### Courses

**ECO EVO 200A. Research in Ecology and Evolutionary Biology. 2-12 Units.**

Individual research with Ecology and Evolutionary Biological faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ECO EVO 200B. Research in Ecology and Evolutionary Biology. 2-12 Units.**

Individual research with Ecology and Evolutionary Biological faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ECO EVO 200C. Research in Ecology and Evolutionary Biology. 2-12 Units.**

Individual research with Ecology and Evolutionary Biological faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ECO EVO 201. Seminar in Ecology and Evolutionary Biology. 2 Units.**

Invited speakers, graduate students, and faculty present current research in ecology and evolutionary biology.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

Concurrent with BIO SCI E107.

**ECO EVO 203A. Graduate Tutorial in Ecology and Evolutionary Biology. 2-12 Units.**

Advanced study in areas not represented by formal courses. May involve individual or small group study through reading, discussion, and composition.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ECO EVO 203B. Graduate Tutorial in Ecology and Evolutionary Biology. 2-12 Units.**

Advanced study in areas not represented by formal courses. May involve individual or small group study through reading, discussion, and composition.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ECO EVO 203C. Graduate Tutorial in Ecology and Evolutionary Biology. 2-12 Units.**

Advanced study in areas not represented by formal courses. May involve individual or small group study through reading, discussion, and composition.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.



**ECO EVO 204. Writing Grant Proposals. 4 Units.**

Provides students with hands-on experience writing proposals in the research areas of ecology, evolution, or physiology.

Restriction: Graduate students only.

**ECO EVO 205. Special Topics in Ecology. 4 Units.**

Survey of special topics in Ecology.

Restriction: Graduate students only.

**ECO EVO 206. Special Topics in Evolution. 4 Units.**

Extensive introduction to the primary literature of evolutionary biology. Topics include population genetics, quantitative genetics, neutralism, molecular evolution, evolution of genetic systems, genetic architecture of fitness, speciation, and macroevolution.

Restriction: Graduate students only.

**ECO EVO 207. Quantitative Methods in Ecology and Evolutionary Biology. 4 Units.**

Statistics for ecologists and evolutionary biologists. Emphasis on specific applications and underlying assumptions rather than on methods of calculation. Topics include experimental design, parametric and nonparametric methods, analysis of variance and covariance, and multiple regression.

Prerequisite: Completion of at least one quarter of statistics including regression and analysis of variance.

Restriction: Graduate students only.

**ECO EVO 208. Ecological and Evolutionary Physiology. 4 Units.**

A summary of information in organismal biology, comparative and ecological physiology, and the biophysical basis of organismal function. Course offered every other fall.

Restriction: Graduate students only.

**ECO EVO 210. Foundations of Physiology. 4 Units.**

Physical and functional principles common to many living forms. Course forms a basis for subsequent specialization in any of the subdisciplines of physiology. Course offered in even years.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 219. Advanced Topics in Ecological Genetics. 4 Units.**

Content and instructor will vary from year to year. Possible topics include coevolution, sex-ratio evolution, evolution senescence, plant population biology, and density-dependent selection.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 221. Advanced Topics in Ecology. 2-4 Units.**

Weekly discussion of current topics in ecology at the graduate level.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

**ECO EVO 222. Statistical Learning in Ecology and Evolution. 4 Units.**

Reviews basic principals of variance/bias trade-offs. Topics include models for prediction and classification, variable selection methods, cross-validation, tree based methods, unsupervised learning. Applications in ecology and evolution using R.

Prerequisite: ECO EVO 207. ECO EVO 207 with a grade of B or better

Restriction: Graduate students only.

**ECO EVO 227. Plant Physiological Ecology. 4 Units.**

Provides a summary of information on plant organismal biology, comparative and ecological physiology, and functional ecology. Offered every other fall.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 228. Seminar in Conservation Biology. 2 Units.**

Devoted to the application of basic ecological principles to the understanding and resolution of environmental problems of both local and global natures. Current problems approached through a combination of readings, group discussions, and visiting speakers.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 230. Topics in Microbial Ecology. 2-4 Units.**

Weekly discussion of current topics in ecology, biogeochemistry, evolution, and physiology of microbial organisms.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**ECO EVO 235. Experimental Evolution. 2 Units.**

Explores experimental evolution, which is now a well-established part of evolutionary biology. With the advent of genomics, it is now one of the most powerful tools for studying the genetic foundations of biology.

Prerequisite: BIO SCI E106

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Biological Sciences students only.

**ECO EVO 246. Seminar in Ecology and Evolution Education. 2 Units.**

Weekly discussion of teaching techniques and challenges that are specific to courses in ecology and evolutionary biology. Emphasis will be on using evidence-based pedagogy techniques. There will be a combination of readings, group discussions and speakers.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 251. Evolutionary and Ecological Principles in Medicine. 4 Units.**

Explore the dynamics of populations on an ecological, epidemiological, and medical level. Considers the dynamics of competition, predation, and parasitism; the spread and control of infectious diseases; and the in vivo dynamics of viral infections and the immune system.

Restriction: Graduate students only.

Concurrent with BIO SCI E151.

**ECO EVO 253. Functional and Structural Evolutionary Genomics. 4 Units.**

Function and organization of genomes analyzed from an evolutionary perspective. Review of some of the most recent experimental approaches in genome analysis and comparative genomics. Relevant software to analyze DNA and expression data is used.

Concurrent with BIO SCI E153.

**ECO EVO 262. Professional Workshop. 2 Units.**

Identify and attend professional or technical skill workshops to gain professional knowledge and certifications related to conservation and restoration science.

Repeatability: May be taken for credit 4 times.

Restriction: Graduate students only.

**ECO EVO 264. Conservation Biology. 4 Units.**

Explores concepts in ecology with potential for conserving biological diversity. Identifies creative applications of ecological research that mitigate impacts of rapid human population growth and habitat destruction on biodiversity.

Restriction: Graduate students only.

**ECO EVO 265. Restoration Ecology. 4 Units.**

Study of principles and practices that help recover degraded ecosystems including restoration in different ecological systems, restoration motives and intensities, implementation and monitoring, and scope and success of case studies.

Restriction: Graduate students only.

**ECO EVO 266L. Field Methods in Restoration. 4 Units.**

Laboratory experience performing field methods that help recover degraded ecosystems in different ecological systems. Emphasis on the plant community composition, soil, irrigation, maintenance, and monitoring of a project.

**ECO EVO 267. Science Communication. 2 Units.**

Develops students' abilities to convey information related to conservation and restoration in a way that has broad appeal and/or effective messaging for non-scientific audiences by assessing the audience, developing effective storytelling, and deploying a persuasive information campaign.

Repeatability: May be taken for credit 2 times.

**ECO EVO 268. Technical Writing. 2 Units.**

Practice developing key documents for restoration projects including a response to a request for proposal (RFP), a restoration project plan, and a monitoring and maintenance plan.

**ECO EVO 269. Project Management. 2 Units.**

Discover the planning, design, implementation, and aftercare phases of managing a conservation or restoration project. Students will project cost, manage risk, analyze sites, evaluate and review projects, and become familiar with common permitting and consultation requirements.

**ECO EVO 270. GIS for Environmental Science. 4 Units.**

Introduction to the fundamental principles of GIS. Topics include cartography, creating/editing GIS data, georeferencing, map projections, geospatial analysis, spatial statistics, and development of GIS models. Focuses on theory and practice.

Restriction: Graduate students only.

**ECO EVO 271. Marine Research and Conservation Methods. 4 Units.**

Field-based introduction to marine ecology and conservation management through the study of the ecology, resource management, and conservation of marine habitats and species, and the use of a variety of marine field research methods.

Restriction: Graduate students only.

**ECO EVO 272. Plant Diversity in a Changing World. 4 Units.**

Investigation of plant diversity in California and throughout the world, including basic systematic concepts, introduction to major groups of flowering plants, and the effects of global biological change on plant diversity. Students carry out a phylogenetic analysis using appropriate software.

Concurrent with BIO SCI E172.

**ECO EVO 275. Wildlife Ecology and Sampling. 4 Units.**

Field-based introduction to wildlife management through the study of the ecology, physiology, population biology management, and conservation of vertebrate wildlife species, and the use of a variety of different wildlife sampling techniques.

Restriction: Graduate students only.

**ECO EVO 282. Fundamentals of Informatics for Biologists. 4 Units.**

Students learn the fundamentals of bioinformatics and the unix operating system (including the shell and Sun Grid Engine) in order to assemble a eukaryotic genome.

Restriction: Graduate students only.

**ECO EVO 283. Advanced Informatics for Biologists. 4 Units.**

Students learn advanced informatics including the analysis of: Poolseq, RNAseq, ATACseq, and ChIPseq datasets using programs such as bwa, tophat, cufflinks, DEseq, Trinity, Augustus, etc., in a unix high-performance computing environment. Statistical tests carried out and publication quality.

Prerequisite: ECO EVO 282

Restriction: Graduate students only.

**ECO EVO 285. Topics in Evolutionary Genetics. 2 Units.**

Weekly discussion of recent research on evolutionary genetics.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 286. MCRS Capstone. 2-12 Units.**

Apply knowledge and skills in a practical professional setting, working with practitioners to identify a conservation or management problem and then to plan, implement, and evaluate a solution.

Repeatability: May be taken for credit for 12 units.

Restriction: Graduate students only.

**ECO EVO 287. Communicating Research Through Video. 4 Units.**

Students explore videography to develop basic production skills through practice with high interest special topics, such as laboratory experimental evolution and educational interdisciplinary field events, and then develop media to communicate their own research or other topics of interest.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 288. Documenting Research Through Cinematic Production. 4 Units.**

Students gain advanced media expertise by conceptualizing investigative research into publicly engaging video projects. Popularly accessible research topics will be adapted into documentary, television, or cinematic pieces that provide opportunities for developing professionally marketable skills in educationally effective media production.

Prerequisite: ECO EVO 287

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 341. Teaching Science in Secondary School. 4 Units.**

Prospective secondary science teachers learn how to teach science in grades 7-12. Covers State science requirements, a variety of teaching methods, criteria for selecting science curricular materials, and how to plan science lessons, units, experiments, projects, and demonstrations.

Same as EDUC 341.

Restriction: Master of Arts in Teaching Degree students only.

**ECO EVO 398. Teaching Assistant Seminar. 2 Units.**

Readings, lectures, workshops, and student presentations designed to help develop teaching skills of graduate students teaching university-level biology classes. Topics vary and may include: course organization, presentation styles, exam design, grading, motivating students, and commonly encountered problems.

Repeatability: May be repeated for credit unlimited times.

**ECO EVO 399. University Teaching. 4 Units.**

Mandatory course for Ecology and Evolutionary Biology Teaching Assistants, required in each quarter in which student has a Teaching Assistant position. Limited to Teaching Assistants.

Repeatability: May be repeated for credit unlimited times.

## Economics (ECON)

### Courses

**ECON 1. Introduction to Economics. 4 Units.**

An analysis of the problems society faces in organizing itself to provide goods and services. How decisions of government, business, and the individual relate to current economic problems such as unemployment, inflation, poverty, and environmental pollution.

Restriction: No Economics Majors. ECON 1 may not be taken for credit if taken concurrently or after ECON 20A or ECON 20B.

(III)

**ECON 11. The Internet and Public Policy. 4 Units.**

How the Internet works. Current public policy issues concerning the Internet. Introductory economics. Communications law. Interactions between information technology, economics, and law. Case studies about Internet and communications policy.

Same as ICS 11.

(II or III).

**ECON 12. Federal Reserve: Past, Present, and Future. 4 Units.**

Studies central banking in the United States from colonial times to the present. Focuses on the past, present, and future of the Federal Reserve and precursors to that system, which was established in 1913.

**ECON 13. Global Economy. 4 Units.**

Acquaints students with the fundamental patterns of the global economy. Emphasizes the historical roots and political implications of economic choices.

Same as IS 13.

Restriction: International Studies Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

(III, VIII)

**ECON 15A. Probability and Statistics in Economics I. 4 Units.**

An introduction to probability, statistics, and econometrics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Examples from economics.

Prerequisite: MATH 2A and MATH 2B

Overlaps with MGMT 7.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

(Va)

**ECON 15B. Probability and Statistics in Economics II. 4 Units.**

An introduction to probability, statistics, and econometrics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Examples from economics.

Prerequisite: ECON 15A

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

(Va)

**ECON 17. An Economic Approach to Religion. 4 Units.**

Introduction to how basic economic concepts such as demand, supply, consumption, production, competition, free-riding, innovation, regulation, and rent-seeking can be applied to understand observed religious behavior.

Same as RLGN 17.

(III)

**ECON 20A. Basic Economics I. 4 Units.**

The fundamentals of microeconomics. The behavior of firms and consumers: markets, supply/demand, utility maximization, resource allocation, and efficiency.

Overlaps with MGMT 4A, ECON 23.

Restriction: Economics, Quantitative Economics, Business Economics, and Business Info Management majors have first consideration for enrollment. For School of Social Sciences majors, MGMT 4A may not be used as a substitute for ECON 20A.

(III)

**ECON 20B. Basic Economics II. 4 Units.**

The fundamentals of macroeconomics. Government behavior: monetary and fiscal policy, inflation, and unemployment. Effective fall 2006, the content of Economics 20B is macroeconomics. This course cannot be taken to repeat Economics 20B taken prior to fall 2006.

Prerequisite: ECON 20A or ECON 13 or ECON 23

Overlaps with MGMT 4B.

Restriction: Business Information Mgmt Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment. For School of Social Sciences majors, MGMT 4B may not be used as a substitute for ECON 20B.

(III)

**ECON 23. Basic Economics for Engineers. 4 Units.**

The fundamentals of microeconomics. The behavior of firms and of consumers: markets, supply/demand, utility maximization, resource allocation, and efficiency.

Overlaps with ECON 20A.

Restriction: Engineering Majors only. Mechanical Engineering Majors only. Aerospace Engineering Majors only. Civil Engineering Majors only. Environmental Engineering Majors only.

(III)

**ECON 25. The Economics of Accounting Decisions. 4 Units.**

Introduction to accounting concepts and principles, including the accounting model and accounting style, transaction analysis, and preparation of financial statements. An analysis of the similarities and differences between accounting and economic concepts (e.g., value, profits).

Prerequisite: ECON 20A

Overlaps with MGMT 30A.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 100A. Intermediate Economics I. 4 Units.**

Determinants of supply and demand; operation of competitive and monopolistic markets; imperfections of the market system, explanations of unemployment, inflation, recessions; public policy for macroeconomic problems.

Prerequisite: ECON 20A and ECON 20B and MATH 2A and MATH 2B

Overlaps with ECON 105A.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 100B. Intermediate Economic II. 4 Units.**

Determinants of supply and demand; operation of competitive and monopolistic markets; imperfections of the market system, explanations of unemployment, inflation, recessions; public policy for macroeconomic problems.

Prerequisite: ECON 100A

Overlaps with ECON 105B.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 100C. Intermediate Economic III. 4 Units.**

Determinants of supply and demand; operation of competitive and monopolistic markets; imperfections of the market system, explanations of unemployment, inflation, recessions; public policy for macroeconomic problems.

Prerequisite: ECON 100B

Overlaps with ECON 105C.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 105A. Intermediate Quantitative Economics I . 4 Units.**

An advanced and mathematical version of ECON 100A for students in the Quantitative Economics major.

Prerequisite: ECON 20A and ECON 20B and MATH 2A and MATH 2B and MATH 3A

Overlaps with ECON 100A.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 105B. Intermediate Quantitative Economics II . 4 Units.**

An advanced and mathematical version of ECON 100B for students in the Quantitative Economics major.

Prerequisite: ECON 105A

Overlaps with ECON 100B.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 105C. Intermediate Quantitative Economics III . 4 Units.**

An advanced and mathematical version of ECON 100C for students in the Quantitative Economics major.

Prerequisite: ECON 105B

Overlaps with ECON 100C.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 107. Economics of Asymmetric Information. 4 Units.**

Focuses on the effects of asymmetric information in the markets for traditional economic goods and resources, such as labor, insurance, used cars, credit, and in auctions and bargaining problems. Prerequisite:..

Prerequisite: ECON 100A or ECON 105A

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 109. Special Topics in Economic Theory. 4 Units.**

Studies in selected areas of Economics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: May be repeated for credit unlimited times.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 115. Behavioral Economics. 4 Units.**

Studies the behavioral and psychological biases in economics settings. Both individual decisions and games are discussed.

Prerequisite: ECON 20A and ECON 20B

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 116A. Game Theory I. 4 Units.**

Extensive form games with perfect information, and coalitional games. The key solution concepts are Nash Equilibrium, Backward Induction, and the Core. Substantive examples include public good production, oligopoly, electoral competition, auctions, holdup, market entry, and voting.

Prerequisite: (ECON 15B or STAT 120B) and (ECON 100A or ECON 105A)

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 116B. Game Theory II. 4 Units.**

Two-quarter sequence on game theory. Bayesian games, extensive form games with imperfect information, zero-sum games.

Prerequisite: ECON 116A

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 122A. Applied Econometrics I. 4 Units.**

Introduction to econometrics emphasizing practical applications in microeconomics and macroeconomics.

Prerequisite or corequisite: ECON 100A or ECON 105A and (ECON 15B or MATH 130B or MATH 133A or STAT 120C)

Overlaps with ECON 123A, ECON 123B.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 122B. Applied Econometrics II. 4 Units.**

Introduction to econometrics emphasizing practical applications in microeconomics and macroeconomics.

Prerequisite: ECON 122A

Overlaps with ECON 123B.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 122CW. Data Analysis Writing. 4 Units.**

Research writing course in econometrics focusing on individual research projects. Students employ econometric analysis to address an economic question in a 20-page paper and present their findings to the class in a short presentation.

Prerequisite: ECON 15A and ECON 15B and ECON 122A and ECON 122B. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

(Ib)

**ECON 123A. Econometrics I. 4 Units.**

Specification, estimation, and testing of econometric models. Applications in various areas of microeconomics and macroeconomics.

Prerequisite: MATH 2A and MATH 2B and MATH 3A and STAT 120A and STAT 120B and (STAT 120C or MATH 131C) and (ECON 100A and ECON 100B and ECON 100C) or (ECON 105A and ECON 105B and ECON 105C)

Overlaps with ECON 122A, ECON 122B.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 123B. Econometrics II. 4 Units.**

Specification, estimation, and testing of econometric models. Applications in various areas of microeconomics and macroeconomics.

Prerequisite: ECON 123A

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.



**ECON 123CW. Econometrics III. 4 Units.**

Seminar course in which students do an original econometric research project.

Prerequisite: ECON 123B. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

(Ib)

**ECON 125. Business Forecasting. 4 Units.**

Students learn how to produce forecasts of the behavior of economic (and other) variables. The techniques examined are linear regression, nonlinear regression, and nonparametric kernel regression; AR, MA, ARMA, ARIMA, and Box-Jenkins.

Prerequisite: ECON 122A

Overlaps with MGMT 180.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 126. Computational Macroeconomics. 4 Units.**

Introduction to the computational methods for studying economic growth and the business cycle. Students learn how to write computer programs to simulate macroeconomic models, download and manage data from internet resources, and to do basic statistics.

Prerequisite or corequisite: (ECON 100C or ECON 105C) and (ECON 122A or ECON 123A)

Restriction: Business Economics Majors only. Economics Majors only. Quantitative Economics Majors only.

**ECON 127A. Experimental Economics . 4 Units.**

Students will learn what constitutes proper experimental design and what laboratory experiments teach us about human behavior and the economy. Students will participate in a sample experiment, evaluate the results, and discuss experiment design and larger issues. Formerly ECON 117.

Prerequisite: ECON 15B and ECON 100B

**ECON 128. Machine Learning for Economists. 4 Units.**

Develops the theory and computation of recent methods at the intersection of econometrics and machine learning as used in economics and business. Building on intermediate econometrics, it introduces causal random forests, double machine learning, and neural networks.

Prerequisite: ECON 123A

Restriction: Business Economics Majors only. Economics Majors only. Quantitative Economics Majors only.

**ECON 129. Special Topics in Quantitative Methods. 4 Units.**

Studies in selected areas of Quantitative Methods. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 131A. The Economics of Risk and Uncertainty. 4 Units.**

The theory of insurance and joint-ownership of risky enterprises; optimal procedures for the allocation of uncertain payoffs.

Prerequisite or corequisite: (ECON 15B or ECON 105A or MATH 130B) and (ECON 100B or ECON 105B or STAT 120B or MATH 133A) and (ECON 100C or STAT 120C)

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 132A. Introduction to Financial Investments. 4 Units.**

Modern theories of investment and their application to the study of financial markets. The relation between risk and return, diversification, asset pricing, efficient markets hypothesis, and the market valuation of stocks, bonds, options, and futures.

Prerequisite or corequisite: ECON 15A and ECON 15B and (ECON 122A or ECON 123A) and (ECON 100A and ECON 100B and ECON 100C) or (ECON 105A and ECON 105B and ECON 105C) or (MATH 130A and STAT 120A and STAT 120B and STAT 120C) or MATH 130B or MATH 133A

Overlaps with MGMT 141.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 134A. Corporate Finance. 4 Units.**

Provides an overview of the modern theory and practice of corporate finance and focuses on two fundamental financial decisions; investment as well as financing. Beginning with discounted cash flow analysis, basic theory will be applied to the valuation of stocks.

Prerequisite: (ECON 100A and ECON 100B and ECON 100C) or (ECON 105A and ECON 105B and ECON 105C) and (ECON 15A or MATH 130A or STAT 120A) and (ECON 15B or STAT 120B)

Overlaps with MGMT 109.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 135. Mathematics of Finance. 4 Units.**

After reviewing tools from probability, statistics, and elementary differential and partial differential equations, concepts such as hedging, arbitrage, Puts, Calls, the design of portfolios, the derivation and solution of the Blac-Scholes, and other equations are discussed.

Prerequisite: MATH 3A or MATH H3A

Same as MATH 176.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Mathematics Majors have first consideration for enrollment.

**ECON 137W. Financial Markets and the Macroeconomy. 4 Units.**

Students are required to write a paper on a research question related to.

Prerequisite: ECON 122A or ECON 123A. Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**ECON 139. Special Topics in Financial Economics. 4 Units.**

Studies in selected areas of Financial Economics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 140. Managerial Economics. 4 Units.**

A collection of concepts and methods for effective decision making. Explores how the tools of microeconomics, including game theory and industrial organization theory, can be used to make better managerial decisions, particularly those involving allocation of resources within firms.

Prerequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B)

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 141A. Public Economics I. 4 Units.**

Examines the role of the government in the economy and its impact on individuals and firms.

Prerequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B)

**ECON 141B. Public Economics II. 4 Units.**

Theory of public goods, externalities, voting models, analysis of bureaucracy, the Tiebout model, income redistribution, intergovernmental grants.

Prerequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B)

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 142A. Industrial Organization I. 4 Units.**

The theory of market structure. Imperfect markets, government policies, and industry performance.

Prerequisite: (ECON 15A and ECON 15B) and (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B)

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 142CW. Industrial Organization III. 4 Units.**

Research in industrial organization. Satisfies the honors research requirement.

Prerequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B). Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

(Ib)

**ECON 143. Energy Economics. 4 Units.**

The economics of markets for oil, natural gas, electricity, and renewable energy, and their interactions with each other and the rest of the economy. Effects of government intervention, policy measures, economic policy issues arising between energy use and the environment.

Prerequisite: ECON 15A and (ECON 100A or ECON 105A)

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 144A. Urban Economics I. 4 Units.**

Why cities exist, economics of urban land-use, housing demand and tenure choice, traffic congestion.

Prerequisite or corequisite: ECON 20A and ECON 20B. Recommended: ECON 100A.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 144B. Urban Economics II. 4 Units.**

Housing policy analysis, urban public goods and services, crime, pollution, urban amenities.

Prerequisite: ECON 20A and ECON 20B. Recommended: ECON 100A.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 145E. Economics of the Environment. 4 Units.**

Surveys economic aspects of natural resources, pollution, population, and the environment. Examines the causes of pollution; analysis of public policies regarding these problems. Emphasis on microeconomic aspects of environmental problems.

Prerequisite: ECON 100A or ECON 105A

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 145FW. Economics of the Environment II. 4 Units.**

Applications of the tools covered in ECON 145E to topics such as global warming, destruction of the ozone layer, and emissions trading. Emphasis on independent research papers. Syllabus and classes include writing technique.

Prerequisite: ECON 145E. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

(Ib)

**ECON 145L. Economics of Law. 4 Units.**

Examination of several economic concepts which are useful in understanding legal rules: externalities, the assignment of property rights, and Coase's theorem. Examples are drawn from the fields of pollution control, no-fault insurance, medical malpractice, and product liability.

Prerequisite or corequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B)

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 146A. Illegal Economics. 4 Units.**

How illegal firms function in illegal markets, why individuals participate in these groups and markets, and what federal, state, and local governments do to disrupt organized illegal activity.

Same as CLS C182.

Restriction: Business Economics Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**ECON 147A. Corporate Governance. 4 Units.**

Studies topics in the internal organization of firms, including rent seeking, incentive contracts, principal-agent problems, internal labor markets, contests, and herd behavior.

Prerequisite: ECON 100A

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 147B. Economics of Strategy. 4 Units.**

Uses tools of economics, game theory in particular, to develop an understanding of business decision-making. Deals with questions such as how the firm decides what kind of business to be in, how large should it be, and others.

Prerequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B)

Overlaps with MGMT 110, MGMT 168.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 148. Business Decisions. 4 Units.**

Surveys normative and descriptive models of decision-making behavior, with an emphasis on organizational and policy contexts. Topics include rational choice theory, biases and heuristics, framing effects, and overconfidence. Management fads, panics, and herd behavior are also discussed.

Prerequisite: (ANTH 10A and ANTH 10B and ANTH 10C) or (SOCL 10A and SOCL 10B and SOCL 10C) or (SSCI 10A and SSCI 10B and SSCI 10C) or (MATH 2A and MATH 2B and (STAT 7 or MGMT 7)) or (STAT 120A and STAT 120B and STAT 120C) or (ECON 15A and ECON 15B)

Same as SOCL 138.

Restriction: Sociology Majors have first consideration for enrollment.

**ECON 149. Special Topics in Economics of Public and Private Organizations. 4 Units.**

Studies in selected areas of Economics of Public and Private Organizations. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 149W. Special Topics in Economics of Public and Private Organizations. 4 Units.**

Studies in selected areas of Economics of Public and Private Organizations. Topics addressed vary each quarter.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**(Ib)****ECON 151A. Labor Economics and Human Resources I. 4 Units.**

Labor demand, labor supply, human capital, personnel economics, and other topics.

Prerequisite: (ECON 15A and ECON 15B) and (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B)

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 152A. Economic Anthropology. 4 Units.**

Economic systems in comparative perspective: production, distribution, and consumption in market and non-market societies; agricultural development in the third world.

Prerequisite: One course in general science, anthropology, economics, geography, or sociology.

Same as ANTH 125A.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment. Anthropology Majors have first consideration for enrollment.

**ECON 154. Voting and Political Manipulation. 4 Units.**

Introduction to social choice and cooperative games. Topics include majority rule, types of voting methods, apportionment and proportional representation, agenda manipulation, coalition formation, voting power, political consequences of electoral laws.

Same as IS 156A, SSCI 121T, PLSC 151H.

Restriction: International Studies Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON H155. Current Issues in Political Economy. 4 Units.**

Political economy seeks explanations that combine insights from both economics and politics. Topics include the interaction of government and markets, the causes of the Great Recession, and the sources of income and wealth inequality.

Prerequisite: ECON 20A or ECON 20B or ECON 13 or IS 13

Restriction: Economics Honors students only.

**ECON 157. Economic Development. 4 Units.**

Considers the process of economic development across the globe and why some countries are rich and others poor. Discusses the major problems facing developing countries, such as population growth, education, capital formation, environmental protection, and international trade.

Prerequisite: ECON 20A and ECON 20B

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 158. Economics of Education. 4 Units.**

Arms students with tools, concepts, and evidence that can be used to analyze complex policy questions in education, enabling students to arrive at their own reasoned judgments about how to improve education.

Prerequisite: ECON 15A and ECON 100A

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 161A. Money and Banking. 4 Units.**

Basic elements of money and banking: institutional features and economics of financial markets and, in particular, the U.S. banking system; determinants of interest rates; the Federal Reserve and its role in money supply; effects of money on output and inflation.

Prerequisite or corequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B) and (ECON 100C or ECON 105C)

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 161B. International Money. 4 Units.**

Open economy macroeconomics and determination of exchange rates. Asset-market approach to the balance of payments. Internal and external balance in the economy. Macroeconomic policies under fixed and floating exchange rates. The international monetary system and institutions.

Prerequisite or corequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B) and ECON 100C

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 161D. Advanced Money and Banking. 4 Units.**

Studies business cycles in the United States during the last century. The first portion of the course reviews the theoretical models employed to study economic fluctuations and empirical methods used to measure fluctuations.

Prerequisite: ECON 161A and (ECON 100C or ECON 105C)

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 162. Poverty, Growth, and Development. 4 Units.**

Examines India as a case study for each of the topics studied: growth experience of India along with its poverty eradication record, aspects of poverty, and the policies that have been undertaken to tackle poverty.

Prerequisite: (ECON 15A or STAT 120A) and (ECON 15B or STAT 120B) and (ECON 100A and ECON 100B and ECON 100C) or (ECON 105A and ECON 105B and ECON 105C)

**ECON 164AW. The Industrial Revolution in Western Europe. 4 Units.**

How do economists explain the process of economic development during the past three centuries? Has the process of industrialization affected living standards? Focusing on these questions, students learn how to apply economic theory and quantitative methods.

Prerequisite or corequisite: ECON 100C or ECON 105C. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

(Ib)

**ECON 164C. American Economic History from Colonization to the Present. 4 Units.**

Examines how the American economy evolved from colonization to the post-war era. Topics include relations with foreign countries, the emergence of manufacturing and big business, railroads, slavery, war, the Great Depression, the rise of fiscal and monetary policies.

Prerequisite: ECON 20A and ECON 20B

**ECON 165. Economics of International Business . 4 Units.**

Students learn to understand and analyze the principal economic issues in the international business arena. Covers topics such as trade theory, foreign direct investment, foreign exchange market, and strategy of international business.

Prerequisite or corequisite: ECON 100C or ECON 105C

**ECON 167. International Trade and Commercial Policy. 4 Units.**

Determination of trade flows and the relative prices. Gains from trade, the terms of trade, and income distribution. Imperfect competition and international trade. The effect of tariffs, export subsidies, and import quotas. The effects of free and restricted trade.

Prerequisite: ECON 100A or ECON 105A

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 169. Special Topics in Development Economics. 4 Units.**

Studies in selected areas of Development Economics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 190. Senior Thesis. 4 Units.**

Students work with faculty to complete their honors thesis.

Repeatability: May be taken for credit 3 times.

**ECON 190BW. Economics Honors Colloquium II. 4 Units.**

Colloquium required for honors students in Economics, Quantitative Economics, and Business Economics. Introduces students to independent research and helps students plan a research program. Students complete their thesis.

Prerequisite: ECON H190A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Economics Honors students only.

**(Ib)****ECON H190A. Economics Honors Colloquium I. 4 Units.**

Colloquium required for honors students in economics, quantitative economics, and business economics. Introduces students to independent research. Helps students plan a research program. Prepares students for thesis writing.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Economics Honors students only.

**ECON 197. Field Study. 4 Units.**

Not listed in Catalogue.

Repeatability: Unlimited as topics vary.

Restriction: Authorization required or Enrollment by add card only

**ECON 198. Directed Group Study. 4 Units.**

Not listed in Catalogue.

Repeatability: Unlimited as topics vary.

Restriction: Authorization required or Enrollment by add card only

**ECON 199. Independent Study. 1-5 Units.**

Independent research with Economics faculty.

Repeatability: May be repeated for credit unlimited times.

**ECON 200A. Graduate Colloquium for Economics I. 2 Units.**

Weekly reports and colloquia by faculty, students, and visitors. Supplemented by class discussion of these presentations and other material on current research methodology.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Economics Majors only.

**ECON 200B. Graduate Colloquium for Economics II. 2 Units.**

Weekly reports and colloquia by faculty, students, and visitors. Supplemented by class discussion of these presentations and other material on current research methodology.

Prerequisite: ECON 200A

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Economics Majors only.

**ECON 200C. Graduate Colloquium for Economics III. 2 Units.**

Weekly reports and colloquia by faculty, students, and visitors. Supplemented by class discussion of these presentations and other material on current research methodology.

Prerequisite: ECON 200B

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Economics Majors only.

**ECON 202. Probability and Statistics. 4 Units.**

Provides lectures on probability theory and the beginning of mathematical statistics (continued in ECON 220A-ECON 221A) necessary to prepare students for the required econometrics sequence. Topics include probability, distributions, mathematical expectation, sampling, and point estimation.

Restriction: Graduate students only.

**ECON 203A. Mathematics for Economists. 4 Units.**

Gives students the mathematical background required for graduate work in economics. Topics covered include multivariate calculus, differential equations, and linear algebra.

Restriction: Graduate students only.

**ECON 210A. Microeconomic Theory I. 4 Units.**

Theoretical microeconomics. Emphasis on the meaning and empirical interpretation of theoretical models. Topics include theory of the firm, theory of the market, theory of the consumer, duality theory, application to econometrics, general equilibrium and welfare economics, uncertainty, game theory.

Restriction: Graduate students only.

**ECON 210B. Microeconomic Theory II. 4 Units.**

Theoretical microeconomics. Emphasis on the meaning and empirical interpretation of theoretical models. Topics include theory of the firm, theory of the market, theory of the consumer, duality theory, application to econometrics, general equilibrium and welfare economics, uncertainty, game theory.

Prerequisite: ECON 210A

Restriction: Graduate students only.

**ECON 210C. Microeconomic Theory III. 4 Units.**

Theoretical microeconomics. Emphasis on the meaning and empirical interpretation of theoretical models. Topics include theory of the firm, theory of the market, theory of the consumer, duality theory, application to econometrics, general equilibrium and welfare economics, uncertainty, game theory.

Prerequisite: ECON 210B

Restriction: Graduate students only.

**ECON 210D. Macroeconomic Theory I. 4 Units.**

Advanced macroeconomic theory including alternative macroeconomic models, microeconomic foundations of macroeconomics, investment and growth theory, inflation and unemployment, rational expectations and macroeconomic policy, wealth effects, crowding out and fiscal policy, money and interest, open economy models.

Restriction: Graduate students only.



**ECON 210E. Macroeconomic Theory II. 4 Units.**

Advanced macroeconomic theory including alternative macroeconomic models, microeconomic foundations of macroeconomics, investment and growth theory, inflation and unemployment, rational expectations and macroeconomic policy, wealth effects, crowding out and fiscal policy, money and interest, open economy models.

Corequisite: ECON 211L

Prerequisite: ECON 210D

Restriction: Graduate students only.

**ECON 210F. Macroeconomic Theory III. 4 Units.**

Advanced macroeconomic theory including alternative macroeconomic models, microeconomic foundations of macroeconomics, investment and growth theory, inflation and unemployment, rational expectations and macroeconomic policy, wealth effects, crowding out and fiscal policy, money and interest, open economy models.

Prerequisite: ECON 210E

Restriction: Graduate students only.

**ECON 211L. Macroeconomics Theory II Lab. 2 Units.**

Overview of stochastic processes; introduction to dynamic programming; two equilibrium concepts; Ricardian equivalence; real business cycle model; complete versus incomplete markets; asset pricing and the equity premium puzzle.

Corequisite: ECON 210E

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**ECON 219. Special Topics in Economic Theory. 2-4 Units.**

Studies in selected areas of Economic Theory. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ECON 220A. Statistics and Econometrics I. 4 Units.**

Takes up where ECON 202 leaves off. Continuing in the likelihood perspective, begins with Bayesian point estimation and then covers interval estimation and hypothesis testing from both frequentist and Bayesian perspectives.

Corequisite: ECON 221A

Restriction: Graduate students only.

**ECON 220B. Statistics and Econometrics II. 4 Units.**

Begins by relaxing the ideal conditions of the standard regression model. Potential topics include kernel density estimation, instrumental variables (IV), two stage least squares (2SLS), panel data models, and simulation-based Bayesian methods, including Gibbs sampling, and the bootstrap.

Corequisite: ECON 221B

Prerequisite: ECON 220A

Restriction: Graduate students only.

**ECON 220C. Statistics and Econometrics III. 4 Units.**

Covers econometric time series, discrete choice and count models, sample selection, and duration models along with Bayesian and classical asymptotic methods.

Corequisite: ECON 221C

Prerequisite: ECON 220B

Restriction: Graduate students only.

**ECON 221A. Statistics and Econometrics Laboratory I. 2 Units.**

Discussion of problems in statistics and econometrics, and their relationships to statistical and econometrics theory. Instruction in the use of computers for applied econometric work.

Corequisite: ECON 220A

**ECON 221B. Statistics and Econometrics Laboratory II. 2 Units.**

Discussion of problems in statistics and econometrics, and their relationships to statistical and econometrics theory. Instruction in the use of computers for applied econometric work.

Corequisite: ECON 220B

**ECON 221C. Statistics and Econometrics Laboratory III. 2 Units.**

Discussion of problems in statistics and econometrics, and their relationships to statistical and econometrics theory. Instruction in the use of computers for applied econometric work.

Corequisite: ECON 220C

**ECON 222. Replication and Applied Economics Writing. 4 Units.**

Before the course begins, students choose a published empirical economics article and obtain the necessary data to replicate it. Students will replicate and extend the economic analysis and write a paper describing their work.

Prerequisite: ECON 220A and ECON 220B and ECON 220C

**ECON 223A. Discrete Choice Econometrics. 4 Units.**

Specification, estimation, and testing of discrete choice models, with emphasis on cross-sectional and panel data models and applications. Students use computer packages to apply models and techniques to real data.

Prerequisite: ECON 220A and ECON 220B and ECON 220C

**ECON 224A. Time Series Econometrics. 4 Units.**

Econometric analysis of time series data. Moving average and autoregressive series, regression analysis, Box-Jenkins techniques, computational methods, and causality conditions.

Prerequisite: ECON 220A and ECON 220B and ECON 220C

**ECON 227A. Experimental Econ I. 4 Units.**

An introduction to experimental social science. Students learn experimental methodology, design, and analysis, and be exposed to active research areas. Each student writes a proposal for their own experiment and presents the design in class.

Restriction: Graduate students only.

**ECON 227B. Experimental Econ II. 4 Units.**

Focuses on implementing experimental projects in a laboratory environment. Subjects learn about human subjects protection, program experimental software for their own projects, and conduct live experiment sessions.

Restriction: Graduate students only.

**ECON 229. Special Topics in Econometrics. 2-4 Units.**

Studies in selected areas of Econometrics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ECON 232. Business Cycles in Historical Perspective. 4 Units.**

Investigates business cycles in the United States and worldwide during the last two centuries. Topics include causes and consequences of business fluctuations, monetary and fiscal policy, models of fluctuations, and empirical macroeconomics.

Prerequisite: ECON 210A and ECON 210B and ECON 210C and ECON 210D and ECON 210E and ECON 210F

**ECON 234. American Economic History. 4 Units.**

Focuses on American economic history from colonization onwards. Topics include the development of legal systems, transport systems, financial markets, industrialization, migration, immigration, technological change, and the consequences of slavery.

Prerequisite: ECON 210A and ECON 210B and ECON 210C and ECON 210D and ECON 210E and ECON 210F

**ECON 239. Special Topics in Financial Economics. 2-4 Units.**

Studies in selected areas of Financial Economics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ECON 241A. Industrial Organization I. 4 Units.**

Analysis of the structure and economic performance of markets, and the impact of public policy and their efficiency and equity. Effects of information structure. Oligopoly, cartels, mergers, vertical integration, patents, innovation, antitrust, and regulation.

Prerequisite: ECON 100B and ECON 203A

Restriction: Graduate students only.

**ECON 241B. Industrial Organization II. 4 Units.**

Analysis of the structure and economic performance of markets, and the impact of public policy and their efficiency and equity. Effects of information structure. Price flexibility and dispersion, auctions, search and industrial structure, intrafirm organization.

Prerequisite: ECON 241A and ECON 100B and ECON 203A

Restriction: Graduate students only.

**ECON 243A. Game Theory. 4 Units.**

A formal introduction to non-cooperative game theory. Topics include properties of Nash Equilibrium and equilibrium refinements, games with imperfect information, and games with incomplete information.

Prerequisite: ECON 210A and ECON 210B and ECON 210C

Restriction: Graduate students only.

**ECON 243B. Advanced Game Theory. 4 Units.**

Provides advanced instruction in game theory. The topics covered will be (i) the theory of repeated games and (ii) evolutionary game theory. Applications include bargaining, collusion, reputation, social norms, and the evolution of preferences via natural selection and cultural transmission.

Prerequisite: ECON 243A

Restriction: Graduate students only.

**ECON 245. Empirical Methods in Applied Microeconomics. 4 Units.**

Focuses on the empirical methods used in modern applied microeconomics. Teaches methods that can be applied to produce original research in applied fields using cross-sectional and panel data. Applications will be drawn heavily from labor, public, health and development economics.

**ECON 249. Special Topics in Microeconomics. 2-4 Units.**

Studies in selected areas of Microeconomics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: May be repeated for credit unlimited times.

**ECON 251A. Labor Economics I . 4 Units.**

Analysis of the relationships between education and the labor market (human capital theory), between resources devoted to education and the return to education (the education production function) and between education and labor market inequality (the theory of skill-biased technical change).

Prerequisite: ECON 203A

Restriction: Graduate students only.

**ECON 251B. Labor Economics II. 4 Units.**

Analysis of core topics in labor economics, with an emphasis on empirical methods. Topics may include minimum wages, discrimination, gender, aging and retirement, labor market networks, personnel economics, and employment policy.

Prerequisite: ECON 203A

Restriction: Graduate students only.

**ECON 251C. Labor Economics III . 4 Units.**

Discussion of treatment effect/program evaluation in labor economics, emphasizing identification. Classical labor topics, including human capital, technology, wages, labor supply, and migration are discussed in the context of causal inference. A unified framework is used in analyzing identification strategies.

Prerequisite: ECON 203A

Restriction: Graduate students only.

**ECON 255. Microeconomics and Public Policy. 4 Units.**

Introduces the fundamental principles of microeconomics that are required for applied policy analysis. Provides students with an intuitive understanding of the microeconomic approach, and familiarizes them with concepts used in applied public policy analysis.

Repeatability: May be taken for credit 2 times.

Same as PPOL 240.

Restriction: Graduate students only.

**ECON 259. Special Topics in Labor Economics. 2-4 Units.**

Studies in selected areas of Labor Economics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ECON 260B. Monetary Economics II. 4 Units.**

Surveys recent issues on monetary policy in uncertain environments. Examines settings where both the policy makers and the private sector are uncertain of future outcomes or the underlying economic structure.

**ECON 261A. International Trade I. 4 Units.**

Covers theoretical models, empirical methods, and policy issues in international trade. Following the conventional treatment of the Richardian model, the Heckscher-Ohlin model and the specific factors model, new trade models which incorporate scale economics and imperfect competition will be discussed.

Prerequisite: ECON 210A and ECON 210B

**ECON 263A. Advanced Macroeconomics I. 4 Units.**

Students build Dynamic Stochastic General Equilibrium (DSGE) macroeconomic models from microeconomic foundations. This approach emphasizes intertemporal optimization by firms and households and typically incorporates nominal rigidities such as sluggish price and/or wage adjustment.

**ECON 269. Special Topics in Macroeconomics. 2-4 Units.**

Studies in selected areas of Macroeconomics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ECON 270A. Political Economy I. 4 Units.**

Political Economy lies at the intersection of economics and political science. Studies effects of politics on the economy and uses tools derived from economics to understand the behavior of governments and of citizens when they deal with politics.

Restriction: Graduate students only.

**ECON 270B. Political Economy II. 4 Units.**

Political Economy lies at the intersection of economics and political science. Studies effects of politics on the economy and uses tools derived from economics to understand the behavior of governments and of citizens when they deal with politics.

Prerequisite: ECON 270A

Restriction: Graduate students only.

**ECON 270C. Political Economy III. 4 Units.**

Political Economy lies at the intersection of economics and political science. Studies effects of politics on the economy and uses tools derived from economics to understand the behavior of governments and of citizens when they deal with politics.

Prerequisite: ECON 270B

Restriction: Graduate students only.

**ECON 272A. Public Economics I. 4 Units.**

Covers two broad categories of government expenditure policies, redistribution programs, and social insurance, from a theoretical and empirical perspective, as well as the effects on individuals of the income tax system.

Prerequisite: ECON 210A and ECON 210B and ECON 210C

**ECON 272B. Public Economics II. 4 Units.**

Covers the theory of public goods and models of decentralized provision of such goods, including voluntary provision, voting, bureaucratic provision, and preference revelation mechanisms.

Prerequisite: ECON 210A and ECON 210B and ECON 210C

**ECON 275. Economics of Government. 4 Units.**

Prepares students to analyze public policy questions with tools from economics. By the end, students should be able to identify important economic issues in public policy debates and consume and critique economic research on these topics.

Same as PPOL 227.

**ECON 279. Special Topics in Political Economy. 2-4 Units.**

Studies in selected areas of Political Economy. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ECON 281A. Urban Economics I. 4 Units.**

Economic reasons for the existence of cities, analysis of urban spatial structure, urban sprawl, Third World urbanization, hedonic price analysis, housing tenure choice.

Prerequisite: ECON 210A

**ECON 281B. Urban Economics II. 4 Units.**

Housing in the portfolio, land-use controls, rent control, homelessness, neighborhood effects, urban quality-of-life measurement, and subcenters.

Prerequisite: ECON 210A

**ECON 282A. Transportation Economics I. 4 Units.**

Applies microeconomic concepts of demand, costs, pricing, investment, and project evaluation to analyze transportation activities. Empirical studies include travel demand using discrete models, and cost functions.

Restriction: Graduate students only.

**ECON 282B. Transportation Economics II. 4 Units.**

Economics of the airline industry. Hub-and-spoke networks, the effects of competition on airfares, price dispersion, airline alliances, airport congestion, product unbundling.

Prerequisite: ECON 282A

Restriction: Graduate students only.

**ECON 289. Special Topics in Urban and Transportation Economics. 2-4 Units.**

Studies in selected areas of Urban and Transportation Economics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: May be repeated for credit unlimited times.

**ECON 290. Dissertation Research. 2-12 Units.**

Dissertation research with Economics faculty.

Repeatability: May be repeated for credit unlimited times.

**ECON 299. Independent Study. 2-4 Units.**

Independent research with Economics faculty.

Repeatability: May be repeated for credit unlimited times.

# Education (EDUC)

## Courses

### **EDUC 10. Educational Research Design. 4 Units.**

Designed to help students become intelligent consumers of research and independent researchers, and provides an introduction to the basic principles of educational research. Topics include research questions, literature reviews, and qualitative and quantitative research designs.

Overlaps with SE 10.

Restriction: Education Sciences Majors have first consideration for enrollment.

(III)

### **EDUC 15. Statistics for Education Research . 4 Units.**

Provides an introduction to the use of statistics in educational research. Focuses on testing and measurement, and provides basic tools to read, interpret, and draw conclusions from quantitative educational research.

Prerequisite: EDUC 10

Overlaps with SE 13.

Restriction: Education Sciences Majors have first consideration for enrollment.

(Va)

### **EDUC 25. Introduction to Education: Disciplinary Perspectives. 4 Units.**

Provides insights into educational organizations and processes by developing understanding of concepts used by four different disciplines (economics, history, psychology, and sociology) to analyze key issues and phenomenon in the field of education that profoundly influence individual life course outcomes.

Restriction: Education Sciences Majors have first consideration for enrollment.

(III)

### **EDUC 30. 21st Century Literacies. 4 Units.**

Provides an overview of literacies required for academic and career success in the 21st century. Issues addressed include reading, writing, academic language, research skills, media and technology skills, scientific literacy, critical thinking, communication, collaboration, and creativity.

Restriction: Education Sciences Majors have first consideration for enrollment.

(III)

### **EDUC 40. Theories of Development and Learning Applied to Education. 4 Units.**

Provides an introductory examination of central theories of human development and learning in their application to contemporary educational settings.

Restriction: Education Sciences Majors have first consideration for enrollment.

(III)

### **EDUC 50. Origins, Purposes, and Central Issues in K-12 Education. 4 Units.**

An introduction to the role of education in U.S. society and to central issues in K–12 education. Education is studied from four different perspectives: social, historical, philosophical, and political.

Restriction: Education Sciences Majors have first consideration for enrollment.

### **EDUC 52. Foundations of Bilingual Education and Bilingualism. 4 Units.**

Provides a comprehensive overview of current issues in bilingual education and bilingualism. Topics include dimensions of bilingualism, the effects of bilingualism on children's linguistic and cognitive development, bilingual education programs, literacy, special needs, and assessment.

Same as LSCI 51B, HUM 52.

**EDUC 55. Knowing and Learning in Mathematics and Science. 5 Units.**

Multidisciplinary study of knowing and learning in secondary school mathematics and science. Topics include standards for knowing, scientific epistemologies, mental representations, problem solving, expert-novice studies, assessment, and domain-specific thinking, learning, and teaching. Applied analysis of learning through clinical interviews.

Prerequisite: PS 5 or BIOL 14

**(III)****EDUC 100. Educational Strategies for Tutoring and Teacher Aiding. 4 Units.**

Placement in a public elementary or secondary school to gain experience as a tutor or teacher aide. Emphasis on cognitive learning and the development of instructional strategies and resources which can be used in effective cross-age and cross-cultural experiences.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 101. Strategies for Tutoring and Teacher Aiding in a Bilingual Classroom. 4 Units.**

Placement in a dual immersion school setting to gain experience as a bilingual (Spanish) tutor or teacher aide. Emphasis on cognitive learning and the development of instructional strategies and resources which can be used in effective cross-age and cross-cultural experiences.

Prerequisite: Must be able to communicate in Spanish.

Grading Option: Pass/no pass only.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 104D. The Arts and Human Development. 4 Units.**

Students use various arts disciplines (e.g. studio art, music, dance, drama, and media arts) to investigate how visual and performing arts support individual human development. Introduction to pedagogy for integrating the arts in K-12 settings. Materials fee.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 104E. Multimedia and the Arts in the Multicultural Classroom. 4 Units.**

Multiculturalism and under-represented U.S. minorities and the visual and performing arts: perspectives in artistic perception, creative expression, historical and cultural context, aesthetic valuing, and media literacy in the interpretation and production of multimedia arts products and applications for K-12 classrooms.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 106. Early Childhood Education Curriculum and Instruction. 4 Units.**

Designed to provide an introductory survey of the nature, needs, and education of young children. Explores questions such as 'What should we teach young children?' and 'How should we teach?'.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 107. Child Development in Education. 4 Units.**

Explores the pathways of normally developing children's growth and change over time. In particular, focuses on how cognitive and social development impact and are driven by educational contexts.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 108. Adolescent Development and Education. 4 Units.**

Explores the physical, cognitive, emotional, and social development of adolescents, with an emphasis on the practical implications of developmental theory and research findings for teachers and other professionals who work with adolescents in middle or high school contexts.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 109. Reading and Writing in Mathematics and Science. 4 Units.**

Emphasis is placed on understanding the literacy processes (listening, speaking, viewing, thinking, reading, and writing) as they relate to middle and high school mathematics and science. Students integrate literacy-related strategies with curriculum-based goals supported in the California State Frameworks.

Corequisite: EDUC 158

**EDUC 122A. Foundations of Elementary Mathematics Learning I. 4 Units.**

Provides understanding of fundamental mathematics necessary to teach for conceptual understanding and higher-level reasoning and problem solving. Conceptual understanding of place value, fractions, proportionality, geometry, algebra, functions, probability, statistics, and measurement. Instructional applications of these concepts in grades K-8 teaching.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 122B. Foundations of Elementary Mathematics Learning II. 4 Units.**

Provides understanding of fundamental mathematics necessary to teach for conceptual understanding and higher-level reasoning and problem solving. Conceptual understanding of place value, fractions, proportionality, geometry, algebra, functions, probability, statistics, and measurement. Instructional applications of these concepts in grades K-8 teaching.

Prerequisite: EDUC 122A

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 122C. Foundations of Elementary Mathematics Learning III. 4 Units.**

Provides understanding of fundamental mathematics necessary to teach for conceptual understanding and higher-level reasoning and problem solving. Conceptual understanding of place value, fractions, proportionality, geometry, algebra, functions, probability, statistics, and measurement. Instructional applications of these concepts in grades K-8 teaching.

Prerequisite: EDUC 122B

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 124. Multicultural Education in K-12 Schools. 4 Units.**

Provides a theoretical and empirical overview of educational issues affecting low-income immigrant and U.S. born minority student populations in an increasingly diverse and changing society.

Same as CHLT 183.

**(VII)****EDUC 125. Children, Schools, and Cinema. 4 Units.**

Through popular films, analyzes aspects of school dynamics and interaction of schools with students, teachers, and public. Melding educational studies and film studies provides deeper understanding of methods used to transmit information and attitudes about schools to the lay public.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 126. Ethics and Education. 4 Units.**

Ethics in education and how ethicists frame moral problems. Presents major ethical themes that affect education. Analysis of models for dealing with ethical goals and developing morality for K–12 students. Models for solving ethical dilemmas within an educational context.

Prerequisite: EDUC 50

**EDUC 127A. Moral Education for Youth Development I. 2 Units.**

The first of a two-course series that examines research-based theories for how school settings and adult mentors contribute to the moral development of adolescents. Students examine theory in the context of real-world application in four program observations.

Prerequisite: EDUC 126

Restriction: Education Sciences Majors only.

**EDUC 127B. Moral Education for Youth Development II. 2 Units.**

Continuation of EDUC 127A. Allows students from 127A to experience the role of adults in the moral development of youth. Students receive training to deliver curriculum and apply research-based theories and methods in real-world youth settings.

Prerequisite: EDUC 126 and EDUC 127A

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 128. Exceptional Learners. 4 Units.**

An introductory survey of the nature, needs, and education of K–12 children with exceptionalities. Covers the categories and characteristics of exceptionalities, relevant state and federal legislation, and the role of general education teachers in special education.

Restriction: Education Sciences Majors have first consideration for enrollment.



**EDUC 130. Children's Learning and Media. 4 Units.**

Examines how popular media may impact how young people learn, develop, and communicate by looking at research related to the impacts of a wide range of popular media including television, video games, digital environments, mobile devices, and other multimedia.

Same as INF 164.

Restriction: Education Sciences Majors only. Informatics Majors only. Informatics Minors only.

**EDUC 131. Educational Technology. 4 Units.**

Presents an overview of the types and uses of educational technology to support and enhance the K–12 learning experience. Familiarizes students with lesson planning, instructional design, learning theory, and integrating technology into the curriculum.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 132. Reading and Writing Enrichment for After-School Programs. 4 Units.**

Examines literacy development and the implementation of research-based practices to enrich learners' reading and writing skills in after-school programs. A minimum of 20 hours of after-school program fieldwork is required in order to design and implement literacy enrichment activities.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 134. Teaching English Internationally. 4 Units.**

Covers methods of teaching English as a foreign language, basic language knowledge for English teachers, the social context of English language teaching around the world, and essential information about securing international employment as an English teacher.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 137. Arts for Elementary Learners. 4 Units.**

Theory and practice in art education for the elementary school classroom. Includes content and pedagogy for future teachers and others interested in the relationship between child development and the production of visual art. Materials fee.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 138. Children's Literature in the Elementary Classroom. 4 Units.**

Explores the wealth of children's literature that can be integrated into the elementary classroom. Surveys traditional literature, fiction, nonfiction, and poetry that make curriculum accessible to all students. Focuses on literary elements for both reading and creating text.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 140. Courts, Classrooms, and Controversies in Education Policy . 4 Units.**

Examines policies and laws defining the K-12 U.S. education system and the politics and controversies surrounding the political decision-making process at the federal, state, and local levels. Discusses original intent versus effects on organization of schools and educational equity.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 142. American History and Education Policy: An Intimate Relationship. 4 Units.**

Examines the interplay between history, politics, and policy. Students examine the interactions between sociopolitical development and environmental contexts (e.g. familial, social, school, cultural) and contemplate the power of normative values in the formulation of education policy.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 143. Controversies in College. 4 Units.**

Explores the fascinating world of postsecondary education. Every week students dive deeper into controversies that make college more than just where students attend class, but rather, one of the most important social institutions shaping our world.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 143AW. Classroom Interactions I. 4 Units.**

Focuses on research-based instructional strategies for enhancing the learning of secondary mathematics and science. Students learn about adolescent and second-language development to assist them in developing analyzing, teaching, and critiquing lessons for secondary classrooms.

Prerequisite: (PS 105 or BIOL 101) and EDUC 55. Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**EDUC 143BW. Classroom Interactions II. 4 Units.**

Focuses on equity and multicultural education research, special education, and research-based instructional and assessment strategies to assist students in designing, teaching, and assessing lessons that meet the needs of all secondary mathematics and science students.

Prerequisite: (PS 105 or BIOL 101) and EDUC 55 and EDUC 143AW and EDUC 148. Satisfactory completion of the Lower-Division Writing requirement.

(IB AND VII ).

**EDUC 144. The American Charter School. 4 Units.**

Explores the legitimacy of the charter school as a viable educational reform movement. Critical themes include the role of choice and privatization in public education and charter schools as a vehicle for fulfilling the promise of educational equality.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 145. Theories and Pedagogies of Race in Education. 4 Units.**

Introduces theoretical frameworks to examine the role of race in American education. Emphasis is placed on introducing students to different race and ethnicity paradigms.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 146. Education, Learning, and Culture. 4 Units.**

Exploration of learning and development through a cultural lens, drawing from a range of research traditions and disciplines to broaden understandings of theories that inform teaching and learning in formal and informal settings.

Restriction: Education Sciences Majors only.

**EDUC 147. Poverty, Education, and Social Change. 4 Units.**

Explores how institutional and demographic changes in the U.S. have shaped disparities in education, the mechanisms through which poverty and social class influence families, and students, and promising programs and interventions to address inequity. Includes community service.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 148. Complex Pedagogical Design. 6 Units.**

In this Cal Teach capstone course, students design lesson plans and complex instructional units, using approaches such as mathematics and science integration, problem-based instruction, project-based learning, technology, representations, scientific and mathematical analysis/modeling, authentic assessment, contextualization, and designing equitable learning environments.

Prerequisite: (PS 105 or BIOL 101) and EDUC 55 and EDUC 143AW

**EDUC 149. Family, School, and Community in Early Childhood. 4 Units.**

Focuses on the many socializing aspects of young children's social worlds. Through the use of ecological perspectives, explores the role of families, schools, and communities on children's social development, especially in early childhood.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 150. Changing the High School Experience. 4 Units.**

Analysis of problems in high school education (e.g., student disengagement and underachievement of disadvantaged) and proposals for changing curriculum, instruction, and school organization. Students suggest own reforms and analyze effective/ineffective school practices.

Prerequisite: Recommended: 1 unit of EDUC 199.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 151. Language and Literacy. 4 Units.**

Addresses the linguistic principles and processes that underlie oral and written language proficiency. Emphasis is on how to use phonology, morphology, orthography, semantics, syntax, and pragmatics to support literacy and oral language development for K-12 students.

Same as PSCI 192V, LSCI 182V.

Restriction: Language Science Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Education Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**EDUC 152. Theory and Practice of Reading Interventions for Students At-Risk for Reading Failure. 4 Units.**

Examines the research concerning reading failure in young children and interventions used to support them. Topics include reading development and reading intervention. Students critically evaluate the relation between their fieldwork experience and the research and evaluation literature.

Repeatability: May be taken for credit 2 times.

Restriction: Education Sciences Majors only.

**EDUC 156. Introduction to Field Methods in Education. 4 Units.**

Introduces students to methods for studying human behavior in context. It prepares students for conducting applied educational research, including designing needs assessments; conducting observations, interviews and focus groups; organizing and analyzing data; and synthesizing and presenting research findings.

Prerequisite: EDUC 10

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 157. Educational Research and Evaluation. 4 Units.**

Covers qualitative and quantitative research methods relevant for the evaluation of educational programs. Students have the opportunity to plan, execute, and write-up a small evaluation project.

Prerequisite: EDUC 10 and EDUC 15

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 158. Student Teaching Mathematics and Science in Middle/High School. 6 Units.**

Student teaching includes orientation, seminars, preparation, and assumption of secondary school classroom instructional responsibilities in accordance with State credentialing requirements and in conjunction with the public school calendar. Five days/week and a minimum four hours/day over two quarters.

Corequisite: EDUC 109

Prerequisite: (PS 105 or BIOL 101) and EDUC 55 and EDUC 143AW and EDUC 143BW and EDUC 148

Repeatability: May be taken for credit 2 times.

**EDUC 158F. Advanced Fieldwork in Middle/High School Math and Science. 3 Units.**

Advanced fieldwork for math and science teacher credential candidates over two quarters, prior to starting a fall student teaching assignment. Requires a minimum of 40 hours per quarter of fieldwork in a K-12 classroom and attendance at weekly seminars.

Prerequisite: (PS 105 or BIOL 101) and EDUC 55 and EDUC 143AW and EDUC 143BW and EDUC 148

Repeatability: May be taken for credit for 6 units.

**EDUC 159. Experimental Research Methods. 4 Units.**

Designed to help students to develop the ability to think critically about research, and to develop an understanding of how to design and conduct experiments. The overall goal is to prepare students to independently plan and implement a research study.

Prerequisite: EDUC 10 and EDUC 15

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 160. Foundations of Out-of-School Learning. 4 Units.**

Provides an overview of child and adolescent learning through participation in out-of-school activities and settings. Recognizes the importance of matching out-of-school experiences with the interests, needs, and development level of students. Observation-based fieldwork included.

Repeatability: May be taken for credit 2 times.

Restriction: Education Sciences Majors have first consideration for enrollment. May be taken a second time if student is a candidate for Certificate in After-School Education, and the first time was prior to Fall 2008.

**EDUC 161. Discovering Science in Out-of-School Hours. 4 Units.**

Examines the design principles and teaching techniques that science museums and other out-of-school science programs use to motivate children and youth to learn science through discovery. Includes field experience at a science learning center or after-school program. Materials fee.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 173. Cognition and Learning in Educational Settings. 4 Units.**

Foundational concepts in cognition and development as applied to student learning. Primary topics include historical behaviorism, basic cognitive structure and processes, complex cognition, cognitive development, and motivation.

Same as PSCI 192T.

Restriction: Psychological Science Majors have first consideration for enrollment. Education Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**EDUC 174. Education and the American Dream: Historical Perspectives on Democracy and Education. 4 Units.**

Examines the relationship between public schooling and the promotion of democratic ideals in American society over the past two centuries.

Same as HIST 147.

**EDUC 175. Foundations of Education. 4 Units.**

Foundational questions of education are viewed from newly emerging developmental perspectives which treat cognition as embodied action and learning as cultural recapitulation. Historical, sociological, psychological, and philosophical implications of views toward aspects of teaching, learning, curriculum, and pedagogy are considered.

Restriction: Education Sciences Majors only.

**EDUC 176. Psychology of Learning, Abilities, and Intelligence. 4 Units.**

Overview of classic positions on the mind, human abilities, and intelligence, especially as related to academic achievement. Contrasting views: psychometric versus information processing; experimental versus correlational research.

Prerequisite: PSYC 7A or PSCI 9 or PSCI 11A or PSCI 11B or PSCI 11C

Same as PSCI 192U.

Restriction: Psychological Science Majors have first consideration for enrollment. Education Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**EDUC 179W. Advanced Writing for Education Sciences. 4 Units.**

Writing for multiple audiences and purposes about central concepts in education sciences, such as schools as organizations; social structures in education and stratification; individual decision making, government regulation and markets; human development and learning.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Seniors only. Education Sciences Majors have first consideration for enrollment.

(Ib)

**EDUC 180. Interdisciplinary Topics in Education. 4 Units.**

Analysis of issues in education from interdisciplinary perspectives. Topics covered vary with interests of instructor.

Repeatability: Unlimited as topics vary.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 181A. Principles and Practices of Coaching Sports I. 4 Units.**

Focuses on foundational theories and instructional practices in coaching sports from fourth grade to the collegiate level. Prepares students for the coach's mandatory state certification examination for high school sports in California.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 185. Social Development in Education. 4 Units.**

Examination of contextual, psychosocial, and biological factors contributing to the social development of children and adolescents. Theoretical perspectives, empirical findings, and methodological issues are emphasized. Implications of the scientific evidence for practical and policy decision-making surrounding development are discussed.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 190. Principles and Practices of K–6 After School Sports and Fitness. 4 Units.**

Focuses on foundational theories and instructional practices in after-school sports and fitness for K–6 students. Includes a 20-hour field experience in an after-school setting.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 191. Advanced Fieldwork in After-School Education. 4 Units.**

Capstone fieldwork experience for students seeking to earn the Department of Education-sponsored Certificate in After-School Education. Students are required to complete 50 or more hours of fieldwork and related assignments at an instructor-approved after-school program.

Prerequisite: EDUC 160

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 193. Directed Studies in Early Childhood Education. 2-4 Units.**

Advanced study of early childhood education under the direction of a faculty member, coupled with a community-based practicum.

Repeatability: May be repeated for credit unlimited times.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 198. Directed Research in Education. 2-8 Units.**

Individually or in small groups, students are exposed to or participate in work related to a faculty member's research. Students also attend a weekly seminar and complete a research paper or comparable project.

Repeatability: May be taken for credit for 12 units.

Restriction: Sophomores only. Upper-division students only.

**EDUC 199. Individual Study. 1-4 Units.**

Intensified advanced study in areas in which a student has considerable background, under the direction of a faculty member who will guide and evaluate the study.

**EDUC 202. Outcomes of Schooling/Student Assessment. 4 Units.**

Focuses on establishment of learning goals and assessment tools that are valid for all students, inform educational decisions, and promote educational success. Provides critical examination of different forms of assessment used in K–12 schools, including developmental assessments and appropriate interventions.

Restriction: Graduate students only. Education-MA/PhD Majors only.

**EDUC 203. Advanced Concepts in Learning and Cognition. 4 Units.**

Theories of cognition and their application to thinking and learning in school settings. Topics include memory, information processing, knowledge representation, problem solving, meta-cognition, and intelligence.

Prerequisite: EDUC 173

Restriction: Graduate students only. Education-MA/PhD Majors only.

**EDUC 205. Critical Assessment of Teaching Practice and Learning. 4 Units.**

Student articulates a problem in instructional practice and uses research on cognition, assessment, and other tools to understand the problem. Capstone course emphasizes practices of teacher inquiry, reflection, and professional collaboration. Student's written analyses are evaluated as program's Comprehensive Examination.

Restriction: Graduate students only. Education-MA/PhD Majors only.

**EDUC 206. Design of Learning Environments for Teachers in Secondary School Subjects. 4 Units.**

Research on comprehension, conceptual understanding, reasoning, critical thinking, and problem solving with applications to pedagogy in secondary school subjects. Required for M.A.T. single subject students, unless substitution of Education 207 is authorized.

**EDUC 207. Cognition and Pedagogy in Quantitative Literacy. 4 Units.**

Reviews research on cognition in elementary mathematics, including numeracy, fractions, probability, proportionality, measurement, geometry, algebra. Emphasizes instructional approaches consistent with this research knowledge. Required for M.A.T. multiple subjects students, unless substitution of Education 206 is authorized by the Department.

**EDUC 208. Reading and Writing Development . 4 Units.**

Covers major theories and evidence about mechanisms and factors that contribute to development and difficulties with reading and writing skills. These include language, cognition, biological and environmental factors, bilingual and second language acquisition, and educational implications.

Restriction: Graduate students only.

**EDUC 210. Language, Literacy, and Discourse. 4 Units.**

Introduces students to the interdisciplinary study of language, literacy, and discourse across historical and educational contexts. Addresses theories of how people learn, interact, and make meaning through a variety of semiotic resources, including oral communication, print, and digital media.

Restriction: Graduate students only.

**EDUC 211. Writing Theory and Practice. 4 Units.**

Offers an overview of histories, theories, and research in the field of composition studies from 1950 to the present. Addresses the influences of theory and research on teaching practice at K–12 and college levels.

Restriction: Graduate students only.

**EDUC 212. Literacy and Technology. 4 Units.**

Examines theoretical, historical, and contemporary relationships of technology and literacy. Topics include online communication, multimodality, video games, the use of technology for literacy instruction in schools, and research approaches for investigating literacy development with technology.

Restriction: Graduate students only.

**EDUC 217. Foundations of Digital Learning. 4 Units.**

Students are introduced to historical, constructionist, instructionist, and new literacies perspectives through reading major works in educational technology and discussing how they apply to both teaching and research.

Restriction: Graduate students only.

**EDUC 218. Special Topics in Teaching, Learning, and Educational Improvement. 4 Units.**

Advanced seminar designed to engage students in highly interactive examination of current issues in teaching and learning. Topics and content vary by quarter, depending upon research interests of the faculty and students.

Repeatability: May be taken for credit 10 times as topics vary.

Restriction: Graduate students only.

**EDUC 220. Developing Adolescent Literacy. 4 Units.**

Examines how adolescents leverage vocabulary knowledge, word-reading skills, background understanding, and knowledge of content-specific text features to master an increasing range of texts both independently and for subject-area learning.

Restriction: Graduate students only.

**EDUC 221. Longitudinal and Advanced Structural Equation Modeling. 4 Units.**

Covers advanced and longitudinal structural equation models. Topics include measurement invariance, growth curve models, measurement models, mixture models, and missing data.

Prerequisite: Recommended: EDUC 288B.

Restriction: Graduate students only.

**EDUC 222. Research Epistemologies and Methodologies. 4 Units.**

Introduction to epistemological underpinnings of educational research and to a range of research methodologies in education. Includes examination of quantitative and qualitative studies through reading and analyzing contemporary research. Critique of selected research studies pertinent to educational practice and policy.

Restriction: Ed.D. Program students only.

**EDUC 223. Oral Language Acquisition and Education. 4 Units.**

Learn about research on domains of development in oral language (phonology, vocabulary, grammar, and extended discourse), bilingual development, and second language acquisition with attention to cognitive, biological, and environmental factors. Focus on learning in school settings and educational implications.

Restriction: Graduate students only.

**EDUC 224A. Learning Analytics Fundamentals. 4 Units.**

Provides students with a survey of learning analytics (LA), emphasizing its application across educational contexts, rather than its underlying algorithmic details. A comprehensive overview orients students to this nascent field and prepares them for advanced research in LA.

Restriction: Graduate students only.

**EDUC 224B. Learning Analytics Practicum. 4 Units.**

Helps students gain hands-on experience working as educational data scientists, while simultaneously learning some of the key guiding principles behind effectively using data to make predictions and decisions. Culminates in an interdisciplinary group research project.

Prerequisite: EDUC 288A

Restriction: Graduate students only.

**EDUC 225. Learning, Development, and Culture. 4 Units.**

Explores issues of learning and development through a cultural lens. The interplay between culture and learning and culture and development is analyzed through the discussion of relevant readings from both psychological and anthropological research traditions.

Restriction: Graduate students only.

**EDUC 226. University Teaching: Concepts and Practices. 4 Units.**

Prepares doctoral students for course design and instruction at the university level. Addresses topics including the university teaching context, preparing a syllabus, and inclusive teaching and learning.

Restriction: Graduate students only.

**EDUC 228. Science Education for the 21st-Century Classroom. 4 Units.**

Aims to develop foundational understanding about science education research. Contemporary research from early childhood through high school is introduced. Issues of equity, social justice, pedagogy, professional development, and innovation in and out of school settings are addressed.

Restriction: Graduate students only.

**EDUC 229. Theories of Human Development. 4 Units.**

Examines developmental theory as a guide for research and practice in education. The evolution of classical development theories and the emergence of new theoretical models are considered. Theoretical perspectives include ecological systems, life course, psychobiology, attachment, and social-cognitive theories.

Restriction: Graduate students only.

**EDUC 229A. Theories and Issues in Human Development - Part I. 4 Units.**

Examines seminal concepts, issues, and theories that underlie contemporary developmental science. Students develop an understanding of these concepts, and develop their skills in using theory as a guide in their own research and practice.

Restriction: Graduate students only.

**EDUC 230. The History and Culture of Schooling in the United States. 4 Units.**

Considers the historical, cultural, and structural processes that contextualize American schooling. In particular, examines the roles of race, class, and gender in the context of public education in the United States.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 231. Interrogating Race and Education. 4 Units.**

Critically explores how race is a socially constructed concept and how it manifests itself in American society. Attention is given to African American, Asian, and Mexican communities throughout U.S. history, with particular emphasis on educational inequality.

Restriction: Graduate students only.

**EDUC 232. Mathematics Cognition and Learning. 4 Units.**

Study of mathematical cognition, learning, and development. Combines readings from cognitive and developmental psychology, education, and learning sciences with the purpose of identifying the most useful applications of cognitive theory and methods for educational research and practice.

Restriction: Graduate students only.



**EDUC 233A. Special Topics in Atypical Development. 4 Units.**

Includes advanced examination of current issues in theories of atypical development, assessment, and intervention as applied to special needs. Understanding physical and/or cognitive mechanisms of child development and disorders. Knowledge and skills for areas of disability.

Repeatability: May be taken for credit 5 times as topics vary.

Restriction: Graduate students only.

**EDUC 234. Measurement and Psychometrics. 4 Units.**

Focuses on appraisal and development of measures, measurement theory, and its application using a classical test theory approach. Topics include scaling, construction, reliability and validity assessment, and item analysis; as well as cross-cultural and cross-linguistic considerations in test development.

Restriction: Graduate students only.

**EDUC 235. Psychology of Reading Acquisition. 4 Units.**

Surveys theory and empirical evidence concerning acquisition, cognitive processes, and consequences of skilled reading. Explores psychological models of skilled reading, how children acquire reading and writing skills in their home and second languages, cognitive consequences of acquiring literacy skills.

Restriction: Graduate students only.

**EDUC 236. Applied Linguistics and Literacy. 4 Units.**

Examines research in applied linguistics as related to teaching literacy. Overview of language knowledge required to understand development and instruction of literacy. Topics include English language structures, psychological processing of these structures, and methodologies to study language and literacy.

Restriction: Graduate students only.

**EDUC 237. Foundations of Teaching and Learning. 4 Units.**

Situates learning in relation to teaching, content, and context. Locates the work of teaching and learning as a cultural practice and considers the limitations of existing theories for advancing learning opportunities for historically under-served and under-resourced communities.

Restriction: Graduate students only.

**EDUC 238. Special Topics in Human Development in Context. 4 Units.**

An advanced seminar designed to engage students in highly interactive examination of current issues in human development. Topics and content vary by quarter, depending upon the research interests of the faculty and students.

Repeatability: May be taken for credit 10 times as topics vary.

Restriction: Graduate students only.

**EDUC 239. Cognitive Neuroscience and Human Development. 4 Units.**

Focuses on the latest empirical work at the intersection of neuroscience, cognitive psychology, developmental science, and educational practice; explores how educational neuroscience fits within those fields; and discusses the main conceptual and practical challenges facing the field.

Restriction: Graduate students only.

**EDUC 241. Children's Sense Making in Science. 2 Units.**

Investigates elementary students as individuals who construct understanding of concepts through their interactions with others and the world around them. Observations of children in informal settings to analyze learning in context.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 243. The Policy Environment of Teaching. 2 Units.**

Examines research and public perceptions about school-based educational processes, the influence of institutional structures and educational policy on the lives of teachers, and the challenges of school reform at the local and classroom levels.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 245. Learning Inside and Outside of School. 2 Units.**

A field-based course focused on observing adolescents in out-of-school contexts to examine adolescent learning and development in a range of contexts, how out-of-school contexts motivate learning and development, and consider the implications for teaching.

Restriction: Master of Arts in Teaching Degree students only.



**EDUC 246. Teaching Investigations: Identifying Dilemmas of Practice. 4 Units.**

Focuses on identifying problems of teaching practice that arise in student teaching, examining the theoretical foundations that underlie problems of practice, and developing approaches for inquiring into strategies to systematically address instructional challenges.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 247. Teaching Investigations: Exploring Dilemmas of Practice. 4 Units.**

Focuses on exploring problems of teaching practice that arise in student teaching, drawing on research to examine the theoretical foundations that underlie problems of practice, and to propose courses of action to address and study educational interventions.

Prerequisite: EDUC 246

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 248. Understanding Teacher Agency. 4 Units.**

Considers how teachers can become agents of change within their school contexts, through their participation in professional organizations and via social media. Candidates experiment with using different avenues for sharing images of practice and action research.

Prerequisite: EDUC 246

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 250. Research Practice Partnerships. 4 Units.**

An introduction to research-practice partnerships (RPPs). It examines the distinctive characteristics of this approach to education improvement by discussing examples of established partnerships and inviting students to become familiar with methods and tools to advance RPP work.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**EDUC 251. Educational Policy and Politics. 4 Units.**

An in-depth study of topics relevant to educational reform and policy-making. Topics include: the policy-making process, the role of values and interest groups, policy analysis, equality of educational opportunity, systemic reform, implementation, and politics at the school site.

Restriction: Graduate students only.

**EDUC 252. Social Organization of Schools and Classrooms. 4 Units.**

Examines how schools are organizations with ambiguous goals, faced with challenges around effective leadership and cooperation, part of loosely coupled systems, and subject to coercive, normative, and mimetic pressures from organizational environments, shaping institutional practices and structures.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EDUC 253. Foundations of Educational Policy. 4 Units.**

Reviews disciplinary models that economists and sociologists employ in approaching education-related policy issues, including markets as emergent systems, human capital, social and cultural capital, and rational choice and institutional models of administrators and teachers.

Restriction: Graduate students only.

**EDUC 254. College Access and Persistence. 4 Units.**

Introduction to how social, political, and economic forces impact college access and persistence in the U.S. higher education system. Investigates historical perspectives and theoretical underpinnings of college access and retention research and the link between K–12 schooling and postsecondary stratification.

Restriction: Graduate students only.

**EDUC 255. Immigration and the New Second Generation. 4 Units.**

Focuses on Asian, Latino, and Black children of immigrants. Investigates how today's second generation adapts, incorporates into the U.S. social structure, transforms the social and economic landscape. Explores assimilation, immigrant families/communities, language, racial/ethnic identities, gender, education, changing U.S. racial structure.

Restriction: Graduate students only.

**EDUC 258. Special Topics in Educational Policy and Social Context. 4 Units.**

An advanced seminar designed to engage students in highly interactive examination of current issues in educational policy and social context. Topics and content will vary by quarter, depending upon the research interests of the faculty and students.

Repeatability: May be taken for credit 10 times.

Restriction: Graduate students only.

**EDUC 259. Community Research and Action. 4 Units.**

Introduces the theoretical underpinnings and research approaches of the field of Community Psychology. Project-based course focused on research and action in communities, organizations, and other extra-individual units (e.g., schools).

Restriction: Graduate students only.

**EDUC 260. The Arts, Human Development, and Social Context. 4 Units.**

Examines the state of empirical knowledge on the impact of visual and performing arts education on the development of academic, communication, and social-emotional skills. The role of the arts in forming personal and cultural identity is discussed.

Restriction: Graduate students only.

**EDUC 261. Social and Cultural Foundations of Education. 4 Units.**

Provides a critical understanding of the social and cultural foundations of education through reproduction theory. Explores the unique ways in which culture and power intersect within schools and schooling systems to reproduce and resist educational inequality.

Restriction: Graduate students only.

**EDUC 264. Economic Foundations of Education and Social Policy. 4 Units.**

Beginning/intermediate microeconomics course provides students with an introduction to how economists think about household decision-making, markets, benefit-cost analysis, social policy issues in general and education policy in particular.

Restriction: Graduate students only.

**EDUC 265. Applied Regression Analysis for Education and Social Research. 4 Units.**

Provides students with a working knowledge of multiple regression and the statistical analysis of longitudinal data. Topics include a review of the OLS regression model, event-history methods, and various other techniques for analyzing longitudinal data.

Prerequisite: EDUC 288B

Restriction: Graduate students only.

**EDUC 266. Design-Based Implementation Research. 4 Units.**

Explores design-based implementation research (DBIR) to organize research and improvement efforts in education. Delves deeper into different techniques of partnership development, design, implementation, and improvement science to build a repertoire of practices for students' studies.

Restriction: Graduate students only.

**EDUC 267. Classroom Research Methods. 4 Units.**

Uses students' research problems as the basis for exploring methods—teacher and student observation, interview, case studies, think alouds. Intended for doctoral students with a specific research question and very good grounding in the literature related to their question.

Restriction: Graduate students only.

**EDUC 268. Out-of-School Learning and Development. 4 Units.**

Examines theory, research, and policy concerning out-of-school time and youth development. Several out-of-school contexts are considered (e.g., unsupervised care, informal leisure activities, and organized activities). A range of developmental outcomes are considered (e.g., achievement, social-emotional competence, and physical health).

Restriction: Graduate students only.

**EDUC 274. Studies of Professional and Staff Development. 2-4 Units.**

Research and theory of effective strategies for professional and staff development. Topics include: adult learning as related to professional growth of teachers, staff development as vehicle for systemic reform, reforms to enhance teacher professionalization and empowerment.

Restriction: Doctoral students only.

**EDUC 276. Early Childhood Education Policy. 4 Units.**

Covers core topics in the field of early education policy. Integrates research from the various perspectives relevant to child policy in a practical way to understand the mechanisms of intervention and to develop policy solutions.

Restriction: Graduate students only.

**EDUC 278. Experimental Designs in Educational Research. 4 Units.**

Designed to enable students to think critically about experimental research, and to develop an understanding of how to design and conduct experiments. The overall goal is to prepare students to independently plan and implement an experimental research study.

Prerequisite: EDUC 222

Restriction: Graduate students only.

**EDUC 279. Advanced Qualitative Methods. 4 Units.**

Further developing qualitative inquiry skills for examining human interaction and studying lived experiences of individuals and communities. Practices and techniques for collecting, working with, and analyzing qualitative data to develop and justify claims.

Prerequisite: EDUC 283A or EDUC 283B

Restriction: Graduate students only.

**EDUC 280. Research Methods: Hierarchical Linear Modeling. 4 Units.**

Research data often have a hierarchical structure, which require multi-level models. Students learn to use HLM; conduct appropriate analyses; and write the methods and results section for a peer-reviewed journal article. Previous coursework in regression is required.

Restriction: Doctor of Philosophy Degree students only. Graduate students only.

**EDUC 283A. Qualitative Research Methods in Education I. 4 Units.**

Introduces students to qualitative research methodologies and methods and explores strengths and challenges of this research tradition. Topics include logistical and ethical issues, reliability, validity and generalizability, and the role of reflexivity. Students will also engage in fieldwork.

Prerequisite: EDUC 222

Restriction: Graduate students only.

**EDUC 283B. Qualitative Research Methods in Education II. 4 Units.**

Provides methods for conducting and analyzing qualitative research in educational settings. Topics include data collection, coding, representing qualitative data, and using software for qualitative data analysis.

Prerequisite: EDUC 283A

Restriction: Graduate students only.

**EDUC 284. Mixed Methods in Educational Research . 4 Units.**

Provides an overview of mixed methods research for students familiar with both quantitative and qualitative research. Consists of defining mixed methods research, describing its history and foundations, and examining various types of mixed methods designs.

Restriction: Graduate students only.

**EDUC 285. Theories of Learning Cognition. 4 Units.**

Overview of theories applicable to learning in schools and extracurricular contexts. Cognitive, psychometric, behavioral, and neuroscience perspectives are applied to such topics as memory, knowledge structures, problem solving, motivation, self-referent beliefs, expertise, assessment, and cognitive abilities, including intelligence.

Restriction: Graduate students only.

**EDUC 287A. Quantitative Data Analysis in Education Research and Evaluation. 4 Units.**

Statistical aspects of survey-based evaluations and quantitative research in education. Includes sampling, coding open-ended information, data management, scale construction, statistical analysis, and presentation of findings. Students analyze data sets - a district-based evaluation and a national survey - using SPSS.

Prerequisite: EDUC 281

Restriction: Graduate students only.

**EDUC 287B. Causal Inference: Methods for Program Evaluation and Policy Research. 4 Units.**

Provides students with a comprehensive overview of how to perform some more advanced statistical methods useful in answering policy questions using observational or experimental data.

Restriction: Graduate students only.

**EDUC 288A. Educational, Social, and Behavioral Statistics. 4 Units.**

Designed for graduate students with previous course work in statistics, including experience with statistical software such as SPSS. The emphasis is on regression analysis and the general linear model. Students learn to analyze real data using Stata software.

Prerequisite: Prior coursework in statistics, and experience with statistical software such as SPSS.

Restriction: Graduate students only.

**EDUC 288B. Structural Equation Modeling for Educ, Soc & Behavioral Analysis. 4 Units.**

Rigorous introduction to structural equation modeling for students with strong prior course work in statistics. Topics include path diagrams, SEM with observed variables, factor analysis, SEM with latent variables. Maximum likelihood estimating, goodness-of-fit measures, nested models, related topics.

Prerequisite: EDUC 288A

Restriction: Graduate students only.

**EDUC 289. Use of Video in Educational Research. 4 Units.**

Provides students with conceptual and methodological tools for using video in educational research. Students work with their own video data or with publicly accessible databases.

Restriction: Graduate students only.

**EDUC 295. Pre-Dissertation Research. 1-12 Units.**

Independent study course taken under the direction of a faculty member who guides the student's research. May include guidance on data collection, methodology, human subjects protocol, conference presentation, scholarly publication, program benchmark activities.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**EDUC 296A. Professional Writing in Educational Research I. 2 Units.**

First of a two-course series designed to extend students' knowledge of conducting and publishing educational research. Topics include the logic of research and how to effectively communicate research findings, with particular emphasis on proficient scientific writing.

**EDUC 296B. Professional Writing in Educational Research II. 2 Units.**

Second of a two-course series designed to extend students' knowledge of conducting and publishing educational research. Topics include the logic of research and how to effectively communicate research findings, with particular emphasis on proficient scientific writing.

**EDUC 298. Independent Study. 1-8 Units.**

Independent research on topics related to education.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EDUC 299. Dissertation Research. 1-12 Units.**

Specifically designed for students researching and writing their dissertations.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Doctoral students only.

**EDUC 301. Directed Elementary Field Experiences in Diverse Schools. 2 Units.**

Fieldwork experiences and seminars to provide introduction to the California Teaching Performance Expectations, including guidelines for professional expectations, observation and participation in classrooms, instructional planning, classroom management, and formative experiences and preparation for the state-mandated Teaching Performance Assessment.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 302. Directed Secondary Field Experiences. 2 Units.**

Field work experiences and seminars to provide introduction to the California Teaching Performance Expectations, including guidelines for professional expectations, observation and participation in classrooms, instructional planning, classroom management, and formative experiences and preparation for the State-mandated Teaching Performance Assessment.

Restriction: Master of Arts Degree students only.

**EDUC 304. Student Teaching in the Elementary Schools. 8-12 Units.**

Student teaching seminars prepare candidates for assumption of classroom instructional responsibilities in accordance with State credentialing requirements. Four full days a week of student teaching in public school elementary classrooms in winter quarter and five full days in spring quarter.

Repeatability: May be repeated for credit unlimited times.

Restriction: Master of Arts Degree students only.

**EDUC 305. Learning to Learn from Teaching in Secondary Schools. 4 Units.**

Analytic tools for (1) observing and reflecting on observed instruction; (2) examining student thinking and the relationship between teaching and learning; (3) understanding particular components of the teaching/learning process; and (4) planning effective instruction including innovative teaching practices.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 306. Supervised Teaching in Bilingual Education, Elementary. 8-12 Units.**

Student teaching experiences in bilingual public school classrooms to include orientation, regular seminars, and preparation for bilingual classroom instructional responsibilities in accordance with State credentialing requirements and in conjunction with the public school calendar.

Repeatability: May be repeated for credit unlimited times.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 307. Student Teaching in Intermediate/Secondary School. 8-12 Units.**

Student teaching includes orientation, seminars, and preparation for and assumption of secondary school classroom instructional responsibilities in accordance with State credentialing requirements and in conjunction with public school calendar. Five full days a week in both winter and spring quarters.

Repeatability: May be repeated for credit unlimited times.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 320. Teaching Physical and Health Education in Elementary School. 4 Units.**

Methods of teaching physical education for the elementary classroom teacher. Through an interactive environment, students experience the California Physical Education and Health content standards with appropriate pedagogy. Concepts address motor skills, physical fitness, and personal responsibility for lifelong health.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 322A. Curriculum and Methods for Elementary School Mathematics I. 4 Units.**

Scope, sequence, and methods of teaching mathematics at all levels of elementary school. Presented through lectures, discussions, demonstrations, and exploration of a variety of materials. Covers how to plan lessons, motivate students, diagnose difficulties, and evaluate learning in mathematics.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 322B. Curriculum and Methods for Elementary School Mathematics II. 4 Units.**

Part two of a course addressing pedagogical methods for elementary mathematics. Lectures, discussions, and exploration of instructional strategies and materials support preservice teacher development in the critical areas of planning, instruction, and assessment for conceptual understanding in mathematics.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 323A. Curriculum Methods in Elementary Science. 2 Units.**

Prospective elementary teachers learn how to teach science in grades K-8. Covers state science requirements, a variety of teaching methods, and criteria for selecting science curriculum materials.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 323B. Curriculum Methods in Elementary Science. 2 Units.**

Prospective elementary teachers learn how to teach science in grades K-8. Covers state science requirements, a variety of teaching methods, criteria for selecting science curriculum materials, and how to plan science lessons, units, experiments, projects, and demonstrations.

Prerequisite: EDUC 323A

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 325. Teaching the Visual and Performing Arts in Elementary School. 2 Units.**

Introduction to the issues and practices — including student diversity, academic literacy, and interdisciplinary content — involved in integrating the California visual and performing arts curriculum framework and academic content standards with developmentally appropriate teaching strategies for the elementary classroom. Materials fee.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 326. Curriculum and Methods for Elementary School Reading. 4 Units.**

Teaching an integrated reading/language arts program in the elementary classroom. Implementing theories, principles, and methods which are research and reality-based. Creating a child-centered, language-rich program to meet needs of children in multicultural/multilingual settings.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 336. Methods of Teaching Languages other than English in Secondary Schools. 4 Units.**

Prepares future teachers of foreign language or primary/home language. Emphasizes hands-on, practical strategies for communication-based instruction and authentic assessment in reading, writing, listening, speaking, and culture.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 337. Methods of Teaching Social Science in the Secondary School. 4 Units.**

Theories, strategies, and methodologies related to the teaching of history and social science in the secondary school. Emphasis on the planning, delivery, and assessment of lessons reflecting an understanding of the History-Social Science Framework for California.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 338. Methods of Teaching English in the Secondary School. 2-4 Units.**

Introduction to teaching reading, writing, and speaking skills in secondary school. Emphasis upon integrative approach to teaching literature, composition, and grammar consistent with the California State Framework. Practice in the design of lesson plans that are both integrated and cumulative.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 339. Methods of Teaching Visual Arts in Secondary Schools. 4 Units.**

Theory, curriculum, and strategies for teaching visual arts in the secondary school. Emphasis on the planning, delivery, and assessment of lessons consistent with California State Framework and content standards.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 340. Methods of Teaching Mathematics in Secondary School. 2-4 Units.**

Theories, strategies, and methodologies related to the teaching of mathematics in the secondary school. Emphasis on the planning, delivery, and assessment of lessons reflecting an understanding of the Mathematics Framework for California and the recommendations of professional organizations.

Repeatability: May be taken for credit for 4 units.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 341. Teaching Science in Secondary School. 4 Units.**

Prospective secondary science teachers learn how to teach science in grades 7-12. Covers State science requirements, a variety of teaching methods, criteria for selecting science curricular materials, and how to plan science lessons, units, experiments, projects, and demonstrations.

Same as EEB 341.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 342A. Applied Instructional Strategies in Secondary Schools. 2 Units.**

Application of pedagogy and research to practice teaching experiences in the secondary schools. A continuation of the methodology course series with an emphasis on the needs of students with culturally diverse backgrounds. Conducted in a five-week format.

Repeatability: May be taken for credit 2 times.

Overlaps with EDUC 342.

Restriction: Master of Arts in Teaching Degree students only. EDUC 342 and EDUC 342A may not both be taken for credit.

**EDUC 342B. Applied Instructional Strategies in Secondary Schools. 2 Units.**

Application of pedagogy and research to practice teaching experiences in the secondary schools. A continuation of the methodology course series with an emphasis on the needs of students with culturally diverse backgrounds. Conducted in a five-week format.

Repeatability: May be taken for credit 2 times.

Overlaps with EDUC 342.

Restriction: Master of Arts in Teaching Degree students only. EDUC 342 and EDUC 342B may not both be taken for credit.

**EDUC 346. Reading and Writing in Middle School and High School Classrooms. 4 Units.**

Emphasis is placed upon understanding the literacy processes (listening, speaking, viewing, reading, and writing) as they relate to all Single Subject areas. Teachers are guided to integrate literacy-related strategies with curriculum-based goals supported in the California State Frameworks.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 347. Culture, Diversity, and Educational Equity . 4 Units.**

Survey of the history of and social theories about the origins and consequences of U.S. racial, gender, and social inequality, and the effects of poverty and racism on the educational opportunities and outcomes of minority groups in the United States.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 348. Educational Equity and the Exceptional Learner. 2 Units.**

Knowledge, skills, and strategies to teach exceptional learners in the general education classroom. Legislation pertaining to the education of exceptional learners. Role of general education teacher in the special education process. Inclusive curriculum to provide equal access to content.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 348A. Educational Equity and the Exceptional Learner I. 2 Units.**

Focuses on knowledge, skills, and strategies needed to teach special populations in general education secondary classrooms. Covers categories and characteristics of disability and exceptionality, state and federal legislation, and the role of general education teachers in the special education process.

Restriction: Graduate students only. Education-MA/PhD Majors only.

**EDUC 348B. Educational Equity and the Exceptional Learner II. 2 Units.**

Emphasizes the use of differentiated instruction to meet special needs and the creation of a positive, inclusive learning environment that provides access to the core curriculum for special needs students.

Restriction: Graduate students only. Education-MA/PhD Majors only.

**EDUC 349. Theories and Methods of English Language Development Applied to Secondary Students. 4 Units.**

Theories and methods of English language development and instruction of English language learners, with focus on secondary students. Includes language acquisition theory, language and content, assessment strategies, and preparation of curricula and instruction for grades 7–12 English language learners.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 358. Media and Information Literacy in the Secondary Classroom. 2 Units.**

Focuses on how teachers can help their students to become critical, ethical, and effective users of technological resources in the secondary classroom. Students learn tools for evaluating, selecting, and incorporating appropriate learning technologies into the secondary classroom.

Restriction: Master of Arts in Teaching Degree students only.



**EDUC 359. Curriculum and Methods for Elementary Social Science and Information Literacy. 4 Units.**

Methods of instruction for Social Science at the K–6 level. Includes integration of the use of technology, development of content literacy, and use of evidence to construct arguments.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 361. The Adolescent Learner . 4 Units.**

Issues of adolescent development and learning in family, school, and community contexts from biological, psychological, cognitive, and social perspectives. Focuses on how adolescents learn, what motivates them to learn, and how schools and teachers contribute to adolescents' growth.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 362. Curriculum and Methods for Elementary Language Arts and English Language Development. 4 Units.**

Methods, instructional practices, and assessment strategies for teaching English-Language Arts, with a focus on instructional practices for supporting English Language Learners. Focuses on core language arts topics, including composition of persuasive, expository, and narrative texts; speaking; and listening.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 364. Instructional Design and Education Technology for the Elementary Classroom. 2 Units.**

Focuses on how teachers can effectively integrate educational technologies for teaching and learning in the elementary school classroom. Students learn tools for evaluating, selecting, and incorporating appropriate technologies into their classroom activities.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 374. Learning and Child Development . 4 Units.**

Issues of child development and learning in family, school, and community contexts from biological, psychological, cognitive, and social perspectives. Focuses on how young children learn and develop, how schools and teachers contribute to children's growth, and implications for instruction.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 399. University Teaching. 1-4 Units.**

Limited to teaching assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Educational Affairs (Sch of Med) (ED AFF)

## Electrical Engineering & Computer Science (EECS)

### Courses

**EECS 1. Introduction to Electrical Engineering and Computer Engineering. 1 Unit.**

Introduction to the fields of Electrical Engineering and Computer Engineering, including possible careers in both traditional and new emerging areas. Background on both the Electrical Engineering and the Computer Engineering majors, curriculum requirements, specializations, and faculty research interests.

(Design units: 0)

Restriction: Electrical Engineering Majors have first consideration for enrollment.

**EECS 10. Computational Methods in Electrical and Computer Engineering. 4 Units.**

An introduction to computers and structured programming. Binary Data Representation. Hands-on experience with a high-level structured programming language. Introduction to algorithm efficiency. Applications of structured programming in solving engineering problems. Programming laboratory.

(Design units: 0)

Corequisite: MATH 2A

Prerequisite: MATH 2A

Overlaps with EECS 12, ICS 31.

Restriction: Electrical Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment.



**EECS 12. Introduction to Programming. 4 Units.**

An introduction to computers and programming. Python programming syntax/style, types. Numbers and sequences. Control flow. I/O and errors/exceptions. Function calling, parameter passing, formal arguments, return values. Variable scoping. Programming laboratory.

(Design units: 0)

Corequisite: MATH 2A

Overlaps with EECS 10, ICS 31.

Restriction: Computer Engineering Majors have first consideration for enrollment.

**EECS 20. Computer Systems and C Programming. 4 Units.**

Introduction to computing systems. Data representation and operations. Simple logic design. Basic computer organization. Instruction set architecture and assembly language programming. Introduction to C. Functions and recursion, data structures, pointers. Programming laboratory.

(Design units: 1)

Prerequisite: EECS 12

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 22. Advanced C Programming. 3 Units.**

C language programming concepts. Control flow, function calls, recursion. Basic and composite data types, static and dynamic data structures. Program modules and compilation units. Preprocessor macros. C standard libraries.

(Design units: 1)

Prerequisite: EECS 10 or EECS 20

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 22L. Software Engineering Project in C Language. 3 Units.**

Hands-on experience with the ANSI-C programming language. Medium-sized programming projects, team work. Software specification, documentation, implementation, testing. Definition of data structures and application programming interface. Creation of program modules, linking with external libraries. Rule-based compilation, version control.

(Design units: 3)

Prerequisite: EECS 22

Restriction: Computer Engineering Majors have first consideration for enrollment.

**EECS 31. Introduction to Digital Systems. 4 Units.**

Digital representation of information. Specification, analysis, design and optimization of combinational and sequential logic, register-transfer components and register-transfer systems with datapaths and controllers. Introduction to high-level and algorithmic state-machines and custom processors.

(Design units: 2)

Prerequisite: ICS 31 or EECS 10 or EECS 12 or MAE 10

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 31L. Introduction to Digital Logic Laboratory. 3 Units.**

Introduction to common digital integrated circuits: gates, memory circuits, MSI components. Operating characteristics, specifications, applications. Design of simple combinational and sequential digital systems (arithmetic processors game-playing machines). Construction and debugging techniques using hardware description languages and CAD tools.

(Design units: 3)

Prerequisite: EECS 31 and (EECS 10 or EECS 12 or ICS 32)

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 40. Object-Oriented Systems and Programming. 4 Units.**

Primitive types and expressions. The class and method definition. Information hiding and encapsulation. Objects and reference. Overloading. Constructors. Inheritance basics. Programming with inheritance. Dynamic binding and polymorphism. Exception handling. An overview of streams and file input/output. Programming laboratory.

(Design units: 2)

Prerequisite: EECS 22L

Restriction: Computer Engineering Majors have first consideration for enrollment.

**EECS 50. Discrete-Time Signals and Systems. 4 Units.**

Analysis of discrete-time linear-time-invariant (DTLTI) systems in the time domain and using z-transforms. Introduction to techniques based on Discrete-Time, Discrete, and Fast Fourier Transforms. Examples of their application to digital signal processing and digital communications.

(Design units: 0)

Prerequisite: EECS 70A

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 55. Engineering Probability. 4 Units.**

Sets and set operations; nature of probability, sample spaces, fields of events, probability measures; conditional probability, independence, random variables, distribution functions, density functions, conditional distributions and densities; moments, characteristic functions, random sequences, independent and Markov sequences.

(Design units: 0)

Prerequisite: MATH 2D

Restriction: Computer Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment.

**EECS 70A. Network Analysis I. 4 Units.**

Modeling and analysis of electrical networks. Basic network theorems. Sinusoidal steady state and transient analysis of RLC networks and the impedance concept.

(Design units: 1)

Corequisite: MATH 3D

Prerequisite: PHYS 7D and (EECS 10 or EECS 12 or MAE 10 or ICS 31 or CEE 20)

Overlaps with MAE 60.

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**EECS 70B. Network Analysis II. 4 Units.**

Laplace transforms, complex frequency, and the s-plane. Network functions and frequency response, including resonance. Bode plots. Two-port network characterization.

(Design units: 1)

Corequisite: EECS 70LB

Prerequisite: (BME 60B or EECS 10 or EECS 12 or ICS 31 or CEE 20 or MAE 10) and EECS 70A

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**EECS 70LA. Network Analysis I Laboratory. 1 Unit.**

Laboratory to accompany EECS 70A.

(Design units: 0)

Corequisite: EECS 70A

Prerequisite: PHYS 7D and (EECS 10 or EECS 12 or BME 60B or CEE 20 or MAE 10)

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 70LB. Network Analysis II Laboratory. 1 Unit.**

Laboratory to accompany EECS 70B. Materials fee.

(Design units: 1)

Corequisite: EECS 70B

Prerequisite: (BME 60B or EECS 10 or EECS 12 or ICS 31 or CEE 20 or MAE 10) and EECS 70A

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 101. Introduction to Machine Vision. 3 Units.**

The use of digital computers for the analysis of visual scenes; image formation and sensing, color, segmentation, shape estimation, motion, stereo, pattern classification, computer architectures, applications. Computer experiments are used to illustrate fundamental principles.

(Design units: 2)

Prerequisite: EECS 150 or EECS 50

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 111. System Software. 4 Units.**

Multiprogramming, interrupt, processes, kernel, parallelism, critical sections, deadlocks, communication, multiprocessing, multilevel memory management, binding, name management, file systems, protection, resource allocation, scheduling. Experience with concurrent programming, synchronization mechanisms, interprocess communication.

(Design units: 2)

Prerequisite: EECS 112 and (ICS 46 or EECS 114)

Overlaps with CS 143A.

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 112. Organization of Digital Computers. 4 Units.**

Building blocks and organization of digital computers, the arithmetic, control, and memory units, and input/output devices and interfaces. Microprogramming and microprocessors.

(Design units: 4)

Prerequisite: EECS 31L

Overlaps with CS 152.

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 112L. Organization of Digital Computers Laboratory. 3 Units.**

Specification and implementation of a processor-based system using a hardware description language such as VHDL. Hands-on experience with design tools including simulation, synthesis, and evaluation using testbenches.

(Design units: 3)

Prerequisite: EECS 112

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 113. Processor Hardware/Software Interfaces. 4 Units.**

Hardware/software interfacing, including memory and bus interfaces, devices, I/O, and compiler code generation/instruction scheduling. Experience microcontroller programming and interfacing. Specific compiler code generation techniques including local variable and register allocations, instruction dependence and scheduling, and code optimization.

(Design units: 3)

Prerequisite: EECS 112

Restriction: Computer Engineering Majors have first consideration for enrollment. Computer Science and Engineering Majors have second consideration for enrollment.

**EECS 114. Engineering Data Structures and Algorithms. 4 Units.**

Introduces abstract behavior of classes data structures, alternative implementations, informal analysis of time and space efficiency. Also introduces classic algorithms and efficient algorithm design techniques (recursion, divide-and-conquer, branch-and-bound, dynamic programming).

(Design units: 2)

Prerequisite: EECS 40

Restriction: Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 116. Introduction to Data Management. 4 Units.**

Introduction to the design of databases and the use of database management systems (DBMS) for applications. Topics include entity-relationship modeling for design, relational data model, relational algebra, relational design theory, and Structured Query Language (SQL) programming.

(Design units: 1)

Prerequisite: ICS 33 or CSE 43 or EECS 114. ICS 33 with a grade of C or better. CSE 43 with a grade of C or better

Same as CS 122A.

Restriction: Computer Science Engineering Majors have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment.

**EECS 117. Parallel Computer Systems. 3 Units.**

General introduction to parallel computing focusing on parallel algorithms and architectures. Parallel models: Flynn's taxonomy, dataflow models. Parallel architectures: systolic arrays, hypercube architecture, shared memory machines, dataflow machines, reconfigurable architectures. Parallel algorithms appropriate to each machine type area also discussed.

(Design units: 1)

Prerequisite: EECS 20 and EECS 114 and EECS 112

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 118. Introduction to Knowledge and Software Engineering. 4 Units.**

Introduction of basic concepts in knowledge engineering and software engineering. Knowledge representation and reasoning, search planning, software life cycle, requirements engineering, software design languages, declarative programming, testing, database and web programming.

(Design units: 2)

Prerequisite: EECS 40

Restriction: Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 119. VLSI. 4 Units.**

Design techniques for Very Large Scale Integrated (VLSI) systems and chips. Review CMOS and related process technologies; primitives such as logic gates and larger design blocks; layout; floor planning; design hierarchy, component interfaces; use of associated CAD tools for design.

(Design units: 4)

Prerequisite: EECS 112 and EECS 170B

Overlaps with EECS 170D, CSE 112.

Restriction: Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 120. Fundamentals of Parallel Computing. 4 Units.**

Fundamentals of parallel computing, focusing on parallel algorithms and architectures. Topics include design of parallel and I/O efficient algorithms, basics of parallel machine architectures, and current/emerging programming models (shared memory, distributed memory, and accelerators).

Prerequisite: (EECS 12 or CS 152) and EECS 114

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 121. System Security. 3 Units.**

Fundamentals and practices of system security. Topics include cryptographic (encryption, decryption, and message authentication), software vulnerabilities (buffer overflow), network security (layer 2-7 attacks and defenses and PKI), web security (XSS and XSRF), and privacy.

Prerequisite: EECS 22 or ICS 45C

**EECS 141A. Communication Systems I. 3 Units.**

Introduction to analog communication systems including effects of noise. Modulation-demodulation for AM, DSB-SC, SSB, VSB, QAM, FM, PM, and PCM with application to radio, television, and telephony. Signal processing as applied to communication systems.

(Design units: 1)

Prerequisite: EECS 55 and EECS 150

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 141B. Communication Systems II. 3 Units.**

Signal space analysis. Optimum receivers for digital communication. Maximum a posteriori and maximum likelihood detection. Matched filter and correlation receiver. PAM, QAM, PSK, FSK, and MSK and their performance. Introduction to equalization, synchronization, information theory, and error control codes.

(Design units: 1)

Prerequisite: EECS 141A

Restriction: Computer Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**EECS 144. Antenna Design for Wireless Communication Links. 4 Units.**

Analysis and synthesis of antennas and antenna arrays. Adaptive arrays and digital beam forming for advanced wireless links. Friis transmission formula. Wireless communication equations for cell-site and mobile antennas, interference, slow and fast fading in mobile communication.

(Design units: 0)

Prerequisite: EECS 180A

**EECS 145. Electrical Engineering Analysis. 4 Units.**

Vector calculus, complex functions, and linear algebra with applications to electrical engineering problems.

(Design units: 0)

Prerequisite: MATH 3D

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering majors have second consideration for enrollment.

**EECS 148. Computer Networks. 4 Units.**

Computer network architectures, protocols, and applications. Internet congestion control, addressing, and routing. Local area networks. Multimedia networking.

(Design units: 2)

Prerequisite: EECS 55 or STAT 67

Same as CS 132.

Restriction: Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**EECS 150. Continuous-Time Signals and Systems. 4 Units.**

Characteristics and properties of continuous-time (analog) signals and systems. Analysis of linear time-invariant continuous-time systems using differential equation convolutional models. Analysis of these systems using Laplace transforms, Fourier series, and Fourier transforms. Examples from applications to telecommunications.

(Design units: 0)

Prerequisite: EECS 70A and EECS 145

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 152A. Digital Signal Processing. 3 Units.**

Nature of sampled data, sampling theorem, difference equations, data holds, z-transform, w-transform, digital filters, Butterworth and Chebychev filters, quantization effects.

(Design units: 2)

Prerequisite: EECS 50

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 152B. Digital Signal Processing Design and Laboratory. 3 Units.**

Design and implementation of algorithms on a DSP processor and using computer simulation. Applications in signal and image processing, communications, radar, etc.

(Design units: 3)

Prerequisite: EECS 152A

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 159A. Senior Design Project I. 3 Units.**

Teaches problem definition, detailed design, integration, and testability with teams of students specifying, designing, building, and testing complex systems. Lectures include engineering values, discussions, and ethical ramifications of engineering decisions.

(Design units: 3)

Prerequisite: EECS 113 or EECS 170C or CS 145

Restriction: Seniors only. Computer Science Engineering Majors only. Electrical Engineering Majors only. Computer Engineering Majors only.

**EECS 159B. Senior Design Project II. 3 Units.**

Teaches problem definition, detailed design, integration, and testability with teams of students specifying, designing, building, and testing complex systems. Lectures include engineering values, discussions, and ethical ramifications of engineering decisions. Materials fee.

(Design units: 3)

Prerequisite: EECS 159A

Restriction: Computer Science Engineering Majors only. Electrical Engineering Majors only. Computer Engineering Majors only.

**EECS 160A. Introduction to Control Systems. 4 Units.**

Modeling, stability, and specifications of feedback control systems. Root locus, Bode plots, Nyquist criteria, and state-space methods for dynamic analysis and design.

(Design units: 2)

Corequisite: EECS 160LA

Prerequisite: (EECS 10 or EECS 12 or MAE 10 or BME 60B or CEE 20) and EECS 150 and EECS 170B and EECS 170LB

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 160LA. Control Systems I Laboratory. 1 Unit.**

Laboratory accompanying EECS 160A. Materials fee.

(Design units: 1)

Corequisite: EECS 160A

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 163. Power Systems. 4 Units.**

Generation, transmission, and use of electrical energy. Fault calculation, protection, stability, and power flow.

(Design units: 1)

Corequisite: EECS 163L

Prerequisite: EECS 70B

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 163L. Power Systems Laboratory. 1 Unit.**

Experiments and field trips relevant to studies in power systems. Materials fee.

(Design units: 0)

Corequisite: EECS 163

Restriction: Computer Science Engineering Majors only. Electrical Engineering Majors only. Computer Engineering Majors only.

**EECS 166A. Industrial and Power Electronics. 4 Units.**

Power switching devices, pulse width modulation (PWM) methods, switching converter topologies, control, and magnetics. Materials fee.

(Design units: 2)

Prerequisite: EECS 170C and EECS 160A

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have second consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

Concurrent with EECS 267A.

**EECS 170A. Electronics I. 4 Units.**

The properties of semiconductors, electronic conduction in solids, the physics and operation principles of semiconductor devices such as diodes and transistors, transistor equivalent circuits, and transistor amplifiers.

(Design units: 1)

Corequisite: PHYS 7E

Prerequisite: PHYS 7D and EECS 70B

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 170B. Electronics II. 4 Units.**

Design and analysis of single-stage amplifiers, biasing circuits, inverters, logic gates, and memory elements based on CMOS transistors.

(Design units: 2)

Corequisite: EECS 170LB

Prerequisite: EECS 70B and EECS 170A and EECS 170LA

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 170C. Electronics III. 4 Units.**

Principles of operation, design, and utilization of integrated circuit modules, including multi-stage amplifiers, operational amplifiers, and logic circuits.

(Design units: 2)

Corequisite: EECS 170LC

Prerequisite: EECS 170B and EECS 170LB

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have second consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 170D. Integrated Electronic Circuit Design. 4 Units.**

Design and fabrication of modern digital integrated circuits. Fabrication of CMOS process, transistor-level design simulation, functional characteristics of basic digital integrated circuits, and different logic families including the static and dynamic logic, layout, and extraction of digital circuits.

(Design units: 4)

Prerequisite: EECS 170C and EECS 170LC

Overlaps with EECS 119, CSE 112.

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have second consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 170E. Analog and Communications IC Design. 4 Units.**

Advanced topics in design of analog and communications integrated circuits. Topics include: implementation of passive components in integrated circuits; overview of frequency response of amplifiers, bandwidth estimation techniques, high-frequency amplifier design; design of radio-frequency oscillators.

(Design units: 3)

Prerequisite: EECS 170C

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have second consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 170LA. Electronics I Laboratory. 1 Unit.**

Laboratory accompanying EECS 170A to perform experiments on semiconductor material properties, semiconductor device physics and operation principles, and transistor amplifiers to improve experimental skills and to enhance the understanding of lecture materials.

(Design units: 1)

Corequisite: EECS 170A and PHYS 7E

Prerequisite: PHYS 7D and EECS 70B

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.



**EECS 170LB. Electronics II Laboratory. 1 Unit.**

Laboratory accompanying EECS 170B.

(Design units: 1)

Corequisite: EECS 170B

Prerequisite: EECS 170A and EECS 170LA

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 170LC. Electronics III Laboratory. 1 Unit.**

Laboratory accompanying EECS 170C to provide hands-on training in design of digital/analog circuits/subsystems. Materials fee.

(Design units: 1)

Corequisite: EECS 170C

Prerequisite: EECS 170B and EECS 170LB

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have second consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 174. Semiconductor Devices. 4 Units.**

Metal-semiconductor junctions, diodes, bipolar junction transistors, MOS structures, MOSFETs, CMOS technology, LEDs, and laser diodes.

(Design units: 1)

Prerequisite: EECS 170A

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment. Materials Science Engineering Majors have second consideration for enrollment.

**EECS 176. Fundamentals of Solid-State Electronics and Materials. 4 Units.**

Physical properties of semiconductors and the roles materials play in device operation. Topics include: crystal structure, phonon vibrations, energy band, transport phenomenon, optical properties and quantum confinement effect essential to the understanding of electronic, optoelectronic and nanodevices.

(Design units: 1)

Prerequisite: EECS 170A

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**EECS 179. Microelectromechanical Systems (MEMS). 4 Units.**

Small-scale machines, small-scale phenomena, MEMS fabrication, MEMS CAD tools, MEMS devices and packaging, MEMS testing.

(Design units: 2)

Restriction: Upper-division students only. Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment.

**EECS 180A. Engineering Electromagnetics I. 4 Units.**

Electrostatics, magnetostatics, and electromagnetic fields: solutions to problems in engineering applications; transmission lines, Maxwell's equations and phasors, plane wave propagation, reflection, and transmission.

(Design units: 1)

Prerequisite: PHYS 7E and EECS 145

Restriction: Electrical Engineering Majors have first consideration for enrollment. Biomedical Engineering Majors have first consideration for enrollment. Materials Science Engineering Majors have first consideration for enrollment.

**EECS 180B. Engineering Electromagnetics II. 4 Units.**

Time-varying electromagnetic fields, plane waves, polarization, guidance of waves like rectangular waveguides and microstrips, optical fibers resonant cavities, skin effects and losses, spherical waves, radiation and reception of waves, antenna basics.

(Design units: 1)

Prerequisite: EECS 180A

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 180C. Engineering Electromagnetics III. 4 Units.**

Propagation in anisotropic media. Propagation in ferrites and non-reciprocal devices. Scattering and dispersion. Electromagnetic properties of materials. Scattering of small nanoparticles. Spherical waves. Cross section of large and small objects. Radar equation. Coherent and incoherent radiation.

(Design units: 0)

Prerequisite: EECS 180B

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment.

**EECS 182. Monolithic Microwave Integrated Circuit (MMIC) Analysis and Design. 4 Units.**

Design of microwave amplifiers including low-noise amplifiers, multiple stage amplifiers, power amplifiers, and introduction to broadband amplifiers. The goal is to provide the basic knowledge for the design of microwave amplifiers ranging from wireless system to radar system.

(Design units: 3)

Prerequisite: EECS 180A

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment.

**EECS 188. Optical Electronics. 4 Units.**

Photodiodes and optical detection, photometry and radiometry, geometric optics, lens theory, imaging system, EM wave propagation, optical waveguides and fibers, heterojunction structures, laser theory, semiconductor lasers, and optical transmission system.

(Design units: 1)

Prerequisite: EECS 180A

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 195. Special Topics in Electrical and Computer Engineering. 1-4 Units.**

Studies special topics in selected areas of Electrical and Computer Engineering. Topics addressed vary each quarter.

(Design units: 1-4)

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**EECS 198. Group Study. 1-4 Units.**

Group study of selected topics in Electrical and Computer Engineering.

(Design units: 1-4)

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**EECS 199. Individual Study. 1-4 Units.**

For undergraduate Engineering majors in supervised but independent reading, research, or design. Students taking Individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Repeatability: May be taken for credit for 8 units.

**EECS 199P. Individual Study. 1-4 Units.**

For undergraduate Engineering majors in supervised but independent reading, research, or design. Students taking individual study for design credit are to submit a written paper to the instructor and to the Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**EECS 202A. Principles of Imaging. 4 Units.**

Linear systems, probability and random processes, image processing, projecting imaging, tomographic imaging.

Same as PHYS 233A.

Restriction: Graduate students only.

Concurrent with PHYS 147A.

**EECS 202B. Techniques in Medical Imaging I: X-ray, Nuclear, and NMR Imaging. 4 Units.**

Ionizing radiation, planar and tomographic radiographic and nuclear imaging, magnetism, NMR, MRI imaging.

Prerequisite: EECS 202A

Same as PHYS 233B.

Restriction: Graduate students only.

Concurrent with PHYS 147B.

**EECS 202BP. Techniques in Medical Imaging: X-ray, Nuclear, and NMR Imaging. 4 Units.**

Ionizing radiation, planar and tomographic radiographic and nuclear imaging, magnetism, NMR, MRI imaging.

Restriction: Master of Engineering students only. Graduate students only.

**EECS 202C. Techniques in Medical Imaging II: Ultrasound, Electrophysiological, Optical. 4 Units.**

Sound and ultrasound, ultrasonic imaging, physiological electromagnetism, EEG, MEG, ECG, MCG, optical properties of tissues, fluorescence and bioluminescence, MR impedance imaging, MR spectroscopy, electron spin resonance and ESR imaging.

Prerequisite: EECS 202B

Same as PHYS 233C.

Restriction: Graduate students only.

Concurrent with PHYS 147C.

**EECS 203A. Digital Image Processing. 4 Units.**

Pixel-level digital image representation and elementary operations; Fourier and other unitary transforms; compression, enhancement, filtering, and restoration; laboratory experience is provided.

Restriction: Graduate students only.

**EECS 211. Advanced System Software. 4 Units.**

Study of operating systems including interprocess communication, scheduling, resource management, concurrency, reliability, validation, protection and security, and distributed computing support. System software design languages and modeling analysis.

Restriction: Graduate students only.

**EECS 211P. Advanced System Software. 4 Units.**

Study of operating systems including interprocess communication, scheduling, resource management, concurrency, reliability, validation, protection and security, and distributed computing support. System software design languages and modeling analysis.

Prerequisite: Recommended: Undergraduate-level knowledge of system software (e.g. EECS 111) and organization of digital computers (e.g. UCI EECS 112).

Restriction: Master of Engineering students only. Graduate students only.

**EECS 213. Computer Architecture. 4 Units.**

Problems in hardware, firmware (microprogram), and software. Computer architecture for resource sharing, real-time applications, parallelism, microprogramming, and fault tolerance. Various architectures based on cost/performance and current technology.

Restriction: Graduate students only.

**EECS 213P. Computer Architecture. 4 Units.**

Problems in hardware, firmware (microprogram), and software. Computer architecture for resource sharing, real-time applications, parallelism, microprogramming, and fault tolerance. Various architectures based on cost/performance and current technology.

Prerequisite: Recommended: Undergraduate-level knowledge of organization of digital computers (e.g. EECS 112 and EECS 112L).

Restriction: Master of Engineering students only. Graduate students only.

**EECS 215. Design and Analysis of Algorithms. 4 Units.**

Computer algorithms from a practical standpoint. Algorithms for symbolic and numeric problems such as sorting, searching, graphs, and network flow. Analysis includes algorithm time and space complexity.

**EECS 215P. Design and Analysis of Algorithms. 4 Units.**

Computer algorithms from a practical standpoint. Algorithms for symbolic and numeric problems such as sorting, searching, graphs, and network flow. Analysis includes algorithm time and space complexity.

Restriction: Master of Engineering students only. Graduate students only.

**EECS 216. Advanced Application of Algorithms. 4 Units.**

Medium-sized group and individual programming project. Topics include specification requirements documentation, practical implementation of algorithms, and testing/verification of design.

Prerequisite: Recommended: Undergraduate course work in engineering data structures and algorithms.

**EECS 217. VLSI System Design. 4 Units.**

Overview of integrated fabrication, circuit simulation, basic device physics, device layout, timing; MOS logic design; layout generation, module generation, techniques for very large scale integrated circuit design.

Restriction: Graduate students only.

**EECS 220. Advanced Digital Signal Processing Architecture. 4 Units.**

Study the latest DSP architectures for applications in communication (wired and wireless) and multimedia processing. Emphasis given to understanding the current design techniques and to evaluate the performance, power, and application domain of the latest DSP processors.

Prerequisite: EECS 213

Restriction: Graduate students only.

**EECS 220P. Advanced Digital Signal Processing Architecture. 4 Units.**

Study the latest DSP architectures for applications in communication (wired and wireless) and multimedia processing. Emphasis given to understanding the current design techniques and to evaluate the performance, power, and application domain of the latest DSP processors.

Prerequisite: EECS 213P

Restriction: Master of Engineering students only. Graduate students only.

**EECS 221. Topics in Computer Engineering. 4 Units.**

New research results in computer engineering.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EECS 222. Embedded System Modeling. 4 Units.**

Computational models for embedded systems. System-level specification and description languages. Concepts, requirements, examples. Embedded system models at different levels of abstraction. Modeling of test benches, design under test, IP components. Discrete event simulation, semantics, and algorithms. Formerly EECS 222A.

Restriction: Graduate students only.

**EECS 223. Real-Time Computer Systems. 4 Units.**

Time bases, clock synchronization, real-time communication protocols, specification of requirements, task scheduling. Validation of timelines, real-time configuration management.

Prerequisite: EECS 211 and EECS 213

Restriction: Graduate students only.

**EECS 223P. Real-Time Computer Systems. 4 Units.**

Time bases, clock synchronization, real-time communication protocols, specification of requirements, task scheduling. Validation of timelines, real-time configuration management.

Prerequisite: EECS 211P and EECS 213P

Restriction: Master of Engineering students only. Graduate students only.

**EECS 224. High-Performance Computing. 4 Units.**

Fundamentals of high-performance computing, covering both theory and practice. Topics include performance analysis and tuning, design of parallel and I/O efficient algorithms, basics of parallel machine architectures, and current/emerging programming models (shared memory, distributed memory, and accelerators).

Prerequisite: EECS 215 or CS 260

Restriction: Graduate students only.

**EECS 225. Embedded Systems Design. 4 Units.**

Embedded systems design flow and methodology. Design space exploration. Co-design of hardware and software, embedded architecture and network exploration and synthesis. System software/hardware interface generation. Real-time constraints, specification-to-architecture mapping, design tools and methodologies. Formerly EECS 222B.

Restriction: Graduate students only.

**EECS 226. Embedded System Software. 4 Units.**

Embedded system software concepts, requirements, examples, for engineering applications such as multi-media and automotive. Software generation methodology. Algorithmic specification, design constraints. Embedded operating systems. Static, dynamic, real-time scheduling. Input/output, interrupt handling. Code generation, compilation, instruction set simulation. Formerly EECS 222C.

Restriction: Graduate students only.

**EECS 227. Cyber-Physical System Design. 4 Units.**

Model-based design of cyber-physical systems including, e.g., plant, sensing, control, actuation, embedded hardware/software, communication, real-time analysis, various levels of simulation (MILS, SILS, HILS), tools and methodologies for automatic synthesis, and application from various interdisciplinary domains.

Restriction: Graduate students only.

**EECS 229. Low Power SoC Design. 4 Units.**

From an inverter to server centers, low-power design theory and practice in modern systems-on-chip (SoC), energy efficient design time and runtime methods are surveyed at circuit, RTL, and architecture levels. Lab assignments will help students quantify tradeoffs and design practices.

Prerequisite: EECS 217

Restriction: Graduate students only.

**EECS 230. Energy Efficiency. 4 Units.**

Green energy sources for production, transmission, storage, and utilization of electricity, with a special focus on solar, wind, and nuclear energy production. Study of newly developed renewable sources of energy including capital cost, product cost, environmental issues, and technical feasibility.

**EECS 231. Advanced System Security. 4 Units.**

Advanced study about system security. Topics include software vulnerabilities (buffer overflow), vulnerability discovery (fuzzing), network security, side-channel analysis (power analysis and micro-architecture attacks), machine-learning security, IoT security, and privacy (differential privacy).

Restriction: Graduate students only.

**EECS 240. Random Processes. 4 Units.**

Extensions of probability theory to random variables varying with time. General properties of stochastic processes. Convergence. Estimation, including nonlinear and linear minimum mean square error and maximum likelihood. Spectral density and linear filters. Poisson processes and discrete-time Markov chains.

Restriction: Graduate students only.

**EECS 240P. Random Processes. 4 Units.**

Extensions of probability theory to random variables varying with time. General properties of stochastic processes. Convergence. Estimation, including nonlinear and linear minimum mean square error and maximum likelihood. Spectral density and linear filters. Poisson processes and discrete-time Markov chains.

Prerequisite: Recommended: Knowledge of engineering probability (e.g. EECS 55).

Restriction: Master of Engineering students only. Graduate students only.

**EECS 241A. Digital Communications I. 4 Units.**

Concepts and applications of digital communication systems. Baseband digital transmission of binary, multi-amplitude, and multidimensional signals. Introduction to and performance analysis of different modulation schemes.

**EECS 241AP. Digital Communications I. 4 Units.**

Concepts and applications of digital communication systems. Baseband digital transmission of binary, multi-amplitude, and multidimensional signals. Introduction to and performance analysis of different modulation schemes.

Restriction: Master of Engineering students only. Graduate students only.

**EECS 241B. Digital Communications II. 4 Units.**

Concepts and applications of equalization, multi-carrier modulation, spread spectrum and CDMA. Digital communications through fading memory channels.

Prerequisite: EECS 241A

Restriction: Graduate students only.

**EECS 241BP. Digital Communications II. 4 Units.**

Concepts and applications of equalization, multi-carrier modulation, spread spectrum, and CDMA. Digital communications through fading memory channels.

Prerequisite: EECS 241AP

Restriction: Master of Engineering students only. Graduate students only.

**EECS 242. Information Theory. 4 Units.**

Fundamental capabilities and limitations of information sources and information transmission systems. Analytical framework for modeling and evaluating communication systems: entropy, mutual information asymptotic equipartition property, entropy rates of a stochastic process, data compression, channel capacity, differential entropy, the Gaussian channel.

Prerequisite: EECS 240

**EECS 243. Error Correcting Codes. 4 Units.**

Different techniques for error correcting codes and analyzing their performance. Linear block codes; cyclic codes; convolutional codes. Minimum distance; optimal decoding; Viterbi decoding; bit error probability. Coding gain; trellis coded modulation.

Prerequisite: EECS 240

Restriction: Graduate students only.

**EECS 244. Wireless Communications. 4 Units.**

Introduction to wireless communications systems. Wireless channel modeling. Single carries, spread spectrum, and multi-carrier wireless modulation schemes. Diversity techniques. Multiple-access schemes. Transceiver design and system level tradeoffs. Brief overview of GSM, CDMA, (IS-95) and 2.5, 3G cellular schemes.

Prerequisite: EECS 241B

Restriction: Graduate students only.

**EECS 244P. Wireless Communications. 4 Units.**

Introduction to wireless communications systems. Wireless channel modeling. Single carries, spread spectrum, and multi-carrier wireless modulation schemes. Diversity techniques. Multiple-access schemes. Transceiver design and system level tradeoffs. Brief overview of GSM, CDMA, (IS-95) and 2.5, 3G cellular schemes.

Prerequisite: EECS 241BP

Restriction: Master of Engineering students only. Graduate students only.

**EECS 245. Space-Time Coding. 4 Units.**

A fundamental study of: Capacity of MIMO Channels, space-time code design criteria, space-time block codes, space-time trellis codes, differential detection for multiple antennas, spatial multiplexing, BLAST.

Prerequisite: EECS 242

Restriction: Graduate students only.

**EECS 247. Information Storage. 4 Units.**

Storage architecture, storage network and networking algorithms in data centers, principle of storage devices and non-volatile memory, data consistency, data availability and integrity, power management.

Restriction: Graduate students only.

**EECS 248A. Computer and Communication Networks. 4 Units.**

Network architecture of the Internet, telephone networks, cable networks, and cell phone networks. Network performance models. Network performance models. Advanced concepts and implementations of flow and congestion control, addressing, internetworking, forwarding, routing, multiple access, streaming, and quality-of-service.

Prerequisite: EECS 148 or CS 132

Same as CS 232, NSYS 201.

Restriction: Graduate students only.

**EECS 250. Digital Signal Processing I. 4 Units.**

Fundamental principles of digital signal processing, sampling, decimation and interpolation, discrete Fourier transforms and FFT algorithms, transversal and recursive filters, discrete random processes, and finite-word effects in digital filters.

Restriction: Graduate students only.

**EECS 250P. Digital Signal Processing I. 4 Units.**

Fundamental principles of digital signal processing, sampling, decimation and interpolation, discrete Fourier transforms and FFT algorithms, transversal and recursive filters, discrete random processes, and finite-word effects in digital filters.

Prerequisite: Recommended: Knowledge of digital signal processing (e.g. EECS 152A).

Restriction: Master of Engineering students only. Graduate students only.

**EECS 251A. Detection, Estimation, and Demodulation Theory. 4 Units.**

Fundamentals of hypothesis testing and Bayes and Maximum Likelihood Estimation. ARMA and state variable models for random time series analysis. Wiener and Kalman filtering and prediction. Adaptive algorithms for identification and tracking of parameters of time-varying models.

Prerequisite: EECS 240

**EECS 251B. Detection, Estimation, and Demodulation Theory. 4 Units.**

Fundamentals of hypothesis testing and Bayes and Maximum Likelihood Estimation. ARMA and state variable models for random time series analysis. Wiener and Kalman filtering and prediction. Adaptive algorithms for identification and tracking of parameters of time-varying models.

Prerequisite: EECS 240

**EECS 260A. Linear Systems I. 4 Units.**

State-space representation of continuous-time and discrete-time linear systems. Controllability, observability, stability. Realization of rational transfer functions.

Restriction: Graduate students only.

**EECS 261A. Linear Optimization Methods. 4 Units.**

Formulation, solution, and analysis of linear programming and linear network flow problems. Simplex methods, dual ascent methods, interior point algorithms, and auction algorithms. Duality theory and sensitivity analysis. Shortest path, max-flow, assignment, and minimum cost flow problems.

Restriction: Graduate students only.

**EECS 267A. Industrial and Power Electronics. 4 Units.**

Power switching devices, pulse width modulation (PWM) methods, switching converter topologies, control, and magnetics. Materials fee.

Restriction: Graduate students only.

Concurrent with EECS 166A.

**EECS 267B. Topics in Industrial and Power Electronics. 4 Units.**

Practical design of switching converters, electromagnetic compatibility, thermal management, and/or control methods.

Prerequisite: EECS 267A

Restriction: Graduate students only.

**EECS 270A. Advanced Analog Integrated Circuit Design I. 4 Units.**

Basic transistor configurations; differential pairs; active load/current sources; supply/temperature-independent biasing; op-amp gain and output stages; amplifier frequency response and stability compensation; nonidealities in op-amps; noise and dynamic range in analog circuits.

Restriction: Graduate students only.

**EECS 270AP. Advanced Analog Integrated Circuit Design I. 4 Units.**

Basic transistor configurations; differential pairs; active load/current sources; supply/temperature-independent biasing; op-amp gain and output stages; amplifier frequency response and stability compensation; nonidealities in op-amps; noise and dynamic range in analog circuits.

Prerequisite: Recommended: Introductory knowledge of control systems (e.g. EECS 160A) and electronics (e.g. EECS 170C).

Restriction: Master of Engineering students only. Graduate students only.

**EECS 270B. Advanced Analog Integrated Circuit Design II. 4 Units.**

Advanced transistor modeling issues; discrete-time and continuous-time analog Integrated Circuit (IC) filters; phase-locked loops; design of ICs operating at radio frequencies; low-voltage/low-power design techniques; A/D and D/A converters; AGC circuits.

Prerequisite: EECS 270A

Restriction: Graduate students only.

**EECS 270BP. Advanced Analog Integrated Circuit Design II. 4 Units.**

Advanced transistor modeling issues; discrete-time and continuous-time analog Integrated Circuit (IC) filters; phase-locked loops; design of ICs operating at radio frequencies; low-voltage/low-power design techniques; A/D and D/A converters; AGC circuits.

Prerequisite: EECS 270AP

Restriction: Master of Engineering students only. Graduate students only.



**EECS 270C. Design of Integrated Circuits for Broadband Applications. 4 Units.**

Topics include: broadband standards and protocols; high-frequency circuit design techniques; PLL theory and design; design of transceivers; electrical/optical interfaces.

Prerequisite: EECS 270A

Restriction: Graduate students only.

**EECS 270D. Radio-Frequency Integrated Circuit Design. 4 Units.**

Topics include: RF component modeling; matching network design; transmission line theory/modeling; Smith chart and S-parameters; noise modeling of active and passive components; high-frequency amplifier design; low-noise amplifier (LNA) design; mixer design; RF power amplifier.

Prerequisite: EECS 270A

Restriction: Graduate students only.

**EECS 270DP. Radio-Frequency Integrated Circuit Design. 4 Units.**

Topics include RF component modeling; matching network design; transmission line theory/modeling; Smith chart and S-parameters; noise modeling of active and passive components; high-frequency amplifier design; low-noise amplifier (LNA) design; mixer design; RF power amplifier.

Prerequisite: EECS 270AP

Restriction: Master of Engineering students only. Graduate students only.

**EECS 270E. High Frequency (Millimeter-Wave and Terahertz) Circuits. 4 Units.**

Discussion of the new methodologies, circuits, and systems developed at mm-wave and terahertz frequency ranges due to the growing interest in high speed communication and high frequency signal generation.

Restriction: Graduate students only.

**EECS 272. Topics in Electrical Engineering. 4 Units.**

New research results in electronic system design.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EECS 275A. Very Large Scale Integration (VLSI) Project. 4 Units.**

Students create VLSI design projects from conception through architecture, floor planning, detailed design, simulation, verification, and submission for project fabrication. Emphasis on practical experience in robust VLSI design techniques. (Successful students are expected to take EECS 275B.).

Restriction: Graduate students only.

**EECS 275B. Very Large Scale Integration (VLSI) Project Testing. 4 Units.**

Test and document student-created Complementary Metal Oxide Semiconductor (CMOS) Very Large Scale Integration (VLSI) projects designed in EECS 275A. Emphasis on practical laboratory experience in VLSI testing techniques. Materials fee.

Prerequisite: EECS 275A

Restriction: Graduate students only.

**EECS 277A. Advanced Semiconductor Devices I. 4 Units.**

Advanced complementary metal-oxide-semiconductor field-effect transistors (CMOSFET), device scaling, device modeling and fabrication, equivalent circuits, and their applications for digital, analog, RF.

Restriction: Graduate students only.

**EECS 277B. Advanced Semiconductor Devices II. 4 Units.**

Metal-semiconductor field-effect transistors (MESFET), heterojunction bipolar transistors (HBT), microwave semiconductor devices, equivalent circuits, device modeling and fabrication, microwave amplifiers, transmitters, and receivers.

Restriction: Graduate students only.

**EECS 277C. Nanotechnology. 4 Units.**

Fabrication and characterization techniques of electrical circuit elements at the nanometer scale. Quantized conductance, semiconductor quantum dots, single electron transistors, molecular wires, carbon nanotubes, self-assembly of nano-circuit elements, quantum methods of information processing.

Restriction: Graduate students only.

**EECS 278. Micro-System Design. 4 Units.**

Covers the fundamentals of the many disciplines needed for design of Micro-Electro-Mechanical Systems (MEMS): microfabrication technology, structural mechanics on micro-scale, electrostatics, circuit interface, control, computer-aided design, and system integration.

Same as MAE 247.

Restriction: Graduate students only.

**EECS 279. Micro-Sensors and Actuators. 4 Units.**

Introduction to the technology of Micro-Electro-Mechanical Systems (MEMS). Fundamental principles and applications of important microsensors, actuation principles on microscale. Introduction to the elements of signal processing; processing of materials for micro sensor/actuator fabrication; smart sensors and microsensor/microactuator array devices.

Same as MAE 249.

Restriction: Graduate students only.

**EECS 280A. Advanced Engineering Electromagnetics I. 4 Units.**

Stationary electromagnetic fields, Maxwell's equations, circuits and transmission lines, plane waves, guided waves, and radiation.

Restriction: Graduate students only.

**EECS 280AP. Advanced Engineering Electromagnetics I. 4 Units.**

Stationary electromagnetic fields, Maxwell's equations, circuits and transmission lines, plane waves, guided waves, and radiation.

Prerequisite: Recommended: Knowledge of engineering electromagnetics (e.g. EECS 180A)

Restriction: Master of Engineering students only. Graduate students only.

**EECS 280B. Advanced Engineering Electromagnetics II. 4 Units.**

Two- and three-dimensional boundary value problems, dielectric waveguides and other special waveguides, microwave networks and antenna arrays, electromagnetic properties of materials, and electromagnetic optics.

Prerequisite: EECS 280A

Restriction: Graduate students only.

**EECS 282. Monolithic Microwave Integrated Circuit (MMIC) Analysis and Design II. 4 Units.**

Design of microwave amplifiers using computer-aided design tools. Covers low-noise amplifiers, multiple stage amplifiers, broadband amplifiers, and power amplifiers. Hybrid circuit design techniques including filters and baluns. Theory and design rules for microwave oscillator design.

Restriction: Graduate students only.

**EECS 284P. RF Antenna Design . 4 Units.**

Advanced transmission line design, radiation of electromagnetic waves, dipole antennas, antenna arrays, advanced antenna designs, and practical design considerations in communications systems. Course is supplemented by RF design tools and modeling.

Prerequisite: EECS 280AP

Restriction: Master of Engineering students only. Graduate students only.

**EECS 285A. Optical Communications. 4 Units.**

Introduction to fiber optic communication systems, optical and electro-optic materials, and high-speed optical modulation and switching devices.

Restriction: Graduate students only.

**EECS 285AP. Optical Communications. 4 Units.**

Introduction to fiber optic communication systems, optical and electro-optic materials, and high-speed optical modulation and switching devices.

Prerequisite: Undergraduate-level Engineering Electromagnetics I (e.g. EECS E80A).

Restriction: Master of Engineering students only. Graduate students only.

**EECS 285B. Lasers and Photonics. 4 Units.**

Covers the fundamentals of lasers and applications, including Gaussian beam propagation, interaction of optical radiation with matters, and concepts of optical gain and feedback. Applications are drawn from diverse fields of optical communication, signal processing, and material diagnosis.

Prerequisite: Undergraduate course work in electromagnetic theory and atomic physics.

**EECS 285C. Nano Imaging. 4 Units.**

Theory and practice of modern nanoscale imaging techniques and applications. Traces the development of microscopy from ancient times to modern day techniques used for visualizing the nano-world from atoms to molecules including hands-on experience in the laboratory.

Restriction: Graduate students only.

**EECS 290. Curricular Practical Training. 1 Unit.**

Curricular practical training. Students will go through practical training under an industry mentor in a technical field corresponding to their concentration area.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EECS 292. Preparation for M.S. Comprehensive Examination. 1-8 Units.**

Individual reading and preparation for the M.S. comprehensive examination.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EECS 293. Preparation for Ph.D. Preliminary Examination. 1-8 Units.**

Individual reading and preparation for the Ph.D. preliminary examination.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EECS 294. Electrical Engineering and Computer Science Colloquium. 1 Unit.**

Invited speakers discuss their latest research results in electrical engineering and computer science.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EECS 295. Seminars in Engineering. 1-4 Units.**

Scheduled each year by individual faculty in major field of interest.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EECS 295P. Special Topics in Electrical Engineering and Computer Science. 4 Units.**

Studies in selected areas of Electrical Engineering. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Master of Engineering students only. Graduate students only.

**EECS 296. Master of Science Thesis Research. 1-16 Units.**

Individual research or investigation conducted in the pursuit of preparing and completing the thesis required for the M.S. degree in Engineering.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EECS 297. Doctor of Philosophy Dissertation Research. 1-16 Units.**

Individual research or investigation conducted in preparing and completing the dissertation required for the Ph.D. degree in Engineering.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EECS 298. Topics in Electrical Engineering and Computer Science. 4 Units.**

Study of Electrical and Computer Engineering concepts.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EECS 299. Individual Research. 1-16 Units.**

Individual research or investigation under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Embedded and Cyber-Physical Systems (ECPS)

### Courses

**ECPS 202. Cyber-Physical Systems Design. 4 Units.**

Requirements and specification, MoCs, tools, design, merging cyber and physical, manufacturing, examples (robots, energy house, self-driving car, pacemaker, etc.). Design process, specification, requirements, modeling, components, selection, interfaces, system structure, different levels, verification, testing.

Restriction: Graduate students only.

**ECPS 203. Embedded Systems Modeling and Design. 4 Units.**

Embedded Systems definition, specification, and languages. Concepts, requirements, examples. Embedded system models at different abstraction levels. Test benches, design under test, Intellectual Property components. Discrete event simulation, semantics, algorithms. Design, analysis techniques for decentralized computer architectures, communication, and hardware-software systems.

Restriction: Graduate students only.

**ECPS 204. Embedded System Software. 4 Units.**

Embedded system software concepts, requirements, examples, for engineering applications such as multimedia and automotive. Software methodology. Specification, design constraints. Embedded operating systems. Input/output, interrupt handling. Code generation, compilation, instruction set simulation. Distributed object model, distributed environment, platform-independent software agents, components.

Restriction: Graduate students only.

**ECPS 205. Sensors, Actuators and Sensor Networks. 4 Units.**

Fundamental principles and applications of sensors, actuators. Smart sensors and microsensor/microactuator array devices. Introduction to signal processing and sensor/actuator networks, deployment and architecture, wireless communication, multiple access control layer, data gathering, routing and querying, collaborating signal processing.

Restriction: Graduate students only.

**ECPS 206. Real-Time and Distributed Systems. 4 Units.**

Time dependent systems, clock synchronization, real-time communication protocols, specification of requirements, task scheduling. Validation of timelines, real-time configuration management. Middleware architecture for distributed real-time and secure services.

Restriction: Graduate students only.

**ECPS 207. Security and Privacy in Cyber-Physical Systems. 4 Units.**

ES and CPS security: attacks and countermeasures, authentication, identification, confidentiality, data integrity, authorization, access control, malware attacks and counter-measures, security protocols. Privacy issues e.g., vehicular devices and smart metering. Applications of public key and symmetric cryptography, e.g., digital certificates, credentials.

Restriction: Graduate students only.

**ECPS 208. Control Systems for Cyber-Physical Systems. 4 Units.**

State space representation (continuous and discrete), principles of optimization, model predictive control, robustness to actuation or communications limitations, control of networked systems, multi-agent co-operation and control.

Restriction: Graduate students only.

**ECPS 209. Cyber-Physical Systems Case Studies . 4 Units.**

Covers CPS case studies in applications such as (but not limited to): automotive and transportation, manufacturing, power distribution grid, medical and healthcare, robotics, civil infrastructure, avionics.

Restriction: Graduate students only.

**ECPS 210. Cyber-Physical Systems Project. 4 Units.**

Students are required to complete a project that deals with a specific emphasis of Cyber-Physical Systems, such as (but not limited to): automotive, transportation, manufacturing, power grid, medical healthcare, robotics, civil infrastructure, avionics.

Prerequisite: ECPS 202 and ECPS 204 and ECPS 209

Repeatability: May be taken for credit 3 times.

**ECPS 211. Machine Learning and Data Mining. 4 Units.**

Introduction to principles of machine learning and data-mining. Learning algorithms for classifications, regression, and clustering. Emphasis is on discriminative classification methods such as decision trees, rules, nearest neighbor, linear models, and naive Bayes.

Restriction: Graduate students only.

**ECPS 212. Entrepreneurship for Scientists and Engineers. 4 Units.**

Real-world introduction to the theory and practice of entrepreneurship. Explores organizational, strategic, and financial challenges; start-up strategies; business-idea evaluation; and business-plan writing. Presentations by prestigious entrepreneurs and industry leaders.

Restriction: Graduate students only.

**ECPS 299. Individual Research. 1-16 Units.**

Individual research or investigation under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Emergency Medicine (ER MED)

## Engineering (ENGR)

### Courses

**ENGR 1A. General Chemistry for Engineers. 4 Units.**

Emphasis on solid-state chemistry. Quantum theory, atomic structure, periodic trends, chemical bonding, molecular orbitals, electronic band structure, gases, liquids, intermolecular forces, unit cells, crystal lattices, phase transformations, and electrochemistry.

(Design units: 0)

Prerequisite: AP Chemistry or SAT Subject Chemistry or SAT Mathematics or ACT Mathematics. AP Chemistry with a minimum score of 3. SAT Subject Chemistry with a minimum score of 600. SAT Mathematics with a minimum score of 600. ACT Mathematics with a minimum score of 27. A score of 85 or higher on the Engineering Chemistry Placement Exam (fee required) is also accepted.

Overlaps with CHEM 1A.

Restriction: Electrical Engineering Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Materials Science Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

(II)

**ENGR 7A. Introduction to Engineering I. 2 Units.**

Introduction to engineering disciplines and the design process. Students enrolled in the online lecture also attend a three-hour lab on campus. Materials fee.

(Design units: 1)

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Lower-division students only. School of Engineering students have first consideration for enrollment.

**ENGR 7B. Introduction to Engineering II. 2 Units.**

Introduction to engineering disciplines and the design process. Students enrolled in the online lecture also attend a three-hour lab on campus. Materials fee.

(Design units: 2)

Prerequisite: ENGR 7A

Restriction: Lower-division students only. School of Engineering students have first consideration for enrollment.

**ENGR 30. Statics. 4 Units.**

Addition and resolution of forces, distributed forces, equivalent system of forces centroids, first moments, moments and products on inertia, equilibrium of rigid bodies, trusses, beams, cables. Course may be offered online.

(Design units: 0)

Corequisite: MATH 2D

Prerequisite: MATH 2D and PHYS 7C

Same as CEE 30, MAE 30.

Restriction: School of Engineering students have first consideration for enrollment.

**ENGR 54. Principles of Materials Science and Engineering. 4 Units.**

Superconductors to biodegradable polymers. Structure and properties of materials, including metal, ceramics, polymers, semiconductors, composites, traditional materials. Atomic structure, bonding, defects, phase equilibria, mechanical properties, electrical, optical and magnetic properties. Introduction to materials processing and synthesis. Materials fee.

(Design units: 0)

Prerequisite: (ENGR 1A or CHEM 1A or CHEM H2A) and PHYS 7C

Restriction: School of Engineering students have first consideration for enrollment.

**ENGR 80. Dynamics. 4 Units.**

Introduction to the kinematics and dynamics of particles and rigid bodies. The Newton-Euler, Work/Energy, and Impulse/Momentum methods are explored for ascertaining the dynamics of particles and rigid bodies. An engineering design problem using these fundamental principles is also undertaken.

(Design units: 0.5)

Prerequisite: MATH 2D and PHYS 7C

Same as CEE 80, MAE 80.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGR 92. Engineering and Computer Educational Laboratory. 1-4 Workload Units.**

Comprehensive academic support designed primarily for underrepresented or underprepared students in Engineering, ICS, or selected areas of the physical sciences. Typical program activities: tutoring, study skills, career planning, self-esteem enhancement, library research techniques.

(Design units: 0)

Grading Option: Workload Credit P/NP Only.

Repeatability: May be taken for credit for 12 units.

**ENGR 93. Public and Professional Service in Engineering. 1-2 Workload Units.**

Student participation in public and professional service activities related to engineering.

(Design units: 0)

Grading Option: Workload Credit P/NP Only.

Repeatability: May be repeated for credit unlimited times.

**ENGR 98. Group Study . 1-4 Units.**

Group study of selected topics in engineering.

(Design units: 1-4)

Repeatability: Unlimited as topics vary.

**ENGR 100. Special Topics in Fabrication Safety. 1 Workload Unit.**

Hands on training in the safe use of item fabrication: metalworking, woodworking, electronics fabrication, composites, welding, adhesives, water disposal, and others. Safety certification will be granted from this course and is required for access to Engineering School fabrication facilities.

(Design units: 0)

Grading Option: Workload Credit Letter Grade with P/NP.

Repeatability: Unlimited as topics vary.

Restriction: School of Engineering students have first consideration for enrollment.

**ENGR 150. Mechanics of Structures. 4 Units.**

Stresses and strains. Torsion. Bending. Beam deflection. Shear force and moment distributions in beams. Yielding and buckling of columns. Combined loading. Transformation of stresses and strain. Yielding criteria. Finite elements analysis of frames. Dynamic of two-bar truss.

(Design units: 2)

Prerequisite: (CEE 30 or ENGR 30 or MAE 30) and MATH 3A

Same as MAE 150.

Overlaps with CEE 150.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGR 165. Advanced Manufacturing. 4 Units.**

Principles in manufacturing processes. All machining requires energy: mechanical (cutting and shaping), heat energy (laser cutting), photochemical (photolithography), chemical energy (electro chemical machining and chemical vapor deposition). These methods and their fundamentals are examined. Materials fee.

(Design units: 2)

Restriction: Seniors only. School of Engineering students only.

Concurrent with ENGR 265.

**ENGR 180. Entrepreneurship for Scientists and Engineers. 4 Units.**

Learn the theory and practice of entrepreneurship and intrapreneurship. Covers positioning an idea, establishing the value propositions and benefits case, going to market strategy, creating an execution plan, and raising funds. Concepts are applied to a real-world venture project.

(Design units: 0)

Restriction: Upper-division students only. School of Engineering students have first consideration for enrollment.

Concurrent with ENGR 280.

**ENGR 189. Senior Project - Topics Vary. 1-4 Units.**

Multidisciplinary group senior project of theoretical or applied nature involving design.

(Design units: 1-4)

Repeatability: May be taken for credit for 12 units as topics vary.

Restriction: Seniors only.

**ENGR 190W. Communications in the Professional World. 4 Units.**

Upper-division technical writing course including the development of presentation skills. Effective communication with a range of audiences. Recognition of ethical and professional responsibilities for engineers.

(Design units: 0)

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: School of Engineering students only. Graduating seniors with an application on file have first consideration.

**(Ib)**

**ENGR 191. Curricular Practical Training. 1 Unit.**

Practical training under an industry mentor in a technical field corresponding to students' area of interest.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**ENGR 195. Special Topics in Engineering. 1-4 Units.**

Studies in selected areas of Engineering. Topics addressed vary each quarter.

(Design units: 1-4)

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ENGR 196W. Engineering Thesis. 4 Units.**

Preparation of final presentation and paper describing individual research in Engineering completed in one or more quarters of individual study (i.e., ENGR 199).

(Design units: 0)

Prerequisite: Completion of at least 4 units of Individual Research in Engineering. Satisfactory completion of the Lower-Division Writing requirement.

**(Ib)**

**ENGR H196W. Honors Thesis. 4 Units.**

Preparation of final presentation and paper describing individual research in Engineering. For participants in the Campuswide Honors Program.

(Design units: 1-4)

Prerequisite: ENGR H199. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Campuswide Honors Collegium students only.

**(Ib)**

**ENGR 199. Individual Study. 1-4 Units.**

Supervised independent reading, research, or design for undergraduate Engineering majors. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Repeatability: May be taken for credit for 8 units.

Restriction: School of Engineering students only.



**ENGR 199P. Individual Study. 1-4 Units.**

Supervised independent reading, research, or design for undergraduate Engineering majors. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**ENGR H199. Individual Study for Honors Students. 1-5 Units.**

Supervised research in Engineering for participants in the Campuswide Honors Program. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-5)

Repeatability: May be repeated for credit unlimited times.

Restriction: Campuswide Honors Collegium students only.

**ENGR 200AP. Entrepreneurship Science and Engineering: Innovation. 4 Units.**

Teaches concepts on how to develop innovate/disruptive ideas through actual delivery and adoption. Focuses on the critical thinking skills, the process of developing an idea into a product/service, and teaching a framework to foster adoption of the idea and product.

Restriction: Master of Engineering students only. Graduate students only.

**ENGR 200BP. Entrepreneurship Science and Engineering: Build. 4 Units.**

Learn how to build an executable plan to transform an idea into a product. Learn how to construct a go-to market plan, raise funds for building the product, and leverage ecosystem resources to fill in resource gaps.

Restriction: Master of Engineering students only. Graduate students only.

**ENGR 200CP. Entrepreneurship Science and Engineering: Launch. 4 Units.**

Understand how to build an actual product. Learn about prototyping and basic project management skills. Learn a framework on when to pivot for course corrections. Identify how to define outcome metrics and measure progress as the product is launched.

Restriction: Master of Engineering students only. Graduate students only.

**ENGR 210P. Capstone Project . 4 Units.**

Students are required to complete a project that deals with a specific emphasis of their Master of Engineering concentration/specialization.

Repeatability: May be taken for credit 4 times.

Restriction: Master of Engineering students only. Graduate students only.

**ENGR 265. Advanced Manufacturing. 4 Units.**

Principles in manufacturing processes. All machining requires energy: mechanical (cutting and shaping), heat energy (laser cutting), photochemical (photolithography), chemical energy (electro chemical machining and chemical vapor deposition). These methods and their fundamentals are examined. Materials fee.

Restriction: Graduate students only. School of Engineering students only.

Concurrent with ENGR 165.

**ENGR 280. Entrepreneurship for Scientists and Engineers. 4 Units.**

Learn the theory and practice of entrepreneurship and intrapreneurship. Covers positioning an idea, establishing the value propositions and benefits case, going to market strategy, creating an execution plan, and raising funds. Concepts are applied to a real-world venture project.

Restriction: School of Engineering students have first consideration for enrollment. Graduate students only.

Concurrent with ENGR 180.

**ENGR 290. Developing Teaching Excellence. 4 Units.**

Introduces the Scholarship of Teaching and Learning (SoTL) as it applies to Engineering Education. Focuses on how teaching practice can be guided by the research literature on teaching and learning.

Restriction: Graduate students only.

**ENGR 291. Internship. 1 Unit.**

Practical training under an industry mentor in a technical field corresponding to the student's area of interest.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ENGR 295. Special Topics in Engineering. 1-4 Units.**

Studies in selected areas of Engineering. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ENGR 296. Master of Science Thesis Research. 1-16 Units.**

Individual research or investigation conducted in the pursuit of preparing and completing the thesis required for the M.S. in Engineering.

Repeatability: May be repeated for credit unlimited times.

**ENGR 297. Doctor of Philosophy Dissertation Research. 1-16 Units.**

Individual research or or investigation conducted in the pursuit of preparing and completing the dissertation required for the Ph.D. in Engineering.

Repeatability: May be repeated for credit unlimited times.

**ENGR 299. Individual Research. 1-16 Units.**

Individual research or investigation under the direction of an individual faculty.

Repeatability: May be repeated for credit unlimited times.

**ENGR 399. University Teaching. 4 Units.**

University teaching with Engineering faculty.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Teaching assistants only.

## English (ENGLISH)

### Courses

**ENGLISH 8. Multicultural American Literature. 4 Units.**

Writings from at least two historically underrepresented groups in California and the United States with particular attention to historical conditions of literary production. Considers in-depth how literary works relate to racial constructions, economic conditions, and/or social movements.

(IV and VII ).

**ENGLISH 9. Shakespeare. 4 Units.**

Plays by William Shakespeare are used to explore the playwright's poetic gifts, theatrical imagination, and inquiry into human relationships and the human condition.

(IV)

**ENGLISH 10. Topics in English and American Literature. 4 Units.**

Explores the diversity of human expression manifested in selected works of literature. By engaging with substantial literary texts, students will think critically about how meaning is created and how experience is interpreted in literary language.

Repeatability: May be taken for credit 3 times as topics vary.

(IV)

**ENGLISH 10B. Topics in English and American Literature. 4 Units.**

Linked with Writing 39B. Explores the diversity of human expression manifested in selected works of literature. By engaging with substantial literary texts, students think critically about how meaning is created and how experience is interpreted in literary language.

Corequisite: WRITING 39B

Repeatability: May be taken for credit 3 times as topics vary.

Overlaps with ENGLISH 10.

(IV)

**ENGLISH 11. Society, Law, and Literature. 4 Units.**

Examines how works of literature represent and influence the relation between law and society. The primary readings will be works of literature, but selections of works of law, politics, and sociology may also be assigned.

(III or IV ).

**ENGLISH 11C. Society, Law, and Literature. 4 Units.**

Linked with Writing 39C. Explores how works of literature represent and influence the relation between law and society. The primary readings are works of literature, but selections of works of law, politics, and sociology may also be assigned.

Corequisite: WRITING 39C

Overlaps with ENGLISH 11.

(III or IV ).

**ENGLISH 12. Young Adult Fiction . 4 Units.**

Young adult fiction studied in historical context, including the publishing industry and mass marketing, as well as education and literacy. Primary readings will focus on young adult fiction, but works of history, advertising, and film will also be included.

(IV)

**ENGLISH 15. Introductory Seminar in English: Topics in Literary Studies. 4 Units.**

Discussion-based seminar on a faculty-chosen topic that introduces majors and those considering a major in English to interpretive methodologies and critical frameworks that characterize the field of English studies.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: English Majors have first consideration for enrollment.

**ENGLISH 16. The Craft of Poetry. 4 Units.**

Reading of selected texts to explore the ways in which these modes formulate experience. Students write several short analytic papers. Requires creative writing.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(IV)

**ENGLISH 17. The Craft of Fiction. 4 Units.**

Reading of selected texts to explore the ways in which these modes formulate experience. Students write several short analytic papers. Requires creative writing.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(IV)

**ENGLISH H80. Sanctuary: Medieval and Modern. 4 Units.**

Principles and significance of the practice of legal sanctuary in medieval English history, literature, and religion. Development of modern use of churches and other safe spaces in the American Civil Rights movement, immigrant sanctuary movements, and international asylum.

Restriction: Campuswide Honors Collegium students only.

(III or IV ).

**ENGLISH H81. What is a Person?. 4 Units.**

Contemporary debates about personhood in law, culture, and society. Beginning with the emergence of ideas of personhood in philosophy and theology, and culminating in the study of highly contested cases: slavery, abortion law, animal rights, corporate personhood, and artificial intelligence.

Restriction: Campuswide Honors Collegium students only.

**(III)****ENGLISH 100. Introduction to Literary Theory. 4 Units.**

Using Plato and Aristotle as points of departure, addresses a range of perspectives and problems in literary theory. To be taken by English majors in the junior year.

Prerequisite: Three courses selected from ENGLISH 8, ENGLISH 9, ENGLISH 10, ENGLISH 11, ENGLISH 12, ENGLISH 15, ENGLISH 16, ENGLISH 17, LIT JRN 20, LIT JRN 21.

**ENGLISH 101W. Undergraduate Seminar in Critical Writing: Topics in Literary History. 4 Units.**

Each instructor identifies a topic within literary history; special attention is given to mastering the conventions of academic argument and expression. To be taken as early as possible in the junior year.

Prerequisite: Three courses selected from ENGLISH 8, ENGLISH 9, ENGLISH 10, ENGLISH 11, ENGLISH 12, ENGLISH 15, ENGLISH 16, ENGLISH 17; or LIT JRN 20 and LIT JRN 21 and one course selected from the above list. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. English Majors have first consideration for enrollment.

**(Ib)****ENGLISH 102A. Topics in Medieval and Renaissance Literature. 4 Units.**

Studies of works representative of Medieval and Renaissance literature in English, with attention to literary history, treating at a minimum more than one author and more than one genre.

Prerequisite: Three courses selected from ENGLISH 8, ENGLISH 9, ENGLISH 10, ENGLISH 11, ENGLISH 12, ENGLISH 15, ENGLISH 16, ENGLISH 17. Or LIT JRN 20 and LIT JRN 21 and one course selected from the above list.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. English Majors have first consideration for enrollment.

**ENGLISH 102B. Topics in Restoration and 18th-Century Literature . 4 Units.**

Studies of works representative of Restoration and 18th-century literature in English, with attention to literary history, treating at a minimum more than one author and more than one genre.

Prerequisite: Three courses selected from ENGLISH 8, ENGLISH 9, ENGLISH 10, ENGLISH 11, ENGLISH 12, ENGLISH 15, ENGLISH 16, ENGLISH 17. Or LIT JRN 20 and LIT JRN 21 and one course selected from the above list.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. English Majors have first consideration for enrollment.

**ENGLISH 102C. Topics in Romantic and 19th-Century Literature. 4 Units.**

Studies of works representative of Romantic and 19th-century literature in English, with attention to literary history, treating at a minimum more than one author and more than one genre.

Prerequisite: Three courses selected from ENGLISH 8, ENGLISH 9, ENGLISH 10, ENGLISH 11, ENGLISH 12, ENGLISH 15, ENGLISH 16, ENGLISH 17. Or LIT JRN 20 and LIT JRN 21 and one course selected from the above list.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. English Majors have first consideration for enrollment.

**ENGLISH 102D. Topics in 20th-Century Literature. 4 Units.**

Studies of works representative of 20th-century literature in English, with attention to literary history, treating at a minimum more than one author and more than one genre.

Prerequisite: Three courses selected from ENGLISH 8, ENGLISH 9, ENGLISH 10, ENGLISH 11, ENGLISH 12, ENGLISH 15, ENGLISH 16, ENGLISH 17. Or LIT JRN 20 and LIT JRN 21 and one course selected from the above list.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. English Majors have first consideration for enrollment.

**ENGLISH 103. Topics in Literature, Theory, and Criticism. 4 Units.**

A series of lectures on and discussions of announced topics in literary criticism, theory, history, genres, modes, major authors.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Recommended: Upper-division students only.

**ENGLISH 105. Multicultural Topics in Literatures in English. 4 Units.**

Focuses on ethnic or minority literatures, or treats issues related to race and cultural identity.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Recommended: Upper-division students only.

**ENGLISH 106. Advanced Seminar: Topics in English Literature . 4 Units.**

Capstone course. Provides intensive work on a topic within the area of literatures in English with particular attention to the theoretical, critical, or conceptual issues it raises, with the goal of producing a substantive research paper.

Prerequisite: (ENGLISH 101W or WRITING 101W) and (ENGLISH 100 and 102A) or (ENGLISH 100 and 102B) or (ENGLISH 100 and 102C) or (ENGLISH 100 and 102D) or (ENGLISH 102A and 102B) or (ENGLISH 102A and 102C) or (ENGLISH 102A and 102D) or (ENGLISH 102B and 102C) or (ENGLISH 102C and 102D) or (ENGLISH 103 and 102A) or (ENGLISH 103 and 102B) or (ENGLISH 103 and 102C) or (ENGLISH 103 and 102D) or (ENGLISH 105 and 102A) or (ENGLISH 105 and 102B) or (ENGLISH 105 and 102C) or (ENGLISH 105 and 102D) or (ENGLISH 100 and 103) or (ENGLISH 103 and 105) or (ENGLISH 100 and 105).

Repeatability: Unlimited as topics vary.

Restriction: Seniors only. English Majors have first consideration for enrollment.

**ENGLISH 150. Topics in Literature for Nonmajors . 4 Units.**

Major texts in English, American, and Comparative Literature explored for basic humanistic issues and themes, on announced topics. Primarily for upper-division students, but not requiring previous training in literature.

Repeatability: Unlimited as topics vary.

Restriction: Recommended: Upper-division students only.

**ENGLISH 160. Topics in English Language Film and TV. 4 Units.**

Focuses on the analysis of film and/or television traditions in the English-speaking world, from a historical, theoretical, or comparative perspective.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Upper-division students only.

**ENGLISH 198. Special Topics. 4 Units.**

Directed group study of selected topics as arranged by instructor.

Repeatability: May be repeated for credit unlimited times.

**ENGLISH 199. Independent Study. 1-4 Units.**

To be taken only when the materials to be studied lie outside the normal run of departmental offerings, and when the student will have no formal chance to pursue the subject. Research paper required.

Repeatability: May be repeated for credit unlimited times.

**ENGLISH 210. Studies in Literary History. 4 Units.**

Studies in selected areas of literary history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**ENGLISH 225. Studies in Literary Genres. 4 Units.**

Studies in selected areas of literary genres. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**ENGLISH 230. Studies in Major Writers. 4 Units.**

Studies in selected areas of major writers. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**ENGLISH 255. Graduate Workshop in Academic Publishing. 4 Units.**

Reading and critique of student-authored essays with the goal of producing a publishable essay. Instructor leads discussion, meets with students individually, and provides an introduction to appropriate venues for publication and the process of submission, peer review, and revision.

Grading Option: Satisfactory/unsatisfactory only.

**ENGLISH 290. Reading and Conference. 4-12 Units.**

Studies in selected areas. Topics addressed vary each quarter.

Repeatability: May be repeated for credit unlimited times.

**ENGLISH 291. Guided Reading Course. 4 Units.**

Studies in selected areas. Topics addressed vary each quarter.

**ENGLISH 299. Dissertation Research. 4-12 Units.**

A units-only course for students in the dissertation phase.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**ENGLISH 398. Rhetoric/Teaching of Composition. 4 Units.**

Readings, lectures, and internship designed to prepare graduate students to teach composition. Formal instruction in rhetoric and practical work in teaching methods and grading.

**ENGLISH 399. University Teaching. 4 Units.**

A units-only course for students appointed as teaching assistants or associates.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Environmental Health, Science, and Policy (ENVIRON)

# Epidemiology (EPIDEM)

## Courses

### **EPIDEM 199. Undergraduate Research in Epidemiology. 2-4 Units.**

Provides disciplinary research participation. Original or existing research options provide undergraduates the opportunity for faculty/mentor interactions including access to appropriate facilities. Medical Epidemiology research areas: Cancer, Genetic/Molecular, Environmental, Occupational, Biostatistics, and Infectious Disease.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only.

### **EPIDEM 200A. Principles of Epidemiology. 4 Units.**

Fundamental principles of epidemiology, biostatistics, and epidemiological research. Topics include research methods of measuring health problems in populations, disease control and prevention in populations, how epidemiology contributes to knowledge of disease etiology, and biostatistical analysis and interpretation of epidemiologic data.

Same as PUBHLTH 206A.

Restriction: Graduate students only.

### **EPIDEM 200B. Intermediate Epidemiology. 4 Units.**

Learn to design and conduct epidemiologic studies using common designs. Determine why bias and measurement error arise in observational studies, and how they influence effect estimates. Perform and interpret epidemiologic data analyses using statistical software.

Prerequisite: PUBHLTH 206A. PUBHLTH 206A with a grade of B or better

Same as PUBHLTH 206B.

Restriction: College of Health Sciences students only. Program in Public Health students only. Master of Public Health Degree students only. Graduate students only. Epidemiology Majors only.

### **EPIDEM 200C. Advanced Epidemiologic Methods. 4 Units.**

Advanced topics in the design and statistical analysis of epidemiologic studies. Topics include simulation methods, counter-matching and multiphase study designs, missing data, and Bayesian analysis. Published simulation studies are discussed and replicated using the R software package.

Prerequisite: EPIDEM 200A and EPIDEM 200B. EPIDEM 200A with a grade of B or better. EPIDEM 200B with a grade of B or better

Same as PUBHLTH 206C.

### **EPIDEM 201. Cancer Epidemiology. 4 Units.**

Concentrates on understanding how epidemiology plays a role in the search for cancer etiology, prevention, control, and treatment; gives an overview of cancer research with an appreciation of the multidisciplinary nature of the field.

Prerequisite: EPIDEM 203 or PUBHLTH 203 or PUBH 206

Restriction: Graduate students only.

### **EPIDEM 202. Genetic Epidemiology. 4 Units.**

Concentrates on the role of genetic factors in the etiology of disease in human populations with an objective of disease control and prevention and the role of interactions of genetic factors and environmental exposures in the occurrence of disease.

Prerequisite: PUBHLTH 203 or EPIDEM 203 or PUBH 206

Restriction: Graduate students only.

### **EPIDEM 204A. Biostatistics I: Introduction to Statistical Methods. 4 Units.**

Designed to help students develop an appreciation for statistician's view of the research process, emphasizing biomedical research. Instills an understanding of how statistical models are used to yield insights about data that form evidence-based understanding of the world around us.

Same as PUBHLTH 204.

Restriction: Graduate students only.

**EPIDEM 204B. Biostatistics II: Intermediate Statistical Methods. 4 Units.**

Intended for graduate students in epidemiology, public health, and clinical research fields. Covers common regression-modeling techniques frequently used in biologic and medical applications.

Prerequisite: EPIDEM 204. EPIDEM 204 with a grade of B or better

Repeatability: May be taken for credit 2 times.

Same as PUBHLTH 204B.

Restriction: Graduate students only.

**EPIDEM 204C. Biostatistics III: Advanced Statistical Methods. 4 Units.**

Intended for graduate students in epidemiology, public health, and related fields. Introduces statistical methods for analyzing survival and longitudinal/clustered data, and techniques to resolve missing data.

Prerequisite: EPIDEM 204B. EPIDEM 204B with a grade of B or better

Repeatability: May be taken for credit 2 times.

Same as PUBHLTH 204C.

Restriction: Graduate students only.

**EPIDEM 205. Environmental Epidemiology. 4 Units.**

Concentrates on epidemiological approaches to the assessment of community environmental hazards; issues involved in environmental exposure estimation; interdisciplinary approaches to environmental epidemiology, including the use of biomarkers of exposures and susceptibility; epidemiological studies within the context of risk assessment.

Prerequisite: EPIDEM 200 and EPIDEM 204

Restriction: Graduate students only.

**EPIDEM 212. Methods for Design and Implementation of Epidemiologic Research. 2 Units.**

Intended for students in epidemiology, public health, and related fields, and covers topics in subject recruitment, data collection, quality assessment and control, and sample-size estimation.

Corequisite: PUBHLTH 206B

Prerequisite: EPIDEM 200A and EPIDEM 204A. EPIDEM 200A with a grade of B or better. EPIDEM 204A with a grade of B or better

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**EPIDEM 215. Introduction to Statistical Genetics. 4 Units.**

Provides students with knowledge of the basic principles, concepts, and methods used in statistical genetic research. Topics include principles of population genetics, and statistical methods for family- and population-based studies.

Prerequisite: Two quarters of upper-division or graduate training in statistical methods.

Same as STATS 257.

**EPIDEM 232. Chronic Disease Epidemiology & Prevention. 4 Units.**

Epidemiological aspects of chronic human diseases. Topics include methodologies for quantifying aspects of prevalent chronic diseases including risk factors, identification of susceptible groups, societal burdens, promising future research; and the intervention, prevention, and control of diseases in populations.

Restriction: Graduate students only.

**EPIDEM 244. Toxic Chemicals in Environment. 4 Units.**

Industrial ecology of toxicants and their impacts on environmental quality and human health. Explores theoretical basis of toxicity thresholds and regulatory issues. Uses classic and contemporary research articles to understand the legacy of traditional toxicants, and to identify emerging threats.

Restriction: Graduate students only.



**EPIDEM 264. Introduction to Environmental Health Science. 4 Units.**

Convergence of agents (chemical, physical, biological, or psychosocial) in environment can emerge as diseases influenced by social, political, and economic factors, allowing them to become rooted in society. How these agents from various spheres come together and impact human health.

Same as EHS 264, PUBHLTH 264.

Restriction: Graduate students only. Environmental Health Sciences Majors only. Epidemiology Majors only. Public Health Majors only. Environ Health Sci and Policy Majors only.

**EPIDEM 265. Advanced Environmental Health Science. 4 Units.**

Explores the complex relationships among exposure processes and adverse health effects of environmental toxins focusing on specific chemicals, sources, transport media, exposure pathways, and human behaviors. Techniques of environmental sampling for exposure assessment are discussed.

Same as PUBHLTH 265.

Restriction: Graduate students only.

**EPIDEM 269. Air Pollution, Climate, and Health. 4 Units.**

Emission of air pollutants into the atmosphere, physical and meteorological processes that affect transport, and influence on global warming. Concepts of how and where people are most exposed, and how exposures and health effects differ in developed and developing regions.

Same as EHS 269, PUBHLTH 269.

**EPIDEM 270. Human Exposure to Environmental Contaminants. 4 Units.**

Introduces founders of conceptual thought that environmental contaminants can impact health. Theory and principles of exposure assessment, the continuum from emissions of a contaminant into the environment to evidence of health effects in a population.

Same as EHS 270, PUBHLTH 270.

**EPIDEM 275. Special Topics in Epidemiology. 1-4 Units.**

Presents various topics and latest research in the broad field of epidemiology.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EPIDEM 280. Epidemiology Research Journal Club. 1 Unit.**

Research journal club is a group discussion of recent publications in epidemiology and related fields. Students rotate as lead discussants, guided by faculty. All attendees are expected to be familiar with the papers at the start of class.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EPIDEM 282. Epidemiology Department Seminar. 1 Unit.**

A forum for the presentation of recent research to epidemiology students, faculty, and other interested parties. The atmosphere is informal, yet rigorous. Speakers range from graduate students through distinguished visitors from other institutions.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EPIDEM 290. Introduction to Biostatistics and Epidemiology for Medical Fellows. 4 Units.**

Prepares medical fellows and other physicians for rotations in research programs. Understanding of basic biostatistics and study design, and interdependencies between the two. Application of principles in evaluation of medical literature for guidance on patient care and public health policy.

Prerequisite: Medical degree.

**EPIDEM 296. M.S. Thesis Research and Writing. 1-12 Units.**

Individual research and study necessary for a graduate student to prepare and complete the thesis required for the Master of Science (M.S.) degree.

Prerequisite: Advancement to candidacy.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EPIDEM 297. PhD Degree Dissertation Research & Writing. 1-12 Units.**

Individual research and study necessary for a graduate student to prepare and complete the dissertation required for the Doctor of Philosophy (Ph.D.) degree.

Prerequisite: Advancement to candidacy.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EPIDEM 298. Directed Study in Epidemiology. 2-4 Units.**

Directed study with Epidemiology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EPIDEM 299. Independent Study in Epidemiology. 2-8 Units.**

Independent research with Epidemiology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EPIDEM 399. University Supervised Teaching. 2-4 Units.**

Limited to students with active Teaching Assistant (T.A.) appointments.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## European Studies (EURO ST)

### Courses

**EURO ST 9. Topics in Europe in the Middle Ages. 4 Units.**

Explores the literature, history, and thought of the European Middle Ages. Topics may include understandings of self and community, aristocratic power and courtly life, colonialism, crusading, religious beliefs and persecution, monasticism and reform, university culture, epic literature, and Arthurian romance.

Repeatability: Unlimited as topics vary.

(IV and VIII ).

**EURO ST 10. Topics in Historical Foundations (1500-1800). 4 Units.**

Offers an overview of the European experience from its social, political, and cultural foundations to modern European issues and institutions in a globalized world. Topics include social, political, and cultural history up to the French Revolution.

Repeatability: Unlimited as topics vary.

Overlaps with EURO ST S10.

((III or IV) and VIII ).

**EURO ST S10. Historical Foundations: Europe and the Foundations of the Modern World. 4 Units.**

Encompasses a variety of perspectives in the social sciences and the humanities involving crucial developments coming out of Europe from roughly 1500 to 1800, (the Protestant Reformation through the French Revolution), that helped shape the modern (western) world.

Overlaps with EURO ST 10.

((III or IV) and VIII ).

**EURO ST 11. Issues and Institutions in Modern Europe (1789-1945). 4 Units.**

Offers an overview of modern European societies in social, political, and cultural terms. Topics include shifting geopolitical borders, social movements, and various forms of cultural expression (film, art, literature) as they intersect with and shape issues and events after 1800.

Repeatability: Unlimited as topics vary.

((III or IV) and VIII ).

**EURO ST S11. Europe's Futures: 1755-Present. 4 Units.**

Introduces students to competing approaches from humanities and social sciences to conceptualizing the future in politics, art, and literature. From the enlightenment to today, investigates the cultural and political context of moments when new ideas emerged to secure Europe's futures.

Overlaps with EURO ST 11.

((III or IV) and VIII ).

**EURO ST 12. What is the Origin of Language?. 4 Units.**

Teaches symbol-based logic and universal grammar in human language as tools to investigate the origin of language. Does language originate with reason? Is language inherently universal or diverse? Does it begin as something literal or figurative.

((III or IV) and Vb ).

**EURO ST 13. Topics in Contemporary Europe (1945 – Today). 4 Units.**

Offers a perspective on contemporary politics and social and cultural life of today's Europe. Introduces students to literature, film, and social theory crises of the contemporary world as they emanated from World War II, such as nationalism and populism.

Repeatability: Unlimited as topics vary.

(IV and VIII ).

**EURO ST 101A. European Studies Core I - Early Europe (Pre-1789). 4 Units.**

Introduction to multidisciplinary approaches to important themes in European society, culture, art, literature, and politics; encourages students to explore intersections among disciplines. Possible themes: Concept of Europe in Renaissance, Self and Other: Europe and Islam, Hybrid Cultures in Medieval Europe.

Repeatability: Unlimited as topics vary.

**EURO ST 101B. European Studies Core II: Modern Europe (Post-1789). 4 Units.**

Multidisciplinary approaches to important themes in modern European society, culture, art, literature, and politics, encouraging students to see points of intersection among disciplines. Possible themes: Subjects, Citizens, and Representation; Europe in the World; European Revolutions in Art and Society.

Repeatability: Unlimited as topics vary.

**EURO ST 102. Topics in Early European History and Culture: Pre-1789. 4 Units.**

Addresses historical and cultural events, issues, and texts (art, literature, music, political theory) from the pre-1789 period in more than one European country.

Repeatability: Unlimited as topics vary.

**EURO ST 103. Topics in Modern European History and Culture: Post-1789. 4 Units.**

Addresses historical and cultural events, issues, and texts (art, literature, music, political theory) from 1789 to present in more than one European country.

Repeatability: Unlimited as topics vary.

**EURO ST 190W. Senior Seminar in European Studies. 4 Units.**

Capstone research seminar. Students engage in rigorous, in-depth, interdisciplinary exploration of specific topics, periods, or themes, investigating and analyzing the intersection of material and discursive culture in different historical periods and geographical locations.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: School of Humanities students only.

(Ib)

**EURO ST 199. Independent Study. 1-4 Units.**

Directed reading and research in consultation with a faculty advisor. Substantial written work required.

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**EURO ST 200A. Core Seminar I: Foundations of European Thought and Culture. 4 Units.**

Provides a historical, geographical, and methodological overview of foundational texts and issues in European thought and culture. Covering several historical periods between the Middle Ages and the present, students will see how ideas and institutions change over time.

**EURO ST 200B. Core Seminar II: Theorizing Periods and Movements in European Thought and Culture. 4 Units.**

Periods and movements still form basic units for organizing European thought and theory, even as such categories are problematized. This course will allow for greater focus on a specific time period or constellation of issues around a period or movement.

**EURO ST 200C. Core Seminar III: European Thought and Culture Beyond Europe. 4 Units.**

Studies the intersection and afterlives of European thought and culture with and in non-European contexts, the way European thought and culture has been translated and transformed, taken up and challenged, in colonial, postcolonial, and other global situations.

**EURO ST 201. Topics in European Studies. 4 Units.**

Seminars on various topics related to European Studies.

Repeatability: Unlimited as topics vary.

**EURO ST 299. Independent Research. 4 Units.**

For students to do independent research with advisors on their master's thesis or master's examination reading lists.

Restriction: Graduate students only. School of Humanities students only.

## Executive MBA (MGMT EP)

### Courses

**MGMT EP 200. Thinking Strategically in the Digital Age for Executives. 6 Units.**

Focuses on the strategic and organizational challenges that a rapidly changing environment poses to the firm's management and frames them according to Merage's strategic emphasis on analytical decision making, innovation, and information technology.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Administration - Executive Majors only.

**MGMT EP 201A. Business Analytics: Decision-Making for Executives. 4 Units.**

Methods of statistical inference, emphasizing applications to administrative and management decision problems. Topics include classical estimation, hypothesis testing, regression, correlation, analysis of variance, decision analysis, and forecasting.

Restriction: Graduate students only. Administration - Executive Majors only.

**MGMT EP 202. Organizational Leadership for Executives. 4 Units.**

Develops a better understanding of individual and group behavior in and across organizations, and the frameworks by which to analyze and understand behavior in complex organizations. Enhances the skills required to manage collaboration and lead. Every other weekend course.

Restriction: Graduate students only. Administration - Executive Majors only.

**MGMT EP 203A. Financial Reporting Policies for Executives. 4 Units.**

Involves the development, analysis, and interpretation of financial accounting information for external reporting purposes. Emphasis on measurement and valuation issues in decision-making problems and cases. Every other weekend course format.

Restriction: Graduate students only. Administration - Executive Majors only.

**MGMT EP 203B. Managerial Accounting for Executives. 4 Units.**

Involves developing and using internal financial and non-financial information to help organizations make planning, budgeting, control, operating, and performance evaluation decisions. Every other weekend course format.

Prerequisite: MGMT EP 203A. MGMT EP 203A with a grade of C or better

Restriction: Graduate students only. Administration - Executive Majors only.

**MGMT EP 204A. Microeconomics for Executives in the Digital Age. 4 Units.**

Provides basic tools for analyzing economic decisions of consumers and firms. Topics include demand and supply analysis, production and cost theory, perfect competition, monopoly, market failures, and introductory game theory. Every other weekend course format.

Restriction: Graduate students only. Administration - Executive Majors only.

**MGMT EP 204B. Macroeconomics for Executives. 4 Units.**

Introduces use of macroeconomic analysis to manage the business cycle for competitive advantage. 'Business cycle-sensitive' management is explored within the context of marketing, operations management, HRM, merger and acquisition activity, and capital financing and expenditures. Every other weekend course format.

Prerequisite: MGMT EP 204A. MGMT EP 204A with a grade of C or better

Restriction: Graduate students only. Administration - Executive Majors only.

**MGMT EP 205. Marketing Leadership. 4 Units.**

Introduction to marketing. Topics include developing familiarity with fundamental marketing concepts, theories, and techniques; acquainting students with the type of decisions made by executives, including customer targeting, product, pricing, place, promotion, and research. Every other weekend course format.

Restriction: Graduate students only. Administration - Executive Majors only.

**MGMT EP 207. Competing with Digital: Technology, Analytics, Business Models. 4 Units.**

Focuses on how information technology is used to create value in organizations through product, process, and strategy innovation. Aims to help managers understand the strategic role of key information technologies in managing organizations. Every other weekend course format.

Restriction: Graduate students only. Administration - Executive Majors only.

**MGMT EP 208. Operational Excellence: Processes, Strategy, and Analytics. 4 Units.**

Introduction to strategic and tactical issues in production and operations management. A blend of quantitative and qualitative considerations. Topics include product planning, process design, capacity management, production planning, inventory control, just-in-time manufacturing, and quality management. Every other weekend course format.

Restriction: Graduate students only. Administration - Executive Majors only.

**MGMT EP 209A. Managerial Finance for Executives. 4 Units.**

Introduces students to financial theory and concepts. Topics include time value of money, valuation of stocks and bonds, capital budgeting, portfolio theory, and capital structure choice. Every other weekend course format.

Prerequisite: MGMT EP 201A and MGMT EP 203A and MGMT EP 204A. MGMT EP 201A with a grade of C or better. MGMT EP 203A with a grade of C or better. MGMT EP 204A with a grade of C or better

Restriction: Graduate students only. Administration - Executive Majors only.

**MGMT EP 210. Strategy for Executives: Foundations and Dynamics . 4 Units.**

Provides conceptual frameworks and techniques to analyze and develop firm strategies. Through case analysis/discussion, helps improve strategic thinking by developing frameworks by which to assess, evaluate, and respond to different business situations. Every other weekend course format.

Prerequisite: MGMT EP 200 and MGMT EP 202 and MGMT EP 205 and MGMT EP 209A. MGMT EP 200 with a grade of C or better. MGMT EP 202 with a grade of C or better. MGMT EP 205 with a grade of C or better. MGMT EP 209A with a grade of C or better

Restriction: Graduate students only. Administration - Executive Majors only.

**MGMT EP 219. Practice of General Management for Executives. 4 Units.**

Teaches the graduating MBA how the best managers actually manage. Students develop a toolkit of proven concepts and practices that will help them succeed as managers at any level.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT EP 225. Negotiations For Executives. 4 Units.**

Using a combination of theory and practice via negotiation simulations, students expand their repertoire of negotiating skills and develop their ability to analyze different negotiation situations and contexts. Every other weekend course format.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT EP 290. Special Topics in Business. 2-4 Units.**

Studies in selected areas of business. Topics addressed vary each quarter.

Repeatability: May be repeated for credit unlimited times.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT EP 295A. Global Business I for Executives. 4 Units.**

Fundamentals of global strategy, economics, and financial issues. Topics include global manager's environment, global strategy, impact of national culture on business systems, strategies and practices, foreign direct investment, corporate governance, human resources, and international marketing. Every other weekend course format.

Restriction: Graduate students only. Administration - Executive Majors only.

**MGMT EP 295B. Global Business II for Executives. 4 Units.**

Emphasizes and reinforces international perspectives contained in the M.B.A. curriculum by providing a week-long intensive seminar abroad in the second year. Scholars and business people from the host country instruct Executive M.B.A. students in designed class sessions and company visits.

Restriction: Graduate students only. Administration - Executive Majors only.

**MGMT EP 296. Executive Leadership. 4 Units.**

Focuses on the conceptual, practical, and personal dimensions of executive leadership. Past and current leadership theories are addressed. Individual personal assessment and diagnosis. Every other weekend course format.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Administration - Executive Majors only.

**MGMT EP 299. Individual Study. 1-8 Units.**

Individual Study under the direction of a selected faculty member.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Master of Business Admin Degree students only.

## Family Medicine (FAM MED)

## Film and Media Studies (FLM&MDA)

### Courses

**FLM&MDA H80. Honors Seminar: Race Sport Media. 4 Units.**

Honors seminar examining the intersection of race, sports, and media in everyday U.S. popular culture (film, TV, advertising, gaming, social media) and political culture. Materials fee.

Restriction: Campuswide Honors Collegium students only.

(IV and VII ).

**FLM&MDA 85A. Introduction to Film and Visual Analysis. 4 Units.**

Introduces the language and techniques of visual and film analysis. Teaches students to analyze the moving image; emphasize framing, camera movement, and sound; and conveys how editing produces meaning, reproduces historical ideologies, fosters or disrupts narrative, and cues spectators.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

(IV)

**FLM&MDA 85B. Broadcast Media History and Analysis. 4 Units.**

History of broadcast media from the radio era to the present day, including social, political, institutional, and audience analysis as well as methods of visual and aural analysis of these media.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

(IV)

**FLM&MDA 85C. New Media and Digital Technologies. 4 Units.**

The study of digital media, computer-mediated communication, and Internet cultures, from historical and theoretical perspectives.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

**(IV)****FLM&MDA 101A. History of Film I: The Silent Era. 4 Units.**

The aesthetic, industrial, and socio-historical developments of cinema in the U.S. and internationally from its invention to the adoption of synchronous sound. Includes early exhibition, developments in narrative and editing, the formation of the studio system, and avant-garde film movements. Materials fee.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 101B. History of Film II: The Studio Era. 4 Units.**

The aesthetic, industrial, and socio-historical developments of cinema in the U.S. and internationally from the 1930s through the 1960s. Includes the Hollywood studio system, propaganda films, Italian neorealism, post-war Japanese cinema, and the French New Wave. Materials fee.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 101C. History of Film III: The Contemporary Era. 4 Units.**

The aesthetic, industrial, and socio-historical developments of cinema in the U.S. and internationally from the late 1960s to the present. Includes New Hollywood and independent U.S. films, ethnic cinemas, postcolonial cinemas, East-Asian new waves, and digital filmmaking. Materials fee.

Prerequisite: FLM&MDA 85A and FLM&MDA 101B. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 110. Film and Media Theory. 4 Units.**

Survey of major directions in film and media theory. Various theories of mass culture, realism, auteurism, semiotics, feminism, cultural studies, and theories of other media, with an emphasis on developing the student's ability to analyze and articulate a theoretical argument. Materials fee.

Prerequisite: FLM&MDA 85A and FLM&MDA 85B and FLM&MDA 85C and (FLM&MDA 101A or FLM&MDA 101B or FLM&MDA 101C). Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 111. Film and Media Theory and Practice. 4 Units.**

Seminar focusing on issues in film and media production and editing. Reading and exercises to understand aspects of film and media production (montage, sound, film movement, directing, and mise en scène), and how ideology works in tandem with style.

Prerequisite: FLM&MDA 85A and FLM&MDA 85B and FLM&MDA 85C and FLM&MDA 120A and (FLM&MDA 101A or FLM&MDA 101B or FLM&MDA 101C). Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 112. Genre Study . 4 Units.**

Critical approaches to the serial productions we call 'genre' films such as westerns, weepies, musicals, horror films, and others; televisual genres, such as sitcoms, drama, comedy, news, docudrama, police; Internet categories, such as chat-rooms, listservs, Web pages.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 113. Narrative/Image . 4 Units.**

What relations do sound, image, and story assume in film, television, video, and Internet narratives? In what ways do these media interact with and borrow from each other and traditional story-telling media? How have the new media explored non-narrative strategies.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 114. Film, Media, and the Arts. 4 Units.**

A synthetic entity, film draws on both established and popular arts. Looks at visual media's exchanges with 'high' and 'low' culture, exploring its relation to areas such as photography, music, painting, and architecture.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.



**FLM&MDA 115. Authorship . 4 Units.**

Theoretical and analytical discussions of visual media authorship, focusing on case studies of directors, producers, scriptwriters, and film, video, and digital artists.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 117A. Introduction to Screenwriting. 4 Units.**

Introduction to the technique and format of the screenplay, with a particular focus on its three act structural elements: coverage, treatment, and 60 beat outline. Materials fee.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 117B. Intermediate Screenwriting. 4 Units.**

Exercises in the development of screenplays, with emphasis on formal and structural considerations of character development. Students work with the hero structure and other character development methodologies, such as method acting. Materials fee.

Prerequisite: FLM&MDA 117A. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 117C. Screenwriting Workshop. 4 Units.**

Continuation and intensification of work initiated in 117B. Students complete a full-length screenplay. Concentrates on both practical and technical concerns, addressing pragmatic and aesthetic questions in intensive small-group discussions. Materials fee.

Prerequisite: FLM&MDA 117B. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 118A. Writing Television I. 4 Units.**

Introduction to the technique and format of the television screenplay. Focuses on character, storytelling, structure, and scene development; culminating in a one-hour drama series treatment and first act of the pilot.

Prerequisite: FLM&MDA 85B. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 118B. Writing Television II. 4 Units.**

Intermediate-level screenwriting class exploring the one-hour television drama format. Students write and workshop an original pilot, continuing work started in 118A, and finish a complete draft of the pilot script.

Prerequisite: FLM&MDA 118A. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 120A. Basic Production. 4 Units.**

Introduction to the basic apparatus of video/film production. The elementary essentials of production, including the use of camera and lenses, lighting, editing, and sound. Materials fee.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 120B. Intermediate Production. 4 Units.**

Students work on individual and group projects, utilizing skills and insights introduced in Film and Media Studies 120A. Materials fee.

Prerequisite: FLM&MDA 120A. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 120C. Production Workshop. 4 Units.**

As film and video are collaborative media, students form production groups and ultimately produce final 10-15-minute film/video projects. Materials fee.

Prerequisite: FLM&MDA 120B. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 130. Multicultural Topics in the Media. 4 Units.**

Investigation of media representations of gender, race, and sexuality in the United States. Topics include media images of and by one or more minority groups in the United States, including African Americans, Asian Americans, Chicano/Latinos, Native Americans, gays, and lesbians.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.



**FLM&MDA 139W. Writing on Film and Media. 4 Units.**

Writing on cinema, television, and/or digital culture, emphasizing identification of reliable sources, close readings, addressing academic, professional, and/or popular audiences. Requires at least 4,000 words of assigned composition.

Prerequisite: FLM&MDA 85A or FLM&MDA 85B or FLM&MDA 85C. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Film and Media Studies Majors only.

(Ib)

**FLM&MDA 143. Critical Theory of Television. 4 Units.**

Introduction to critical, theoretical, and scholarly understandings and analyses of television, which offer in-depth analyses of television programming, audience reception practices, and industry strategies of address.

Prerequisite: FLM&MDA 85B. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 144. Studies in New Media. 4 Units.**

Advanced analysis of the technologies, texts, theories, and cultures of computers, video games, networks, or platforms.

Prerequisite: FLM&MDA 85C. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 145. Popular Culture and Media. 4 Units.**

Considers the forms, ideologies, consumption, and marketing of popular entertainment and technologies. May focus on cultural studies methods, transnational approaches, and synergy between media.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 146. Sound Studies. 4 Units.**

Focuses on the production, theories, and meanings of sound recordings, music, and/or audio technologies. Topics may include the cultures of popular music and audio devices, music television, and theories of film sound.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 150. Audiences and Reception. 4 Units.**

Explores the dynamics of address, interpretation, and appropriation between film and media texts and their viewers. Topics may include reception studies, fandom, audience-defined modes of production, demographics, spectatorial pleasure, and historical approaches to audiences.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 151. Documentary and Experimental Film and Media. 4 Units.**

Examines nonfiction and/or experimental cinemas and media, such as documentary, the historical avant-garde, video art, and activist media. Students consider the specific aesthetics and ideologies of forms distinct from narrative feature films.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 160. National/Regional Cinemas and Media. 4 Units.**

National schools, period styles, or cultural movements beyond U.S. cinema, as defined by national borders or by geographic regions, such as Latin America. May be approached from a comparative perspective.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 161. Global/Transnational Cinemas and Media. 4 Units.**

Analyzes the multinational production, circulation, and reception of film and media texts beyond singular national borders or specific geographic regions. Topics may include transnational co-productions, exports, and diasporic reception.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 162. US Cinema . 4 Units.**

Explores the modes of production and distribution, aesthetics, and contexts that have shaped cinema in the United States. Topics may include classical Hollywood, American independent cinema, or periods such as 1970s cinema.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 185. Television and New Media. 4 Units.**

Advanced seminar focusing on special topics in television and new media. Past examples have included courses on media marketing and brand identity; television and sound; game theory; and other issues related to popular culture, broadcast media, and new media technologies.

Prerequisite: FLM&MDA 85B or FLM&MDA 85C. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 190. Special Topics in Film and Modern Media. 4 Units.**

Special issues concerned with film and media history, theory, and criticism.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 191. Special Topics in Critical Practice. 4 Units.**

Integrates critical analysis, historical, and theoretical methods with creative projects to illuminate film and media production and industries. May include courses in adaptation, writing television, media activism, writing the short film, performance studies, and movie title sequences.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 192. Special Topics in Advanced Film Production. 4 Units.**

Focuses on special topics in production. Culminates in final 6-10-minute group film projects. Topics include producing, acting, and/or directing in short films, experimental films, documentaries, television, and other media.

Prerequisite: FLM&MDA 120A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 193. Special Topics in Advanced Screenwriting. 4 Units.**

Focuses on special topics in screenwriting. Topics include adaptation, alternative screenwriting, writing the first feature, act two construction, and rewriting.

Prerequisite: FLM&MDA 117A or FLM&MDA 118A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 197. Professional Internship. 2-4 Units.**

Professional internship in the film, broadcast, and/or digital media industries designed to provide students with closely supervised professional experience to enhance their understanding of media from industrial, historical, and critical perspectives. Journal and final report required.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

Restriction: Upper-division students only.

**FLM&MDA 198. Creative Project. 2-4 Units.**

Creative project in screenwriting, filmmaking, videomaking, or Web or internet design intended to provide advanced production and creative writing training beyond the Film and Media Studies 117A-B-C or 120A-B-C series. Final project required.

Prerequisite: (FLM&MDA 85A and FLM&MDA 117A and FLM&MDA 117B and FLM&MDA 117C) or (FLM&MDA 120A and FLM&MDA 120B and FLM&MDA 120C). Satisfactory completion of the Lower-Division Writing requirement. Recommended: FLM&MDA 101A.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Upper-division students only.

**FLM&MDA 199. Directed Research. 4 Units.**

Directed reading and research under supervision of a faculty member in topic areas not covered by regular course offerings. Final research paper required.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only.

**FLM&MDA 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Film and Media Studies (see FLM&MDA) (FILMSTD)

## Finance (FIN)

### Courses

**FIN 203A. Financial Reporting for Management. 4 Units.**

Financial reporting is concerned with the preparation and public dissemination of financial reports designed to reflect corporate performance and financial condition. Provides a base level of knowledge needed by corporate executives to understand and discuss corporate financial statements.

Restriction: Master of Finance Degree students only. Graduate students only.

**FIN 209B. Investments Management. 4 Units.**

Introduction to how securities are traded and how their prices are determined. Discussion of different market organizations, including some recently developed online financial markets. Study of pricing models, including Capital Asset, factor models, and Arbitrage Pricing Theory.

Restriction: Master of Finance Degree students only. Graduate students only.

**FIN 210. Foundations of Finance. 4 Units.**

Examines foundations of finance. Teaches tools such as time value of money, capital budgeting techniques, cash flow analysis. Examines foundations of investment management and theory/empirical evidence related to portfolio theory, market efficiency, asset pricing models, factor models, option pricing theory.

Restriction: Master of Finance Degree students only.

**FIN 211. Master of Finance ProSeminar.**

Provides students in the Merage School Master of Finance program with information and practical skills for success in the program and for business career planning.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Master of Finance Degree students only.

**FIN 240. Financial Research Methodology. 4 Units.**

Provides an introduction into the computational research methods necessary in modern finance, such as optimization, simulation methods, and finite difference and finite element methods. Some applications include quadratic programming for portfolio selection and option pricing.

Restriction: Master of Finance Degree students only.

**FIN 241. Risk Management. 4 Units.**

Examines modern techniques for managing financial risks, including market, credit, liquidity, and operational risks. Covers measurement techniques for different financial risks and instruments. Discusses how risk measurement tools can be used for management of the risk/return profile of financial institutions.

Prerequisite: FIN 249. FIN 249 with a grade of C or better

Restriction: Master of Finance Degree students only. Graduate students only.

**FIN 242. Portfolio Management. 4 Units.**

Provides a working understanding of the themes and concepts of portfolio management. Covers several disciplines, such as investment valuation, investment decision-making, investing styles, asset allocation, monitoring and re-balancing portfolios, risk management strategies, performance evaluation, and attribution analysis.

Restriction: Master of Finance Degree students only.

**FIN 243. Bonds and Fixed Income. 4 Units.**

Addresses concepts covering a broad spectrum of debt securities with emphasis on qualitative and quantitative analysis of fixed income securities in many areas, including corporate (credit) debt, MBS/ABS, structured debt, and credit derivatives.

**FIN 244. Multinational Finance. 4 Units.**

Examines the history of the world's foreign exchange markets, the macroeconomics of foreign exchange, major parity conditions, hedging of currency exposure and international investment. Gives students a basic understanding of foreign exchange market.

**FIN 246F. Seminar in Management of the Real Estate Enterprise. 4 Units.**

Capstone seminar. Looks beyond "The Deal" to management of the real estate enterprise itself. Explores aspects of decision-making focused upon strategic objectives: goal setting, legal/tax structures, public vs. closely-held entities, corporate ethics, capital structure, managing growth, diversification, technology. Guest professionals.

Restriction: Master of Finance Degree students only. Graduate students only.

**FIN 246G. Applied Real Estate Security Analysis and Portfolio Management. 4 Units.**

Provides an understanding of the public real estate investment trust (REIT) market and its place in modern investment strategies, presents methods for analyzing and valuing companies, and introduces basic concepts for constructing and managing a real estate investment portfolio.

Restriction: Master of Finance Degree students only. Graduate students only.

**FIN 247. Cases in Corporate Financial Management. 4 Units.**

Case-based course in corporate finance. Introduces advanced analytical tools and techniques for value-based financial management in a broad range of corporate settings, including financial forecasting, mergers and acquisitions, leveraged buyouts, ownership and control, corporate restructuring, and financial distress.

Restriction: Master of Finance Degree students only.

**FIN 248. Corporate Valuation. 4 Units.**

Expands on concepts covered in introductory finance. Combines lectures and cases designed to confront students with real-world problems to enhance their understanding of the value and limitations of finance theory. Focuses on the value of firms/projects in diverse settings.

Prerequisite: FIN 210. FIN 210 with a grade of C or better

Restriction: Master of Finance Degree students only.

**FIN 249. Derivatives. 4 Units.**

Covers major derivative instruments that are widely used for hedging, including forward, futures, swaps and options, speculation, and arbitrage. Focuses on understanding the instruments, how to use and price them, basic risk management principles, and how to implement investment strategies.

Restriction: Master of Finance Degree students only.

**FIN 250. Mergers and Acquisitions. 4 Units.**

Focuses on mastering mergers and acquisitions concepts and techniques that will enable participants to practically apply them in related fields such as investment banking, consulting, and corporate development. Studies drivers of success in M&A with heavy attention on transactional review.

Restriction: Master of Finance Degree students only.

**FIN 251. Behavioral Finance. 4 Units.**

Describes the scientific evidence about where misvaluation comes from, how investors can trade profitably to exploit market inefficiency, how corporate managers should make financing and investment decisions in an inefficient market, and how managers can correct biases to avoid mistakes.

Restriction: Master of Finance Degree students only.

**FIN 252. Wealth Management. 4 Units.**

Provides overview of considerations needed to connect singular functional areas that comprise personal and business wealth management, including basic and advanced estate planning, investment management, tax management, life/liability and property/casualty insurance, medical and long-term care coverage, retirement and philanthropy considerations.

Restriction: Graduate students only.

**FIN 253. Venture Capital and Private Equity. 4 Units.**

Overview of venture capital and private equity, which constitute the "alternative" asset class (as opposed to conventional investments). Many start-up and entrepreneurial firms require substantial capital, and venture capital and private equity organizations finance these high-risk but potentially high-reward companies.

Restriction: Master of Finance Degree students only.

**FIN 254. Advanced Derivatives. 4 Units.**

Describes the scientific evidence about where misvaluation come from, how investors can trade profitably to exploit market inefficiency, how corporate managers should make financing and investment decisions in an inefficient market, and how managers can correct their own biases.

Prerequisite: FIN 249. FIN 249 with a grade of C or better

Restriction: Master of Finance Degree students only.

**FIN 255. Finance Internship. 2-4 Units.**

Provides students with opportunities to apply knowledge obtained from classroom theory through actual practical work experiences. Also provides knowledge of career opportunities, understanding of finance in business environments, and preparation for the finance profession.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Master of Finance Degree students only.

**FIN 290. Special Topics in Finance. 4 Units.**

Studies in selected areas of finance. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**FIN 296. Master of Finance Capstone. 4 Units.**

Students work in teams on an applied finance project associated with their area of focus to demonstrate knowledge and expertise. The project can involve experiential learning, collaboration with a faculty member, or association with an internship.

Restriction: Master of Finance Degree students only.

**FIN 299. Individual Study. 1-4 Units.**

Individual study under the direction of a select faculty member.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## French (FRENCH)

### Courses

**FRENCH 1A. Fundamentals of French. 5 Units.**

First quarter of first-year French in a hybrid format. Students are taught to conceptualize in French as they learn to understand, read, write, and speak. Classes are conducted entirely in French.

Overlaps with FRENCH S1AB, FRENCH 1AB, FRENCH 1ABSP.

**FRENCH 1AB. Intensive Fundamentals of French. 7.5 Units.**

Intensive first half of first-year French. Students are taught to conceptualize in French as they learn to read, write, and speak. Students develop an awareness of and sensibility to French and Francophone life and culture through reading, viewing, and discussion.

Overlaps with FRENCH 1A, FRENCH 1B, FRENCH S1AB.

**FRENCH 1ABSP. Accelerated Fundamentals of French for Spanish Speakers. 5 Units.**

Accelerated first half of first-year French for Hispanophone students. Teaches conceptualizing in French while learning to read, write, and speak using knowledge of Spanish. Develops awareness of and sensibility to French and Francophone life and culture through reading, viewing, discussing.

Prerequisite: Two years of high school Spanish, one semester of college Spanish, or heritage speaker of Spanish.

Overlaps with FRENCH 1A, FRENCH 1AB, FRENCH S1AB, FRENCH 1B.

**FRENCH 1B. Fundamentals of French. 5 Units.**

First quarter of first-year French in a hybrid format. Students are taught to conceptualize in French as they learn to understand, read, write, and speak. Classes are conducted entirely in French.

Prerequisite: FRENCH 1A. FRENCH 1A with a grade of C or better

Overlaps with FRENCH S1AB, FRENCH S1BC, FRENCH 1AB, FRENCH 1BC, FRENCH 1ABSP, FRENCH 1BCSP.

**FRENCH 1BC. Intensive Fundamentals of French. 7.5 Units.**

Intensive second half of first-year French. Students are taught to conceptualize in French as they learn to read, write, and speak. Students develop an awareness of and sensibility to French and Francophone life and culture through reading, viewing, and discussion.

Prerequisite: FRENCH 1AB or FRENCH 1B or FRENCH S1AB. FRENCH 1AB with a grade of C or better. FRENCH 1B with a grade of C or better. FRENCH S1AB with a grade of C or better. Placement into FRENCH 1BC is also accepted.

Overlaps with FRENCH 1B, FRENCH 1C, FRENCH S1BC.

**(VI)****FRENCH 1BCSP. Accelerated Fundamentals of French for Spanish Speakers. 5 Units.**

Accelerated second half of first-year French for Hispanophone students. Teaches conceptualizing in French while learning to read, write, and speak using knowledge of Spanish. Develops awareness of and sensibility to French and Francophone life and culture through reading, viewing, discussing.

Prerequisite: FRENCH 1ABSP or FRENCH 1AB or FRENCH S1AB or FRENCH 1B. FRENCH 1ABSP with a grade of C or better. FRENCH 1AB with a grade of C or better. FRENCH S1AB with a grade of C or better. FRENCH 1B with a grade of C or better. Two years of high school Spanish, one semester of college Spanish, or heritage speaker of Spanish.

Overlaps with FRENCH 1B, FRENCH 1BC, FRENCH S1BC, FRENCH 1C.

**(VI)****FRENCH 1C. Fundamentals of French. 5 Units.**

First quarter of first-year French in a hybrid format. Students are taught to conceptualize in French as they learn to understand, read, write, and speak. Classes are conducted entirely in French.

Prerequisite: FRENCH 1B. FRENCH 1B with a grade of C or better

Overlaps with FRENCH S1BC, FRENCH 1BC, FRENCH 1BCSP.

**(VI)****FRENCH S1AB. Intensive Fundamentals of French. 7.5 Units.**

First half of first-year French in an intensified form and hybrid format. Students are taught to conceptualize in French as they learn to understand, read, write, and speak. Classes are conducted entirely in French.

Overlaps with FRENCH 1A, FRENCH 1B, FRENCH 1AB, FRENCH 1ABSP.

**FRENCH S1BC. Intensive Fundamentals of French. 7.5 Units.**

Second half of first-year French in an intensified form and hybrid format. Students are taught to conceptualize in French as they learn to understand, read, write, and speak. Classes are conducted entirely in French.

Prerequisite: FRENCH S1AB or FRENCH 1B or FRENCH 1AB or FRENCH 1ABSP. FRENCH S1AB with a grade of C or better. FRENCH 1B with a grade of C or better. FRENCH 1AB with a grade of C or better. FRENCH 1ABSP with a grade of C or better

Overlaps with FRENCH 1B, FRENCH 1C, FRENCH 1BC, FRENCH 1BCSP.

**(VI)****FRENCH 2A. Intermediate French. 4 Units.**

Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in French.

Prerequisite: FRENCH 1C or FRENCH 1BC or FRENCH S1BC or FRENCH 1BCSP. FRENCH 1C with a grade of C or better. FRENCH 1BC with a grade of C or better. FRENCH S1BC with a grade of C or better. FRENCH 1BCSP with a grade of C or better. Placement into FRENCH 2A is also accepted.

Overlaps with FRENCH S2AB.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)****FRENCH 2AB. Intensive Intermediate French . 6 Units.**

Intensive first half of second-year French. Texts and films of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in French.

Prerequisite: FRENCH 1C or FRENCH 1BC or FRENCH S1BC. FRENCH 1C with a grade of C or better. FRENCH 1BC with a grade of C or better. FRENCH S1BC with a grade of C or better. Prior high school or college French is recommended. Placement into French 2AB is also accepted.

Overlaps with FRENCH 2A, FRENCH 2B, FRENCH S2AB.

**(VIII)****FRENCH 2B. Intermediate French. 4 Units.**

Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in French.

Prerequisite: FRENCH 2A. FRENCH 2A with a grade of C or better

Overlaps with FRENCH S2AB, FRENCH S2BC.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment. FRENCH 2B and FRENCH S2AB and FRENCH S2BC may not be taken for full credit.

**(VIII)****FRENCH 2BC. Intensive Intermediate French . 6 Units.**

Intensive second half of second-year French. Texts and films of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in French.

Prerequisite: FRENCH S2AB or FRENCH 2AB. FRENCH S2AB with a grade of C or better. FRENCH 2AB with a grade of C or better. Prior high school or college French is recommended. Placement into French 2BC is also accepted.

Overlaps with FRENCH S2BC, FRENCH 2B, FRENCH 2C.

**(VIII)**

**FRENCH 2C. Intermediate French. 4 Units.**

Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in French.

Prerequisite: FRENCH 2B or FRENCH S2AB. FRENCH 2B with a grade of C or better. FRENCH S2AB with a grade of C or better

Overlaps with FRENCH S2BC.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment. FRENCH 2C and FRENCH S2BC may not be taken for full credit.

**(VIII)****FRENCH S2AB. Intermediate French. 6 Units.**

First half of second-year French in an intensified form. Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in French. Prior high school or college French recommended.

Prerequisite: FRENCH 1C or FRENCH 1BC or FRENCH S1BC. FRENCH 1C with a grade of C or better. FRENCH 1BC with a grade of C or better. FRENCH S1BC with a grade of C or better. Placement into FRENCH S2AB is also accepted.

Overlaps with FRENCH 2A, FRENCH 2B.

Restriction: FRENCH S2AB and FRENCH 2A and FRENCH 2B may not be taken for full credit.

**(VIII)****FRENCH S2BC. Intermediate French. 6 Units.**

Second half of second-year French in an intensified form. Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in French. Prior high school or college French recommended.

Prerequisite: FRENCH S2AB or FRENCH 2B. FRENCH S2AB with a grade of C or better. FRENCH 2B with a grade of C or better

Overlaps with FRENCH 2C, FRENCH 2B.

Restriction: FRENCH S2BC and FRENCH 2B and FRENCH 2C may not be taken for full credit.

**(VIII)****FRENCH 10. French Peer Tutoring. 1 Unit.**

Tutoring Program in which advanced French students provide assistance to students at a lower level. One hour of tutoring per week.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**FRENCH 50. Topics in French Culture and the Modern World. 4 Units.**

Introductory course for non-majors. Focuses on France's role in the modern world and its cultural connections to Asia, the Middle East, Africa, Europe, and the Americas. Taught in English.

Repeatability: May be taken for credit 3 times as topics vary.

**(IV and VIII ).****FRENCH 97. Fundamentals of French (with Emphasis on Reading). 4 Units.**

Designed primarily for students interested in acquiring a solid reading knowledge of French, and to facilitate the understanding and translating of French texts dealing with a variety of disciplines.

Restriction: No French Majors.

**FRENCH 101A. Introduction to 19th-Century French Literature. 4 Units.**

Fiction, nonfiction, drama, and poetry of the 19th century studied in relationship to a specific literary or historical problem.

Prerequisite: FRENCH 2C or FRENCH S2BC

**FRENCH 101B. Introduction to 18th-Century French Literature. 4 Units.**

Literature and philosophy of the 18th century studied in relationship to a specific literary or historical problem.

Prerequisite: FRENCH 2C or FRENCH S2BC



**FRENCH 101C. Introduction to 20th-Century French Literature. 4 Units.**

Literatures of the French-speaking world studied in relationship to a specific literary or historical problem.

Prerequisite: FRENCH 2C or FRENCH S2BC

**FRENCH 102A. Grammar and Composition. 4 Units.**

Review of grammar taught in FRENCH 2A-B-C. Students gain facility in writing French and increase reading comprehension. Short texts and films are introduced to generate substantive discussion, and multiple short writing exercises are assigned to solidify skills. Formerly FRENCH 60.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better

**FRENCH 102B. Topics in Issues in French and Francophone Culture. 4 Units.**

Investigation of an issue of cultural significance in the francophone world through historical documents, literary works, and newspaper articles. Supplemented with films and/or other elements of popular culture. Multiple short writing assignments to solidify writing skills. Formerly FRENCH 61.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 102C. Translation. 4 Units.**

Introduction to the theory and practice of translation from French to English and English to French. Many opportunities provided to improve skills in writing and comprehension. Formerly FRENCH 62.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better

**FRENCH 102D. Topics in the Work World in French. 4 Units.**

A view into the world of work in French. Areas of study include international relations; French administration; and tensions between management and workers. Attention given to vocabulary and grammar of professional interactions in French. Formerly FRENCH 63.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 102E. Advanced French Language and Style. 4 Units.**

Intended for advanced students who wish to improve their expressive capabilities in French. Review of more nuanced grammar points. Emphasis placed on rhetoric, syntax, and precision. Advanced readings increase comprehension. Formerly FRENCH 64.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better

**FRENCH 116. Topics in 16th-Century French Literature. 4 Units.**

Examines the diverse literature of the Renaissance and the Age of Exploration.

Repeatability: Unlimited as topics vary.

**FRENCH 117. Topics in 17th-Century French Literature. 4 Units.**

Examines the age of drama and other vibrant forms in French literature of the period.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC or FRENCH 60. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better. FRENCH 60 with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 118. Topics in 18th-Century French Literature. 4 Units.**

Examines the literature and philosophy of the Enlightenment, the Ancient Régime, Classicism, and/or Revolution.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC or FRENCH 60. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better. FRENCH 60 with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 119. Topics in 19th-Century French Literature. 4 Units.**

Focuses on the literature of an era that experienced many modernist transformations.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC or FRENCH 60. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better. FRENCH 60 with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 120. Topics in 20th-Century French and Francophone Literature. 4 Units.**

A study of modern and contemporary literature and culture.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC or FRENCH 60. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better. FRENCH 60 with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 125. Topics in African Literature of French Expression. 4 Units.**

Introduction to the principal African and Caribbean works written in French. Offers opportunity to study literature and culture in French in a non-European context. Lectures and papers in French.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC or FRENCH 60. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better. FRENCH 60 with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 127. Topics in Francophone Literature and Culture. 4 Units.**

Literature and cultures of the francophone world.

Repeatability: Unlimited as topics vary.

**FRENCH 139W. Literature and Society. 4 Units.**

In English. Readings of masterpieces of French literature in their social, political, and historical contexts. Requires at least 4,000 words of assigned composition based on French works. Several essays required.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. French Majors have first consideration for enrollment.

**(Ib)**

**FRENCH 140. Topics in French Literary Genre. 4 Units.**

Examines the development and transformation of a single genre, such as the poem or the novel.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC or FRENCH 60. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better. FRENCH 60 with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 150. Topics in French Literature and Culture. 4 Units.**

Study of a theme, movement, or problem crucial to understanding French Literature and Culture.

Repeatability: Unlimited as topics vary.

**FRENCH 160. French Cinema. 4 Units.**

Study of a period, movement, or theme in French or Francophone cinema.

Repeatability: May be taken for credit 2 times as topics vary.

**FRENCH 170. Topics in History and Literature. 4 Units.**

Examines the dialogue between historical events and literary texts.

Repeatability: Unlimited as topics vary.

**FRENCH 171. Politics and Literature. 4 Units.**

Examines the role played by politics and ethics in French literature, film, and culture.

Repeatability: Unlimited as topics vary.

**FRENCH 180. Topics in Theory and Criticism. 4 Units.**

Advanced study of theoretical and critical texts.

Repeatability: Unlimited as topics vary.

**FRENCH 185. Junior/Senior Seminar in French Literature and Culture. 4 Units.**

Required intensive writing course for French majors to explore in depth selected topic in French literature and culture. Students complete major independent research project on topic studied, making use of literary and critical materials in their capstone essay. In French.

Prerequisite: FRENCH 100A and FRENCH 100B and FRENCH 101A and FRENCH 101B and FRENCH 101C. One course from FRENCH 101A, FRENCH 101B, or FRENCH 101C may be taken as a corequisite.

**FRENCH 199. Special Studies in French. 1-4 Units.**

A project proposal is prepared by the student and approved by the faculty member who directs the project. Procedure must be completed by the end of the first week of classes.

Repeatability: Unlimited as topics vary.

Restriction: Repeatability: once for M.A. candidates; twice for Ph.D. candidates.

**FRENCH 216. Studies in Renaissance Literature. 4 Units.**

Advanced study of a topic in the Renaissance period.

Repeatability: Unlimited as topics vary.

**FRENCH 217. Studies in Seventeenth-Century Literature. 4 Units.**

Advanced study of a topic in the 17th century.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**FRENCH 218. Studies in Eighteenth-Century Literature. 4 Units.**

Advanced study of a topic in the 18th century.

Repeatability: Unlimited as topics vary.

**FRENCH 219. Studies in Nineteenth-Century Literature. 4 Units.**

Advanced study of a topic in the 19th century.

Repeatability: Unlimited as topics vary.

**FRENCH 220. Studies in Twentieth-Century Literature. 4 Units.**

Advanced study of a topic in the 20th and 21st century.

Repeatability: May be taken for credit 9 times as topics vary.

Restriction: Graduate students only.

**FRENCH 225. Francophone Literature and Culture. 4 Units.**

Studies in different francophone literatures and cultures (of Canada, the Caribbean, West and North Africa, and Southeast Asia).

Repeatability: Unlimited as topics vary.

**FRENCH 231. Studies in Fiction . 4 Units.**

Examines the art of fiction.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**FRENCH 232. Studies in Nonfictional Prose. 4 Units.**

Examines non-fictional genres such as the essay and the memoir.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**FRENCH 233. Studies in Poetry and Poetics. 4 Units.**

Examines the genre of poetry and theories of poetry.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**FRENCH 240. Studies on a Major Writer. 4 Units.**

Focused study of one author.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**FRENCH 250. Studies in Theory and Criticism. 4 Units.**

Advanced study of a topic in theory and/or criticism.

Repeatability: Unlimited as topics vary.

**FRENCH 254. History and Literature. 4 Units.**

Advanced study of literary works in their historical context.

Repeatability: Unlimited as topics vary.

**FRENCH 272. Cultural Studies . 4 Units.**

Examines the theoretical paradigm of cultural studies.

Repeatability: Unlimited as topics vary.

**FRENCH 290. Research in French Language and Literature. 4 Units.**

A project proposal is prepared by the student and approved by the faculty member who directs the project. Procedure must be completed by the end of the first week of classes. Limit: Once for M.A. candidates; twice for Ph.D. candidates.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only. French Majors only.

**FRENCH 299. Dissertation Research. 4-12 Units.**

For graduate students writing a dissertation with a faculty member in French.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Humanities students only.

**FRENCH 399. University Teaching. 4 Units.**

For graduate students completing a course on foreign language pedagogy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Humanities students only.

## Fully Employed MBA (MGMT FE)

### Courses

**MGMT FE 200. Thinking Strategically in the Digital Age for Managers. 6 Units.**

Focuses on the strategic and organizational challenges that a rapidly changing environment poses to the firm's management and frames them according to Merage's strategic emphasis on analytical decision making, innovation, and information technology.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 201A. Business Analytics: Decision-Making for Managers . 4 Units.**

Methods of statistical inference, emphasizing applications to administrative and management decision problems. Topics include classical estimation, hypothesis testing, regression, correlation, analysis of variance, decision analysis, and forecasting. Evening or weekend course format.

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 201B. Management Science for Managers. 4 Units.**

Uses both prescriptive analysis and risk analysis to explore linear programming models, network problems, and simulation. The goal is to introduce and help students acquire some skills of logical thinking with formal models and improve students' decision making capability.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 202. Organizational Leadership for Managers. 4 Units.**

Develops a better understanding of individual and group behavior in and across organizations; the frameworks by which to analyze and understand behavior in complex organizations; and enhances the skills required to manage collaboration and lead. Evening or weekend course format.

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 203A. Financial Reporting for Managers. 4 Units.**

Involves the development, analysis, and interpretation of financial accounting information for external reporting purposes. Emphasis on measurement and valuation issues in decision-making problems and cases. Evening or weekend course format.

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 203B. Driving Profitability Through Managerial Accounting. 4 Units.**

Teaches skills for making vital strategic and tactical decisions (e.g., outsourcing; adding/dropping product lines), to maximize profitability while managing risk. Also covers managerial tools (e.g., budgeting, cost-volume-profit analysis) to drive strategy implementation and incentivize employees. Taught in an evening/weekend format.

Prerequisite: MGMT FE 203A or MGMTMBA 203A. MGMT FE 203A with a grade of C or better. MGMTMBA 203A with a grade of C or better

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 204A. Microeconomics for Managers in the Digital Age. 4 Units.**

Provides basic tools for analyzing economic decisions, the determinants and consequences of market structure and market failure. Topics include demand and supply analysis, production and cost theory, perfect competition, monopoly, and introductory game theory. Evening and weekend course format.

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 204B. Macroeconomics for Managers. 4 Units.**

Introduces use of macroeconomic analysis to manage the business cycle for competitive advantage. 'Business cycle-sensitive' management is explored within the context of marketing, operations management, HRM, merger and acquisition activity, and capital financing and expenditures. Evening and weekend course format.

Prerequisite: MGMT FE 204A or MGMTMBA 204A

Restriction: Graduate students only. Business Administration Majors only.

**MGMT FE 205. Marketing Management. 4 Units.**

Introduction to marketing. Develops familiarity with fundamental concepts, theories, and techniques in marketing and acquaints students with the type of decisions made by marketing managers including customer targeting, product, pricing, placement, promotion, and research. Evening or weekend course format.

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 206. Business and Government for Managers. 4 Units.**

Introduces students to the many non-market issues that affect today's managers, such as environment protection, health and safety, intellectual property protection, antitrust, and lobbying. Takes an interdisciplinary approach using economics, political science, public policy, and law. Evening and weekend course.

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 207. Competing with Digital. 4 Units.**

Focuses on the technological and managerial issues surrounding the development and use of IT in organizations. Examines how technology can be used to execute an organization's business strategy and to enable new, innovative business strategies. Evening or weekend course format.

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 208. Operational Excellence: Processes, Principles, and Analytics. 4 Units.**

Introduction to strategic and tactical issues in production and operations management. Blend of quantitative and qualitative considerations. Topics include product planning, process design, capacity management, production planning, inventory control, distribution management, just-in-time manufacturing, quality management. Evening or weekend course format.

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 209A. Finance for Managers. 4 Units.**

Introduces students to financial theory and concepts. Topics include time value of money, valuation of stocks and bonds, capital budgeting, portfolio theory, and capital structure choice. Evening or weekend course format.

Prerequisite: MGMT FE 201A and MGMT FE 203A and MGMT FE 204A

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 209B. Investments for Managers. 4 Units.**

Foundations of investment management. Theory and empirical evidence related to portfolio theory, market efficiency, and valuation models for equities, bonds, and options. Emphasis on practical applications, including optimal investment strategies. Evening or weekend course format.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 210. Strategy for Managers: Foundations and Dynamics . 4 Units.**

Provides conceptual frameworks and techniques to analyze and develop firm strategies. Through case analysis and discussion, helps improve strategic thinking by developing frameworks by which to assess, evaluate, and respond to different business situations. Evening or weekend course format.

Prerequisite: MGMT FE 200 and MGMT FE 202 and MGMT FE 205 and MGMT FE 209A

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 211. Networks, Platforms, and Ecosystems . 4 Units.**

Focuses on unique strategic issues raised by multi-sided platform businesses that facilitate interaction among different parties. Combining economic theory and case examples to unpack subtle factors making multi-sided businesses different. From value propositions to pricing strategies to design decisions.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 212. Business Growth Strategies for Managers. 4 Units.**

Focuses on management of growth opportunities in industries where applied innovation, usually in the form of technology, people, or processes, creates distinct competitive advantages.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 214. Entrepreneurship. 4 Units.**

A project course in which student teams develop a business plan to launch a new venture. Drafts of sections of the plan are due throughout the course. Evening or weekend course format.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 215. Strategy in a Digital Age. 4 Units.**

Focuses on applying unchanging basic principles of strategy, economics, and organization to digital technologies. Studies historical and contemporary competitive situations to work out key underlying digital mechanisms that shape competition over time.

Restriction: Master of Business Admin Degree students only.

**MGMT FE 217. Competitive Intelligence for Managers. 4 Units.**

Focuses on how to design a competitive intelligence program, which is a core foundation upon which competitive strategies and execution tactics are developed, assessed, and modified. Evening or weekend course format.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 219. Practice of General Management. 4 Units.**

Designed to teach the graduating M.B.A. students how the best managers actually manage. Students will develop a toolkit of proven concepts and practices that will help them succeed as managers at any level.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 220. Organizational Change in a Digital World for Managers. 4 Units.**

Focuses on the implementation of change. Identifies the features of successful changes in organizations of varying sizes and configurations, with an emphasis on the reasons why individuals resist or embrace change. Evening or weekend course format.

Prerequisite: MGMT FE 202 or MGMTMBA 202

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 222. Performance Management in 21st Century Organizations . 4 Units.**

The key to sustained competitive advantage in a 21st century organization. Performance management is all about aligning employee attitudes and behaviors with firm goals and performance.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 225. Negotiations For Managers. 4 Units.**

Using a combination of theory and practice via negotiation simulations, students expand their repertoire of negotiating skills and develop their ability to analyze different negotiation situations and contexts. Evening or weekend course format.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 227. Global Negotiations. 4 Units.**

Emphasizes economic, political, social, and cultural environments of international business negotiations. Topics include self-assessment/analysis, environmental analysis, international team building, negotiation processes and strategies, resources, skills, pre-negotiation preparations, agreements, and post-contract negotiations. Specific emphasis will be placed on cross-cultural problem-solving.

Restriction: Graduate students only.

**MGMT FE 228. International Management for Managers. 4 Units.**

Introduction to the effects of different national cultures, and political and economic systems on the assumptions, expectations, organizational practices, and organizational forms needed to conduct cross-national organizational work. Evening or weekend course format.

Prerequisite: MGMT FE 202

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 229. Building Your Leadership Toolkit. 2 Units.**

Provides insights/perspectives about the study and development of leadership. Helps students answer three questions: Where am I currently as a leader? What tools can I use to improve my leadership? What is my plan for the future as a leader.

Prerequisite: MGMT FE 202 or MGMTMBA 202. MGMT FE 202 with a grade of C or better. MGMTMBA 202 with a grade of C or better

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 231A. Financial Statement Analysis and Valuation for Managers I. 4 Units.**

Develops skills essential to using financial statements for business analysis by examining financial information quality, profitability and risk analysis, earnings management, revenue recognition, asset recognition and valuation, and how financial reporting is related to the business environment and managerial incentives.

Prerequisite: MGMT FE 203A or MGMTMBA 203A. MGMT FE 203A with a grade of C or better. MGMTMBA 203A with a grade of C or better

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 231B. Financial Statement Analysis and Valuation for Managers II. 4 Units.**

Focuses on the financial statement analysis of liabilities and stockholders' equity. Topics include forecasting financial statements, earnings-based valuation models, accounting analysis of mergers and acquisitions, leases, bankruptcy prediction, and derivatives. Evening or weekend course format.

Prerequisite: MGMT FE 203A or MGMTMBA 203A. MGMT FE 203A with a grade of C or better. MGMTMBA 203A with a grade of C or better

Restriction: Master of Business Admin Degree students only. Graduate students only.



**MGMT FE 233. Wealth Management for Managers. 4 Units.**

Aims to integrate behavioral finance, psychology, personal financial planning, risk management, and asset management to provide students with the theoretical and practical knowledge to effectively build and manage wealth.

Restriction: Admin - Fully Employed Majors only.

**MGMT FE 245. FinTech and the Digital Economy. 4 Units.**

Provides working knowledge of the role of IT-enabled innovation in financial markets to help students acquire an understanding of broad economic issues that are of wide applicability in many areas of FinTech. Both qualitative analysis and quantitative applications are explored.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 246A. Introduction to the Real Estate Process. 4 Units.**

Introductory survey course providing an understanding of the real estate market. Topics include real estate economics, valuation, feasibility, investment, tax considerations, financing, development, and corporate real estate asset management. Hands-on lectures, with guest lectures by real estate professionals.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 246B. International Real Estate. 4 Units.**

Survey of international real estate investment opportunities. Topics include size and breadth; opportunities and challenges (tax treatment, currency/political/market risks, transaction costs, lack of local knowledge); ownership vehicles (REITs, joint ventures, equity funds, etc.). Global cast of guest lecturers supplements lectures.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 246C. Real Estate Capital Markets. 4 Units.**

Understanding the four sectors of real estate capital markets: public debt, private debt, public equity, private equity; estate investment, key players, investment types drive capital solutions, underwriting strategies, and vehicle structuring, debt versus equity source characteristics and implications for returns.

**MGMT FE 246D. The Real Estate Development Process. 4 Units.**

Nature and composition of development community and development process. Emphasis on role of conflicting interests, values and goals, and market uncertainty. Special attention paid to deal structuring and risk management. Lectures, guest lecturers, team projects evaluating actual development project.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 246F. Seminar in Management of the Real Estate Enterprise. 4 Units.**

Beyond 'The Deal' to management of the real estate enterprise itself. Explores aspects of decision-making focused upon strategic objectives: goal setting, legal/tax structures, family-owned firms, going public, corporate ethics, capital structure, diversification, core competencies, technology. Guest professionals.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 246G. Applied Real Estate Security Analysis and Portfolio Management. 4 Units.**

Provides an understanding of the public real estate investment trust (REIT) market and its place in modern investment strategies, presents methods for analyzing and valuing companies, and introduces basic concepts for constructing and managing a real estate investment portfolio.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 247. Venture Capital and Private Equity for Managers. 4 Units.**

Geared to students who are seeking a career in finance and/or in working with venture capital firms, private equity/buyout firms, investment banks, commercial lenders, mezzanine fund investors, corporate finance, and entrepreneurial firms.

Restriction: Master of Business Admin Degree students only.

**MGMT FE 249. Derivatives for Managers. 4 Units.**

Studies financial derivatives instruments, including forward contracts, futures, swaps, and options. Advanced applications of these instruments, including pricing and risk management, are emphasized. Evening or weekend course format.

Prerequisite: MGMT FE 209A or MGMTMBA 209A

Restriction: Master of Business Admin Degree students only. Graduate students only.



**MGMT FE 251A. Marketing Research for Managers. 4 Units.**

Qualitative and quantitative marketing techniques that generate customer insights. Discusses problem formulation, data collection, statistical analyses, formulating managerial recommendations, implementation, and how research is used by companies. Evening or weekend course format.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 252A. Managing Advertising and Communications. 4 Units.**

Integrated marketing communications, including advertising, sale promotions, public relations, and direct mail. Exposure to elements of a communications plan; marketing research, including copy testing and tracking; creating brand value; media strategies; metrics. Evening or weekend course format.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 255. Business to Business Selling and Sales Management. 4 Units.**

Sales is the interpersonal process where the needs of the buyer are uncovered and satisfied, to the long-term benefit of both parties. Students explore sales force management and personal selling in a dynamic, digital environment.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 257. Marketing on the Internet for Managers. 4 Units.**

Examines the Internet's impact on traditional methods of marketing. Discusses how to capitalize on and increase the Internet's utility as a tool that can increase marketing effectiveness, efficiency, and competitiveness. Evening or weekend course format.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 258. Marketing Strategies for High Technology for Managers. 4 Units.**

Framework and tools for managing technology-intensive businesses. Product and pricing policies; network externalities; compatibility concerns; systems competitions; technological and market uncertainty; technology licensing strategies; contracting in high-tech markets; product line design; product bundling strategies; usage-based pricing; pricing of networks; auctions.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 259. Strategic Brand Management for Managers. 4 Units.**

Addresses important branding decisions faced by organizations. A computer simulation allows students hands-on experience in making decisions about their brand and seeing the results of those decisions. Evening or weekend course format.

Prerequisite: MGMT FE 205 or MGMT MBA 205

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 273. Business Intelligence for Analytical Decisions for Managers. 4 Units.**

Introduces methods to mine data repositories for business intelligence to facilitate analytical decision-making. Topics include clustering for market segmentation; association rules to discover relationships between different purchase decisions; Naive-Bayes classification techniques for decision making using decision-trees. Evening or weekend format.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 278. Data and Programming for Analytics. 4 Units.**

Challenges and teaches students to handle data that come in a variety of forms and sizes. Guides students through the whole data management process, from initial data acquisition to final data analysis.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 279. Digital Strategies and Markets. 4 Units.**

Examines how online social media are impacting organizations and markets. Topics include collective intelligence, online social influence, social networks, and social media monetization. The target audience consists of students interested in IT consulting, competitive strategy, marketing, and entrepreneurship.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 281. Analytical Decision Models for Managers. 4 Units.**

An introduction of analytics tools for decision making. Topics include linear and non-linear optimization and simulation models. Excel Solver will be used as the optimization tool and Risk Solver Platform will be used as the simulation tool. Evening or weekend.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 282. Revenue Management for Managers. 4 Units.**

Students learn to apply advanced analytics to earn incremental revenue through the efficient use of resources and science-based pricing methods. Statistics and optimization (using Excel and Excel Solver). Industry-specific implementation issues.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 283. Decision Analysis for Managers. 4 Units.**

Models of preferences and uncertainty; exercises in creative problem solving. Assessment and use of preference models for private, public, and not-for-profit decision making. Assessment and use of subjective probabilities in decision making. Evening or weekend course format.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 288. Predictive Analytics. 4 Units.**

Deals with predicting entities, such as demand for a product or service (forecasting) and predicting membership of known groups (classification). Blends methodologies of forecasting and data mining and focuses on the application of these methods to managerial problems and decision-making.

Restriction: Graduate students only.

**MGMT FE 290. Special Topics in Business. 2-4 Units.**

Studies in selected areas of Business. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 292. Business Law for Managers. 4 Units.**

Detailed study from a business viewpoint of contract theories, assignments, delegation of duties, third-party beneficiary contracts, defenses to consensual contracts, types of conditions, methods of excusing conditions, remedies, and types of damages. Evening or weekend course format.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 293. Information, Communication, and Coordination: Practicum for Analyzing Organizations. 4 Units.**

Use of contextual inquiry and ethnographic methods to assess real world contexts. Exploring culture, power, physical layout, and the role of artifacts in information flow, communication practices, and coordination through qualitative fieldwork in an organization.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 294. EDGE for Managers. 4 Units.**

Explores the crucial roles of external forces: globalization, technology, shifting demographics - as transformative catalysts for change - opening markets, erasing boundaries, and transforming industries. This course prepares future business leaders to innovate and successfully compete.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 295A. Introduction to Global Business for Managers.**

Fundamentals of global strategy, economics, and financial issues. Topics include global manager's environment, global strategy, impact of national culture on business systems, strategies and practices, foreign direct investment, corporate governance, human resources, and international marketing. Evening and weekend course format.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 295B. Global Business for Managers. 4 Units.**

Emphasizes and reinforces international perspectives contained in the FEMBA curriculum by providing a week-long intensive seminar abroad in the second year. Scholars and business people from the host country instruct FEMBA students in specially designed class sessions and company visits.

Prerequisite: MGMT FE 295A. MGMT FE 295A with a grade of B or better

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 296. Executive Leadership. 6 Units.**

Provides perspectives on leadership. Helps students answer three questions: Where am I currently as a leader? What tools can I use to improve my leadership? What is my plan for the future as a leader? Evening or weekend course format.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 298. Merage Consulting Projects for Managers. 4 Units.**

Provides students the opportunity to put into practice concepts, skills, and tools acquired in other parts of the MBA program. Seminars augment internship experiences with analyses of relevant administrative issues.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 299. Individual Directed Study. 1-8 Units.**

Individual study under the direction of a selected faculty member.

Restriction: Graduate students only. Master of Business Admin Degree students only.

## Gender and Sexuality Studies (GEN&SEX)

### Courses

**GEN&SEX 20. Introduction to Queer Studies. 4 Units.**

Study of sexuality from the perspective of lesbian, gay, queer, transgender scholarship spanning humanities, social sciences, and arts.

(IV and VII ).

**GEN&SEX 50A. Gender and Feminism in Everyday Life. 4 Units.**

What is gender? Why does studying it matter? Explores how feminism has understood not only gender as a category of social analysis, but how gender structures personal identities, family, citizenship, work and leisure, social policy, sexuality, and language.

(IV, VII)

**GEN&SEX 50B. Gender and Power. 4 Units.**

From workplace to home to schools to prisons, how are societal institutions and politics "gendered"? Examines power and inequalities around gender, race, class, and sexuality in national and transnational contexts.

(IV, VII)

**GEN&SEX 50C. Gender and Popular Culture. 4 Units.**

An investigation of gender, race, and sexuality in film, TV, video, music, and advertising, with attention to the ways that popular culture shapes understandings of technology, national identities, leisure and work, historical memory, international communication, and multicultural representation.

(IV, VII)

**GEN&SEX 60A. Gender and Science. 4 Units.**

Examines science from a variety of feminist viewpoints in order to explore how science influences everyday life. Special attention is given to the ways science shapes our understanding of gender, race, and sexuality.

(III)

**GEN&SEX 60B. Gender and Law. 4 Units.**

Introduction to the relationship between gender, race, sexuality, and the law. Critical thinking about how law defines citizenship, political representation, and democracy, focusing on the history of legal reform undertaken in the name of women as a social group.

(III)

**GEN&SEX 60C. Gender and Religion. 4 Units.**

Introduces the topic of religion in a feminist context by performing cross-cultural exploration of gender, authority, and faith in various traditions. Study includes (but is not limited to) writings of contemporary Jewish, Christian, and Muslim feminists.

Same as REL STD 61.

(III and VIII ).

**GEN&SEX 100A. Feminism and Social Change. 4 Units.**

Explores feminist modes of knowledge production in relation to histories and activist practices of various social movements. Examines the kinds of information, research, ideas, theories, and concepts that underlie feminist cultural analysis and social movement organizing.

**GEN&SEX 100B. Feminist Theory. 4 Units.**

Introduction to historical traditions in theory and various conceptual frameworks informing scholarship in gender studies, sexuality studies, and women's studies as a field of critical inquiry.

**GEN&SEX 100C. Feminist Cultural Studies. 4 Units.**

Investigation of the theories and methods that inform the feminist study of culture. Focuses on the interpretation of the visual arts and literature created by, and predominately for, women.

**GEN&SEX 100D. Queer Knowledges. 4 Units.**

Explores the emergence of historical elaboration of non-normative sexual identities, practices, and communities; focuses on medical, legal, literary, aesthetic, scientific, and religious notions about homosexuality and appropriations and subversions of these notions by queer people.

**GEN&SEX 110A. Gender, State, and Nation. 4 Units.**

Examination of gender and sexuality in relation to the production of identities created through participation in state and nation. Examines complexity of relationship between feminism and nationalism, feminism and the state.

**GEN&SEX 110B. Money, Sex, and Power. 4 Units.**

Examination of gender and sexuality in relation to the emergence of the modern world, modernity, and capitalism; commodification, circulation, and transnational exchanges relating to race, gender, class, sexuality, religion, and nationality.

**GEN&SEX 110D. The Politics of Health and Medicine. 4 Units.**

Focuses on cultural and political-economic analysis and representations of disease both within the U.S. and globally.

**GEN&SEX 120A. Histories of Sexuality. 4 Units.**

Examines the historical production of non-normative sexual and gender identities, bodies, practices, and communities. Explores how past formations inform and shape the present and future.

**GEN&SEX 120B. Image Problems. 4 Units.**

Examination of scholarly approaches to gender stereotypes and politics of representation as they present possibilities for critical analysis and produce problems and limitations; how powerful ideas of gender intersect with other forms of social differentiation such as race and class.

**GEN&SEX 120C. Practices of Embodiment. 4 Units.**

Explores how science, medicine, and law have shaped the understanding of differentiated bodies; examines shifting norms and ideals about producing, shaping, adorning, and dressing gendered bodies across diverse historical, cultural, social, economic, and spatial contexts.

**GEN&SEX 139. Topics in Gender Studies. 4 Units.**

Various topics in gender studies. Encompasses issues of gender, culture, race and class, including issues of sexualities and social justice.

Repeatability: Unlimited as topics vary.

**GEN&SEX 155. Topics in Gender and Sexuality Studies. 4 Units.**

Designed to provide students with an opportunity to conduct advanced work in Gender and Sexuality Studies.

Repeatability: Unlimited as topics vary.

**GEN&SEX 157. Topics in Queer Studies. 4 Units.**

Explores issues in queer studies from one or more of the following perspectives: theoretical, historical, legal, economic, political, sociological, and representation in the arts.

Repeatability: Unlimited as topics vary.

**GEN&SEX 165F. Gender and Technology. 4 Units.**

Using a variety of disciplinary methods, examines how various technological processes and products produce culturally complex meanings associated with gender and technology.

**GEN&SEX 167A. Militarism and Gender. 4 Units.**

Examination of feminist approaches to militarism, war, and political violence; drawing on representations of women as both victims of and participants in military violence; effects of militarism on formations of gender; effects of military industrial complex on nationalism and identity.

Same as INTL ST 153F.

**GEN&SEX 170. Topics in Gender, Feminism, Literature, and Language. 4 Units.**

Topics cover issues in language and literature which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 171. Topics in Gender, Feminism, and History. 4 Units.**

Topics cover issues in history which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 171A. Sex and Conquest in Latin America. 4 Units.**

Competing ideas of masculinity and femininity, sexual violence, sexual identities, and gendered hierarchies informed how the Spanish engaged in military and religious domination of Mexican and Andean communities, as well as the forms of native resistance throughout colonial Latin America.

Same as ANTHRO 140, CHC/LAT 150A, HISTORY 160.

**GEN&SEX 174. Topics in Gender, Feminism, and the Arts. 4 Units.**

Topics cover issues in the arts which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 175. Topics in Gender, Feminism, and the Media. 4 Units.**

Topics cover issues in the media which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 180. Topics in Gender, Feminism, and Anthropology. 4 Units.**

Topics cover issues in Anthropology which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 181. Topics in Gender, Feminism, and Cognitive Psychology. 4 Units.**

Topics cover issues in cognitive psychology which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 182. Topics in Gender, Feminism and Economics. 4 Units.**

Topics cover issues in economics which relate to women and gender or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 183. Topics in Gender, Feminism, and Sociology. 4 Units.**

Topics cover issues in sociology which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 184. Topics in Gender, Feminism, and Political Science. 4 Units.**

Topics cover issues in political science which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 185. Topics in Gender, Feminism, and Social Sciences. 4 Units.**

Topics cover issues in social sciences which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 187. Topics in Gender, Feminism, and Social Ecology. 4 Units.**

Topics cover issues in social ecology which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 188. Topics in Gender, Feminism, and Science. 4 Units.**

Topics cover issues in science which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 189. Topics in Gender, Feminism, and Interdisciplinary Studies. 4 Units.**

Topics cover issues in interdisciplinary studies which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 190. Topics in Sexualities Studies. 4 Units.**

Topics cover issues in the humanities, social sciences, sciences, and arts that relate to critical inquiry of sexualities.

Repeatability: Unlimited as topics vary.

**GEN&SEX 197. Senior Seminar in Gender and Sexuality Studies. 4 Units.**

Students read advanced scholarship in Gender and Sexuality Studies and complete a major seminar paper.

Prerequisite: Satisfactory completion of the Upper-Division Writing requirement.

Restriction: Gender and Sexuality Studies Majors only.

**GEN&SEX 199. Independent Study . 1-4 Units.**

Directed reading and research in consultation with a faculty member. Substantial written work required. Includes independent study, involving 3-12 hours a week.

Repeatability: May be repeated for credit unlimited times.

**GEN&SEX 200A. Feminist Knowledge and Social Change. 4 Units.**

Provides a broad and introductory overview of Women's Studies and feminist knowledge, including key concepts, theoretical frameworks, disciplinary approaches and methods, and critical debates that have shaped the field.

Repeatability: May be taken for credit 2 times.

**GEN&SEX 200B. Problems in Feminist Research. 4 Units.**

Colloquium on analytic approaches to interdisciplinary feminist research in Women's Studies and exploration of how feminist knowledges are produced in different academic disciplines.

Repeatability: May be taken for credit 2 times.

**GEN&SEX 201. Special Topics in Feminist Studies. 4 Units.**

Seminars on various topics in feminist studies.

Repeatability: Unlimited as topics vary.

**GEN&SEX 210A. Topics in Graduate Feminist Theory. 4 Units.**

In-depth introduction to various theoretical frameworks that have and continue to inform scholarship in Women's Studies including (but not limited to) identity, representation, and political economy.

Repeatability: Unlimited as topics vary.

**GEN&SEX 290. Directed Research. 2-12 Units.**

Directed graduate study/research in Gender and Sexuality Studies.

Repeatability: May be taken for credit for 24 units.

Restriction: Graduate students only.

**GEN&SEX 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

## German (GERMAN)

### Courses

**GERMAN 1A. Fundamentals of German. 5 Units.**

Emphasizes the development of meaningful communicative skills in German for the purposes of interaction with German speakers and beginning study of German. With a learner-centered approach, the courses help students develop speaking, listening, reading, writing, and cultural skills and knowledge.

Overlaps with GERMAN S1AB, GERMAN 1AB.

**GERMAN 1AB. Intensive German Fundamentals . 7.5 Units.**

First half of first-year German in a time-intensive form. Development of meaningful communicative skills for the purposes of interaction with German speakers and beginning study of German. Learner-centered approach develops speaking, listening, reading, writing, and cultural skills and knowledge. Materials fee.

Prerequisite: Placement into GERMAN 1AB.

Overlaps with GERMAN S1AB, GERMAN 1A, GERMAN 1B.

Restriction: GERMAN 1AB and GERMAN 1A and GERMAN 1B and GERMAN S1AB may not be taken for full credit.

**GERMAN 1B. Fundamentals of German. 5 Units.**

Emphasizes the development of meaningful communicative skills in German for the purposes of interaction with German speakers and beginning study of German. With a learner-centered approach, students develop speaking, listening, reading, writing, and cultural skills and knowledge.

Prerequisite: GERMAN 1A. GERMAN 1A with a grade of C or better. Placement into GERMAN 1B is also accepted.

Overlaps with GERMAN S1AB, GERMAN S1BC, GERMAN 1AB, GERMAN 1BC.

**GERMAN 1BC. Intensive German Fundamentals. 7.5 Units.**

Second half of first-year German in a time-intensive form. Development of meaningful communicative skills for the purposes of interaction with German speakers and beginning study of German. Learner-centered approach develops speaking, listening, reading, writing, and cultural skills and knowledge. Materials fee.

Prerequisite: GERMAN 1AB or GERMAN 1B or GERMAN S1AB. GERMAN 1AB with a grade of C or better. GERMAN 1B with a grade of C or better. GERMAN S1AB with a grade of C or better. Placement into GERMAN 1BC is also accepted.

Overlaps with GERMAN 1B, GERMAN 1C, GERMAN S1BC.

Restriction: GERMAN 1BC and GERMAN 1B and GERMAN 1C and GERMAN S1AB may not be taken for full credit.

**(VI)****GERMAN 1C. Fundamentals of German. 5 Units.**

Emphasizes the development of meaningful communicative skills in German for the purposes of interaction with German speakers and beginning study of German. With a learner-centered approach, students develop speaking, listening, reading, writing, and cultural skills and knowledge.

Prerequisite: GERMAN 1B. GERMAN 1B with a grade of C or better. Placement into GERMAN 1C is also accepted.

Overlaps with GERMAN 1BC, GERMAN S1BC.

**(VI)****GERMAN S1AB. Fundamentals of German. 7.5 Units.**

First half of first-year German in a time-intensive form. Development of meaningful communicative skills for the purposes of interaction with German speakers and beginning study of German. Learner-centered approach develops speaking, listening, reading, writing, and cultural skills and knowledge.

Overlaps with GERMAN 1A, GERMAN 1B, GERMAN 1AB.

Restriction: GERMAN S1AB and GERMAN 1A and GERMAN 1B and GERMAN 1AB may not be taken for full credit.

**GERMAN S1BC. Fundamentals of German. 7.5 Units.**

Second half of first-year German in a time-intensive form. Development of meaningful communicative skills for the purposes of interaction with German speakers and beginning study of German. Learner-centered approach develops speaking, listening, reading, writing, and cultural skills and knowledge.

Prerequisite: GERMAN 1AB or GERMAN 1B or GERMAN S1AB. GERMAN 1AB with a grade of C or better. GERMAN 1B with a grade of C or better. GERMAN S1AB with a grade of C or better. Placement into GERMAN S1BC is also accepted.

Overlaps with GERMAN 1B, GERMAN 1C, GERMAN 1BC.

Restriction: GERMAN 1BC and GERMAN S1BC and GERMAN 1B and GERMAN 1C may not be taken for full credit.

**(VI)**



**GERMAN 2A. Intermediate German. 4 Units.**

Emphasizes communicative skills for the purposes of interaction with German speakers and intermediate study of German. With a learner-centered approach, helps students develop reading, writing, speaking, listening, grammatical, and cultural skills and knowledge. First-year grammar is reviewed and expanded.

Prerequisite: GERMAN 1BC or GERMAN 1C or GERMAN S1BC. GERMAN 1BC with a grade of C or better. GERMAN 1C with a grade of C or better. GERMAN S1BC with a grade of C or better. Placement into GERMAN 2A is also accepted.

Overlaps with GERMAN S2AB.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(VIII)

**GERMAN 2B. Intermediate German. 4 Units.**

Emphasizes communicative skills for the purposes of interaction with German speakers and intermediate study of German. With a learner-centered approach, helps students develop reading, writing, speaking, listening, grammatical, and cultural skills and knowledge. First-year grammar is reviewed and expanded.

Prerequisite: GERMAN 2A. GERMAN 2A with a grade of C or better. Placement into GERMAN 2B is also accepted.

Overlaps with GERMAN S2AB, GERMAN S2BC.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(VIII)

**GERMAN 2C. Intermediate German. 4 Units.**

Emphasizes communicative skills for the purposes of interaction with German speakers and intermediate study of German. With a learner-centered approach, helps students develop reading, writing, speaking, listening, grammatical, and cultural skills and knowledge. First-year grammar is reviewed and expanded.

Prerequisite: GERMAN 2B. GERMAN 2B with a grade of C or better. Placement into GERMAN 2C is also accepted.

Overlaps with GERMAN S2BC.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(VIII)

**GERMAN S2AB. Intermediate German. 6 Units.**

First half of second-year German in a time-intensive form. Emphasizes communicative skills for the purposes of interaction with German speakers and intermediate study of German. Learner-centered approach develops reading, writing, speaking, listening, grammatical, and cultural skills and knowledge.

Prerequisite: GERMAN 1C or GERMAN S1BC

Overlaps with GERMAN 2A, GERMAN 2B.

Restriction: GERMAN S2AB and GERMAN 2A and GERMAN 2B may not be taken for full credit.

(VIII)

**GERMAN S2BC. Intermediate German. 6 Units.**

Second half of second-year German in a time-intensive form. Emphasizes communicative skills for the purposes of interaction with German speakers and intermediate study of German. Learner-centered approach develops reading, writing, speaking, listening, grammatical, and cultural skills and knowledge.

Prerequisite: GERMAN 2B or GERMAN S2AB. GERMAN 2B with a grade of C or better. GERMAN S2AB with a grade of C or better

Overlaps with GERMAN 2B, GERMAN 2C.

Restriction: GERMAN S2BC and GERMAN 2B and GERMAN 2C may not be taken for full credit.

(VIII)



**GERMAN 53. Advanced Conversation. 2 Units.**

Includes reading of political and cultural material. Conducted in German.

Prerequisite or corequisite: GERMAN 2C

Repeatability: May be repeated for credit unlimited times.

**GERMAN 97. Fundamentals of German (with Emphasis on Reading). 4 Units.**

Primarily for students interested in acquiring a solid reading knowledge of German. Facilitates comprehension and translation of texts in various disciplines. Does not serve as prerequisite for any higher-level German courses or fulfill any undergraduate foreign language requirement.

Repeatability: May be taken for credit 3 times.

Restriction: No German Studies Majors.

**GERMAN 101. Topics in Introduction to German Literature and Culture. 4 Units.**

Sample interpretations of texts in their cultural and historical contexts. Introduction to critical language in German.

Prerequisite or corequisite: GERMAN 2C. GERMAN 2C with a grade of C or better

Repeatability: Unlimited as topics vary.

**GERMAN 102. Topics in German Culture and Society. 4 Units.**

Interdisciplinary introduction to German culture from the perspective of its aesthetic, social, and political aspects. Methodological problems arising from an analysis of culture in its historical context.

Prerequisite or corequisite: GERMAN 2C. GERMAN 2C with a grade of C or better

Repeatability: Unlimited as topics vary.

**GERMAN 103. Topics in German Film. 4 Units.**

Introduction to the history and interpretation of German film within its cultural and social contexts. Enhances German grammar knowledge and vocabulary and develops sophisticated speaking, writing, and reading skills.

Prerequisite or corequisite: GERMAN 2C. GERMAN 2C with a grade of C or better

Repeatability: Unlimited as topics vary.

**GERMAN 104. Topics in German Linguistics. 4 Units.**

Introduces German or other Germanic-language linguistic, sociolinguistic, or ethnography-of-communication topics. Taught in German.

Prerequisite or corequisite: GERMAN 2C. GERMAN 2C with a grade of C or better

Repeatability: Unlimited as topics vary.

**GERMAN 105. German for Professions . 4 Units.**

Explores the structure of German business practices, including in scientific fields and engineering, while developing verbal and written skills important for professional life in Germany. Taught in German.

Prerequisite or corequisite: GERMAN 2C. GERMAN 2C with a grade of C or better

**GERMAN 115. Topics in Advanced German for Business and Economics. 4 Units.**

Explores the structure of the German economy and business practices while developing advanced verbal and written skills important for professional life in Germany. Taught in German.

Prerequisite or corequisite: GERMAN 101 or GERMAN 102 or GERMAN 103 or GERMAN 104 or GERMAN 105

Repeatability: Unlimited as topics vary.

**GERMAN 118. Topics in Studies in the Age of Goethe. 4 Units.**

Individual authors such as Lessing, Goethe, Schiller, Kleist, and Hölderlin, or the drama of the 'angry young men' of the German 1770s.

Prerequisite or corequisite: GERMAN 101 or GERMAN 102 or GERMAN 103 or GERMAN 104 or GERMAN 105

Repeatability: Unlimited as topics vary.

**GERMAN 119. Topics in 19th Century German Literature and Culture. 4 Units.**

Individual authors such as Büchner, Grillparzer, Keller, and Nietzsche, or broader social-literary phenomena.

Prerequisite or corequisite: GERMAN 101 or GERMAN 102 or GERMAN 103 or GERMAN 104 or GERMAN 105

Repeatability: Unlimited as topics vary.

**GERMAN 120. Topics in 20th Century German Literature and Culture. 4 Units.**

Individual authors such as Thomas Mann, Brecht, and Kafka, or topics addressing questions of genre and/or social-literary problems.

Prerequisite or corequisite: GERMAN 101 or GERMAN 102 or GERMAN 103 or GERMAN 104 or GERMAN 105

Repeatability: Unlimited as topics vary.

**GERMAN 130. Topics in German Literature and Culture. 4 Units.**

Literary and cultural topics not fully contained within the periods listed above, such as 'German Comedy' and 'Turn-of-the-Century Vienna.'

Prerequisite or corequisite: GERMAN 101 or GERMAN 102 or GERMAN 103 or GERMAN 104 or GERMAN 105

Repeatability: Unlimited as topics vary.

**GERMAN 140. Topics in Literary Theory and Criticism. 4 Units.**

In English. Theoretical dimensions of literary criticism and the German philosophical tradition. Topics have included Marxism, Freudian thought, German Idealist aesthetics, Historicism, twentieth-century hermeneutics, Frankfurt School, and Rezeptionsästhetik.

Repeatability: Unlimited as topics vary.

**GERMAN 140W. Topics in Literary Theory and Criticism. 4 Units.**

In English. Theoretical dimensions of literary criticism and the German philosophical tradition. Topics have included Marxism, Freudian thought, German Idealist aesthetics, Historicism, twentieth-century hermeneutics, Frankfurt School, and Rezeptionsästhetik.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only.

**(Ib)****GERMAN 150. German Literature and Culture in Translation. 4 Units.**

In English. Major works in Germanic literature and culture in context.

Repeatability: Unlimited as topics vary.

**GERMAN 150W. German Literature and Culture in Translation. 4 Units.**

In English. Major works in Germanic literature and culture in context.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only.

**(Ib)****GERMAN 160. German Cinema.**

Historical, theoretical, and comparative perspectives on German cinema.

Repeatability: Unlimited as topics vary.

**GERMAN 160W. German Cinema. 4 Units.**

Historical, theoretical, and comparative perspectives on German cinema.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only.

**(Ib)**

**GERMAN 170. Topics in German Linguistics. 4 Units.**

Explores linguistic, sociolinguistic, or ethnography-of-communication topics of German or other Germanic languages (Swedish, Icelandic, Yiddish, and others). Taught in English.

Repeatability: Unlimited as topics vary.

**GERMAN 170W. Topics in German Linguistics. 4 Units.**

Explores linguistic, sociolinguistic, or ethnography-of-communication topics of German or other Germanic languages (Swedish, Icelandic, Yiddish, and others). Taught in English.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only.

**(Ib)**

**GERMAN 197. German Internship . 4 Units.**

In this internship course, students will engage in professional practice (e.g., Engineering, Business Administration, government) in a German setting and thereby increase their knowledge of German language and culture in a setting beyond the academic classroom.

Prerequisite: GERMAN 2C

Grading Option: Pass/no pass only.

**GERMAN 199. Independent Study. 1-4 Units.**

Independent research with German faculty.

Repeatability: May be repeated for credit unlimited times.

**GERMAN 200. Literary Criticism . 4 Units.**

Topics in literary criticism.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**GERMAN 210. Literary Theory . 4 Units.**

Topics in literary theory.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**GERMAN 220. Selected Topics in German Linguistics . 4 Units.**

Topics in German linguistics.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**GERMAN 230. Literary and Cultural History. 4 Units.**

Topics in literary and cultural history.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**GERMAN 290. Independent Study. 4 Units.**

Counted toward course requirements for the M.A. or Ph.D. A term paper or project is required.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Humanities students only.

**GERMAN 298. Independent Directed Reading. 4-12 Units.**

For students preparing for doctoral examination.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**GERMAN 299. Dissertation Research. 4-12 Units.**

For students who have been admitted to doctoral candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Humanities students only.

**GERMAN 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Global Cultures (GLBLCLT)

### Courses

**GLBLCLT 103A. Global Cultures I . 4 Units.**

Introduction to the processes by which economies, cultural practices, national entities, groups, individuals, and personal identities have undergone globalization. General background and methodological tools for understanding problems and processes of globalization.

Repeatability: Unlimited as topics vary.

**GLBLCLT 103B. Global Cultures II . 4 Units.**

Introduction to the processes by which economies, cultural practices, national entities, groups, individuals, and personal identities have undergone globalization. Explores how globalization has manifested itself in specific topics, periods, or societies.

Repeatability: Unlimited as topics vary.

**GLBLCLT 105. Language Origins: Evolution, Genetics, and the Brain. 4 Units.**

Examines how human language(s) may have originated. Studies pertinent techniques (reconstruction) and addresses related questions, including is our language faculty inborn (i.e., genetically encoded)? Can brain imaging and population genetics research help to unlock this mystery of human evolution?.

Same as ANTHRO 152A, LSCI 175, HISTORY 135G.

**GLBLCLT 191. Senior Seminar: Topics in Global Cultures. 4 Units.**

Students explore a topic(s) concerning processes and/or problems of globalization from an interdisciplinary perspective and build on their critical and analytical skills when investigating cultural and other phenomena that cut across national borders. Research assignments, class presentations, final seminar paper.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only.

**GLBLCLT 199. Independent Study. 1-4 Units.**

Directed reading and research in consultation with a faculty advisor. Substantial written work required.

Repeatability: May be repeated for credit unlimited times.

## Global Middle East Studies (GLBL ME)

### Courses

**GLBL ME 60A. Humanities and Arts: Problems and Methods for Global Middle East Studies. 4 Units.**

Introduces students to the broad set of humanities and arts approaches to studying the Middle East as a global zone of cultural, political, and economic interaction.

(IV and VIII ).

**GLBL ME 60B. Social Sciences: Problems and Methods for Global Middle East Studies. 4 Units.**

Introduces students to the broad set of social sciences approaches to studying the Middle East as a global zone of cultural, political, and economic interaction.

(III and VIII ).

**GLBL ME 60C. Social Ecology and Sciences: Problems and Methods for Global Middle East Studies. 4 Units.**

Introduces students to the broad set of approaches to studying the Middle East as a global zone of cultural, political, and economic interaction, focusing on the disciplines related to Social Ecology.

(III and VIII ).

**GLBL ME 100W. Research and Writing for Global Middle East Studies. 4 Units.**

Research and writing course for Global Middle East Studies majors. The primary focus is to refine the skills necessary for students to engage in independent research and writing in Global Middle East Studies.

Prerequisite or corequisite: GLBL ME 60A or GLBL ME 60B or GLBL ME 60C. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Global Middle East Studies Majors have first consideration for enrollment.

(Ib)

## Greek (GREEK)

### Courses

**GREEK 1A. Fundamentals of Greek. 5 Units.**

Elements of Classical Greek grammar, syntax, and vocabulary.

Overlaps with GREEK S1AB.

Restriction: GREEK 1A and GREEK S1AB may not be taken for full credit.

**GREEK 1B. Fundamentals of Greek. 5 Units.**

Elements of Classical Greek grammar, syntax, and vocabulary.

Prerequisite: GREEK 1A. GREEK 1A with a grade of C or better

Overlaps with GREEK S1AB, GREEK S1BC.

Restriction: GREEK 1B and GREEK S1AB and GREEK S1BC may not be taken for full credit.

**GREEK 1C. Fundamentals of Greek. 5 Units.**

Introduction to reading texts.

Prerequisite: GREEK 1B. GREEK 1B with a grade of C or better

Overlaps with GREEK S1BC.

Restriction: GREEK 1C and GREEK S1BC may not be taken for full credit.

(VI)

**GREEK 99. Special Studies in Greek. 1-4 Units.**

Lower-division level independent research with Greek faculty.

Repeatability: May be repeated for credit unlimited times.

**GREEK 100. Topics in Attic Greek. 4 Units.**

Selected readings in Attic Greek prose and poetry. Authors may include Xenophon, Lysias, Antiphon, Euripides, and others. Selections from prose and poetry will be read each quarter. Grammar and syntax review included.

Prerequisite: GREEK 1C. GREEK 1C with a grade of C or better. Placement into GREEK 100 is also accepted.

Repeatability: Unlimited as topics vary.

**GREEK 103. Seminar in Greek Prose. 4 Units.**

Specialized and focused study of a particular Greek prose author or topic.

Prerequisite: GREEK 100

Repeatability: Unlimited as topics vary.

**GREEK 104. Seminar in Greek Poetry. 4 Units.**

Specialized and focused study of a particular topic or author of Greek poetry.

Prerequisite: GREEK 100

Repeatability: Unlimited as topics vary.

**GREEK 198. Directed Group Study. 4 Units.**

Special topics in Greek culture and civilization through directed reading and research.

Repeatability: May be repeated for credit unlimited times.

**GREEK 199. Independent Studies in Greek. 1-4 Units.**

Independent research with Greek faculty.

Repeatability: May be repeated for credit unlimited times.

## Health Care MBA (MGMT HC)

### Courses

**MGMT HC 200. Responding to Dynamic Times: Thinking Strategically for Healthcare Executives. 7 Units.**

Focuses on the strategic and organizational challenges that a rapidly changing environment poses to the firm's management and frames them according to Merage's strategic emphasis on analytical decision making, innovation, and information technology.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 201A. Statistics for Healthcare Executives . 5 Units.**

Methods of statistical inference, emphasizing applications to administrative and management decision problems. Topics include classical estimation, hypothesis testing, regression, correlation, analysis of variance, decision analysis, and forecasting.

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 201B. Operations Analytics for Healthcare Executives. 5 Units.**

An introduction to computer-based models for decision making. Topics include optimization (linear programming, integer programming, network flow models) and computer simulation. Uses spreadsheets extensively, including Excel built-in and add-in packages. Once a month weekend course format.

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 202. Organizational Behavior for Healthcare Executives. 5 Units.**

Develops a better understanding of individual and group behavior in and across organizations, the frameworks by which to analyze and understand behavior in complex organizations; enhances the skills required to manage collaboration and lead. Once a month weekend course format.

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 203A. Financial Reporting for Healthcare Executives. 5 Units.**

Involves the development, analysis, and interpretation of financial accounting information for external reporting purposes. Emphasis on measurement and valuation issues in decision-making problems and cases. Once a month weekend course format.

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 203B. Managerial Accounting for Healthcare Executives. 5 Units.**

Involves developing and using internal financial and non-financial information to help organizations make planning, budgeting, control, operating, and performance evaluation decisions. Once a month weekend course format.

Prerequisite: MGMT HC 203A

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 204A. Microeconomics for Healthcare Executives. 5 Units.**

Provides basic tools for analyzing economic decisions of consumers and firms. Topics include demand and supply analysis, production and cost theory, perfect competition, monopoly, market failures, and introductory game theory. Once a month weekend course format.

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 205. Marketing for Healthcare Executives. 5 Units.**

Introduction to marketing. Develops familiarity with fundamental marketing concepts, theories, and techniques, and acquainting students with the type of decisions made by marketing managers, including customer targeting, product, pricing, place, promotion, and research. Once a month weekend course format.

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 206. Business and Government for Healthcare Executives. 2 Units.**

Introduces students to the many non-market issues that affect today's managers: environment protection, health and safety, intellectual property protection, antitrust, and lobbying. Takes an interdisciplinary approach using economics, political science, public policy, and law. Once a month weekend course format.

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 207. Competing with Digital in Healthcare: Analytics, Platforms, and Business Models. 5 Units.**

Focuses on how information technology is used to create value in healthcare-related organizations through product, process, and strategy innovation. Aims to help managers and healthcare professionals understand the strategic role of technology. Every other weekend course format.

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 209A. Managerial Finance for Healthcare Executives. 5 Units.**

Introduces students to financial theory and concepts. Topics include time value of money, valuation of stocks and bonds, capital budgeting, portfolio theory, capital structure choice. Once a month weekend course format.

Prerequisite: MGMT HC 201A and MGMT HC 203A and MGMT HC 204A

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 209B. Investments for Healthcare Executives. 3 Units.**

Foundations of investment management. Theory and empirical evidence related to portfolio theory, market efficiency, and valuation models for equities, bonds, and options. Emphasis on practical applications, including optimal investment strategies. Once a month weekend course format.

Prerequisite: MGMT HC 209A

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 210. Strategic Management for Healthcare Executives. 5 Units.**

Provides conceptual frameworks and techniques to analyze and develop firm strategies. Through case analysis and discussion, helps students improve analytical and strategic thinking by which to assess, evaluate, and respond to different business situations. Once a month weekend course format.

Prerequisite: MGMT HC 200 and MGMT HC 202 and MGMT HC 205 and MGMT HC 209A

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 225. Negotiations For Healthcare Executives. 5 Units.**

Using a combination of theory and practice via negotiation simulations, students expand their repertoire of negotiating skills and develop their ability to analyze different negotiation situations and contexts. Once a month weekend course format.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT HC 267. Understanding Managed Care. 2-5 Units.**

This course is designed to increase understanding of the various concepts of managed health care with an emphasis on the organizational processes required to make it work, and explore the economics and financial pressures these organizations face.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT HC 290. Special Topics in Business. 2-5 Units.**

Studies in selected areas of business. Topics addressed vary each quarter.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT HC 295. Federal Policy in Health Care. 8 Units.**

National/international one-week residential course exploring political analysis as related to management of health care organizations. Topics include political environment of management, concepts, and processes central to political analysis, bureaucratic politics, politics, and the manager.

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 296. Leadership for Healthcare Executives. 7 Units.**

Focuses on the conceptual, practical, and personal dimensions of executive leadership. Past and current leadership theories are addressed. Individual personal assessment and diagnosis. Once a month weekend course format.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Administration - Health Care Majors only.

## Hebrew (HEBREW)

### Courses

**HEBREW 1A. Fundamentals of Hebrew. 5 Units.**

Designed for students with little or no exposure to Hebrew. May focus on Biblical Hebrew and/or modern Hebrew. Students learn the writing system and basics of grammar via latest pedagogical materials. Topics in Jewish culture are also included.

Prerequisite: Placement into HEBREW 1A is also accepted.

**HEBREW 1C. Fundamentals of Hebrew. 5 Units.**

Designed for students with little or no exposure to Hebrew. May focus on Biblical Hebrew and/or modern Hebrew. Students learn the writing system and basics of grammar via latest pedagogical materials. Topics in Jewish culture are also included.

Prerequisite: HEBREW 1B. HEBREW 1B with a grade of C or better. Placement into HEBREW 1C is also accepted.

### (VI)

**HEBREW 10A. Hebrew Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. HEBREW 10A is for language mentors.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**HEBREW 10B. Hebrew Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. HEBREW 10B is for language mentors.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.



**HEBREW 50. Jewish and Israeli Culture. 4 Units.**

Examination of subjects relevant to the culture of Israel and Judaism in their historical and modern day contexts through the study of film, literature, religious texts, artistic representations, etc.

(IV, VIII)

**HEBREW 199. Independent Study. 4 Units.**

Research paper required.

Repeatability: May be repeated for credit unlimited times.

## Hindi (HINDI)

## History (HISTORY)

### Courses

**HISTORY 10. The Holocaust. 4 Units.**

Introduction to the history of European Jewish communities before the Holocaust; the origins of Nazi antisemitism; the implementation of the 'Final Solution'; Jewish resistance to the Nazis; and attempts in film and literature to represent the Holocaust since 1945.

(IV, VIII)

**HISTORY 11. Genocide and Crimes Against Humanity Since WWII. 4 Units.**

Investigates instances of genocide since 1945 (including Cambodia, Bosnia, Rwanda, and others); explores the history behind these mass murders; considers why people kill, how victims survive, and questions whether international agreements are enough to prevent crimes against humanity.

(III, VIII)

**HISTORY 12. Introductory Topics in History . 4 Units.**

Introduces methods and premises of historical study. Topics include introductions to cultural, political, economic, social, and religious history.

Repeatability: Unlimited as topics vary.

(IV)

**HISTORY 15A. Native American History. 4 Units.**

An overview of major developments in Indian-white relations from the American Revolution to the present with an emphasis on political and legal history. How tribal sovereignty has been redefined over time is a central theme of the course.

(IV, VII)

**HISTORY 15C. Asian American Histories. 4 Units.**

Examines and compares diverse experiences of major Asian American groups since the mid-nineteenth century. Topics include origins of emigration; the formation and transformation of community; gender and family life; changing roles of Asian Americans in American society. Formerly ASIANAM 60A.

Same as ASIANAM 50, SOC SCI 78A.

((III or IV) and VII ).

**HISTORY 15D. History of Sexuality in the US . 4 Units.**

Explores intertwined histories of sexuality, race, and gender in the US. By examining how different cultures and times viewed sexuality, race and gender, it analyzes relationships between regulation of bodies/behaviors and construction of cultural, economic, and political norms.

(IV, VII)

**HISTORY 15F. What to Eat? Immigrants and the Development of American Cuisines. 4 Units.**

Relationship between immigration and changing American foodways; impact of several major culinary traditions of immigrants and racial minorities, such as African Americans, Asian Americans, Mexican Americans, Italian Americans, Irish Americans, and Jewish Americans, on America's gastronomical and socioeconomic landscape.

((III or IV) and VII ).

**HISTORY 15G. Racial Segregation in Modern U.S.. 4 Units.**

Explores the history of racial segregation in the United States from the late 19th century to the present.

(VII)

**HISTORY 16A. World Religions I. 4 Units.**

An introduction to the history, doctrine, culture, and writing of Judaism, Christianity, and Islam.

Same as REL STD 5A.

(IV and VIII ).

**HISTORY 16B. World Religions II. 4 Units.**

An introduction to various religious traditions in selected areas of the world—including India and South Asia, East Asia, Africa, and the Americas.

Same as REL STD 5B.

(IV and VIII ).

**HISTORY 16C. Religious Dialogue. 4 Units.**

Lectures and discussion on controversial topics in religion: sexual morality; religious violence; science; treatment of women and girls; religious truth, American Constitutional matters; secularization; the future of religion, and other topics.

Same as REL STD 5C.

(IV, VIII)

**HISTORY 18A. Major Jewish Texts. 4 Units.**

Introduction to the diversity of Jewish cultures from ancient to modern times. Surveys the Jewish experience in various societies and civilizations: ancient Mediterranean, Middle East and North Africa, Europe, and the Americas.

(IV and VIII ).

**HISTORY 21A. World: Innovations. 4 Units.**

Treats major themes of world historical development through the mid-seventeenth century, focusing on the Eurasian world, but with secondary emphasis on Africa and the Americas.

(IV, VIII)

**HISTORY 21B. World: Empires and Revolutions. 4 Units.**

Examines three major transformations that made the world of 1870 dramatically different from that of 1650: e.g., the scientific revolution, industrialization, and the formation of modern states and nations.

(IV, VIII)

**HISTORY 21C. World: Nation, War, and Rights. 4 Units.**

Considers several major currents of modern history: technological change and its social effects; changes in gender relations; totalitarianism; peasant revolutions and the crisis of colonization; international migration; and ecological problems.

(IV and VIII ).

**HISTORY 36A. The Formation of Ancient Greek Society: Early Greece. 4 Units.**

A survey of ancient Greek civilization from its origins in the Bronze Age to the mid-Archaic period. Examines political and social history, as well as literature, art, religion, and archaeological remains.

Same as CLASSIC 36A.

(IV)

**HISTORY 36B. The Formation of Ancient Greek Society: Late Archaic and Classical Greece. 4 Units.**

A survey of ancient Greek civilization from the Late Archaic period to the Classical period. Focuses on major institutions and cultural phenomena as seen through the study of ancient Greek literature, history, archaeology, and religion.

Same as CLASSIC 36B.

(IV)

**HISTORY 36C. The Formation of Ancient Greek Society: Fourth-Century and Hellenistic Greece. 4 Units.**

A survey of ancient Greek civilization from the fourth century BCE through to the Hellenistic period. Focuses on major institutions and cultural phenomena as seen through the study of ancient Greek literature, history, archaeology, and religion.

Same as CLASSIC 36C.

(IV)

**HISTORY 37A. The Formation of Ancient Roman Society: Origins to Roman Republic. 4 Units.**

A survey of the development of Roman civilization from its eighth century BCE beginnings to the civil wars of the first century BCE. Examines political and social history, as well as literature, art, architecture, and religion.

Same as CLASSIC 37A.

(IV)

**HISTORY 37B. The Formation of Ancient Roman Society: Roman Empire. 4 Units.**

A survey of Roman civilization from Augustus's consolidation of power following the civil wars of the first century BCE to the crisis of the third century CE. Includes social history, literature, art, architecture, and religion.

Same as CLASSIC 37B.

(IV)

**HISTORY 37C. The Formation of Ancient Roman Society: The Fall of Rome. 4 Units.**

A survey of Roman civilization from the crisis of the third century CE to the so-called "fall of Rome" in 476 CE. Examines political and social history, as well as literature, art, architecture, and religion.

Same as CLASSIC 37C.

(IV)

**HISTORY 40A. Colonial America: New Worlds. 4 Units.**

Important themes in the social, economic, political, and cultural development in North America that transformed part of the geographical space into the U.S. Topics include Native Americans, European colonization, African enslavement, borderlands, gender, economic stratification, the American Revolution, the Constitution.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

(IV)

**HISTORY 40B. Nineteenth-Century U.S.: Crisis and Expansion. 4 Units.**

Explores the transformation of American society, economy, and politics during the nineteenth century. Topics include industrial revolution, slavery, antislavery, women's rights, reform movements, Civil War and Reconstruction, immigration and ethnicity, and cultural and social transformation.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

(IV)

**HISTORY 40C. Modern America: Culture and Power. 4 Units.**

Important themes in U.S. history in the twentieth and early twenty-first centuries. Topics include corporate capitalism, empire, immigration, race, gender, consumer society, World Wars, Progressiveness, New Deal, Great Society, civil rights, women's movements, Vietnam War, conservative politics, and economic stratification.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

(IV)

**HISTORY 50. Crises and Revolutions. 4 Units.**

Study of turning points in world history, illustrating themes and methods of historical analysis.

Repeatability: May be taken for credit 3 times as topics vary.

(IV, VIII)

**HISTORY 60. The Making of Modern Science. 4 Units.**

Surveys the history of science and mathematics since the Scientific Revolution, examining central developments both chronologically and thematically, as well as investigating their significance for contemporary philosophical debates about the role and status of current scientific theories.

Same as LPS 60.

**(GE II or GE IV ).**

**HISTORY 70A. Problems in History: Asia. 4 Units.**

An introduction to the historical problems, the issues of interpretation, the primary sources, and the historical scholarship of the history of Asia, with an emphasis on developing skills in historical essay-writing.

Repeatability: Unlimited as topics vary.

**(IV, VIII)**

**HISTORY 70B. Problems in History: Europe. 4 Units.**

An introduction to the historical problems, the issues of interpretation, the primary sources, and the historical scholarship of the history of Europe, with an emphasis on developing skills in historical essay-writing.

Repeatability: Unlimited as topics vary.

**(IV, VIII)**

**HISTORY 70C. Problems in History: United States. 4 Units.**

An introduction to the historical problems, the issues of interpretation, the primary sources, and the historical scholarship of the history of the United States, with an emphasis on developing skills in historical essay-writing.

Repeatability: Unlimited as topics vary.

**(IV)**

**HISTORY 70D. Problems in History: Latin America. 4 Units.**

An introduction to the historical problems, the issues of interpretation, the primary sources, and the historical scholarship of the history of Latin America, with an emphasis on developing skills in historical essay-writing.

Repeatability: Unlimited as topics vary.

**(IV, VIII)**

**HISTORY 70E. Problems in History: Middle East and Africa. 4 Units.**

An introduction to the historical problems, the issues of interpretation, the primary sources, and the historical scholarship of the history of the Middle East and Africa, with an emphasis on developing skills in historical essay-writing.

Repeatability: Unlimited as topics vary.

**(IV, VIII)**

**HISTORY 70F. Problems in History: Transregional History. 4 Units.**

An introduction to the historical problems, the issues of interpretation, the primary sources, and the historical scholarship of transregional history, with an emphasis on developing skills in historical essay-writing.

Repeatability: Unlimited as topics vary.

**(IV, VIII)**

**HISTORY 100W. Writing About History. 4 Units.**

Specialized courses focusing on history writing and research skills. Each class reflects the instructor's intellectual interests and is conducted as a discussion group. Limited to 18 students. Several short writing assignments and one longer project meeting the upper-division writing requirement.

Prerequisite: HISTORY 12 or HISTORY 15A or HISTORY 15C or HISTORY 15D or HISTORY 16A or HISTORY 16B or HISTORY 16C or HISTORY 18A or HISTORY 21A or HISTORY 21B or HISTORY 21C or HISTORY 40A or HISTORY 40B or HISTORY 40C or HISTORY 60 or HISTORY 70A or HISTORY 70B or HISTORY 70C or HISTORY 70D or HISTORY 70E or HISTORY 70F. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: History Majors have first consideration for enrollment.

(Ib)

**HISTORY 102B. Topics in Environmental History. 4 Units.**

Explores the many historical interfaces between climate change, modes of production, and culture. Topics include the environmental history of warfare, imperialism, and famine in the nineteenth century and the history of environmental thought.

Repeatability: Unlimited as topics vary.

**HISTORY 110D. Topics in Medieval Europe. 4 Units.**

Studies of the topics in Medieval Europe.

Repeatability: Unlimited as topics vary.

**HISTORY 112D. Topics in Early Modern Europe. 4 Units.**

Theme-based approach to the main social, political, and cultural developments in Europe between the fifteenth and eighteenth centuries. Topics included Renaissance humanism, Reformation and Counter-Reformation, scientific revolution, court culture and nation building, interactions with non-European peoples, cities and commerce.

Repeatability: Unlimited as topics vary.

**HISTORY 114. Topics in Modern European History. 4 Units.**

Course content changes with instructor. Topics include the Inquisition; science and religion in modern Europe; sex and society in modern Europe; French revolutions; culture in interwar Europe; the Holocaust; the fall of communism in Eastern Europe.

Repeatability: Unlimited as topics vary.

**HISTORY 120D. War and Empire: France and the World in the 20th Century. 4 Units.**

Examines French experience of World War I, the defeat and occupation by Germany in World War II, the violent struggles that came with the loss of the French empire in the 1950s and 1960s, immigration, French responses to globalization.

**HISTORY 122B. Hitler and the Germans. 4 Units.**

Focuses on Hitler's rise to power and Nazi society. Examines Germany's defeat in World War I; the political and cultural experimentation of the 1920s; the causes of Hitler's success; and life in Germany under the Nazis.

**HISTORY 123D. Topics in Spanish History. 4 Units.**

Topics include Spain in the nineteenth century, the Spanish Civil War, and dictatorship and democracy in modern Spain.

Repeatability: Unlimited as topics vary.

**HISTORY 124B. Twentieth-Century Russia. 4 Units.**

Political and social developments in Twentieth-Century Russia.

**HISTORY 126B. The Era of World War II: 1933-45. 4 Units.**

The era of World War II and its political, social and economic history.

**HISTORY 128C. Topics in the History of Women in Europe. 4 Units.**

Studies in selected areas of history of European women. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 130C. Topics in the Jewish History. 4 Units.**

Studies in selected areas of Jewish history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 130F. Jews and Power. 4 Units.**

Examines the relationship between the Jewish people and political power over a 3500 year period. How have Jews preserved their communal interests and personal safety? How have they defined the proper relationship of the people to political authority.

Same as POL SCI 154J, REL STD 130F.

**HISTORY 131A. History of Zoroastrianism. 4 Units.**

Reviews major trends in the history of Zoroastrianism.

Same as REL STD 131A.

**HISTORY 131B. Ancient Persia. 4 Units.**

Survey of the history of Persia in antiquity.

**HISTORY 131C. Medieval Persia. 4 Units.**

A survey of Persian history in the context of Late Antique and Medieval Islamic history.

**HISTORY 131D. Modern Iran. 4 Units.**

The history of Iran from the end of the Safavid Empire in the eighteenth century to the present.

**HISTORY 132B. The Emergence of the Modern Middle East. 4 Units.**

Offers a survey of the history of the Middle East from the 19th century to the present time. Formerly History 133A.

**HISTORY 132C. Women and Gender in the Middle East. 4 Units.**

Focuses on women and gender in the Middle East from the pre-modern to the contemporary.

**HISTORY 132D. Armenians and Armenia in Ancient to Early Modern World History. 4 Units.**

A history of Armenia and Armenians from ethnogenesis to the early modern period at the end of the 1700s within a regional and global context. Takes into account interactions and encounters with the empires, and peoples that encompassed their orbit.

**HISTORY 132E. Armenians and Armenia in Modern World History. 4 Units.**

Covers the most important themes in the history of Armenians and Armenia in the 19th, 20th, and 21st centuries within a regional (i.e., Middle East and Caucasus) and global context.

**HISTORY 132H. Topics in Middle Eastern History. 4 Units.**

Topics include the cultural, political, intellectual, social, and/or economic histories of one or many regions of the Middle East.

Repeatability: Unlimited as topics vary.

**HISTORY 134A. Africa: Societies and Cultures. 4 Units.**

Introduction to the variety of cultures, political organizations, social structures, and artistic expressions created by Africans over a broad time span. Indigenous development of African societies in distinct regions of the continent. Issues, themes, processes for understanding history of Africa.

**HISTORY 134C. Topics in the History of Africa. 4 Units.**

Studies in selected areas of African history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 134D. Topics in South African History. 4 Units.**

Introduction to important historical events and processes in Southern Africa. Focuses on particular themes and explores how those themes change over time. Topics include: changing ideas about race, the development of class structures, identity formation, the role of gender.

Repeatability: Unlimited as topics vary.

**HISTORY 134E. History of the African Diaspora. 4 Units.**

Examines the causes and consequences of the multiple diasporas of African peoples since the sixteenth century in the Atlantic world, especially the Americas and Europe.

Same as AFAM 137.

**HISTORY 135B. Crossing the World's Oceans: From Sail to Steam. 4 Units.**

Explores the basics of oceanography, the evolution of ships and sailing in the ancient Mediterranean world, the North Atlantic, Polynesia, the South China Sea, the Arab Indian Ocean, the global oceanic world, and the discovery of celestial and terrestrial navigation.

**HISTORY 135E. Topics in the History of Science and Technology. 4 Units.**

Studies in selected areas of science and technological history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 135G. Language Origins: Evolution, Genetics, and the Brain. 4 Units.**

Examines how human language(s) may have originated. Studies pertinent techniques (reconstruction) and addresses related questions, including is our language faculty inborn (i.e., genetically encoded)? Can brain imaging and population genetics research help to unlock this mystery of human evolution?.

Same as ANTHRO 152A, GLBLCLT 105, LSCI 175.

**HISTORY 136D. Topics in the History of Medicine and Health Care. 4 Units.**

Studies in selected areas of Medicine and Health Care history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 140B. Revolutionary America: 1740-1790. 4 Units.**

An exploration of why 13 continental colonies, whose commercial and cultural connections with Britain far exceed their interaction with one another, resisted imperial reform after 1763 to the point of war in 1775 and independence the following year.

**HISTORY 142A. California Dreaming: Conquest, Conflict, and Globalization in the Golden State. 4 Units.**

California as a case study of national trends and as a unique setting: its specific problems and culture. Major themes include: colonization, immigration, race relations, agricultural development, industrialization, urbanization, working class movements, social conflict, and political reform.

**HISTORY 142B. Topics in American Social and Economic History. 4 Units.**

Studies in selected areas of American social and economic history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 144G. Topics in American Cultural and Intellectual History. 4 Units.**

Studies in selected areas of American cultural and intellectual history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 146H. Topics in Women and Gender Relations in the United States. 4 Units.**

Studies in selected areas of women and gender relations in the United States. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 147. Education and the American Dream: Historical Perspectives on Democracy and Education. 4 Units.**

Examines the relationship between public schooling and the promotion of democratic ideals in American society over the past two centuries.

Same as EDUC 174.

**HISTORY 148B. Topics in Multicultural U.S. History. 4 Units.**

Examines the variety of cultural expressions through which the people who came to inhabit the United States historically signify their collective identities.

Repeatability: Unlimited as topics vary.

**HISTORY 149. Veterans in History and Society. 4 Units.**

Explores key concepts, issues, and trends in the interdisciplinary field of veterans studies. Students gain a deep understanding of the ways that social scientists and historians have analyzed the identities, experiences, and worldviews of U.S. military veterans.

Same as SOC SCI 132.

**HISTORY 150. Topics in African American History. 4 Units.**

Studies in selected areas of African American history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as AFAM 138.

**HISTORY 151A. Chicana/Chicano History: Pre-Colonial to 1900. 4 Units.**

Examines social history of the southwest region from antiquity to 1900. Discusses major questions, theory and research methods pertinent to Chicanas/Chicanos. Themes include: indigenous empires, conquest, colonialism, social stratification, ideology, marriage, sexuality, industrial capitalism, accommodation and resistance.

Same as CHC/LAT 132A.

**HISTORY 151B. Chicana/Chicano History: Twentieth Century. 4 Units.**

Examines social history of the Southwest with emphasis on Mexican-origin people. Discusses major questions, theory and research methods pertinent to Chicana/Chicano history. Themes explored include: immigration, xenophobia, class struggle, leadership, generational cohorts, unionization, education, barrioization, ethnicity, patriarchy, sexuality.

Same as CHC/LAT 132B.

**HISTORY 151C. Latinas in the Twentieth Century U.S.. 4 Units.**

Latinas in the U.S. from 1900 to present, offering a diversity of their cultures, regional histories, sexualities, generations, and classes.

Same as CHC/LAT 135.

**HISTORY 151D. Latina/Latino Pop: Latina/Latino Popular Culture. 4 Units.**

With a focus on the politics of language and space/place, prepares students to critically analyze sites of Latina/Latino popular culture including: music, film, performance, sports, media, and varied subcultures.

Same as CHC/LAT 121.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. History Majors have first consideration for enrollment.

**HISTORY 152. Topics in Asian-American History. 4 Units.**

Introduction to important themes in the history of people of Asian ancestry in the United States from the nineteenth century to the present.

Repeatability: Unlimited as topics vary.

**HISTORY 152A. Asian American Labor. 4 Units.**

Explores history of Asian Americans and work from the nineteenth century to the present. Areas of study include migration, colonialism, family, social organization, and work culture.

Same as ASIANAM 137.

**HISTORY 152B. Asian American and African American Relations. 4 Units.**

Addresses relationships of Asian American and African American communities in the United States. Topics include race, class, gender, labor, economic systems, political mobilization, community, civil rights, activism, cultural expression.

Same as AFAM 117, ASIANAM 167.

**HISTORY 154. American Urban History. 4 Units.**

A study of urban communities in the United States, from colonial times to the present. Traces the impact of industrialization and urbanization on social and cultural life, and investigates the significance of urban life for U.S. democratic culture.

**HISTORY 160. Sex and Conquest in Latin America. 4 Units.**

Competing ideas of masculinity and femininity, sexual violence, sexual identities, and gendered hierarchies informed how the Spanish engaged in military and religious domination of Mexican and Andean communities, as well as the forms of native resistance throughout colonial Latin America.

Same as ANTHRO 140, CHC/LAT 150A, GEN&SEX 171A.

**HISTORY 162. Topics in Brazilian History. 4 Units.**

Studies in selected areas of Brazilian history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 163. World of Coffee . 4 Units.**

History of consumption and production of coffee over the centuries, and coffee's cultural, economic, social, political consequences. Coffee's social life as a drug, symbol of hospitality, religious rite, sociability and bourgeois lifestyle, commodity, source of livelihoods, imperial revenues, corporate profits.

Same as INTL ST 111B.



**HISTORY 164A. Caribbean History: Colonization to Emancipation. 4 Units.**

Exploration of the history of the archipelago from pre-Columbian times to the end of slavery; examining the impact of European colonization, decimation of the indigenous populations, African slavery, resistance, and emancipation; the unity and diversity of experience in region.

Same as AFAM 134A.

**HISTORY 164B. Caribbean History: Emancipation to Independence. 4 Units.**

Post-emancipation and anti-colonial struggles ending with political independence for most of the region. Examines social, political, economic, cultural dimensions of post-emancipation period, including large-scale migration to Central America, the U.S., and Britain; the region's global cultural and political contribution.

Same as AFAM 134B.

**HISTORY 165. Race and Empire in Colonial Latin America. 4 Units.**

Explores how native people of Latin America with enslaved and free African incorporated and defied Spanish and Portuguese colonization. Focuses on religious adaptations, resistance movements, legal systems, and the emergence of multicultural communities to explain how race shaped European empires.

Same as ANTHRO 162C.

**HISTORY 165A. War and Revolution in Colonial Latin America. 4 Units.**

Comparison of how Andeans resurrected the leaders of the Inca, a defeated indigenous empire, to contest the Spanish empire with how enslaved Africans, with their descendants and others, defeated Spanish colonial rule in what would become the Cuban nation.

**HISTORY 166. U.S. Intervention in Latin America. 4 Units.**

Explores political, economic, social, and cultural ties that bind Latin America to the United States. Focuses on U.S. intervention and Latin American response from early nineteenth century to present day. Case studies include Mexico, Guatemala, Cuba, Chile, and Central America.

Same as POL SCI 142J, INTL ST 177D, CHC/LAT 150.

**HISTORY 166B. Revolution and Reaction in Cold War Latin America. 4 Units.**

Explores Latin American experiences of revolutionary change and military dictatorship during the Cold War (1945-1990). Pays particular attention to the lives of women, peasants, workers, and the urban middle classes. Case studies include Guatemala, Cuba, Chile, Argentina, Nicaragua, and Mexico.

Same as INTL ST 177G.

**HISTORY 166C. Cuban Society and Revolution. 4 Units.**

Explores the causes, development, and legacy of the 1959 Revolution. Themes include economic dependency, democracy, race, gender, culture, and the always volatile relations between Cuba and the United States.

Same as POL SCI 153G, INTL ST 177E, CHC/LAT 157.

**HISTORY 166D. Revolution in Latin America. 4 Units.**

Presents a comparative analysis of the causes, development, and consequences of selected revolutionary movements, focusing on outbreaks in Mexico, Bolivia, Cuba, Chile, Nicaragua, and Grenada. Explores topics of state formation, economic nationalism, social justice, ethnicity, and role of international affairs.

Same as CHC/LAT 151B, SOC SCI 173N, INTL ST 177C.

**HISTORY 169. Topics in Latin American History. 4 Units.**

Studies in selected areas of Latin American history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 170A. Ancient India. 4 Units.**

Examines the visual and religious history of the region defined as 'India' today, but necessarily encompassing modern Bangladesh and Pakistan. Culminates with the supposed Golden Age of the Gupta empire and its far-reaching legacies.

Same as ART HIS 155A, REL STD 122.

Concurrent with ART HIS 255A.

**HISTORY 170B. Medieval India. 4 Units.**

Begins with the Gupta period's aesthetic legacies in South Asia's architecture, sculpture, and painting. Explores the dispersal of Islam throughout South Asia, including the Muslim communities of southern India.

Same as ART HIS 155B, REL STD 123.

Concurrent with ART HIS 255B.

**HISTORY 171D. Chinese History to 1800. 4 Units.**

A survey of the history of China to 1800.

**HISTORY 171E. Chinese History: 1800-1949. 4 Units.**

An examination of Chinese society and thought from the late-eighteenth century to the 1949 revolution. Focuses on the role of intellectuals; popular culture; women in Chinese society; developments in commerce and urban life; rebellion; foreign imperialism.

**HISTORY 171G. Topics in the History of China. 4 Units.**

Topics include the cultural, political, economic, social, intellectual, and religious history of China.

Repeatability: Unlimited as topics vary.

**HISTORY 172G. Topics in the History of Japan. 4 Units.**

Topics include the cultural, political, economic, social, intellectual and religious history of Japan.

Repeatability: Unlimited as topics vary.

**HISTORY 173G. Topics in the History of Korea. 4 Units.**

Topics include the cultural, political, economic, social, intellectual, and religious history of Korea.

Repeatability: Unlimited as topics vary.

**HISTORY 174G. Topics in the History of South Asia. 4 Units.**

Topics include the cultural, political, economic, social, intellectual, and religious history of South Asia.

Repeatability: Unlimited as topics vary.

**HISTORY 180. Special Studies in Social History. 4 Units.**

Studies in selected areas of social history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 182. Special Studies in Intellectual-Cultural History. 4 Units.**

Studies in selected areas of intellectual-cultural history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 183. Special Studies in International History. 4 Units.**

Studies in selected areas of international history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 184. Special Studies in Comparative History. 4 Units.**

Studies in selected areas of comparative history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 185. Special Studies in Social Theory. 4 Units.**

Studies in selected areas of social theory. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 190. Colloquium . 4 Units.**

Specialized courses dealing primarily with close reading and analysis of primary and secondary works; required reports and papers. Each colloquium reflects the instructor's intellectual interests and is conducted as a discussion group. Limited to 18 students.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. History Majors have first consideration for enrollment.

**HISTORY 193. Advanced Research Seminar I. 4 Units.**

The first course in a two-quarter advanced research sequence, this course allows upper-division history majors to undertake significant research and writing under close faculty supervision.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: History majors only. Upper-division students only.

**HISTORY 194. Advanced Research Seminar II. 4 Units.**

Second course in a two-quarter advanced research sequence. Allows upper division history majors to undertake significant research and writing under close faculty supervision.

Prerequisite: HISTORY 193. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. History Majors only.

**HISTORY 197. Internships in Public History. 4 Units.**

Students will sharpen their abilities to research, critically interpret, and present history by "doing history" beyond the formal classroom. Internships, which introduce students to the field of "public history," include working as archivists, oral historians, project advisers, and exhibit curators.

Grading Option: Pass/no pass only.

Restriction: Upper-division students only. History Majors only.

**HISTORY 198. Directed Group Study. 4 Units.**

Special topics through directed reading. Paper required.

Repeatability: Unlimited as topics vary.

**HISTORY 199. Independent Reading. 1-4 Units.**

Investigation of special topics through directed reading. Paper required.

Repeatability: May be repeated for credit unlimited times.

**HISTORY 200. History and Theory. 4 Units.**

Explores a variety of theoretical issues and methodological concerns that have sparked lively debate in the humanities and social sciences in past decades and which remain of urgent concern to 21st-century historical writing.

Repeatability: May be repeated for credit unlimited times.

**HISTORY 202A. First-Year Research Seminar. 4 Units.**

Introduction to historical methodologies and preparation for the first-year research paper. Required of all first-year doctoral students and M.A. students.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. History Majors only.

**HISTORY 202B. First-Year Research Seminar. 4 Units.**

Research and writing of a paper demonstrating command of historical methods explored in HISTORY 202A. Required of all first-year Ph.D. students and M.A. students.

Prerequisite: HISTORY 202A

Repeatability: May be taken for credit 1 times as topics vary.

**HISTORY 204A. Second-Year Research Seminar. 4 Units.**

Part one of a two-quarter sequence required of all Ph.D. students during the second year of the program; not required for M.A. students. Includes primary research and writing a research paper, often related to a future dissertation topic.

Restriction: Graduate students only. History Majors only.

**HISTORY 204B. Second-Year Research Seminar. 4 Units.**

Part two of a two-quarter sequence required of all Ph.D. students. Taken during the second year of the Ph.D. program; not required for M.A. students. Includes primary research and writing a research paper, often related to a future dissertation topic.

Prerequisite: HISTORY 204A

Restriction: Graduate students only. History Majors only.

**HISTORY 230. Topics in European History . 4 Units.**

Studies in selected themes and time periods in European history. Topics and period vary.

Repeatability: Unlimited as topics vary.

**HISTORY 240. Topics in World History. 4 Units.**

Studies in selected themes and time periods in world history. Topics and period vary.

Repeatability: Unlimited as topics vary.

**HISTORY 250. Topics in Latin American History . 4 Units.**

Studies in selected themes and time periods in Latin American history. Topics and period vary.

Repeatability: Unlimited as topics vary.

**HISTORY 260. Topics in American History. 4 Units.**

Studies in selected themes and time periods in U.S. history. Topics and period vary.

Repeatability: Unlimited as topics vary.

**HISTORY 270C. Seminar in Japanese History: 1600-Present. 4 Units.**

Studies in Japanese history since 1600. Topics addressed vary each quarter.

**HISTORY 273. Research Methods in Chinese History. 4 Units.**

Introduces major tools for research in Qing and twentieth-century Chinese history as well as an introduction to research tools for earlier periods.

**HISTORY 280. Topics in Asian History. 4 Units.**

Studies in selected themes and time periods in Asian history. Topics and period vary.

Repeatability: Unlimited as topics vary.

**HISTORY 290. Special Topics . 4 Units.**

Lectures, readings, and discussion on subjects more limited in scope than those included in the year-long colloquium series.

Repeatability: Unlimited as topics vary.

**HISTORY 291. Directed Reading. 4-12 Units.**

Reading courses focused on specialized topics.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. History Majors only.

**HISTORY 297. History Internship. 4 Units.**

Limited to History graduate students with Department-approved internships. Materials fee.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. History Majors only.

**HISTORY 298. Experimental Group Study. 4-12 Units.**

Open to four or more students.

Repeatability: May be repeated for credit unlimited times.

**HISTORY 299. Dissertation Research. 4-12 Units.**

Specifically designed for students researching and writing their dissertations.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Advancement to Ph.D. candidacy.

**HISTORY 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Humanities (HUMAN)

### Courses

**HUMAN 1A. Humanities Core Lecture. 4 Units.**

Through a range of cultural traditions and an interdisciplinary approach to works of literature, history, philosophy, and contemporary media, students are introduced to the humanities.

Restriction: Lower-division students only.

**(IV)****HUMAN 1AES. Humanities Core Writing: Entry Level Writing. 4 Units. 2 Workload Units.**

A small writing course for Entry Level Writing students exploring the ideas presented in the companion lecture course and illustrated in the literary, historical, philosophical, and media works assigned.

Corequisite: HUMAN 1A

Grading Option: Workload Credit Letter Grade with P/NP.

Overlaps with HUMAN 1AS, HUMAN H1AS.

Restriction: Lower-division students only.

**HUMAN 1AS. Humanities Core Writing. 4 Units.**

A small writing course in which students explore the ideas presented in the companion lecture course and illustrated in the literary, historical, philosophical, and media works assigned.

Corequisite: HUMAN 1A

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

Overlaps with HUMAN 1AES, HUMAN H1AS.

Restriction: Lower-division students only.

**(Ia)****HUMAN 1B. Humanities Core Lecture. 4 Units.**

Through a range of cultural traditions and an interdisciplinary approach to works of literature, history, philosophy, and contemporary media, students are introduced to the humanities.

Restriction: Lower-division students only.

**(IV)****HUMAN 1BES. Humanities Core Writing: Entry Level Writing. 4 Units. 2 Workload Units.**

A small writing course for Entry Level Writing students exploring the ideas presented in the companion lecture course and illustrated in the literary, historical, philosophical, and media works assigned.

Corequisite: HUMAN 1B

Prerequisite: HUMAN 1AES. HUMAN 1AES with a grade of C- or better

Grading Option: Workload Credit Letter Grade with P/NP.

Overlaps with HUMAN 1BS, HUMAN H1BS.

Restriction: Lower-division students only.

**(Ia)**

**HUMAN 1BS. Humanities Core Writing. 4 Units.**

A small writing course in which students explore the ideas presented in the companion lecture course and illustrated in the literary, historical, philosophical, and media works assigned.

Corequisite: HUMAN 1B

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

Overlaps with HUMAN H1BS, HUMAN 1BES.

Restriction: Lower-division students only.

**(Ia)**

**HUMAN 1C. Humanities Core Lecture. 4 Units.**

Through a range of cultural traditions and an interdisciplinary approach to works of literature, history, philosophy, and contemporary media, students are introduced to the humanities.

Prerequisite: HUMAN 1A or HUMAN 1B

Restriction: Lower-division students only.

**(IV and VII and VIII ).**

**HUMAN 1CS. Humanities Core Writing. 4 Units.**

A small writing course in which students explore the ideas presented in the companion lecture course and illustrated in the literary, historical, philosophical, and media works assigned.

Corequisite: HUMAN 1C

Prerequisite: HUMAN 1AS or HUMAN H1AS or HUMAN 1AES or HUMAN 1BS or HUMAN H1BS or HUMAN 1BES. HUMAN 1AS with a grade of C or better. HUMAN H1AS with a grade of C or better. HUMAN 1AES with a grade of C or better. HUMAN 1BS with a grade of C or better. HUMAN H1BS with a grade of C or better. HUMAN 1BES with a grade of C or better

Overlaps with HUMAN H1CS, HUMAN 1CES.

Restriction: Lower-division students only.

**(Ia)**

**HUMAN B1A. Humanities Core Biological Sciences Lecture. 4 Units.**

Through a range of cultural traditions and an interdisciplinary approach to works of literature, history, philosophy, and contemporary media, students are introduced to the humanities.

Overlaps with HUMAN 1A.

Restriction: Lower-division students only. Biological Sciences Majors only.

**(IV)**

**HUMAN H1AS. Humanities Core Writing: Honors. 4 Units.**

For Campuswide Honors students exploring the ideas presented in the companion lecture course and illustrated in the literary, historical, philosophical, and media works assigned.

Corequisite: HUMAN 1A

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

Overlaps with HUMAN 1AS, HUMAN 1AES.

Restriction: Campuswide Honors Collegium students only. Lower-division students only.

**(Ia)**

**HUMAN H1BS. Humanities Core Writing: Honors. 4 Units.**

For Campuswide Honors students exploring the ideas presented in the companion lecture course and illustrated in the literary, historical, philosophical, and media works assigned.

Corequisite: HUMAN 1B

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

Overlaps with HUMAN 1BS, HUMAN 1BES.

Restriction: Campuswide Honors Collegium students only. Lower-division students only.

**(Ia)**

**HUMAN H1CS. Humanities Core Writing: Honors. 4 Units.**

For Campuswide Honors students exploring the ideas presented in the companion lecture course and illustrated in the literary, historical, philosophical, and media works assigned.

Corequisite: HUMAN 1C

Prerequisite: HUMAN 1AS or HUMAN H1AS or HUMAN 1AES or HUMAN 1BS or HUMAN H1BS or HUMAN 1BES with a grade of C or better.

Overlaps with HUMAN 1CS, HUMAN 1CES.

Restriction: Lower-division students only. Campuswide Honors Program students only.

**(Ia)**

**HUMAN 10. Masterpieces of Literature. 4 Units.**

Students closely read major works of world literature that are significant (1) in their own right, (2) for a specific literary tradition, and (3) because of their reception in other cultural contexts. Literature written in English and English translation.

Repeatability: Unlimited as topics vary.

**(IV and VIII ).**

**HUMAN 52. Foundations of Bilingual Education and Bilingualism. 4 Units.**

Provides a comprehensive overview of current issues in bilingual education and bilingualism. Topics include dimensions of bilingualism, the effects of bilingualism on children's linguistic and cognitive development, bilingual education programs, literacy, special needs, and assessment.

Same as EDUC 52, LSCI 51B.

**HUMAN H80. Exploring Memory. 4 Units.**

Questions about human memory are central to a wide range of disciplines. Students will explore how historians, sociologists, social psychologists, legal experts, and neuroscientists understand human memory and apply their findings to understand and shape their own societies.

Restriction: Campuswide Honors Collegium students only.

**(IV)**

**HUMAN H81. The Vietnam War . 4 Units.**

Examines the origins, evolution, opposition against, conclusion, and legacy of the United States in the Vietnam War.

Restriction: Campuswide Honors Collegium students only.

**(GE III or IV ).**

**HUMAN H83. How Nations Remember. 4 Units.**

Just like people, nations select and organize what and how they want to remember. Compares how specific historical events (such as slavery and the Holocaust) are memorialized in various countries and represented in public art works, museums, literature, and film.

Restriction: Campuswide Honors Collegium students only.

**(III)**

**HUMAN H84. Traveling East/West. 4 Units.**

Traveling East/West presents a wide range of travel writings by Chinese, Indian, and Euro-American authors in which they contemplate the complexities of cross-cultural encounters and how knowledge about others and knowledge of ourselves are closely intertwined.

Same as EAS H84.

Restriction: Campuswide Honors Collegium students only.

**(IV)****HUMAN H120. Honors Proseminar . 4 Units.**

Interdisciplinary Honors courses organized each year around a single topic problem designed to compare and contrast modes of analysis in history, literary studies, and philosophy.

Repeatability: May be taken for credit 3 times as topics vary.

Restriction: Humanities Honors students only.

**HUMAN H140. Senior Honors Seminar. 4 Units.**

Directed by Humanities Honors Thesis Advisor and required of students in Humanities Honors program and Humanities majors in Campuswide Honors Program. Designed to facilitate exchange of ideas and research strategies among students and begin process of writing senior honors thesis.

Restriction: Humanities Honors students only. Seniors only.

**HUMAN H141. Senior Honors Thesis. 4 Units.**

Directed independent research required of participants in the Humanities Honors Program and Humanities majors in the Campuswide Honors Program.

Prerequisite: HUMAN H140

Restriction: Campuswide Honors Collegium students only. Humanities Honors students only.

**HUMAN H142W. Senior Honors Colloquium. 4 Units.**

Completion, presentation, and discussion of Senior Honors Theses.

Prerequisite: HUMAN H141

Restriction: Campuswide Honors Collegium students only. Humanities Honors students only.

**(Ib)****HUMAN H145. Arts of Contemporary Communication. 4 Units.**

A workshop seminar exploring the theory and practice of visual design, data visualization, and oral presentation. Designed to get students to think about, and hone their skills in, effective presentation of information in multiple media.

Restriction: Campuswide Honors Collegium students only. Humanities Honors Program students can enroll as space allows.

**HUMAN 175. Topics in Humanities and Science . 4 Units.**

Interdisciplinary topics exploring the relationship between the humanities and the physical and biological sciences.

Repeatability: May be taken for credit 3 times as topics vary.

**HUMAN 195. Humanities Out There (H.O.T.) Practicum. 0 - 2 Units.**

H.O.T. sponsors tutoring opportunities in local schools and after-school sites for UCI students. Requirements include weekly one-hour training sessions at UCI; at least eight off-site tutoring sessions; and short writing assignments.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 8 units.

**HUMAN 198. Directed Group Study. 1-4 Units.**

Directed group study on special topics.

Grading Option: Pass/no pass only.

Repeatability: Unlimited as topics vary.



**HUMAN 199. Directed Research. 1-4 Units.**

Directed research for senior Humanities students.

Repeatability: Unlimited as topics vary.

Restriction: Seniors only.

**HUMAN 220B. Studies in Literary Theory and Its History. 4 Units.**

Introduction to criticism and aesthetics for beginning graduate students. Readings from continental, English, and American theorists.

Same as CRITISM 220B.

Restriction: Graduate students only.

**HUMAN 260A. Critical Theory Workshop.**

A year-long Critical Theory Workshop, conducted by a team of instructors, conceived as a reading group, and developed with the input of all participants, where significant texts are discussed and analyzed in class.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**HUMAN 260B. Critical Theory Workshop.**

A year-long Critical Theory Workshop, conducted by a team of instructors, conceived as a reading group, and developed with the input of all participants, where significant texts are discussed and analyzed in class.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**HUMAN 260C. Critical Theory Workshop. 4 Units.**

A year-long Critical Theory Workshop, conducted by a team of instructors, conceived as a reading group, and developed with the input of all participants, where significant texts are discussed and analyzed in class.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**HUMAN 261. Race and Justice Studies Writing Seminar . 4 Units.**

A required writing-intensive seminar conducted by an instructor affiliated with the Race and Justice Studies emphasis. Students with manuscripts on relevant topics will read and critique peer manuscripts, and revise manuscripts toward completion of articles, dissertation chapters, and other publications.

Prerequisite: CRM/LAW C260C

Same as CRM/LAW C261, SOC SCI 253K.

Restriction: Graduate students only.

**HUMAN 265A. Issues In Latin American Studies I.**

Students discuss significant texts on Latin America from a range of disciplines in the humanities, social sciences, and the arts. This course will meet 3-4 times per quarter throughout the academic year.

Grading Option: Satisfactory/unsatisfactory only.

**HUMAN 265B. Issues In Latin American Studies II.**

Students discuss significant texts on Latin America from a range of disciplines in the humanities, social sciences, and the arts. This course will meet 3-4 times per quarter throughout the academic year.

Prerequisite: HUMAN 265A

Grading Option: Satisfactory/unsatisfactory only.

**HUMAN 265C. Issues In Latin American Studies III . 4 Units.**

Students discuss significant texts on Latin America from a range of disciplines in the humanities, social sciences, and the arts. This course will meet 3-4 times per quarter throughout the academic year.

Prerequisite: HUMAN 265B

Grading Option: Satisfactory/unsatisfactory only.

**HUMAN 270. Advanced Critical Theory. 4 Units.**

Seminars on various topics in critical theory.

Prerequisite: Students should have taken introductory courses before enrolling in these seminars.

Repeatability: Unlimited as topics vary.

**HUMAN 298. Humanities Out There (H.O.T.) Practicum. 4 Units.**

Individual study with H.O.T. faculty supervisor.

Repeatability: May be repeated for credit unlimited times.

**HUMAN 398A. Foreign Language Teaching: Approaches and Methods. 2 Units.**

Introduces approaches and methods of foreign language learning and teaching, and the theoretical models of second-language acquisition and teaching. Focus areas include lesson planning, teaching vocabulary, grammar, speaking, reading, writing, listening, culture, task-based teaching, uses of digital media.

Restriction: Graduate students only.

**HUMAN 398B. Foreign Language Teaching: Approaches and Methods. 2 Units.**

Introduces approaches and methods of foreign language learning and teaching, and the theoretical models of second-language acquisition and teaching. Focus areas include lesson planning, teaching vocabulary, grammar, speaking, reading, writing, listening, culture, task-based teaching, uses of digital media.

Restriction: Graduate students only.

**HUMAN 399. University Teaching. 4 Units.**

Limited to Teaching Associates in Humanities Core course.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Humanities and Arts (HUMARTS)

## Informatics (IN4MATX)

### Courses

**IN4MATX 12. Barter to Bitcoin: Society, Technology and the Future of Money. 4 Units.**

Digital money has captured the broad imagination of speculators, coders, regulators, criminals and the mass media. Course puts this change in context: how do we understand money as a social, political and technological phenomenon?.

Same as SOC SCI 11A.

(II and III ).

**IN4MATX 43. Introduction to Software Engineering. 4 Units.**

Concepts, methods, and current practice of software engineering. Large-scale software production, software life cycle models, principles and techniques for each stage of development.

Prerequisite: I&C SCI 32 or I&C SCI 32A

Overlaps with I&C SCI 105.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX H81. Ethics, Technology, and Design. 4 Units.**

Provides a critical framework for how and why biases of many kinds are built into everyday digital tools. Reflections on ethics, technology, and design through case studies drawn from machine learning, CS education, engineering, social media, and criminal justice.

Restriction: Campuswide Honors Collegium students only.

**(III)****IN4MATX 101. Concepts in Programming Languages I. 4 Units.**

In-depth study of several contemporary programming languages stressing variety in data structures, operations, notation, and control. Examination of different programming paradigms, such as logic programming, functional programming and object-oriented programming; implementation strategies, programming environments, and programming style.

Prerequisite: (I&C SCI 51 or CSE 31 or EECS 31) and (I&C SCI 46 or CSE 46). I&C SCI 51 with a grade of C or better. CSE 31 with a grade of C or better. EECS 31 with a grade of C or better. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better

Same as COMPSCI 141.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 102. Concepts of Programming Language II. 4 Units.**

In-depth study of major programming paradigms: imperative, functional, declarative, object-oriented, and aspect-oriented. Understanding the role of programming languages in software development and the suitability of languages in context. Domain-specific languages. Designing new languages for better software development support.

Prerequisite: IN4MATX 101 or COMPSCI 141 or CSE 141

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 113. Requirements Analysis and Engineering. 4 Units.**

Equips students to develop techniques of software-intensive systems through successful requirements analysis techniques and requirements engineering. Students learn systematic process of developing requirements through cooperative problem analysis, representation, and validation.

Prerequisite: (I&C SCI 33 or CSE 43) and IN4MATX 43. I&C SCI 33 with a grade of C or better. CSE 43 with a grade of C or better. IN4MATX 43 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 115. Software Testing, Analysis, and Quality Assurance. 4 Units.**

Preparation for developing high-quality software through successful verification and validation techniques. Fundamental principles of software testing, implementing software testing practices, ensuring the thoroughness of testing to gain confidence in the correctness of the software.

Prerequisite: (I&C SCI 45J or I&C SCI 45C or I&C SCI 46 or CSE 46) and IN4MATX 43. I&C SCI 45J with a grade of C or better. I&C SCI 45C with a grade of C or better. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better. IN4MATX 43 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 117. Project in Software System Design. 4 Units.**

Specification, design, construction, testing, and documentation of a complete software system. Special emphasis on the need for and use of teamwork, careful planning, and other techniques for working with large systems.

Prerequisite: (IN4MATX 43 and I&C SCI 33) or CSE 43

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 121. Software Design: Applications. 4 Units.**

Introduction to application design: designing the overall functionality of a software application. Topics include general design theory, software design theory, and software architecture. Includes practice in designing and case studies of existing designs.

Prerequisite: I&C SCI 33 or CSE 43. I&C SCI 33 with a grade of C or better. CSE 43 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 122. Software Design: Structure and Implementation. 4 Units.**

Introduction to implementation design: designing the internals of a software application. Topics include design aesthetics, design implementation, design recovery, design patterns, and component reuse. Includes practice in designing and case studies of existing designs.

Prerequisite: (I&C SCI 45J or I&C SCI 46 or IN4MATX 45) and (IN4MATX 101 or COMPSCI 141 or CSE 141)

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 124. Internet Applications Engineering. 4 Units.**

Concepts in Internet applications engineering with emphasis on the Web. Peer-to-Peer and Interoperability. Topics include HTTP and REST, Remote Procedure/Method Calls, Web Services, data representations, content distribution networks, identity management, relevant W3C/IETF standards, and relevant new large-scale computing styles.

Prerequisite: (COMPSCI 132 or EECS 148) and I&C SCI 45J

Same as COMPSCI 137.

Overlaps with COMPSCI 122B.

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 125. Computer Game Development. 4 Units.**

Introduction to the principles of interactive 2D and 3D computer game development. Concepts in computer graphics, algorithms, software engineering, art and graphics, music and sound, story analysis, and artificial intelligence are presented and are the basis for student work.

Prerequisite: COMPSCI 112 or COMPSCI 171 or IN4MATX 121 or ART 106B or I&C SCI 163 or I&C SCI 166

Same as COMPSCI 113.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 131. Human Computer Interaction. 4 Units.**

Basic principles of human-computer interaction (HCI). Introduces students to user interface design techniques, design guidelines, and usability testing. Students gain the ability to design and evaluate user interfaces and become familiar with some of the outstanding research problems in HCI.

Prerequisite: I&C SCI 10 or I&C SCI 31 or I&C SCI 32A or CSE 41 or ENGR 10 or ENGRMAE 10 or EECS 10. I&C SCI 10 with a grade of C or better. I&C SCI 31 with a grade of C or better. I&C SCI 32A with a grade of C or better. CSE 41 with a grade of C or better. ENGR 10 with a grade of C or better. ENGRMAE 10 with a grade of C or better. EECS 10 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 132. Project in Human-Computer Interaction Requirements and Evaluation. 4 Units.**

Students undertake significant projects in the elicitation and specification of HCI requirements and the thorough evaluation of user interfaces.

Prerequisite: IN4MATX 131

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 133. User Interaction Software. 4 Units.**

Introduction to human-computer interaction programming. Emphasis on current tools, standards, methodologies for implementing effective interaction designs. Widget toolkits, Web interface programming, geo-spatial and map interfaces, mobile phone interfaces.

Prerequisite: I&C SCI 45J or I&C SCI 45C. I&C SCI 45J with a grade of C or better. I&C SCI 45C with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 134. Project in User Interaction Software. 4 Units.**

Students complete an end-to-end user interface programming project based on an iterative design paradigm. Topics may include requirements brainstorming, paper prototyping, iterative development, cognitive walk-through, quantitative evaluation, and acceptance testing. Materials fee.

Prerequisite: IN4MATX 131 and IN4MATX 133

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 141. Information Retrieval. 4 Units.**

An introduction to information retrieval including indexing, retrieval, classifying, and clustering text and multimedia documents.

Prerequisite: (I&C SCI 45C or I&C SCI 45J) and (STATS 7 or STATS 67). I&C SCI 45C with a grade of C or better. I&C SCI 45J with a grade of C or better

Same as COMPSCI 121.

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**IN4MATX 143. Information Visualization. 4 Units.**

Introduction to interactive visual interfaces for large datasets, and to principles of human visual perception and human computer interaction that inform their design. Various applications for data analysis and monitoring are discussed.

Prerequisite: (IN4MATX 131 or IN4MATX 43) and (I&C SCI 31 or I&C SCI 32A or CSE 41). IN4MATX 131 with a grade of C or better. IN4MATX 43 with a grade of C or better. I&C SCI 31 with a grade of C or better. I&C SCI 32A with a grade of C or better. CSE 41 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**IN4MATX 148. Project in Ubiquitous Computing. 4 Units.**

Introduction to ubiquitous computing research methods, tools, and techniques. Prototyping, design, and evaluation of physical computing applications, smart environments, embedded systems, and future computing scenarios. Includes hands-on in-class laboratory exercises. Materials fee.

Prerequisite: I&C SCI 10 or I&C SCI 31 or CSE 41 or I&C SCI 32A. I&C SCI 10 with a grade of C or better. I&C SCI 31 with a grade of C or better. CSE 41 with a grade of C or better. I&C SCI 32A with a grade of C or better

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment.

**IN4MATX 151. Project Management. 4 Units.**

Introduces theoretical and practical aspects of project management. Topics include organizational theory, group behavior, project management skills, case studies, personal and group productivity tools, management of distributed work, stakeholders, consultants, and knowledge management. Students do a project exercise.

Prerequisite: IN4MATX 43

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**IN4MATX 153. Computer Supported Cooperative Work. 4 Units.**

Introduces concepts and principles of collaborative systems. Topics may include shared workspaces, group interaction, workflow, architectures, interaction between social and technical features of group work, and examples of collaborative systems used in real-world settings. Students develop a simple collaborative application.

Prerequisite: (IN4MATX 161 or IN4MATX 43) and (I&C SCI 31 or I&C SCI 32A or CSE 41). I&C SCI 31 with a grade of C or better. I&C SCI 32A with a grade of C or better. CSE 41 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**IN4MATX 161. Social Analysis of Computing. 4 Units.**

Introduction of computing as a social process. Examines the social opportunities and problems raised by new information technologies, and the consequences of different ways of organizing. Topics include computing and work life, privacy, virtual communities, productivity paradox, systems risks.

Prerequisite: I&C SCI 10 or I&C SCI 31 or I&C SCI 32A or CSE 41 or ENGR 10 or EECS 10 or ENGRMAE 10. I&C SCI 10 with a grade of C or better. I&C SCI 31 with a grade of C or better. I&C SCI 32A with a grade of C or better. CSE 41 with a grade of C or better. ENGR 10 with a grade of C or better. EECS 10 with a grade of C or better. ENGRMAE 10 with a grade of C or better. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**IN4MATX 162W. Organizational Information Systems. 4 Units.**

Introduction to role of information systems in organizations, components and structure of organizational information systems, and techniques used in information systems analysis, design, and implementation.

Prerequisite: IN4MATX 161. Satisfactory completion of the Lower-Division Writing requirement.

**(Ib)****IN4MATX 163. Project in the Social and Organizational Impacts of Computing . 4 Units.**

Students undertake projects intended to gather and analyze data from situations in which computers are used, organize and conduct experiments intended to test hypotheses about impacts, and explore the application of concepts learned in previous courses.

Prerequisite: IN4MATX 162W

**IN4MATX 164. Children's Learning and Media. 4 Units.**

Examines how popular media may impact how young people learn, develop, and communicate by looking at research related to the impacts of a wide range of popular media including television, video games, digital environments, mobile devices, and other multimedia.

Same as EDUC 130.

Restriction: Education Sciences Majors only. Informatics Majors only. Informatics Minors only.

**IN4MATX 171. Introduction to Medical Informatics. 4 Units.**

Broad overview of medical informatics for students with varied backgrounds. Electronic medical records, online resources, mobile technologies, patient safety, and computational design. Legal, ethical, and public policy issues. Health systems management. Evaluation and fieldwork for health systems.

Prerequisite: WRITING 39C or WRITING 30 or WRITING 31 or HUMAN 1C or HUMAN H1C. WRITING 39C with a grade of C or better. WRITING 30 with a grade of C or better. WRITING 31 with a grade of C or better. HUMAN 1C with a grade of C or better. HUMAN H1C with a grade of C or better

Same as PUBHLTH 105.

Restriction: Upper-division students only. Satisfactory completion of the Lower-Division Writing requirement.

**IN4MATX 172. Project in Health Informatics. 4 Units.**

Students undertake significant quarter-long projects related to health informatics. Topics may include field evaluations of health care technologies, prototypes, iterative design, and system implementations.

Prerequisite: PUBHLTH 105 or IN4MATX 171

Same as PUBHLTH 106.

**IN4MATX 190. Special Topics in Informatics. 4 Units.**

Studies in selected areas of informatics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**IN4MATX 191A. Senior Design Project. 4 Units.**

Group supervised project in which students analyze, specify, design, construct, evaluate, and adapt a significant information processing system. Topics include team management, professional ethics, and systems analysis.

Prerequisite: IN4MATX 113 and IN4MATX 121 and IN4MATX 131 and IN4MATX 151

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Seniors only. Software Engineering Majors have first consideration for enrollment. Informatics Majors have first consideration for enrollment.

**IN4MATX 191B. Senior Design Project. 4 Units.**

Group supervised project in which students analyze, specify, design, construct, evaluate, and adapt a significant information processing system. Topics include team management, professional ethics, and systems analysis.

Prerequisite: IN4MATX 191A. In Progress (IP) grade for IN4MATX 191A is also accepted.

Restriction: Seniors only.

**IN4MATX H198. Honors Research. 4 Units.**

Directed independent research in Informatics for honors students.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be repeated for credit unlimited times.

Restriction: Bren School of ICS Honors students only. Campuswide Honors Collegium students only.

**IN4MATX 199. Individual Study. 2-5 Units.**

Individual research or investigation under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

**IN4MATX 201. Research Methodology for Informatics. 4 Units.**

Introduction to strategies and idioms of research in Informatics. Includes examination of issues in scientific inquiry, qualitative and quantitative methods, and research design. Both classic texts and contemporary research literature are read and analyzed.

**IN4MATX 203. Qualitative Research Methods in Information Systems. 4 Units.**

Introduction to qualitative research methods used to study computerization and information systems, such as open-ended interviewing, participant observation, and ethnography. Studies of the methods in practice through examination of research literature.

Prerequisite: IN4MATX 261 or IN4MATX 251

**IN4MATX 205. Quantitative Research Methods in Information Systems. 4 Units.**

Quantitative research methods used to study computerization and information systems. Design of instruments, sampling, sample sizes, and data analysis. Validity and reliability. Longitudinal versus cross-sectional designs. Analysis of secondary data. Studies of the methods through examination of research literature.

Prerequisite: IN4MATX 251 or IN4MATX 261. Basic knowledge of elementary statistics is also required.

**IN4MATX 207S. Doctoral Seminar on Research and Writing. 2 Units.**

Doctoral seminar centered on original research and writing. Provides a chance for doctoral students at all levels to present original work, brainstorm ongoing issues, and learn to provide and receive critical feedback from peers.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**IN4MATX 209S. Seminar in Informatics. 2 Units.**

Current research and research trends in informatics. Forum for presentation and criticism by students of research work in progress.

Repeatability: Unlimited as topics vary.

**IN4MATX 231. User Interface Design and Evaluation. 4 Units.**

Introduction to the design and evaluation of user interfaces, with an emphasis on methodology. Cognitive principles, design life cycle, on-line and off-line prototyping techniques. Toolkits and architectures for interactive systems. Evaluation techniques, including heuristic and laboratory methods.

**IN4MATX 232. Research in Human-Centered Computing. 4 Units.**

Introduction to contemporary topics in human-computer interaction, including methods, technologies, design, and evaluation. Emerging application domains and their challenges to traditional research methods. Advanced architectures and technologies. Critical issues.

Prerequisite: Some familiarity with HCI principles.

**IN4MATX 237. Usable Security and Privacy. 4 Units.**

Introduces usability problems in security and privacy methods, tools, and software. Overviews prominent examples of both failures and successes in usable security and privacy. Surveys state-of-the-art techniques and evaluation methodologies.

Same as COMPSCI 204.

Overlaps with IN4MATX 231, COMPSCI 203.

Restriction: Informatics Majors have first consideration for enrollment. Computer Science Majors have first consideration for enrollment. Undergraduate degree in CompSci or Informatics is strongly recommended.

**IN4MATX 241. Introduction to Ubiquitous Computing. 4 Units.**

The 'disappearing computer' paradigm. Differences to the desktop computing model: applications, interaction in augmented environments, security, alternate media, small operating systems, sensors, and embedded systems design. Evaluation by project work and class participation.

Same as COMPSCI 248A.

**IN4MATX 244. Introduction to Embedded and Ubiquitous Systems. 4 Units.**

Embedded and ubiquitous system technologies including processors, DSP, memory, and software. System interfacing basics; communication strategies; sensors and actuators, mobile and wireless technology. Using pre-designed hardware and software components. Design case studies in wireless, multimedia, and/or networking domains.

Prerequisite: I&C SCI 51 and COMPSCI 152 and COMPSCI 161 and (I&C SCI 6N or MATH 3A or MATH 6G or I&C SCI 6D). B.S. degree in Computer Science is also accepted.

Same as COMPSCI 244.

**IN4MATX 251. Computer-Supported Cooperative Work. 4 Units.**

The role of information systems in supporting work in groups and organizations. Examines various technologies designed to support communication, information sharing, and coordination. Focuses on behavioral and social aspects of designing and using group support technologies.

**IN4MATX 261. Social Analysis of Computing. 4 Units.**

The social and economic impacts of computing and information technologies on groups, organizations, and society. Topics include computerization and changes in the character of work, social control and privacy, electronic communities, and risks of safety-critical systems to people.

**IN4MATX 263. Computerization, Work, and Organizations. 4 Units.**

Selected topics in the influence of computerization and information systems in transforming work and organizations. Theories of organization and organizational change. Processes by which diverse information technologies influence changes in work and organizations over short and long time periods.

Prerequisite: IN4MATX 251 or IN4MATX 261

**IN4MATX 265. Theories of Information Society . 4 Units.**

Social and economic conceptions of information technology. Macrosocial and economic conditions that foster changes in information technologies. Social construction of information and computer technology in professional worlds. Theories of information technology and large-scale social change.

Prerequisite: IN4MATX 251 or IN4MATX 261

**IN4MATX 267. Digital Media and Society. 4 Units.**

Selected topics in the technological and social aspects of online interactions, and policy including online games, social media, electronic activism, e-commerce, and digital libraries. Media-theoretic approaches to digital technology. Architectures, infrastructure considerations, and their consequences.

Prerequisite: IN4MATX 251 or IN4MATX 261



**IN4MATX 273. Information Technology in Global Sustainability . 4 Units.**

Explores the relationship between recent developments in information technology and the global transition to sustainability. Topics include the role of IT systems in the provision of human needs and wants (e.g., smart grids, food systems, and other IT-enabled infrastructure).

Restriction: Graduate students only.

**IN4MATX 280. Overview of Human-Computer Interaction and Design . 4 Units.**

Introduction to human-computer interaction and user-centered design. The material is focused on laying the groundwork for understanding the history, importance, and methods of human-computer interaction and design.

**IN4MATX 281. User Needs Analysis . 4 Units.**

Understanding the user's context, needs, and preferences. Topics include interviews and observations, modeling the context, flow, culture, space and artifacts involved in an endeavor, ways of aggregating what is found, and presenting these findings to others.

Prerequisite: IN4MATX 280

**IN4MATX 282. Design and Prototyping . 4 Units.**

Introduction to user-centered design and prototyping. Focused on practical methods for interaction design. Topics include the nature of design and the challenges to creating and evaluating good designs, as well specific skills for designing interactive systems.

Prerequisite: IN4MATX 280

**IN4MATX 283. User Experience Evaluation . 4 Units.**

Evaluating prototypes and completed systems. Topics include comparative analysis, laboratory experiments, heuristic evaluation, cognitive walkthroughs, surveys, clickstreams, and help-desk.

Prerequisite: IN4MATX 280

**IN4MATX 284. Advanced Design and Prototyping . 4 Units.**

Develop and communicate interactive technology design prototypes. Moving concepts from brainstorming and paper prototypes to wireframe and limited functionality mock-ups.

Prerequisite: IN4MATX 282

**IN4MATX 285. Interactive Technology Studio . 4 Units.**

Technologies, languages, and skills required for creating prototypes to communicate interactive technology concepts. Topics include HTTP, CSS, CSS scripting, AJAX, Design Patterns, Javascript, Javascript libraries such as jQuery, SQL, MVC, and cloud architectures.

Prerequisite: IN4MATX 280

**IN4MATX 286. Innovations in HCI and Design . 4 Units.**

Recent social and technological developments in human-computer interaction and design. Topics will vary as the field progresses but include novel input techniques, novel platforms, and innovations in theory and methods of design.

Prerequisite: IN4MATX 280

**IN4MATX 287. Capstone Project in HCI and Design . 4 Units.**

Group project that reinforces all concepts learned in this program, including knowing where user experience work is most appropriate and essential, and executing the appropriate steps.

Prerequisite: IN4MATX 283 and IN4MATX 284

**IN4MATX 288. Capstone Project and Portfolio . 4 Units.**

Completion of capstone projects and development of portfolios. Ideation, critique, development, and critique.

Prerequisite: IN4MATX 287

**IN4MATX 290. Research Seminar. 2 Units.**

Forum for presentation and criticism by students of research work in progress. Presentation of problem areas and related work. Specific goals and progress of research.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IN4MATX 291S. Literature Survey in Software Engineering. 2 Units.**

Reading and analysis of relevant literature in Software Engineering under the direction of a faculty member.

Repeatability: May be repeated for credit unlimited times.

**IN4MATX 295. Special Topics in Informatics. 4 Units.**

Studies in selected areas of informatics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**IN4MATX 298. Thesis Supervision. 2-12 Units.**

Individual research or investigation conducted in preparation for the M.S. thesis option or the dissertation requirements for the Ph.D. program.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IN4MATX 299. Individual Study. 1-12 Units.**

Individual research or investigation under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Information and Computer Science (I&C SCI)

### Courses

**I&C SCI 3. Internet Technologies and their Social Impact. 4 Units.**

Examines current Internet technologies and social implications at the individual, group, and societal level. Blogs, wikis, sharing of video, photos, and music, e-commerce, social networking, gaming, and virtual environments. Issues include privacy, trust, identity, reputation, governance, copyright, and malicious behavior.

(III)

**I&C SCI 4. Human Factors for the Web. 4 Units.**

Principles of human-computer interaction in evaluating, designing, and developing information presented on the World Wide Web. User characteristics, usability analysis, navigation and organization. Color, typography, multimedia, information visualization, prototyping, user studies, evaluation strategies. Web accessibility.

Restriction: May not be taken for credit after IN4MATX 131.

(II)

**I&C SCI 5. Global Disruption and Information Technology. 4 Units.**

Explores how new forms of information technology may support transition to a sustainable civilization. Topics include design and implementation of IT systems, science of global change, online community building, and "green IT". Activities involve reading, writing, discussion, and final project.

(II)

**I&C SCI 6B. Boolean Logic and Discrete Structures. 4 Units.**

Relations and their properties; Boolean algebras, formal languages; finite automata.

Prerequisite: High school mathematics through trigonometry.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

(Vb)

**I&C SCI 6D. Discrete Mathematics for Computer Science. 4 Units.**

Covers essential tools from discrete mathematics used in computer science with an emphasis on the process of abstracting computational problems and analyzing them mathematically. Topics include mathematical induction, combinatorics, and recurrence relations.

Prerequisite: Recommended: I&C SCI 6B

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment. Computer Engineering majors have second consideration.

**(Vb)**

**I&C SCI 6N. Computational Linear Algebra. 4 Units.**

Matrices and linear transformations, systems of linear equations, determinants, linear vector spaces, eigenvalues and eigenvectors, orthogonal matrices, diagonalization, and least squares. Topics taught primarily from an algorithmic perspective, including computational solutions, applications, and numerical error analysis.

Overlaps with MATH 6G, MATH 3A.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**(II and V.B ).**

**I&C SCI 7. Introducing Modern Computational Tools. 4 Units.**

A unified look at a spectrum of modern tools for building, solving, and analyzing simple computational models (deterministic and random) in diverse subject areas. Tools include those for numeric/symbolic computation, and those for acquiring, organizing, translating, processing, and displaying information.

**(Va)**

**I&C SCI 10. How Computers Work. 4 Units.**

Introduction to digital computer and communication systems. Capabilities and limitations of information technology. Representing information in digital form. Overview of computer organization, internet, operating systems, software. Human-computer interaction and social impact.

Restriction: May not be taken for credit after I&C SCI 31, I&C SCI 32, I&C SCI 32A, I&C SCI 51, I&C SCI 105, or IN4MATX 43.

**(II)**

**I&C SCI 11. The Internet and Public Policy. 4 Units.**

How the Internet works. Current public policy issues concerning the Internet. Introductory economics. Communications law. Interactions between information technology, economics, and law. Case studies about Internet and communications policy.

Same as ECON 11.

**(II or III ).**

**I&C SCI 20. Invitation to Computing. 4 Units.**

Foundational principles of computer science for students with no computing background that are interested in a related career. Big ideas of computing explored, including programming through use of sequential, conditional, iterative logic. Good computational practices, problem solving, and organization discussed.

**I&C SCI 31. Introduction to Programming. 4 Units.**

Introduction to fundamental concepts and techniques for writing software in a high-level programming language. Covers the syntax and semantics of data types, expressions, exceptions, control structures, input/output, methods, classes, and pragmatics of programming.

Overlaps with EECS 10, EECS 12, ENGRMAE 10.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**(II and VB ).**

**I&C SCI 32. Programming with Software Libraries. 4 Units.**

Construction of programs for problems and computing environments more varied than in I&C SCI 31. Using library modules for applications such as graphics, sound, GUI, database, Web, and network programming. Language features beyond those in I&C SCI 31 are introduced as needed.

Prerequisite: I&C SCI 31 or CSE 41. I&C SCI 31 with a grade of C or better. CSE 41 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

(II and (VA or VB) ).

**I&C SCI 32A. Python Programming and Libraries (Accelerated). 4 Units.**

Introduces Python syntax and semantics for fundamental programming concepts. Constructing programs for varied problems and environments. Using library modules for applications such as graphics, sound, GUI, database, Web, and network programming. Accelerated course for students with previous programming background.

Prerequisite: AP Computer Science A. AP Computer Science A with a minimum score of 3. Placement via a transfer course in computer programming or equivalent experience may also be accepted upon review.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

(II and (VA or VB) ).

**I&C SCI 33. Intermediate Programming. 4 Units.**

Intermediate-level language features and programming concepts for larger, more complex, higher-quality software. Functional programming, name spaces, modules, class protocols, inheritance, iterators, generators, operator overloading, reflection. Analysis of time and space efficiency.

Prerequisite: I&C SCI 32 or CSE 42 or I&C SCI 32A. I&C SCI 32 with a grade of C or better. CSE 42 with a grade of C or better. I&C SCI 32A with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

(II and VB) ).

**I&C SCI 45C. Programming in C/C++ as a Second Language. 4 Units.**

An introduction to the lexical, syntactic, semantic, and pragmatic characteristics of the C/C++ languages for experienced programmers. Emphasis on object-oriented programming, using standard libraries, and programming with manual garbage collection.

Prerequisite: I&C SCI 33 or CSE 43 or EECS 40. I&C SCI 33 with a grade of C or better. CSE 43 with a grade of C or better. EECS 40 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**I&C SCI 45J. Programming in Java as a Second Language. 4 Units.**

An introduction to the lexical, syntactic, semantic, and pragmatic characteristics of the Java language for experienced programmers. Emphasis on object-oriented programming, using standard libraries, and programming with automatic garbage collection.

Prerequisite: I&C SCI 33 or CSE 43. I&C SCI 33 with a grade of C or better. CSE 43 with a grade of C or better

Overlaps with I&C SCI 22, I&C SCI 23, CSE 23.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment. I&C SCI 45J may not be taken for credit after I&C SCI 22, I&C SCI 23, or CSE 23.

**I&C SCI 46. Data Structure Implementation and Analysis. 4 Units.**

Focuses on implementation and mathematical analysis of fundamental data structures and algorithms. Covers storage allocation and memory management techniques.

Prerequisite: CSE 45C or I&C SCI 45C. CSE 45C with a grade of C or better. I&C SCI 45C with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

(Vb)

**I&C SCI 51. Introductory Computer Organization. 6 Units.**

Multilevel view of system hardware and software. Operation and interconnection of hardware elements. Instruction sets and addressing modes. Virtual memory and operating systems. Laboratory work using low-level programming languages.

Prerequisite: (I&C SCI 31 or CSE 41 or I&C SCI 32A) and I&C SCI 6B

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**(II)****I&C SCI 53. Principles in System Design. 4 Units.**

Introduces basic principles of system software: operating systems, compilers, and networking. Exposure to the following topics through theoretical and practical programming experiences: linking and loading, process and memory management, concurrency and synchronization, network communication, programming for performance, etc.

Corequisite: I&C SCI 53L

Prerequisite: I&C SCI 46 and I&C SCI 51. I&C SCI 46 with a grade of C or better. I&C SCI 51 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**I&C SCI 53L. Principles in System Design Library. 2 Units.**

Required laboratory section and co-requisite for I&C SCI 53.

Corequisite: I&C SCI 53

Prerequisite: I&C SCI 51

**I&C SCI 60. Computer Games and Society. 4 Units.**

The study and critical analysis of computer games as art objects, cultural artifacts, gateways to virtual worlds, educational aids, and tools for persuasion and social change. Emphasis on understanding games in their historical and cultural context.

Prerequisite: Satisfaction of the UC Entry Level Writing Requirement.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Game Science Majors have first consideration for enrollment.

**(III)****I&C SCI 61. Game Systems and Design. 4 Units.**

Principles and usage of game design elements. Introduction to technologies that support modern computer games. Students design, implement, and critique several small games.

Restriction: Computer Game Science Majors have first consideration for enrollment.

**(II)****I&C SCI 62. Game Technologies and Interactive Media. 4 Units.**

Technologies for interactive media and game design. Web-based software systems, virtual world platforms, and game engines. Emphasis is on conceptual and architectural aspects of these technologies.

Prerequisite: I&C SCI 31 or I&C SCI 32A

**I&C SCI 90. New Students Seminar. 1 Unit.**

Introduces students to the Donald Bren School of Information and Computer Sciences. Focuses on advising students making the transition to UCI, community building, and mostly surveying the technical areas within departments in ICS, via talks by faculty on their research.

Grading Option: Pass/no pass only.

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**I&C SCI 105. Digital Information Systems. 4 Units.**

Design and analysis of digital information systems. Covers underlying database and network technology, and software engineering principles used to build these systems. Evaluating digital information systems, and recognizing common flaws and vulnerabilities.

Prerequisite: I&C SCI 10 or I&C SCI 21 or CSE 21 or I&C SCI H21 or IN4MATX 41. I&C SCI 10 with a grade of C or better. I&C SCI 21 with a grade of C or better. CSE 21 with a grade of C or better. I&C SCI H21 with a grade of C or better. IN4MATX 41 with a grade of C or better

Overlaps with I&C SCI 52, IN4MATX 43.

**I&C SCI 139W. Critical Writing on Information Technology. 4 Units.**

Study and practice of critical writing and oral communication as it applies to information technology. Each student writes assignments of varying lengths, totaling at least 4,000 words.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment.

**(Ib)****I&C SCI 161. Game Engine Lab. 4 Units.**

The use of an open source game or graphics engine in the design and implementation of a computer game. Principles of game engine design. Students work on teams to design, implement, and evaluate new computer games based on an engine.

Prerequisite: I&C SCI 45C or CSE 45C

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**I&C SCI 162. Modeling and World Building. 4 Units.**

Use of 3D modeling software and related tools to design and create animated, textured models, and expansive virtual worlds incorporating objects, scenes, and venues for activity within game worlds and online environments.

Prerequisite or corequisite: I&C SCI 33 and (I&C SCI 6N or MATH 3A) and I&C SCI 61

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**I&C SCI 163. Mobile and Ubiquitous Games. 4 Units.**

Design and technology of mobile games, including mixed reality gaming, urban games, and locative media. Case studies of significant systems. Uses and limitations of location-based technologies. Infrastructures and their relationships to gameplay and design.

Prerequisite: I&C SCI 61 and (I&C SCI 10 or I&C SCI 31 or I&C SCI 32A)

**I&C SCI 166. Game Design. 4 Units.**

Game design takes into consideration psychology, narrative, platform features and limitations, marketing, computer science capabilities, human-computer interface principles, industry trends, aesthetic judgment, and other factors. Students focus on video game design through lectures, readings, presentations, implementation, and play testing.

Prerequisite: I&C SCI 61 and IN4MATX 43

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Game Science Majors have first consideration for enrollment.

**I&C SCI 167. Multiplayer Game Systems. 4 Units.**

Foundations and technologies that enable multiuser, networked, and persistent virtual environments. Emphasis on database design and management, network protocols, and concurrency control to accommodate large numbers of simultaneous users.

Prerequisite: I&C SCI 51

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Game Science Majors have first consideration for enrollment.

**I&C SCI 168. Multiplayer Game Project. 4 Units.**

Designing and implementing a multiuser, networked, and persistent virtual environment or game. Emphasis on cultural aspects, community building, user interface issues and design, security, privacy, and economics.

Prerequisite: IN4MATX 43 and I&C SCI 167. IN4MATX 43 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Game Science Majors have first consideration for enrollment.

**I&C SCI 169A. Capstone Game Project I. 4 Units.**

Students work in teams to design and implement a new computer game or virtual world. Emphasis on sound, art, and level design, building a community, cut scenes, production values, full utilization of hardware and software platform, and current industry trends.

Prerequisite: I&C SCI 168

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Computer Game Science Majors have first consideration for enrollment.

**I&C SCI 169B. Capstone Game Project II. 4 Units.**

Students work in teams to design and implement a new computer game or virtual world. Emphasis on sound, art, and level design, building a community, cut scenes, production values, full utilization of hardware and software platform, and current industry trends.

Prerequisite: I&C SCI 169A. I&C SCI 169A with a grade of D- or better. In Progress grade for I&C SCI 169A also accepted.

Restriction: Computer Game Science Majors have first consideration for enrollment.

**I&C SCI 192. Industrial or Public Sector Field Study. 2-4 Units.**

Students participate in an off-campus, supervised internship for a minimum of 60 hours. Students apply classroom knowledge through internship projects in the private sector or nonprofit agencies.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**I&C SCI 193. Tutoring in ICS. 2 Units.**

Principles and practice of providing technical assistance to novice learners in information and computer sciences.

Repeatability: May be taken for credit for 18 units.

Restriction: ICS Peer Tutoring Program students only.

**I&C SCI H197. Honors Seminar. 2 Units.**

An overview of computer science and selected recent trends in research. Students attend talks on current faculty research, with opportunities for discussion.

Grading Option: Pass/no pass only.

Restriction: Bren School of ICS Honors students only. Campuswide Honors Collegium students only.

**I&C SCI 398A. Teaching Assistant Training Seminar. 2 Units.**

Theories, methods, and resources for teaching computer science at the university level, particularly by teaching assistants. Classroom presentations, working with individuals, grading, motivating students. Participants will give and critique presentations and may be videotaped while teaching.

Grading Option: Satisfactory/unsatisfactory only.

**I&C SCI 398B. Advanced Teaching Assistant Seminar. 4 Units.**

Teaching computer science at the university level, emphasizing issues in teaching an entire course. Course organization, designing examinations and projects, grading, motivating students. Participants will begin to assemble teaching portfolios.

Prerequisite: I&C SCI 398A

Grading Option: Satisfactory/unsatisfactory only.

**I&C SCI 399. University Teaching. 4 Units.**

Involves on-the-job experience for Teaching Assistants.

Repeatability: May be repeated for credit unlimited times.

Restriction: Teaching assistants only.

## Innovation and Entrepreneurship (INNO)

## Internal Medicine (INT MED)

## International Studies (INTL ST)

### Courses

**INTL ST 1. Introduction to Global Studies. 4 Units.**

Ongoing historical processes that increase global integration, the social, economic, and political interdependence of different regions, cultures, and peoples. Topics include ancient empires, colonialism, nationalism, industrialization, modern imperialism and warfare, decolonization, global social movements, conflict, inequality, and global governance.

Same as SOC SCI 4A.

Restriction: International Studies Majors have first consideration for enrollment.

**(III and VIII ).**

**INTL ST 11. Global Cultures and Society. 4 Units.**

Offers a general overview of the rise of global interdependence in political, economic, demographic, and cultural terms. Considers what drove people from relative isolation into intensified intercourse with one another, and investigates the consequences of this shift.

Same as ANTHRO 41A.

Restriction: Anthropology Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(III and VIII ).**

**INTL ST 12. Global Political Ideologies. 4 Units.**

An overview of the major political ideologies shaping the current world order and global conflict. Topics include liberalism, democracy, nationalism, capitalism, communism, socialism, fascism, neoliberalism, clash of civilizations, sectarian violence, populist nationalism, and de-globalization.

Same as POL SCI 44B, SOC SCI 12.

Restriction: International Studies Majors have first consideration for enrollment.

**(III and VIII ).**

**INTL ST 13. Global Economy. 4 Units.**

Acquaints students with the fundamental patterns of the global economy. Emphasizes the historical roots and political implications of economic choices.

Same as ECON 13.

Restriction: International Studies Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**(III, VIII)**

**INTL ST 14. Introduction to International Relations. 4 Units.**

Analysis of political relations between and among nations with emphasis on explanations of conflict and cooperation. The role of ideologies and their relation to international problems are also examined.

Same as POL SCI 41A.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(III and VIII ).**



**INTL ST 15. Global Political Economy. 4 Units.**

The global economy as an integrated system. The rise of world trade, capitalism, national economies, market cycles, competing economic ideologies, development, globalization, transnational labor, multinational corporations, and the role of UN, World Bank, WTO, and the IMF in global governance.

Same as SOC SCI 15.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

(III and VIII ).

**INTL ST 16. Human Rights and Global Governance. 4 Units.**

Historical development of civil, political rights and the rise of human rights in international law. Explores role, and limitations, of the UN, ICJ, and ICC in global governance. Reconceptualizing democracy and political representation in a postnational 21st century.

Same as POL SCI 45A, SOC SCI 16.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

(III and VIII ).

**INTL ST 17. Global Environmental Issues. 4 Units.**

Examines problems such as global climate change, growing human populations, fisheries depletion, ocean acidification, biodiversity loss, deforestation, and food security. Introduces political, social, and economic factors contributing to environmental issues and their disproportional impacts on the world's poor and minorities.

Same as SOC SCI 17.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

(III and VIII ).

**INTL ST 32A. Dilemmas of Diversity. 4 Units.**

Focuses on racial, ethnic, and gender diversity, multiculturalism, and their impact on our social and political ideals. Traces the sources of ideas about difference, equality, and toleration, and examines tensions that occur when forms of identity conflict with one another.

Same as POL SCI 32A.

(VII)

**INTL ST 100. Global Trials. 4 Units.**

Explores landmark legal trials that have impacted both domestic and world affairs. The trials provide a lens through which to explore society at the time, as well as shed light on the historical legacies of current social, political, and legal values.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 101A. Global Social Movements. 4 Units.**

The evolution of global social movements over past 250 years. Age of Revolutions in America, France, and Haiti; nationalism and labor; 1960s global decolonization; 21st century Latin American indigenous movements; Occupy Wall Street, Arab Spring, and social media's #metoo, #BlackLivesMatter.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 101B. Global Cities and Slums. 4 Units.**

Cities as a window into contemporary challenges of the globalized world. Global cities such as Los Angeles, London, and Beijing compared with cities with slums in the global south such as Rio de Janeiro, Johannesburg, and Mumbai.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 102A. Global Refugees and Stateless People. 4 Units.**

Examines the reason behind global refugee crises, and what it means to be a displaced migrant or stateless person in history and in contemporary society. Links case studies about refugees around the world.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 102B. Global Asia and Orientalism. 4 Units.**

Examines how the modern world is divided between East and West in the age of globalization. Through the postcolonial framework of Orientalism, it considers a pluralistic idea of Asia and the current notion of the new world order as one.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 103A. Case Studies in Global and Planetary Health. 4 Units.**

Explores critical global health and planetary health studies, linking past trends to current research of health inequalities. Case studies include maternal-fetal mortality, environmental contamination, disaster preparedness, pharmaceutical development and access, and humanitarian aid interventions.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 104A. Global Trafficking. 4 Units.**

Explores trafficking in different global contexts. Covers sex trafficking, labor trafficking, and organ trafficking. Tracks the use of the concept in policy, human rights, law, humanitarianism, and media. Provides a complex and nuanced understanding of the problem and its solutions.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 104BW. Global Gender and Sexuality. 4 Units.**

Develops critical insights into gender and sexuality as products of the world around us and as lived experiences across the globe. Topics include agency and resistance, intersectionality, feminisms, colonialism, heteronormativity, gender violence, masculinities, media and popular culture, globalization and migration.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**(Ib)****INTL ST 106A. Global Political Ecology. 4 Units.**

Introduction to political ecology and critical analysis of the global scale and globalization. Topics include current and historical climate change, fossil fuels, international trade and investment, soil erosion and pollution, deforestation, waste, ocean ecology, water crisis, wars, revolutions, and refugees.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 106B. Global Food Environment. 4 Units.**

Examines the global political ecology of food, focusing on the U.S., China, and Brazil. Topics include the history of agriculture, imperialism/neocolonialism, Malthusianism, migration, agro-industrialization, deforestation, GMOs, agrochemicals, soil and water contamination, land struggles, food security/safety/sovereignty, dietary habits, and climate change.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 111B. World of Coffee . 4 Units.**

History of consumption and production of coffee over the centuries, and coffee's cultural, economic, social, political consequences. Coffee's social life as a drug, symbol of hospitality, religious rite, sociability and bourgeois lifestyle, commodity, source of livelihoods, imperial revenues, corporate profits.

Same as HISTORY 163.

**INTL ST 112A. International Business. 4 Units.**

Introduction to conducting business in the international arena, decision making in the organization, and globalization of markets and production. Topics covered range from tax and finance to ethics, marketing, and more. Continuing corporate regulatory scandals discussed.

Same as SOC SCI 115D.

**INTL ST 114A. International Political Economy. 4 Units.**

Examination of problems in global political-economic relations through competing conceptual lenses or grand theories: mercantilism, liberalism, and Marxism. Surveys North-North and North-South issues relating power and wealth.

Same as POL SCI 141B.

**(VIII)****INTL ST 115. Global Poverty and Inequality in the 21st Century. 4 Units.**

Explores a multidisciplinary understanding of poverty and inequality in the 21st century and assesses impact of education, health, technology, and other interventions. Course offered online only.

Same as UPPP 115.

**INTL ST 117A. Transnational Migration. 4 Units.**

Examines the movement of people across national borders, governmentality and the role of state practices to control populations, and issues of citizenship, belonging, and identity. Examples are drawn from the United States, Europe, Latin America, Asia, and Africa.

Same as CHC/LAT 161, ANTHRO 125X.

(VIII)

**INTL ST 122. Nuclear Environments. 4 Units.**

Understanding the impact of the nuclear age on the environment and human health through interrelated developments of nuclear power and nuclear weapons. The early years of weapon development, catastrophic environmental pollution, perils of nuclear power in the U.S. and Russia.

Same as SOCECOL E127, PUBHLTH 168.

(VIII)

**INTL ST 124A. Introduction to the Comparative Study of Legal Cultures. 4 Units.**

Traces the anthropological and comparative cultural study of law from the nineteenth century to the present; briefly surveys the diversity of recorded legal cultures and critically examines key concepts which have been used to describe and classify them.

Same as CRM/LAW C102.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 130. Transnational Gangs. 4 Units.**

Examines the internationalization of U.S. domestic street gangs. The relationship between California gangs Mara Salvatrucha and 18th Street and Mexico/Central American gangs is assessed. Specified topics include: mobilization, migration, territorialism, culture, organization, and use of technology.

Same as SOC SCI 120.

Overlaps with SOC SCI XI120, INTL ST XI130.

**INTL ST 131A. Just War Revisited. 4 Units.**

Examines the evolution of the doctrine of the just war across the history of Western political thought, the importance of changes in the doctrine and whether it applies today; examines international relations case studies to determine today's relevancy.

Same as POL SCI 135B.

**INTL ST 140A. Approaches to International Relations. 4 Units.**

Reviews theoretical and methodological approaches to the study of international relations using contending perspectives to analyze power and influence, capabilities, interdependence, reciprocity, international regimes, anarchy, cooperation, imperialism, and hegemony.

Same as POL SCI 144A.

Restriction: Upper-division students only. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 141B. Homeland Security . 4.0 Units.**

Examines the 9/11 origins of the concept of homeland security; assess the evolution, structure, and operations of the Department of Homeland Security; critically examines the evolution of threat assessment to the U.S. and the utilization of risk management methodologies.

Same as POL SCI 143G.

**INTL ST 142A. U.S. Foreign Policy I: Globalism and Cold War. 4 Units.**

Looks at changing international perspectives, policy responses, and military strategies of presidential administrations from Truman to Reagan. In assessing the motives and objectives of U.S. foreign policy leaders during the "Cold War" era, the concept of "national interest" is examined.

Same as POL SCI 142D.

Restriction: International Studies Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment.

**INTL ST 142D. The International Relations of East Asia. 4 Units.**

Surveys various aspects of relations between the nations of East Asia. Topics include the historical development of the region; current political and security relations, including the impact of the American military presence.

Same as POL SCI 142B.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 142E. U.S. Coercive Diplomacy. 4 Units.**

Examines the theory of compellence and the U.S. practice of coercive diplomacy--the power to change behavior of other governments. Specific case examples: the Cuban missile crisis, bombing of North Vietnam, the Nicaraguan Contras, Desert Shield/Desert Storm, and Libya.

Same as POL SCI 142G.

Restriction: Upper-division students only. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 142G. U.S. Foreign Policy Toward Asia. 4 Units.**

U.S. policy toward the countries of East Asia: bilateral and regional security relationships, U.S. economic relations with the major Asian countries, the development of regional institutions, and human rights.

Same as POL SCI 141E.

**INTL ST 143A. Vietnam War. 4 Units.**

Examines social structures and social changes in Vietnamese and U.S. societies through the study of the Vietnam War.

Same as SOCIOL 170A.

**INTL ST 144A. Comparative Politics: Four Nations, Three Continents. 4 Units.**

Studies four countries in a comparative fashion: their respective political histories and cultural traditions; actual differences among their superficially similar party, parliamentary, and executive institutions; contemporary economic policy. The countries represent three continents and varying levels of economic development.

Same as POL SCI 154C.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 145A. International Law. 4 Units.**

Examination of the origin, changing structure, application of international law, and the role of legal norms in regulating the behavior of states and maintaining international order.

Prerequisite: POL SCI 71A

Same as POL SCI 172A.

**(VIII)****INTL ST 147CW. International Humanitarianism. 4 Units.**

Examines, analyzes, and evaluates the humanitarian phenomenon, the actors involved in it (including states, international organizations (IOs), and nongovernmental organizations (NGOs)), the rise of a body of international humanitarian law, and the problems and debates associated with international humanitarianism today.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as POL SCI 147CW.

**(Ib)****INTL ST 147D. International Organizations. 4 Units.**

Active learning course that examines origins, decision-making processes, activities, and evolution of leading international organizations (e.g. U.N., NATO, EU, AU, WTO, World Bank, IMF). Activities include drafting reforms, applying theory, assessing dysfunctions, and participating in U.N. negotiation simulations.

Same as POL SCI 147D.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 148W. Global Futures. 4 Units.**

Develops critical insights into our collective future as it reflects different perspectives of the world. Topics include techno-orientalism, afro-futurism, feminist futures, indigenous cosmology, and environmental concerns.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**(Ib)****INTL ST 150. Racism and Global Apartheid. 4 Units.**

The concept of race has been used to draw a global color line dividing rich from poor, developed from developing, first from third worlds. Racism is used to justify slavery, colonialism, imperialism, eugenics, genocide, and extreme inequalities produced by globalization.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

**INTL ST 151B. Religion and World Politics. 4 Units.**

Examines the relationship between religion and world politics historically and today, focusing on connections with peace/war, democracy, human rights, secularism(s), and globalization. Covers major debates, scholarship, concepts, and theories through class exercises, exams, and essays.

Prerequisite: POL SCI 41A or INTL ST 11 or INTL ST 12 or REL STD 5A or REL STD 5B or REL STD 5C

Same as POL SCI 146B, REL STD 115.

**INTL ST 152A. Non-Government Organization (NGO) Fundamentals. 4 Units.**

Introduction to non-governmental organizations, including their role in U.S. society and the international community. Explores varying definitions of NGOs and the characteristics held in common by all NGOs.

Same as SOC SCI 152A.

**INTL ST 153B. Cross-Cultural Studies of Gender. 4 Units.**

Explores the construction of gender in national and transnational contexts. Special attention is given to how race, sexuality, class, and global inequalities shape different experiences of gender, and how gender structures political, institutional, and social life across the world.

Same as ANTHRO 121D.

**(VII)****INTL ST 153C. Urban Anthropology. 4 Units.**

Cultural roles of urban centers and processes of urbanization in comparative perspective, focusing on both nonwestern, nonindustrial societies of past and present; the relationship between modern urban centers and Third World peoples. Migration, urban poverty, in Africa, Asia, Latin America.

Same as ANTHRO 121J.

**INTL ST 153D. Colonialism and Gender. 4 Units.**

An anthropological enquiry into the ways colonial relations of power have been structured and gendered throughout the world, and to what effect. Examines the social locations of men and women in the everyday exercise of colonial and imperial power.

Same as ANTHRO 136G.

Restriction: Anthropology Majors have first consideration for enrollment.

**INTL ST 153E. Nationalism and Ethnicity in the Contemporary World. 4 Units.**

An exploration of the concepts of identity, culture, ethnicity, race, and nation through ethnographic cases, with a view to asking larger questions: how do people create nativeness and foreignness? How does 'culture' get worked into contemporary racisms and nationalisms.

Same as ANTHRO 136A.

**(VIII)****INTL ST 153F. Militarism and Gender. 4 Units.**

Examination of feminist approaches to militarism, war, and political violence; drawing on representations of women as both victims of and participants in military violence; effects of militarism on formations of gender; effects of military industrial complex on nationalism and identity.

Same as GEN&SEX 167A.

**INTL ST 154B. Human Rights. 4 Units.**

Examines the causes and consequences of human rights violations with a focus on Latin America. What are human rights? When and where are they violated? What political mechanisms are available to deal with human rights problems? How effective are they.

Same as POL SCI 153E.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 154C. Ethics in an Age of Terror and Genocide. 4 Units.**

Original sources document personal impact of wars on genocides, from World War II to the Bosnian and Rwandan genocides and current wars in Iraq and Afghanistan. Students train for and conduct personal interviews with someone who lived through a war.

Same as POL SCI 145A.

**INTL ST 154W. Ethics and Justice in International Affairs. 4 Units.**

Analyzes choices regarding the use of force, resolving conflict, and promoting human rights and social justice. Special attention is given to the American experience as a principal case study of ethics and statecraft.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. International Studies Majors have first consideration for enrollment.

**(Ib)****INTL ST 156A. Voting and Political Manipulation. 4 Units.**

Introduction to social choice and cooperative games. Topics include majority rule, types of voting methods, apportionment and proportional representation, agenda manipulation, coalition formation, voting power, political consequences of electoral laws.

Same as POL SCI 151H, SOC SCI 121T, ECON 154.

Restriction: International Studies Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**INTL ST 157A. 21st Century Africa. 4 Units.**

Comparative studies of the cultures and societies of Sub-Saharan Africa, with emphasis on critical study of colonialism and postcoloniality, social transformation, and the politics of identity.

Prerequisite: ANTHRO 2A

Same as ANTHRO 164A.

Restriction: Anthropology Majors have first consideration for enrollment.

**(Ib)****INTL ST 157C. Comparing European and US Societies. 4 Units.**

Society, culture, institutions of U.S. and European countries. Fertility to football, guns to government, work to welfare, health to housework. Cross-national approaches for understanding the world and thinking critically about taken-for-granted practices. Policies the U.S. might borrow for social issues.

Same as SOCIOL 157C.

**INTL ST 158B. Peoples of the Pacific. 4 Units.**

The cultural history and recent developments among the Pacific peoples of Polynesia, Micronesia, Melanesia, New Guinea, and Australia.

Same as ANTHRO 163A.

**(VIII)****INTL ST 158D. China in the Global Age. 4 Units.**

Chinese society from 1949 to present. Social change in the context of political control and ideological considerations. Focus on the power structure, political decision processes, and ideological legitimization, and interplay with the Chinese community and its culture.

Same as SOCIOL 175B.

**INTL ST 161A. Political Islam. 4 Units.**

Political Islam is a diverse phenomenon. While noticeable barriers exist to 'Islamist democracy,' it is the Islamists who will define the political future of much of the Muslim world. Reviews the experience of Saudi Arabia, Egypt, Pakistan, Turkey, and Indonesia.

Same as SOC SCI 188K.

**INTL ST 162B. Peoples and Cultures of Post-Soviet Eurasia. 4 Units.**

Examines the cultures and political conflicts of the more than 130 indigenous ethnic groups in the European and Asian territories of the former U.S.S.R. Emphasis is on the theoretical issues of ethnicity, nationalism, and conflict management.

Same as POL SCI 154F, ANTHRO 164P.

**(VIII)****INTL ST 163. Global Inequalities. 4 Units.**

An examination of various forms of social, economic, and political inequality within and between nations. Different approaches to understanding inequality and the intersections of poverty, race, ethnicity, class, gender, nationality, health, and violence.

Restriction: International Studies Majors have first consideration for enrollment.

**INTL ST 165. Introduction to Contemporary Middle East Politics. 4 Units.**

An overview of basic issues that shape the politics of the Middle East and North Africa. Themes include implication of the colonization era, nation-state formation, inter-Arab relations, nationalism, Arab-Israel conflict, Islamic resurgence, and more.

Same as SOC SCI 188A, POL SCI 158D.

**INTL ST 175A. U.S. War on Terrorism. 4.0 Units.**

Analyzes the United States war on terrorism by focusing on terrorism, the U.S. wars in Afghanistan and Iraq, and changes in police powers through the Patriot Act, as well as the political leadership which directs the war.

Same as SOCIOL 170B.

**INTL ST 176C. Introduction to Chinese Politics. 4 Units.**

Background to the Chinese revolution, rise of the communist party; and institutions, ideology, and structure of Communist party rule from 1949-present.

Same as POL SCI 151B.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 176D. Chinese Politics: Policy, Leadership, and Change. 4 Units.**

Examines major policies from 1949 to the present, and considers the changing role of the Communist Party and its shifting treatment of various social groups; the era of Mao Zedong, reforms under Deng, and post-Deng politics.

Same as POL SCI 151C.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 176I. West European Politics. 4 Units.**

Explores four main themes: (1) thinking scientifically about politics; (2) understanding the linkages between different political structures and spheres of activity; (3) evaluating some theories about politics; (4) learning about three countries: Britain, France, and Germany.

Same as POL SCI 152F.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 176L. Canadian Politics. 4 Units.**

Addresses the basic structures and processes of contemporary Canadian government and politics. Additional topics may include regionalism, federalism, western alienation and oil, Canadian solutions to social welfare policy questions, developments in Quebec, and other issues associated with French-English relations.

Same as POL SCI 153B.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 177C. Revolution in Latin America. 4 Units.**

Presents a comparative analysis of the causes, development, and consequences of selected revolutionary movements, focusing on outbreaks in Mexico, Bolivia, Cuba, Chile, Nicaragua, and Grenada. Explores topics of state formation, economic nationalism, social justice, ethnicity, and role of international affairs.

Same as CHC/LAT 151B, HISTORY 166D, SOC SCI 173N.

**INTL ST 177D. U.S. Intervention in Latin America. 4 Units.**

Explores political, economic, social, and cultural ties that bind Latin America to the United States. Focuses on U.S. intervention and Latin American response from early nineteenth century to present day. Case studies include Mexico, Guatemala, Cuba, Chile, and Central America.

Same as POL SCI 142J, HISTORY 166, CHC/LAT 150.

**INTL ST 177E. Cuban Society and Revolution. 4 Units.**

Explores the causes, development, and legacy of the 1959 Revolution. Themes include economic dependency, democracy, race, gender, culture, and the always volatile relations between Cuba and the United States.

Same as POL SCI 153G, HISTORY 166C, CHC/LAT 157.

**INTL ST 177G. Revolution and Reaction in Cold War Latin America. 4 Units.**

Explores Latin American experiences of revolutionary change and military dictatorship during the Cold War (1945-1990). Pays particular attention to the lives of women, peasants, workers, and the urban middle classes. Case studies include Guatemala, Cuba, Chile, Argentina, Nicaragua, and Mexico.

Same as HISTORY 166B.

**INTL ST 177I. Ancient Civilization of Mexico and the Southwest. 4 Units.**

The prehistory and cultural evolution of the civilization which originated in Mexico, including the Olmecs, Aztecs, Toltecs, Maya, and Zapotec, as well as the Pueblos of the Southwestern U.S. Topics include the origins of food production and of the state.

Same as ANTHRO 141A.

**INTL ST 177J. Peoples and Cultures of Latin America. 4 Units.**

Surveys the prehistory of Latin America and its indigenous cultures, emphasizing the impact of colonial rule, capitalism, and twentieth-century transformations. Emphasis on communities from several countries. In some years, emphasis on comparisons between the Latin American and Caribbean experiences.

Same as ANTHRO 162A, CHC/LAT 120.

**(VIII)****INTL ST 178A. Immigration Politics in Western Europe. 4 Units.**

Examines immigration politics in Western Europe, analyzing trends and policy from the postwar period through to today. Topics include citizenship, immigrant integration, asylum, the far-right, and a rotating focus on contemporary issues, e.g., terrorism, Islamophobia.

Same as POL SCI 152K.

Overlaps with POL SCI 141D.

**INTL ST 179. Special Topics: Geographic Focus in International Studies. 4 Units.**

Studies in selected areas of international studies. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**INTL ST H180. International Studies Honors Research Seminar. 4 Units.**

Assists students to prepare a thesis prospectus for the Honors Program in International Studies. Students choose a topic, learn writing and research methods, write a prospectus and orally present and defend it, and conduct a literature review.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Honors students only.

**INTL ST 183A. Global and International Studies Forum. 4 Units.**

A faculty-student forum featuring lectures from a variety of institutions with discussion issues related to Global and International Studies.

Repeatability: May be taken for credit 4 times.

Same as SOCECOL 183A, SOC SCI 183A.



**INTL ST 183B. Seminar in Mediation. 4 Units.**

Students develop mediation skills and refine knowledge in the practice and theory of conflict resolution. Students who complete this course may serve as mediators in the Campus Mediation Program. Course is a prerequisite to completing Indep Study as an intern.

Same as SOC SCI 183B, SOCECOL 183B.

Restriction: International Studies Majors have first consideration for enrollment. School of Humanities students have first consideration for enrollment. School of Social Ecology students have first consideration for enrollment. School of Social Sciences students have first consideration for enrollment.

**INTL ST 183CW. Seminar Conflict Resolution. 4 Units.**

Designed for seniors who are pursuing the minor in Conflict Resolution and/or International Studies major. Provides a forum in which students will refine skills and theory in the study of cooperation and conflict, from local to global arenas.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as SOCECOL 183CW, SOC SCI 183CW.

**(Ib)****INTL ST 183E. Conflict Resolution in Cross-Cultural Perspective. 4 Units.**

Examines theories of conflict management. Analyzes how conflict is mitigated in diverse cultures: at the interpersonal level, between groups, and on the international scale. Students discuss readings, hear from conflict management practitioners, and simulate negotiations.

Same as ANTHRO 136D, SOC SCI 183E, POL SCI 154G.

**(VIII)****INTL ST 189. Special Topics: Global Focus in International Studies. 2-4 Units.**

Studies in selected areas of international studies. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**INTL ST H190. Honors Thesis. 4 Units.**

Students work with faculty to complete their honors thesis.

Repeatability: May be taken for credit 2 times.

Restriction: International Studies Honors students only.

**INTL ST 199. Individual Study. 2-4 Units.**

Students participate in planned research and study under written contract with a supervising UCI instructor. Students may enroll for only one individual study course each quarter.

Repeatability: Unlimited as topics vary.

**INTL ST 201. What is Global Studies?. 4 Units.**

Introduces graduates to the field of global and international studies. Landmark studies outline the transition from globalization studies to contemporary global studies. Identify complex global issues, underlying processes of globalization, and the impacts they have on people around the world.

Restriction: Graduate students only.

**INTL ST 202. Foundations of European Social Thought. 4 Units.**

Provides graduate students with a broad overview of the major landmarks in the development of modern social thought. Introduces key philosophers and theorists Adam Smith, Marx, Durkheim, Weber, Freud, and Du Bois, focusing on the global dimensions of their work.

Restriction: Graduate students only.

**INTL ST 203. Globalizing Social Theory in the Age of Extremes. 4 Units.**

Examines important developments in social theory between 1914 and 1991. The overarching goal is to synthesize from these various approaches a critical and transdisciplinary theoretical framework to analyze complex global issues.

Restriction: Graduate students only.

**INTL ST 204. Theories of Globalization. 4 Units.**

Theories of globalization engage deep historical transformations, keeping the interrelated dynamics of economics, politics, and culture in focus. Theories examine transformations emanating at transnational and state levels, and from below in the form of social movements led by everyday people.

Restriction: Graduate students only.

**INTL ST 205. Theories from the Global South. 4 Units.**

Looking beyond the theoretical traditions of the Euro-American academy scholars can begin to engage important theoretical contributions from the Global South. Explores alternative standpoints and interventions challenging dominant narratives and calling into question taken-for-granted assumptions, categories, concepts, values, and perspectives.

Restriction: Graduate students only.

**INTL ST 206. Engaging Global Issues. 4 Units.**

Critical and interdisciplinary works on global issues serve as examples that graduates can use in their own research. Each week focuses on a different example of outstanding global research done by a scholar having an important impact on the field.

Restriction: Graduate students only.

**INTL ST 207. Research Design and Methods . 4 Units.**

Fundamentals of empirical research design, strategies for global research, sampling logics, reliability, validity, mixed methods, integrating qualitative and quantitative methods. Introduction to basic data collection methods and examples of more advanced methodological strategies. Research ethics and the IRB review process.

Restriction: Graduate students only.

**INTL ST 208. Grant Writing. 4 Units.**

Focuses on production, critique, and revision of student research proposals. A practical seminar designed to improve student proposals, help students through the application processes, and increase students' chances of obtaining support for their research.

Restriction: Graduate students only.

**INTL ST 210A. Proseminar in Global Studies I. 4 Units.**

Year-long intensive introduction to graduate students to a range of topics pertinent to the field of Global Studies. The guest speakers and topics addressed vary each quarter.

Repeatability: May be taken for credit 6 times.

Restriction: Graduate students only.

**INTL ST 210B. Proseminar in Global Studies II. 4 Units.**

Year-long intensive introduction to graduate students to a range of topics pertinent to the field of Global Studies. The guest speakers and topics addressed vary each quarter.

Repeatability: May be taken for credit 6 times.

Restriction: Graduate students only.

**INTL ST 210C. Proseminar in Global Studies III. 4 Units.**

Year-long intensive introduction to graduate students to a range of topics pertinent to the field of Global Studies. The guest speakers and topics addressed vary each quarter.

Repeatability: May be taken for credit 6 times.

Restriction: Graduate students only.

**INTL ST 260. Directed Reading and Research. 4-12 Units.**

Readings focused on specialized topics in consultation with, and with the consent of, a faculty member. Students are expected to produce a paper based on the readings.

Repeatability: May be taken for credit 6 times.

Restriction: Graduate students only.

**INTL ST 290. Dissertation Research. 1-12 Units.**

Dissertation research with Global and International Studies faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**INTL ST 299. Independent Study. 4-12 Units.**

Independent research with Global and International Studies faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Iranian Studies (IRAN)

### Courses

**IRAN 231A. History of Zoroastrianism. 4 Units.**

Reviews major trends in the history of Zoroastrianism.

Restriction: Graduate students only.

Concurrent with HIST 131A.

**IRAN 231B. Ancient Persia. 4 Units.**

Survey of the history of Persia in antiquity.

Restriction: Graduate students only.

Concurrent with HIST 131B.

**IRAN 231C. Medieval Persia. 4 Units.**

A survey of Persian history in the context of Late Antique and Medieval Islamic history.

Restriction: Graduate students only.

Concurrent with HIST 131C.

**IRAN 255A. Ancient India. 4 Units.**

Examines the visual and religious history of the region defined as 'India' today, but necessarily encompassing modern Bangladesh and Pakistan. Culminates with the supposed Golden Age of the Gupta empire and its far-reaching legacies.

Same as AHIS 255A.

Restriction: Graduate students only.

Concurrent with AHIS 155A.

**IRAN 255B. Medieval India. 4 Units.**

Begins with the Gupta period's aesthetic legacies in South Asia's architecture, sculpture, and painting. Explores the dispersal of Islam throughout South Asia, including the Muslim communities of southern India.

Same as AHIS 255B.

Restriction: Graduate students only.

Concurrent with AHIS 155B.

**IRAN 280. Studies in Old Iranian. 4 Units.**

Studies in grammars and texts of Old Persian and Avestan.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IRAN 281. Studies in Middle Iranian. 4 Units.**

Studies in grammars and texts of Middle Iranian languages (e.g., Middle Persian, Parthian, Sogdian, Bactrian).

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IRAN 282. Studies in Classical Persian. 4 Units.**

Studies in the premodern literatures and historical texts of medieval and early modern Persian.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IRAN 290. Special Topics in Premodern Iranian Studies. 4 Units.**

Studies in selected areas of premodern Iranian Studies. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**IRAN 292. Seminar in Premodern Iranian Studies. 4 Units.**

Seminar in selected areas of premodern Iranian Studies. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**IRAN 293. Directed Readings in Premodern Iranian Studies. 4 Units.**

Directed reading on a specific topic agreed upon by student and instructor.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IRAN 294. Curatorial Methods. 4 Units.**

Development of curatorial methodologies with an instructor in conjunction with curatorial internship or practicum.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IRAN 295. Special Methods. 4 Units.**

Reading course focused on the development of particular research skills (e.g. archaeological field methods, numismatics, digital humanities) often in conjunction with a practicum.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IRAN 296. Ethics, Law, and Art. 4 Units.**

Addresses a broad range of ethical and legal issues pertaining to art, ownership, looting and theft, museum policies, and cultural heritage.

Prerequisite: Background in Art History or Legal Studies.

Same as AHIS 296.

Concurrent with AHIS 196.

## Italian (ITALIAN)

### Courses

**ITALIAN 1A. Fundamentals of Italian. 5 Units.**

First quarter of first-year Italian in a hybrid format. Students are taught to conceptualize in Italian as they learn to understand, read, write, and speak. Classes are conducted entirely in Italian.

Overlaps with ITALIAN S1AB, ITALIAN 1AB.

**ITALIAN 1AB. Intensive Italian Fundamentals. 7.5 Units.**

First half of first-year Italian in a time-intensive form. Development of meaningful communicative skills for the purposes of interaction with Italian speakers and beginning study of Italian. Learner-centered approach develops speaking, listening, reading, writing, and cultural skills and knowledge.

Overlaps with ITALIAN 1A, ITALIAN 1B, ITALIAN S1AB.

Restriction: ITALIAN 1AB and ITALIAN 1A and ITALIAN 1B and ITALIAN S1AB may not be taken for full credit.

**ITALIAN 1B. Fundamentals of Italian. 5 Units.**

Second quarter of first-year Italian in a hybrid format. Students are taught to conceptualize in Italian as they learn to understand, read, write, and speak. Classes are conducted entirely in Italian.

Prerequisite: ITALIAN 1A. ITALIAN 1A with a grade of C or better. Placement into ITALIAN 1B is also accepted.

Overlaps with ITALIAN S1AB, ITALIAN S1BC, ITALIAN 1AB, ITALIAN 1BC.

**ITALIAN 1BC. Intensive Italian Fundamentals. 7.5 Units.**

Second half of first-year Italian in a time-intensive form. Development of meaningful communicative skills for the purposes of interaction with Italian speakers and beginning study of Italian. Learner-centered approach develops speaking, listening, reading, writing, and cultural skills and knowledge.

Prerequisite: ITALIAN 1AB or ITALIAN S1AB or ITALIAN 1B. ITALIAN 1AB with a grade of C or better. ITALIAN S1AB with a grade of C or better. ITALIAN 1B with a grade of C or better. Placement into ITALIAN 1BC is also accepted.

Overlaps with ITALIAN 1B, ITALIAN 1C, ITALIAN S1BC.

Restriction: ITALIAN 1AB and ITALIAN 1A and ITALIAN 1B and ITALIAN S1AB may not be taken for full credit.

**(VI)****ITALIAN 1C. Fundamentals of Italian. 5 Units.**

Third quarter of first-year Italian in a hybrid format. Students are taught to conceptualize in Italian as they learn to understand, read, write, and speak. Classes are conducted entirely in Italian.

Prerequisite: ITALIAN 1B or ITALIAN 1AB or ITALIAN S1AB. ITALIAN 1B with a grade of C or better. ITALIAN 1AB with a grade of C or better. ITALIAN S1AB with a grade of C or better. Placement into ITALIAN 1C is also accepted.

Overlaps with ITALIAN S1BC, ITALIAN 1BC.

**(VI)****ITALIAN S1AB. Italian Fundamentals. 7.5 Units.**

First-year Italian in an intensified form. Students are taught to conceptualize in Italian as they learn to understand, read, write, and speak. Classes are conducted entirely in Italian and meet daily three hours for five weeks each session.

Overlaps with ITALIAN 1A, ITALIAN 1B, ITALIAN 1AB.

Restriction: ITALIAN S1AB and ITALIAN 1A and ITALIAN 1B and ITALIAN 1AB may not be taken for full credit.

**ITALIAN S1BC. Italian Fundamentals. 7.5 Units.**

First-year Italian in an intensified form. Students are taught to conceptualize in Italian as they learn to understand, read, write, and speak. Classes are conducted entirely in Italian and meet daily three hours for five weeks each session.

Prerequisite: ITALIAN S1AB or ITALIAN 1B or ITALIAN 1AB. ITALIAN S1AB with a grade of C or better. ITALIAN 1B with a grade of C or better. ITALIAN 1AB with a grade of C or better.

Overlaps with ITALIAN 1B, ITALIAN 1C, ITALIAN 1BC.

Restriction: ITALIAN S1BC and ITALIAN 1B and ITALIAN 1C and ITALIAN 1BC may not be taken for full credit.

**(VI)**

**ITALIAN 2A. Intermediate Italian. 4 Units.**

Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in Italian.

Prerequisite: ITALIAN 1C or ITALIAN 1BC or ITALIAN S1BC. ITALIAN 1C with a grade of C or better. ITALIAN 1BC with a grade of C or better. ITALIAN S1BC with a grade of C or better. Placement into ITALIAN 2A is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(VIII)

**ITALIAN 2B. Intermediate Italian. 4 Units.**

Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in Italian.

Prerequisite: ITALIAN 2A. ITALIAN 2A with a grade of C or better. Placement into ITALIAN 2B is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(VIII)

**ITALIAN 2C. Intermediate Italian. 4 Units.**

Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in Italian.

Prerequisite: ITALIAN 2B. ITALIAN 2B with a grade of C or better. Placement into 2C is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(VIII)

**ITALIAN 50. Topics in Italian Culture. 4 Units.**

Examines Italian culture at home and from abroad, in cinema, literature, and popular culture.

Repeatability: Unlimited as topics vary.

(IV and VIII ).

**ITALIAN 99. Special Studies in Italian. 4 Units.**

Both student and instructor arrive at the theme of the course and the critical approach to be followed in consultation. Intended to offer courses in Italian otherwise unavailable.

Repeatability: May be repeated for credit unlimited times.

**ITALIAN 150. Topics in Italian Literature and Culture. 4 Units.**

Major themes, periods, and/or movements in Italian literature and culture. Taught in English.

Repeatability: Unlimited as topics vary.

**ITALIAN 199. Tutorial in Italian Literature and Culture. 4 Units.**

The student must submit a written description of the proposed course to the instructor and the Chair prior to the beginning of the course.

Repeatability: Unlimited as topics vary.

## Japanese (JAPANESE)

### Courses

**JAPANESE 1A. Fundamental Japanese. 5 Units.**

Students develop listening, speaking, reading, and writing abilities in Japanese for meaningful communication. Content deals with daily life, society, and culture in Japan. Approximately 180 kanji (Chinese characters) are introduced in addition to the hiragana and katakana orthography.

Prerequisite: Placement into JAPANESE 1A is accepted.

Overlaps with JAPANESE S1AB.

Restriction: JAPANESE 1A and JAPANESE S1AB may not be taken for full credit.

**JAPANESE 1B. Fundamental Japanese. 5 Units.**

Students develop listening, speaking, reading, and writing abilities in Japanese for meaningful communication. Content deals with daily life, society, and culture in Japan. Approximately 180 kanji (Chinese characters) are introduced in addition to the hiragana and katakana orthography.

Prerequisite: JAPANESE 1A or JAPANESE S1AB. JAPANESE 1A with a grade of C or better. JAPANESE S1AB with a grade of C or better. Placement into JAPANESE 1B is also accepted.

Overlaps with JAPANESE S1AB, JAPANESE S1BC.

Restriction: JAPANESE 1B and JAPANESE S1AB and JAPANESE S1BC may not be taken for full credit.

**JAPANESE 1C. Fundamental Japanese. 5 Units.**

Students develop listening, speaking, reading, and writing abilities in Japanese for meaningful communication. Content deals with daily life, society, and culture in Japan. Approximately 180 kanji (Chinese characters) are introduced in addition to the hiragana and katakana orthography.

Prerequisite: JAPANESE 1B or JAPANESE S1AB. JAPANESE 1B with a grade of C or better. JAPANESE S1AB with a grade of C or better. Placement into JAPANESE 1C is also accepted.

Overlaps with JAPANESE S1BC.

Restriction: JAPANESE 1C and JAPANESE S1BC may not be taken for full credit.

**(VI)****JAPANESE S1AB. Fundamentals of Japanese. 7.5 Units.**

First half of first-year Japanese in an intensified form.

Prerequisite: Placement into JAPANESE 1A.

Overlaps with JAPANESE 1A, JAPANESE 1B.

Restriction: JAPANESE S1AB and JAPANESE 1A and JAPANESE 1B may not be taken for full credit.

**JAPANESE S1BC. Fundamentals of Japanese. 7.5 Units.**

Second half of first-year Japanese in an intensified form.

Prerequisite: JAPANESE S1AB or JAPANESE 1B. JAPANESE S1AB with a grade of C or better. JAPANESE 1B with a grade of C or better. Placement into JAPANESE 1C is also accepted.

Overlaps with JAPANESE 1C, JAPANESE 1B.

Restriction: JAPANESE S1BC and JAPANESE 1B and JAPANESE 1C may not be taken for full credit.

**(VI)****JAPANESE 2A. Intermediate Japanese. 5 Units.**

Japanese listening, speaking, reading, and writing abilities developed for meaningful communication. Content deals with daily life, society, and culture, including social issues in Japan. Approximately 180 kanji (Chinese characters) are introduced in addition to the 180 characters learned in 1A-B-C.

Prerequisite: JAPANESE 1C or JAPANESE S1BC. JAPANESE 1C with a grade of C or better. JAPANESE S1BC with a grade of C or better. Placement into JAPANESE 2A is also accepted.

Overlaps with JAPANESE S2AB.

Restriction: JAPANESE 2A and JAPANESE S2AB may not be taken for full credit.

**(VIII)**

**JAPANESE 2B. Intermediate Japanese. 5 Units.**

Japanese listening, speaking, reading, and writing abilities developed for meaningful communication. Content deals with daily life, society, and culture, including social issues in Japan. Approximately 180 kanji (Chinese characters) are introduced in addition to the 180 characters learned in 1A-B-C.

Prerequisite: JAPANESE 2A. JAPANESE 2A with a grade of C or better. Placement into JAPANESE 2B is also accepted.

Overlaps with JAPANESE S2AB.

Restriction: JAPANESE 2B and JAPANESE S2AB and JAPANESE S2BC may not be taken for full credit.

**(VIII)**

**JAPANESE 2C. Intermediate Japanese. 5 Units.**

Japanese listening, speaking, reading, and writing abilities developed for meaningful communication. Content deals with daily life, society, and culture, including social issues in Japan. Approximately 180 kanji (Chinese characters) are introduced in addition to the 180 characters learned in 1A-B-C.

Prerequisite: JAPANESE 2B or JAPANESE S2AB. JAPANESE 2B with a grade of C or better. JAPANESE S2AB with a grade of C or better. Placement into JAPANESE 2C is also accepted.

Overlaps with JAPANESE S2BC.

Restriction: JAPANESE 2C and JAPANESE S2BC may not be taken for full credit.

**(VIII)**

**JAPANESE S2AB. Intermediate Japanese. 7.5 Units.**

First half of second-year Japanese in an intensified form.

Prerequisite: JAPANESE 1C or JAPANESE S1BC. JAPANESE 1C with a grade of C or better. JAPANESE S1BC with a grade of C or better. Placement into JAPANESE 2A is also accepted.

Overlaps with JAPANESE 2A, JAPANESE 2B.

Restriction: JAPANESE S2AB and JAPANESE 2A and JAPANESE 2B may not be taken for full credit.

**(VIII)**

**JAPANESE S2BC. Intermediate Japanese. 7.5 Units.**

Second half of second-year Japanese in an intensified form.

Prerequisite: JAPANESE S2AB or JAPANESE 2B. JAPANESE S2AB with a grade of C or better. JAPANESE 2B with a grade of C or better. Placement into JAPANESE 2C is also accepted.

Overlaps with JAPANESE 2C, JAPANESE 2B.

Restriction: JAPANESE S2BC and JAPANESE 2B and JAPANESE 2C may not be taken for full credit.

**(VIII)**

**JAPANESE 3A. Advanced Japanese. 4 Units.**

Students are taught to conceptualize in Japanese as they learn to understand, read, write, and speak. Authentic Japanese texts are used. Approximately 360 kanji (Chinese characters) in addition to the 270 characters learned in 1A-B-C and 2A-B-C are introduced.

Prerequisite: JAPANESE 2C or JAPANESE S2BC or placement into JAPANESE 3A. JAPANESE 2C with a grade of C or better. JAPANESE S2BC with a grade of C or better.

**(VIII)**

**JAPANESE 3B. Advanced Japanese. 4 Units.**

Students are taught to conceptualize in Japanese as they learn to understand, read, write, and speak. Authentic Japanese texts are used. Approximately 360 kanji (Chinese characters) in addition to the 270 characters learned in 1A-B-C and 2A-B-C are introduced.

Prerequisite: JAPANESE 3A. JAPANESE 3A with a grade of C or better. Placement into JAPANESE 3B is also accepted.

**(VIII)**



**JAPANESE 3C. Advanced Japanese. 4 Units.**

Students are taught to conceptualize in Japanese as they learn to understand, read, write, and speak. Authentic Japanese texts are used. Approximately 360 kanji (Chinese characters) in addition to the 270 characters learned in first and second year are introduced.

Prerequisite: JAPANESE 3B. JAPANESE 3B with a grade of C or better. Placement into JAPANESE 3C is also accepted.

Restriction: Japanese Language Literature Majors have first consideration for enrollment.

**(VIII)****JAPANESE 100A. Classical Japanese. 4 Units.**

Introduction to classical Japanese grammar and vocabulary with emphasis on reading and analysis of basic texts.

Prerequisite: JAPANESE 3C. JAPANESE 3C with a grade of C or better

**JAPANESE 100B. Classical Japanese. 4 Units.**

Introduction to classical Japanese grammar and vocabulary with emphasis on reading and analysis of basic texts.

Prerequisite: JAPANESE 100A. JAPANESE 100A with a grade of C or better

**JAPANESE 101A. Fourth Year Japanese. 4 Units.**

Continued emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation through intensive study and analysis of a variety of texts.

Prerequisite: JAPANESE 3C

**JAPANESE 101B. Fourth Year Japanese. 4 Units.**

Continued emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation through intensive study and analysis of a variety of texts.

Prerequisite: JAPANESE 3C

**JAPANESE 115. Japanese Literature: Advanced Texts. 4 Units.**

Designed for students with near-fluency in reading Japanese. Texts include both fiction and nonfiction by important writers, and may be supplemented and contextualized where needed by literary criticism and cultural-studies texts in English.

Prerequisite: JAPANESE 101A or JAPANESE 101B or JAPANESE 101C

Repeatability: Unlimited as topics vary.

**JAPANESE 180. Topics in Japanese Literature. 4 Units.**

Special topics through directed reading in Japanese. Paper required.

Prerequisite: JAPANESE 3C. JAPANESE 3C with a grade of C or better

Repeatability: May be taken for credit 3 times as topics vary.

**JAPANESE 199. Independent Study. 1-4 Units.**

Investigation of special topics through directed reading in Japanese. Paper required.

Repeatability: May be taken for credit for 12 units.

**JAPANESE 201. Readings in Traditional Japanese Prose. 4 Units.**

Close reading of selected premodern prose texts, including tales, journals, travel journals, essays.

Prerequisite: JAPANESE 100B

Repeatability: Unlimited as topics vary.

**JAPANESE 202. Readings in Traditional Japanese Poetry or Drama. 4 Units.**

Close reading of selected premodern poetic or dramatic texts.

Prerequisite: JAPANESE 100B

Repeatability: Unlimited as topics vary.

**JAPANESE 203. Readings in Modern Japanese Literature. 4 Units.**

Texts include both fiction and nonfiction by important writers, and may be supplemented where needed by literary criticism and cultural-studies texts in English.

Prerequisite: JAPANESE 101C

Repeatability: Unlimited as topics vary.

**JAPANESE 204. Readings in Traditional Japanese Literary and Cultural Theory . 4 Units.**

Close reading of selected texts involving literary criticism and/or aesthetics.

Prerequisite: JAPANESE 100B

Repeatability: Unlimited as topics vary.

**JAPANESE 205. Readings in Japanese Religion. 4 Units.**

Close readings of selected Japanese religious texts.

Prerequisite: JAPANESE 101C

Repeatability: Unlimited as topics vary.

**JAPANESE 211A. Studies in Traditional Japanese Prose. 4 Units.**

Studies in selected areas of traditional Japanese prose. Topics addressed vary each quarter. Research paper required.

Prerequisite: JAPANESE 100B

Repeatability: Unlimited as topics vary.

**JAPANESE 211B. Studies in Traditional Japanese Prose. 4 Units.**

Studies in selected areas of traditional Japanese prose. Topics addressed vary each quarter. Research paper required.

Prerequisite: JAPANESE 100B and JAPANESE 211A

Repeatability: Unlimited as topics vary.

**JAPANESE 212A. Studies in Traditional Japanese Poetry or Drama. 4 Units.**

Studies in selected areas of traditional Japanese poetry or drama. Topics addressed vary each quarter. Research paper required.

Prerequisite: JAPANESE 100B

Repeatability: Unlimited as topics vary.

**JAPANESE 212B. Studies in Traditional Japanese Poetry or Drama. 4 Units.**

Studies in selected areas of traditional Japanese poetry or drama. Topics addressed vary each quarter. Research paper required.

Prerequisite: JAPANESE 212A

Repeatability: Unlimited as topics vary.

**JAPANESE 213A. Studies in Modern Japanese Literature. 4 Units.**

A two-quarter, in-depth look at a major author and/or issue in modern Japanese literature. Seminar format. The first quarter is devoted to reading of the requisite texts; the second quarter, to the writing of a research paper.

Prerequisite: JAPANESE 203

Repeatability: Unlimited as topics vary.

**JAPANESE 213B. Studies in Modern Japanese Literature. 4 Units.**

A two-quarter, in-depth look at a major author and/or issue in modern Japanese literature. Seminar format. The first quarter is devoted to reading of the requisite texts; the second quarter, to the writing of a research paper.

Prerequisite: JAPANESE 203 and JAPANESE 213A

Repeatability: May be repeated for credit unlimited times.

**JAPANESE 214. Studies in Japanese Literary and Cultural Theory. 4 Units.**

Studies in selected areas of Japanese literary and cultural theory. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**JAPANESE 215. Studies in Japanese Religion. 4 Units.**

Studies in selected areas of Japanese religion. Topics addressed vary each quarter. Research paper required.

Prerequisite: JAPANESE 101C

Repeatability: Unlimited as topics vary.

**JAPANESE 230. Topics in Japanese Literature and Culture. 4 Units.**

A topical study that addresses important issues in Japanese literature and culture. May focus on a specific writer or writers, or on a specific issue or set of related issues.

Prerequisite: JAPANESE 203

Repeatability: Unlimited as topics vary.

**JAPANESE 290. Independent Study. 4 Units.**

Directed research on topic determined in consultation with faculty member. A term paper or project is required.

Repeatability: May be repeated for credit unlimited times.

**JAPANESE 299. Dissertation Research. 4-12 Units.**

For Students who have been admitted to doctoral candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Judaica Studies (JUDAICA)

## Korean (KOREAN)

### Courses

**KOREAN 1A. Fundamental Korean. 5 Units.**

Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing for students with no previous background in Korean. Conducted in both English and Korean.

Prerequisite: Placement into KOREAN 1A.

Overlaps with KOREAN 1KA, KOREAN S1AB.

Restriction: KOREAN 1A and KOREAN 1KA and KOREAN S1AB may not be taken for full credit.

**KOREAN 1B. Fundamental Korean. 5 Units.**

Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing for students with no previous background in Korean. Conducted in both English and Korean.

Prerequisite: KOREAN 1A. KOREAN 1A with a grade of C or better. Placement into KOREAN 1B is also accepted.

Overlaps with KOREAN S1BC, KOREAN 1KB, KOREAN S1AB.

Restriction: KOREAN 1B and KOREAN 1KB and KOREAN S1AB and KOREAN S1BC may not be taken for full credit.

**KOREAN 1C. Fundamental Korean. 5 Units.**

Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing for students with no previous background in Korean. Conducted in both English and Korean.

Prerequisite: KOREAN 1B or KOREAN S1AB. KOREAN 1B with a grade of C or better. KOREAN S1AB with a grade of C or better. Placement into KOREAN 1C is also accepted.

Overlaps with KOREAN 1KC, KOREAN S1BC.

Restriction: KOREAN 1C and KOREAN 1KC and KOREAN S1BC may not be taken for full credit.

**(VI)****KOREAN 1KA. Fundamental Korean for Students with a Previous Background in Korean. 5 Units.**

Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing for students with a previous background in Korean. Conducted in both English and Korean.

Prerequisite: Placement into KOREAN 1KA.

Overlaps with KOREAN 1A, KOREAN S1AB.

Restriction: KOREAN 1KA and KOREAN 1A and KOREAN S1AB may not be taken for full credit.

**KOREAN 1KB. Fundamental Korean for Students with a Previous Background in Korean . 5 Units.**

Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing for students with a previous background in Korean. Conducted in both English and Korean.

Prerequisite: KOREAN 1KA. KOREAN 1KA with a grade of C or better. Placement into KOREAN 1KB is also accepted.

Overlaps with KOREAN 1B, KOREAN S1AB, KOREAN S1BC.

Restriction: KOREAN 1KB and KOREAN 1B and KOREAN S1AB and KOREAN S1BC may not be taken for full credit.

**KOREAN 1KC. Fundamental Korean for Students with a Previous Background in Korean. 5 Units.**

Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing for students with a previous background in Korean. Conducted in both English and Korean.

Prerequisite: KOREAN 1KB. KOREAN 1KB with a grade of C or better. Placement into KOREAN 1KC is also accepted.

Overlaps with KOREAN 1C, KOREAN S1BC.

Restriction: KOREAN 1KC and KOREAN 1C and KOREAN S1BC may not be taken for full credit.

**(VI)****KOREAN S1AB. Fundamentals of Korean. 7.5 Units.**

First half of first-year Korean in an intensified form.

Prerequisite: Placement into KOREAN 1A or KOREAN 1KA or KOREAN 1B or KOREAN 1KB.

Overlaps with KOREAN 1A, KOREAN 1B, KOREAN 1KA, KOREAN 1KB.

Restriction: KOREAN S1AB and KOREAN 1A and KOREAN 1KA and KOREAN 1B and KOREAN 1KB may not be taken for full credit.

**KOREAN S1BC. Fundamentals of Korean. 7.5 Units.**

Second half of first-year Korean in an intensified form.

Prerequisite: KOREAN S1AB or KOREAN 1B or KOREAN 1KB. KOREAN S1AB with a grade of C or better. KOREAN 1B with a grade of C or better. KOREAN 1KB with a grade of C or better. Placement into KOREAN 1C or KOREAN 1KC is also accepted.

Overlaps with KOREAN 1C, KOREAN 1KB, KOREAN 1KC, KOREAN 1B.

Restriction: KOREAN S1BC and KOREAN 1B and KOREAN 1KB and KOREAN 1C and KOREAN 1KC may not be taken for full credit.

**(VI)**

**KOREAN 2A. Intermediate Korean. 5 Units.**

Designed to develop writing and reading skills as well as communicative skills in authentic situations for students without previous initial background in Korean. Students also introduced to aspects of Korean culture as related to lesson topics and basic Chinese characters.

Prerequisite: KOREAN 1C or KOREAN S1BC. KOREAN 1C with a grade of C or better. KOREAN S1BC with a grade of C or better. Placement into KOREAN 2A is also accepted.

Overlaps with KOREAN 2KA.

(VIII)

**KOREAN 2B. Intermediate Korean. 5 Units.**

Designed to develop writing and reading skills as well as communicative skills in authentic situations for students without previous initial background in Korean. Students also introduced to aspects of Korean culture as related to lesson topics and basic Chinese characters.

Prerequisite: KOREAN 2A. KOREAN 2A with a grade of C or better. Placement into KOREAN 2B is also accepted.

Overlaps with KOREAN 2KB.

(VIII)

**KOREAN 2C. Intermediate Korean. 5 Units.**

Designed to develop writing and reading skills as well as communicative skills in authentic situations for students without previous initial background in Korean. Students also introduced to aspects of Korean culture as related to lesson topics and basic Chinese characters.

Prerequisite: KOREAN 2B. KOREAN 2B with a grade of C or better. Placement into KOREAN 2C is also accepted.

Overlaps with KOREAN 2KC.

(VIII)

**KOREAN 2KA. Intermediate Korean for Students with a Previous Background in Korean . 5 Units.**

Designed to develop writing and reading skills as well as communicative skills in authentic situations for students with previous background in Korean. Students also introduced to aspects of Korean culture as related to lesson topics and basic Chinese characters.

Prerequisite: KOREAN 1KC or KOREAN S1BC. KOREAN 1KC with a grade of C or better. KOREAN S1BC with a grade of C or better. Placement into KOREAN 2KA is also accepted.

Overlaps with KOREAN 2A.

(VIII)

**KOREAN 2KB. Intermediate Korean for Students with a Previous Background in Korean . 5 Units.**

Designed to develop writing and reading skills as well as communicative skills in authentic situations for students with previous background in Korean. Students also introduced to aspects of Korean culture as related to lesson topics and basic Chinese characters.

Prerequisite: KOREAN 2KA. KOREAN 2KA with a grade of C or better. Placement into KOREAN 2KB is also accepted.

Overlaps with KOREAN 2B.

(VIII)

**KOREAN 2KC. Intermediate Korean for Students with a Previous Background in Korean. 5 Units.**

Designed to develop writing and reading skills as well as communicative skills in authentic situations for students with previous background in Korean. Students also introduced to aspects of Korean culture as related to lesson topics and basic Chinese characters.

Prerequisite: KOREAN 2KB. KOREAN 2KB with a grade of C or better. Placement into KOREAN 2KC is also accepted.

Overlaps with KOREAN 2C.

(VIII)

**KOREAN 3A. Advanced Korean. 4 Units.**

Focuses on developing advanced reading/writing and translation skills with additional instruction in Chinese characters.

Prerequisite: KOREAN 2C or KOREAN 2KC or KOREAN S2BC. KOREAN 2C with a grade of C or better. KOREAN 2KC with a grade of C or better. KOREAN S2BC with a grade of C or better. Placement into KOREAN 3A is also accepted.

(VIII)

**KOREAN 3B. Advanced Korean. 4 Units.**

Focuses on developing advanced reading, writing, and translation skills.

Prerequisite: KOREAN 3A or KOREAN 2C or KOREAN 2KC or KOREAN S2BC. KOREAN 3A with a grade of C or better. KOREAN 2C with a grade of C or better. KOREAN 2KC with a grade of C or better. KOREAN S2BC with a grade of C or better. Placement into KOREAN 3B is also accepted.

(VIII)

**KOREAN 3C. Advanced Korean. 4 Units.**

Focuses on developing advanced reading, writing, and translation skills.

Prerequisite: KOREAN 2C or KOREAN 2KC or KOREAN S2BC or KOREAN 3A or KOREAN 3B. KOREAN 2C with a grade of C or better. KOREAN 2KC with a grade of C or better. KOREAN S2BC with a grade of C or better. KOREAN 3A with a grade of C or better. KOREAN 3B with a grade of C or better. Placement into KOREAN 3C is also accepted.

(VIII)

**KOREAN 101A. Fourth-Year Korean. 4 Units.**

Continued emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation through intensive study and analysis of a variety of modern texts.

Prerequisite: KOREAN 3A or KOREAN 3B or KOREAN 3C. KOREAN 3A with a grade of C or better. KOREAN 3B with a grade of C or better. KOREAN 3C with a grade of C or better.

**KOREAN 115. Korean Literature: Advanced Texts. 4 Units.**

Designed for students with near-fluency in reading Korean. Readings include modern Korean literary works (poetry, prose, and drama) by important writers. Emphasis is on the interpretation of the texts and writings that interpret those texts in the original language.

Prerequisite: KOREAN 101A or KOREAN 101B or KOREAN 101C

Repeatability: Unlimited as topics vary.

**KOREAN 199. Independent Study. 1-4 Units.**

Investigation of special topics through directed reading in Korean. Paper required.

Repeatability: May be taken for credit for 12 units.

## Language Science (LSCI)

### Courses

**LSCI 1. Languages of the World. 4 Units.**

The world has over 6,000 languages, with an exuberant variety of sounds, words, grammars. Introduction to a representative (about eight), drawn from every continent. Students not expected to learn these languages, but to explore and study their structure and complexity.

(VIII)

**LSCI 2. Discovering Language. 4 Units.**

Explores language's pervasiveness and diversity; demonstrates ways linguistics illuminates language's crucial--albeit hidden--societal role. Issues: self- and group-identification, language death, language in legal and educational settings. Illustrations: spoken and signed languages, varieties of English, Native American languages.

(VII)

**LSCI 3. Introduction to Linguistics. 4 Units.**

Emphasis on the notion that language is a remarkable achievement of the human mind. Current insights into the nature of language. Survey of various subfields of linguistics. Introduction to linguistic analysis.

(III and V.B ).

**LSCI 10. Introduction to Phonology. 4 Units.**

Basic concepts in phonetic description and phonological analysis.

(III and V.B ).

**LSCI 20. Introduction to Syntax. 4 Units.**

Basic concepts in syntactic description and grammatical analysis.

Prerequisite: LSCI 3

(III and V.B ).

**LSCI 43. Introduction to Symbolic Logic. 4 Units.**

An introduction to the symbolism and methods of the logic of statements, including evaluation of arguments by truth tables, the techniques of natural deduction, and semantic tableaux.

Same as LPS 30, PHIL 30.

(Vb)

**LSCI 51. Acquisition of Language. 4 Units.**

What children say, what they mean, and what they understand. Theories about the learning of language by one-, two-, and three-year-olds. Comparison of kinds of data on which these theories are based.

Same as PSYC 56L.

(III)

**LSCI 51B. Foundations of Bilingual Education and Bilingualism. 4 Units.**

Provides a comprehensive overview of current issues in bilingual education and bilingualism. Topics include dimensions of bilingualism, the effects of bilingualism on children's linguistic and cognitive development, bilingual education programs, literacy, special needs, and assessment.

Same as EDUC 52, HUM 52.

**LSCI 68. Introduction to Language and Culture. 4 Units.**

Explores what the study of language can reveal about ourselves as bearers of culture. After introducing some basic concepts, examines how cultural knowledge is linguistically organized and how language might shape our perception of the world.

Same as ANTH 2D.

(III)

**LSCI 99. Special Topics in Language Science. 4 Units.**

Special Topics at lower-division level.

Repeatability: Unlimited as topics vary.

**LSCI 102. Formal Languages and Automata. 4 Units.**

Formal aspects of describing and recognizing languages by grammars and automata. Parsing regular and context-free languages. Ambiguity, nondeterminism. Elements of computability; Turing machines, random access machines, undecidable problems, NP-completeness.

Prerequisite: (ICS 46 or CSE 46) and MATH 2B and ICS 6B and ICS 6D. ICS 46 with a grade of C or better. CSE 46 with a grade of C or better

Same as CS 162.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment. Language Science Majors have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**LSCI 106M. Computational Models of Language Learning. 4 Units.**

Focuses on using computational models to investigate questions related to language learning. Topics include computational models of language acquisition, principles underlying models of language learning and language change, computational learning theory, and modeling information extraction from language by humans.

Prerequisite: LSCI 151. LSCI 151 with a grade of A- or better

Concurrent with LSCI 206C.

**LSCI 107M. Computational Methods for Language Research. 4 Units.**

Focuses on computational methods useful for language research. Students become familiar with software and programming languages used for extracting information from electronic datasets and for creating basic simulations of linguistic cognition. No prior programming experience assumed.

Prerequisite: PSYC 150 or LSCI 155 or PSYC 156A or LSCI 151

Same as PSYC 157M.

**LSCI 109. Special Topics in Computational Linguistics. 4 Units.**

Topics in computational linguistics.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**LSCI 111. Intermediate Phonology. 4 Units.**

Fundamentals of phonological theory. Intensive practice in phonological analysis.

Prerequisite: Recommended: LSCI 10

Concurrent with LING 211.

**LSCI 115. Introduction to Phonetics. 4 Units.**

Introduces students to fundamental concepts of phonetics. The sound systems of selected languages around the world, including that of English, are described in detail. Students are trained to work with speech sound recognition, phonetic transcription, and language sound production.

Prerequisite: LSCI 3

**LSCI 119. Special Topics in Phonetics/Phonology. 4 Units.**

Topics in Phonetics/Phonology.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**LSCI 121. Intermediate Syntax. 4 Units.**

Examines various phenomena within a generative theory of syntax, focusing on the nature of syntactic rules, representations, and constraints. Introduces methods of experimental syntax, providing students hands-on opportunity to recognize the connection(s) between theory and experiential results.

Prerequisite: LSCI 20

**LSCI 124. Current Topics in Syntactic Theory. 4 Units.**

Research seminar in syntax. Intensive study of a small number of well-defined topics which have had significant impact on the development of syntactic theory.

Repeatability: May be repeated for credit unlimited times.

**LSCI 129. Special Topics in Syntax. 4 Units.**

Topics in Syntax.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**LSCI 139. Special Topics in Morphology. 4 Units.**

Topics in Morphology.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**LSCI 141. Topics in Philosophy of Language. 4 Units.**

Selected topics in the philosophy of language, e.g., the nature of meaning, mechanisms of reference, speech acts.

Repeatability: Unlimited as topics vary.

Same as LPS 145, PHIL 145.



**LSCI 142. Introduction to Logic. 4 Units.**

Introduction to sentence logic, including truth tables and natural deduction; and to predicate logic, including semantics and natural deduction.

Same as LPS 104, PHIL 104.

**LSCI 143. Introduction to Formal Semantics. 4 Units.**

Introduces students to the analytical tools used in the investigation of natural language semantics. Topics include the truth-conditional approach to meaning, compositionality, scope and anaphora, generalized quantifier theory, and intensionality.

Prerequisite: LPS 30 or PHIL 30 or LPS 104 or PHIL 104. LPS 30 with a grade of A- or better. PHIL 30 with a grade of A- or better. LPS 104 with a grade of A- or better. PHIL 104 with a grade of A- or better

**LSCI 145A. Elementary Set Theory. 4 Units.**

An introduction to the basic working vocabulary of mathematical reasoning. Topics include sets, Boolean operations, ordered n-tuples, relations, functions, ordinal and cardinal numbers.

Same as LPS 105A, PHIL 105A.

**LSCI 145B. Metalogic. 4 Units.**

Introduction to formal syntax (proof theory) and semantics (model theory) for first-order logic, including the deduction, completeness, compactness, and Löwenheim-Skolem theorems.

Prerequisite: PHIL 105A

Same as LPS 105B, PHIL 105B.

Overlaps with MATH 150.

**LSCI 145C. Undecidability and Incompleteness. 4 Units.**

Introduction to the formal theory of effective processes, including recursive functions, Turing machines, Church's thesis, and proofs of Gödel's incompleteness theorem for arithmetic, and Church's undecidability theorem for first-order logic.

Prerequisite: PHIL 105B

Same as LPS 105C, PHIL 105C.

Overlaps with MATH 152.

Concurrent with LPS 205C.

**LSCI 149. Special Topics in Semantics. 4 Units.**

Topics in Semantics.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**LSCI 151. Acquisition of Language II. 4 Units.**

Focuses on native language learning, exploring the way in which infants and very young children unconsciously uncover the rich systematic knowledge of their native language. Examines both experimental and computational studies that quantitatively investigate the 'how' of language acquisition.

**LSCI 151B. Bilingual Acquisition. 4 Units.**

Focuses on different forms of bilingualism, including bilingual first language acquisition, early second language acquisition, and late second language acquisition. Research techniques discussed include theoretical, experimental, and computational methods.

Prerequisite: LSCI 151 or PSYC 156A. Placement via consent of the instructor is also accepted.

**LSCI 151S. Second Language Acquisition . 4 Units.**

Examines a number of theoretical perspectives that attempt to explain second language learning with a focus on adult learners. How universal constraints, individual differences, and social factors influence the task of learning a second language as an adult.

Prerequisite: LSCI 3 or SPAN 113B

**LSCI 152. Acquisition of Language III . 4 Units.**

Focuses on native language learning, exploring the way in which infants and very young children unconsciously uncover the rich systematic knowledge of their native language. Examines both experimental and computational studies that quantitatively investigate the 'how' of language acquisition.

**LSCI 155. Psychology of Language. 4 Units.**

Examines language using the tools of experimental psychology. From sounds to words to spoken and written sentences, explores how language is used in real time, and how its use reveals how it is represented in the mind.

Prerequisite: PSYC 7A or PSCI 9 or PSYC 9B or PSCI 11B or LSCI 3

Same as PSYC 150.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Language Science Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**LSCI 158. Language and the Brain . 4 Units.**

Research analysis on biological bases of human linguistic capacity. Development, focusing on hemispheric specialization, plasticity; localization of specific linguistic functions in adults, with emphasis on study of aphasias; relation of linguistic capacity to general cognitive capacity, considering research on retardation.

Prerequisite: (PSYC 7A or PSB 9 or PSYC 9A or PSB 11A) and (PSYC 9B or PSB 11B or BIOL 35 or BIOL N110 or BIOL N115A)

Same as BIOL N160, PSYC 161.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Biological Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**LSCI 159. Special Topics in Psycholinguistics. 4 Units.**

Topics in Psycholinguistics.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**LSCI 164A. Topics in Romance Languages. 4 Units.**

Topics in Romance Languages.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**LSCI 164B. French Phonetics. 4 Units.**

Study of the sound structure of French. Introduction to elements of general phonetics, contrastive (French/English) phonetics, and French phonetics and phonology. Designed to help students improve their pronunciation. Also serves as a preparatory course for language teaching.

Prerequisite: FREN 1C

**LSCI 165B. Structure of Japanese. 4 Units.**

An overview of the linguistic features of modern Japanese. Provides students with a systematic introduction to the nature and characteristics of the language.

Same as EAS 123.

**LSCI 165L. Language Change, Acquisition, and Complexity. 4 Units.**

Focuses on models of language change, acquisition, and complexity, looking at the connections between them to explain empirical data relating to the form of existing languages and how languages change over time. Emphasis is placed on computational and mathematical models.

Prerequisite: PSYC 156A. PSYC 156A with a grade of A- or better

**LSCI 168J. Improvisation, Language, and Culture. 4 Units.**

Addresses improvisation, both in performance and in everyday life. Examines improvisation as the 'flexible regulation' of everyday behavior by exploring different scholarly treatments of language and interaction, and working on developing actual theatrical improvisation skills.

Same as ANTH 151A.

Restriction: Upper-division students only.

**LSCI 168S. Language and Social Cognition. 4 Units.**

Explores the relationship between language and cognition in social and cultural contexts. The overall goal is to think through how language structure and use impact how individuals perceive, think about, and understand the world around them.

Same as ANTH 150A.

Restriction: Anthropology Majors have first consideration for enrollment.

**LSCI 169. Special Topics in Language Studies. 4 Units.**

Topics in Language Studies.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**LSCI 172. History of English. 4 Units.**

Traces the history of English from its roots through its earliest written records and into the present, including fundamental changes in morphology, phonology, syntax, semantics, and vocabulary, as well as social, cultural, and historical forces affecting language.

Prerequisite: LSCI 3

**LSCI 175. Language Origins: Evolution, Genetics, and the Brain. 4 Units.**

Examines how human language(s) may have originated. Studies pertinent techniques (reconstruction) and addresses related questions, including is our language faculty inborn (i.e., genetically encoded)? Can brain imaging and population genetics research help to unlock this mystery of human evolution?.

Same as ANTH 152A, GLBC 105, HIST 135G.

**LSCI 176. Introduction to Pidgins and Creoles. 4 Units.**

Explores the linguistic structures of pidgin and creole languages and examines major theories for the surprisingly high degree of similarity found across pidgin and creole languages. Includes sociolinguistic and field methods.

Prerequisite: LSCI 3 or SPAN 113A

**LSCI 179. Special Topics in Historical Linguistics. 4 Units.**

Topics in Historical Linguistics.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**LSCI 182V. Language and Literacy. 4 Units.**

Addresses the linguistic principles and processes that underlie oral and written language proficiency. Emphasis is on how to use phonology, morphology, orthography, semantics, syntax, and pragmatics to support literacy and oral language development for K-12 students.

Same as EDUC 151, PSCI 192V.

Restriction: Language Science Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Education Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**LSCI 189. Special Topics in Applied Language Science: Writing Skills for Language Science. 4 Units.**

Topics in Applied Language Science.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**LSCI 195A. Language Science Research I. 4 Units.**

Provides students with in-depth experience in different facets of research in language science. It includes theoretical, behavioral, computational, and/or applied language science topics and methodologies.

Prerequisite: Permission of faculty advisor. If this is not the same faculty member as the course instructor, the faculty advisor will coordinate with the course instructor when it comes to assessing the student's research process at the end of each quarter.

Repeatability: May be repeated for credit unlimited times.

**LSCI 195B. Language Science Research II. 4 Units.**

Provides students with in-depth experience in different facets of research in language science. It includes theoretical, behavioral, computational, and/or applied language science topics and methodologies.

Prerequisite: Permission of faculty advisor. If this is not the same faculty member as the course instructor, the faculty advisor will coordinate with the course instructor when it comes to assessing the student's research process at the end of each quarter.

Repeatability: May be repeated for credit unlimited times.

**LSCI 195C. Language Science Research III. 4 Units.**

Provides students with in-depth experience in different facets of research in language science. It includes theoretical, behavioral, computational, and/or applied language science topics and methodologies.

Prerequisite: Permission of faculty advisor. If this is not the same faculty member as the course instructor, the faculty advisor will coordinate with the course instructor when it comes to assessing the student's research process at the end of each quarter.

Repeatability: May be repeated for credit unlimited times.

**LSCI 195W. Writing Skills for Language Science. 4 Units.**

Focuses on written technical communication skills in language science. Topics include the scientific publication process (focusing on research abstracts), how to write for pieces of different lengths, and writing for different audiences.

(Ib)

**LSCI 198. Directed Group Study. 4 Units.**

Directed study with Linguistics faculty.

Repeatability: Unlimited as topics vary.

**LSCI 199. Independent Study. 4 Units.**

Independent research with Linguistics faculty. Students may enroll for only one 199 each quarter.

Repeatability: May be repeated for credit unlimited times.

**LSCI 201A. Language Science Research. 1.3 Unit.**

Involves colloquia and scientific reports by faculty, students, and visitors. Students are exposed to current language science research and gain experience in active listening and scientific discourse.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Language Science Majors only.

**LSCI 201B. Language Science Research . 1.3 Unit.**

Involves colloquia and scientific reports by faculty, students, and visitors. Students are exposed to current language science research and gain experience in active listening and scientific discourse.

Grading Option: In Progress (Letter Grade with S/U).

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Language Science Majors only.

**LSCI 201C. Language Science Research. 1.3 Unit.**

Involves colloquia and scientific reports by faculty, students, and visitors. Students are exposed to current language science research and gain experience in active listening and scientific discourse.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Language Science Majors only.

**LSCI 202A. Skills for Language Science I. 4 Units.**

Focuses on computational skills for language science research. Topics include computational literacy, programming languages, and database interfaces that are useful for language science research, allowing for general scripting and file manipulation, and enabling statistical analysis and data visualization.

Restriction: Graduate students only.

**LSCI 202B. Skills for Language Science II. 4 Units.**

Introduction to the scientific publication process and practice of scientific writing skills.

Prerequisite: LSCI 202A

Restriction: Graduate students only.

**LSCI 202C. Skills for Language Science III. 4 Units.**

Introduction to scientific presentation for audiences of different backgrounds and practice of scientific presentations skills.

Prerequisite: LSCI 202B

Repeatability: May be taken for credit for 4 units as topics vary.

Restriction: Graduate students only.

**LSCI 202D. Advanced Skills for Language Science . 4 Units.**

Practice of advanced professional writing skills, including writing of grants, journal publications, research profiles, academic CVs, teaching statements, and cover letters. Students bring their own academic material to workshop.

Prerequisite: LSCI 202A and LSCI 202B and LSCI 202C. LSCI 202A with a grade of B or better. LSCI 202B with a grade of B or better. LSCI 202C with a grade of B or better

Restriction: Graduate students only.

**LSCI 206C. Computational Models of Language Learning. 4 Units.**

Focuses on computational models of native language learning, exploring how probabilistic learning and inference fare on difficult case studies within language acquisition. In all cases, grounds the learning models in available empirical data and considers their psychological plausibility.

Prerequisite: LSCI 251. LSCI 251 with a grade of B- or better

Same as PSYC 245M.

Restriction: Graduate students only.

Concurrent with LSCI 106M.

**LSCI 209. Special Topics in Computational Linguistics. 1-4 Units.**

Focuses on ongoing research in linguistics. Variable units based on course content, as determined by Department. May be repeated for credit as topic varies.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

Concurrent with LSCI 109.

**LSCI 239. Special Topics in Morphology. 4 Units.**

Topics in morphology.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**LSCI 248M. Modal Logic. 4 Units.**

Introduction to modal logic methods and their application.

Restriction: Graduate students only.

**LSCI 250. Psycholinguistics. 4 Units.**

Examines how language is used in real time, and how its use reveals how it is represented in the mind and the brain.

Restriction: Graduate students only.

**LSCI 250B. Bilingualism. 4 Units.**

Examines how bilingualism interfaces with language representation, language use, and language development.

Restriction: Graduate students only.

**LSCI 250H. Heritage Language Acquisition. 4 Units.**

Examines how heritage languages are represented in speakers' minds, processed in real time, and acquired.

Restriction: Graduate students only.

**LSCI 251. Language Acquisition. 4 Units.**

Focuses on native language learning, exploring the way in which infants and very young children unconsciously uncover the rich systematic knowledge of their native language. Examines both experimental and computational studies that quantitatively investigate the 'how' of language acquisition.

Restriction: Graduate students only.

**LSCI 251A. Atypical Acquisition. 4 Units.**

Focuses on different types of atypical acquisition, including acquisition in special populations and acquisition under atypical circumstances. Research techniques discussed include theoretical, experimental, and computational methods.

Restriction: Graduate students only.

Concurrent with LSCI 151A.

**LSCI 253M. Experimental Methods for Language Research. 4 Units.**

Focuses on experimental methods useful for language research. Students become familiar with software and programming languages used for implementing and analyzing behavioral experiments.

Restriction: Graduate students only.

**LSCI 259. Special Topics in Psycholinguistics. 4 Units.**

Topics in Psycholinguistics. May be repeated for credit as topic varies.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**LSCI 265L. Language Change, Acquisition, and Complexity. 4 Units.**

Focuses on models of language change, acquisition, and complexity, looking at the connections between them to explain empirical data relating to the form of existing languages and how languages change over time. Emphasis is placed on computational and mathematical models.

Restriction: Graduate students only.

Concurrent with LSCI 165L.

**LSCI 281L. Language Learning with Digital Media. 4 Units.**

Provides students with a graduate-level introduction to key issues of digital media in second-language teaching and learning.

Restriction: Graduate students only.

**LSCI 281S. Second Language Acquisition and Teaching. 4 Units.**

Explores the prevailing paradigms that seek to account for how adults learn second languages (L2s) in instructed settings.

Restriction: Graduate students only.

**LSCI 290. Dissertation Research. 4-12 Units.**

Dissertation Research.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**LSCI 299. Independent Study. 1-12 Units.**

Independent study. Research with language science faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

# Latin (LATIN)

## Courses

### **LATIN 1A. Fundamentals of Latin. 5 Units.**

Elements of Latin grammar, syntax, and vocabulary.

Overlaps with LATIN S1AB.

Restriction: LATIN 1A and LATIN S1AB may not be taken for full credit.

### **LATIN 1B. Fundamentals of Latin. 5 Units.**

Elements of Latin grammar, syntax, and vocabulary.

Prerequisite: LATIN 1A. LATIN 1A with a grade of C or better

Overlaps with LATIN S1AB, LATIN S1BC.

Restriction: LATIN 1B and LATIN S1AB and LATIN S1BC may not be taken for full credit.

### **LATIN 1C. Fundamentals of Latin. 5 Units.**

Introduction to reading texts, including study of the poetry of Catullus and selected readings.

Prerequisite: LATIN 1B. LATIN 1B with a grade of C or better

Overlaps with LATIN S1BC.

Restriction: LATIN 1C and LATIN S1BC may not be taken for full credit.

## (VI)

### **LATIN 99. Special Studies in Latin. 1-4 Units.**

Lower-division level independent research with Latin faculty.

Repeatability: May be repeated for credit unlimited times.

### **LATIN 100. Topics in Classical Latin. 4 Units.**

Selected readings in Classical Latin prose and poetry. Authors may include Cicero, Caesar, Ovid, Catullus, and others. Selections from prose and poetry will be read each quarter. Grammar and syntax review included.

Prerequisite: LATIN 1C. LATIN 1C with a grade of C or better. Placement into Latin 100 is also accepted.

Repeatability: Unlimited as topics vary.

### **LATIN 103. Seminar in Latin Prose. 4 Units.**

Specialized and focused study of a particular Latin prose author or topic.

Prerequisite: LATIN 100

Repeatability: Unlimited as topics vary.

### **LATIN 104. Seminar in Latin Poetry. 4 Units.**

Specialized and focused study of a particular topic or author in Latin poetry.

Prerequisite: LATIN 100

Repeatability: Unlimited as topics vary.

### **LATIN 198. Directed Group Study. 1-4 Units.**

Special topics in Roman culture and civilization through directed reading and research.

Repeatability: May be repeated for credit unlimited times.

### **LATIN 199. Independent Studies in Latin. 1-4 Units.**

Independent research with Latin faculty.

Repeatability: May be repeated for credit unlimited times.

## Law (LAW)

## Linguistics (LINGUIS)

### Courses

**LINGUIS 150. Acquisition of Language II. 4 Units.**

Focuses on native language learning, exploring the way in which infants and very young children unconsciously uncover the rich systematic knowledge of their native language. Examines both experimental and computational studies that quantitatively investigate the 'how' of language acquisition.

Prerequisite: PSYCH 56L or LINGUIS 51

Same as PSYCH 156A.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

## Literary Journalism (LIT JRN)

### Courses

**LIT JRN 20. Introduction to Literary Journalism. 4 Units.**

Reading of selected texts to explore the ways in which literary journalism and related nonfiction modes formulate experience. Students complete a range of writing projects.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Literary Journalism Majors have first consideration for enrollment.

#### (IV)

**LIT JRN 21. Reporting for Literary Journalism. 4 Units.**

Instruction and hands-on training in how to interview, report, research, and collect the types of information needed to write literary journalism.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Literary Journalism Majors have first consideration for enrollment.

**LIT JRN 100. Advanced Reporting. 4 Units.**

Practical engagement with advanced reporting techniques of Literary Journalism, emphasizing the importance of thorough and effective research in the production of high-quality journalistic writing. Prepares students to make good decisions about where and how to publish their writing.

Prerequisite: LIT JRN 21

**LIT JRN 101A. Studies in the History, Theory, and Ethics of Literary Journalism. 4 Units.**

Lectures and discussion on topics that explore the historical and theoretical dimensions of literary journalism, with particular emphasis on the evolution of ethics in the field.

Prerequisite: LIT JRN 21 and LIT JRN 20 and (ENGLISH 28A or ENGLISH 28B or ENGLISH 28C or ENGLISH 28D or ENGLISH 28E or COM LIT 60A or COM LIT 60B or COM LIT 60C or ENGLISH 8 or ENGLISH 10 or ENGLISH 11 or ENGLISH 12 or ENGLISH 15 or ENGLISH 16 or ENGLISH 17)

**LIT JRN 101BW. Literary Journalism Core Writing Workshop. 4 Units.**

Writing workshops in announced specialized genres that students will both study and practice. Examples include 'The Memoir,' 'Review Writing,' 'The Editorial,' 'Writing Biography,' 'The Profile,' and 'Political Writing.'

Prerequisite: LIT JRN 101A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 3 times as topics vary.

Restriction: Upper-division students only. Students may enroll in one LITJ 101BW course per quarter.

#### (Ib)



**LIT JRN 103. Lectures on Topics in Literary Journalism. 4 Units.**

A series of lectures on, and discussions of, announced topics in literary journalism and the literature of fact. Examples include 'Travel Literary Journalism'; 'Literature of True Crime'; 'Narratives in the Digital Age'; 'Journalism on the Edge'.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Recommended: Upper-division students only.

**LIT JRN 197. Community Reporting . 4 Units.**

Directed group study in which students work with an instructor to report and write about community news in a newsroom-style format. Students will partner with local publications to pitch, market, and publish their stories.

Prerequisite: Satisfactory completion of lower-division writing requirement.

Repeatability: May be repeated for credit unlimited times.

**LIT JRN 198. Special Topics. 4 Units.**

Directed group study of selected topics.

Repeatability: Unlimited as topics vary.

**LIT JRN 199. Reading and Conference. 1-4 Units.**

To be taken only when the materials to be studied lie outside the normal run of departmental offerings.

Repeatability: May be repeated for credit unlimited times.

## Logic and Philosophy of Science (LPS)

### Courses

**LPS 29. Critical Reasoning. 4 Units.**

Introduction to analysis and reasoning. The concepts of argument, premise, and conclusion, validity and invalidity, consistency and inconsistency. Identifying and assessing premises and inferences. Deductive versus inductive reasoning, and introduction to the probability calculus. Evaluating definitions. Informal fallacies.

Same as PHIL 29.

(II and Vb ).

**LPS 30. Introduction to Symbolic Logic. 4 Units.**

An introduction to the symbolism and methods of the logic of statements, including evaluation of arguments by truth tables, the techniques of natural deduction, and semantic tableaux.

Same as LSCI 43, PHIL 30.

(Vb)

**LPS 31. Introduction to Inductive Logic. 4 Units.**

Philosophical questions concerning the foundations of scientific inference, e.g., the traditional problem of induction, the Goodman paradox, the concept of cause, Mill's method of inductive reasoning, probability calculus, different interpretations of probability, and their interaction in inductive reasoning.

Same as PHIL 31.

(II, Va)

**LPS 40. The Nature of Scientific Inquiry. 4 Units.**

Investigates the nature, scope, and status of scientific knowledge and the methods used to acquire it. Uses concrete historical examples from a variety of scientific fields to identify distinctive features of the scientific enterprise and explore their significance.

(II)

**LPS 60. The Making of Modern Science. 4 Units.**

Surveys the history of science and mathematics since the Scientific Revolution, examining central developments both chronologically and thematically, as well as investigating their significance for contemporary philosophical debates about the role and status of current scientific theories.

Same as HIST 60.

**(GE II or GE IV ).**

**LPS H80. Scientific Realism and Instrumentalism. 4 Units.**

Explores competing views of the character and status of theoretical knowledge in science, including challenges to and defenses of the view that contemporary scientific theories offer straightforward and accurate descriptions of how things stand in otherwise inaccessible domains of nature.

Restriction: Campuswide Honors Collegium students only.

**(II)**

**LPS H81. What is Space? . 4 Units.**

Historical, philosophical, scientific exploration of the concept of 'space.' Questions of interest include: What kind of a thing is space? How can we know what space is like? How is space different from time.

Restriction: Campuswide Honors Collegium students only.

**(II)**

**LPS 91. The Philosophy of Sex. 4 Units.**

Discusses the origins of biological sex, dynamics of sexual selection, sex differences in humans, and the construction of gender in human societies. Seeks to understand the role social values play in the creation of science.

Same as PHIL 91.

Overlaps with LPS H91.

**(III)**

**LPS H91. The Philosophy and Biology of Sex. 4 Units.**

Covers the origins of biological sex, dynamics of sexual selection, the evolution and cultural creation of sexual behavior in humans, and the construction of gender in human societies.

Restriction: Campuswide Honors Collegium students only.

**(II and III ).**

**LPS H95. Jurisprudence and Constitutional Law. 4 Units.**

Applies competing theories of the nature of law and legal reasoning to evaluate decisions of the U.S. Supreme Court in controversial areas of constitutional law such as free speech, privacy, sexual conduct, affirmative action, and political campaign contributions.

Restriction: Campuswide Honors Collegium students only.

**(III)**

**LPS 100W. Writing Philosophy. 4 Units.**

Discussion of those aspects of writing of special importance in philosophy, e.g., philosophical terminology, techniques for evaluating arguments, philosophical definitions and theories. At least 4,000 words of assigned composition based on philosophical readings.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as PHIL 100W.

Restriction: Upper-division students only.

**(Ib)**

**LPS 102. Introduction to the Theory of Knowledge. 4 Units.**

A study of one or more of the basic issues in epistemology, e.g., the role of perception in the acquisition of knowledge, the nature of evidence, the distinction between belief and knowledge, and the nature of truth and certainty.

Same as PHIL 102.

**LPS 104. Introduction to Logic. 4 Units.**

Introduction to sentence logic, including truth tables and natural deduction; and to predicate logic, including semantics and natural deduction.

Same as LSCI 142, PHIL 104.

**LPS 105A. Elementary Set Theory. 4 Units.**

An introduction to the basic working vocabulary of mathematical reasoning. Topics include sets, Boolean operations, ordered n-tuples, relations, functions, ordinal and cardinal numbers.

Same as LSCI 145A, PHIL 105A.

**LPS 105B. Metalogic. 4 Units.**

Introduction to formal syntax (proof theory) and semantics (model theory) for first-order logic, including the deduction, completeness, compactness, and Löwenheim-Skolem theorems.

Prerequisite: PHIL 105A

Same as LSCI 145B, PHIL 105B.

Overlaps with MATH 150.

**LPS 105C. Undecidability and Incompleteness. 4 Units.**

Introduction to the formal theory of effective processes, including recursive functions, Turing machines, Church's thesis, and proofs of Gödel's incompleteness theorem for arithmetic, and Church's undecidability theorem for first-order logic.

Prerequisite: PHIL 105B

Same as LSCI 145C, PHIL 105C.

Overlaps with MATH 152.

Concurrent with LPS 205C.

**LPS 106. Topics in Logic . 4 Units.**

Selected topics in mathematical or philosophical logic.

Prerequisite: PHIL 105B or LPS 105B

Repeatability: Unlimited as topics vary.

Same as PHIL 106.

**LPS 108. Topics in Induction, Probability, and Decision Theory. 4 Units.**

Selected topics in induction, probability, and decision theory.

Repeatability: Unlimited as topics vary.

Same as PHIL 108.

**LPS 113. Topics in Modern Philosophy. 4 Units.**

Focuses on the works of central philosophical figures of modern Philosophy (e.g., Descartes, Leibniz, Hobbes, Locke, Hume, Kant) or on the treatment of one or more central philosophical problems by a number of these figures.

Repeatability: Unlimited as topics vary.

Same as PHIL 113.

**LPS 115. Topics in History of Analytic Philosophy. 4 Units.**

Review of central theories or figures in the history of analytic philosophy. Emphasis on writings of Frege, Russell, Schlick, Carnap, and Quine. Topics include the nature of meaning and truth, the synthetic/analytic distinction, and scientific knowledge.

Repeatability: Unlimited as topics vary.

Same as PHIL 115.

**LPS 120. Topics in Metaphysics. 4 Units.**

Examines central philosophical questions concerning our own fundamental nature and that of the world around us (e.g., causation and necessity, determination, free will, personal identity, the mind-body problem).

Repeatability: Unlimited as topics vary.

Same as PHIL 120.

**LPS 121. Topics in the Theory of Knowledge . 4 Units.**

One or more topics in the theory of knowledge, e.g., the nature of rational justification, of perceptual knowledge, of a priori knowledge.

Repeatability: Unlimited as topics vary.

Same as PHIL 121.

**LPS H123. What is Disease?. 4 Units.**

Explores philosophical issues associated with scientific efforts to understand and explain disease.

Restriction: Campuswide Honors Collegium students only.

**(II)****LPS H125. What Is Time? . 4 Units.**

Engages the question 'what is time?' by drawing on physics, philosophy, fiction, film, and psychology. Organized around understanding and addressing the tension between time as represented in physics and our immediate temporal experience.

Restriction: Campuswide Honors Collegium students only.

**(III)****LPS 140. Topics in Philosophy of Science. 4 Units.**

Selected topics in contemporary philosophy of science, e.g., the status of theoretical entities, the confirmation of theories, the nature of scientific explanation.

Repeatability: Unlimited as topics vary.

Same as PHIL 140.

**LPS 141A. Topics in Philosophy of Physics. 4 Units.**

Selected topics in the philosophy of physics, e.g., the interpretation of quantum mechanics, the nature of spacetime, the problem of quantum field theories.

Repeatability: Unlimited as topics vary.

Same as PHIL 141A.

**LPS 141B. Geometry and Spacetime. 4 Units.**

An examination of the foundations of the special theory of relativity, with emphasis on the geometry of Minkowski spacetime, and its relation to both Euclidean and non-Euclidean (hyperbolic) plane geometries.

Prerequisite: MATH 2D and (MATH 3A or MATH 6G)

Same as PHIL 141B.

**LPS 141C. Philosophy of Quantum Mechanics. 4 Units.**

An examination of the standard von Neumann-Dirac formulation of quantum mechanics. The quantum measurement problem is discussed along with several proposed solutions, including GRW, many-worlds, man-minds, and Bohm's theory.

Same as PHIL 141C.

**LPS 141D. Probability and Determinism. 4 Units.**

An examination of a cluster of interrelated issues concerning probability, determinism, logic, and the foundations of quantum mechanics.

Prerequisite: MATH 2D and (MATH 3A or MATH 6G)

Same as PHIL 141D.

**LPS H141. Honors Philosophy of Quantum Mechanics. 4 Units.**

An examination of the standard von Neumann-Dirac formulation of quantum mechanics. The quantum measurement problem is discussed along with several proposed solutions, including GRW, many-worlds, man-minds, and Bohm's theory.

Overlaps with LPS 141C.

Restriction: Campuswide Honors Collegium students only.

**LPS 142W. Writing/Philosophy of Biology. 4 Units.**

Philosophy of biology, e.g., scientific method in biology, the structure of evolutionary theory, teleology, ethics, and evolution. Course work includes one 4,000-word and four 1,000-word papers.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as PHIL 142W, BIOL E142W.

Restriction: Juniors only.

**(Ib)**

**LPS 143. Topics in Philosophy of Psychology. 4 Units.**

Selected topics in the philosophy of psychology, e.g., the nature of psychological explanation, reductionism, issues in cognitive, behavioral, and neuroscience.

Repeatability: Unlimited as topics vary.

Same as PHIL 143, PSYC 123P.

Restriction: Psychology Majors have first consideration for enrollment. Philosophy Majors have first consideration for enrollment.

**LPS 144. Topics in Philosophy of Social Science. 4 Units.**

Selected topics in the philosophy of the social sciences, e.g., Is their goal to understand behavior or to predict and control it?; Are they normative and the natural sciences not?; Do they incorporate philosophical doctrines about language and mind?.

Repeatability: May be taken for credit for 4 units as topics vary.

Same as PHIL 144.

**LPS 145. Topics in Philosophy of Language. 4 Units.**

Selected topics in the philosophy of language, e.g., the nature of meaning, mechanisms of reference, speech acts.

Repeatability: Unlimited as topics vary.

Same as LSCI 141, PHIL 145.

**LPS 146. Topics in Philosophy of Logic. 4 Units.**

Selected topics in the philosophy of logic, e.g., the nature of logical truth and our knowledge of it, the status of propositions, definite descriptions, and existential presuppositions.

Repeatability: Unlimited as topics vary.

Same as PHIL 146.

**LPS 147. Topics in Philosophy of Mathematics. 4 Units.**

Selected historical and contemporary topics in the philosophy of mathematics, e.g., mathematical truth and ontology, mathematical knowledge, the nature and role of proof, the workings of mathematics in application.

Repeatability: Unlimited as topics vary.

Same as PHIL 147.

**LPS 199. Independent Study. 1-4 Units.**

Independent research with Logic and Philosophy of Science faculty.

Repeatability: May be taken for credit for 12 units.

**LPS 200. Topics in Logic and Philosophy of Science. 4 Units.**

Studies in selected areas of Logic and Philosophy of Science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**LPS 205A. Set Theory. 4 Units.**

The basic working vocabulary of mathematical reasoning. Topics include: sets, Boolean operations, ordered n-tuples, relations, functions, ordinal and cardinal numbers.

Same as PHIL 205A.

**LPS 205B. Metalogic. 4 Units.**

Formal syntax (proof theory) and semantics (model theory) for first-order logic, including the deduction, completeness, compactness, and Loewenheim-Skolem theorems.

Prerequisite: PHIL 205A or LPS 205A

Same as PHIL 205B.

**LPS 205C. Undecidability and Incompleteness. 4 Units.**

Formal theory of effective processes, including recursive function, Turing machines, Church's thesis, proofs of Goedel's incompleteness theorem for arithmetics, and Church's undecidability for first-order logic.

Prerequisite: PHIL 205B or LPS 205B

Same as PHIL 205C.

Restriction: Graduate students only.

Concurrent with LPS 105C.

**LPS 206. Topics in Logic . 4 Units.**

Studies in selected areas of logic. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 206.

**LPS 213. Topics in Modern Philosophy. 4 Units.**

Studies in selected areas of modern philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 213.

**LPS 215. Topics in Analytic Philosophy. 4 Units.**

Studies in selected areas of analytic philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 215.

**LPS 220. Topics in Metaphysics. 4 Units.**

Studies in selected areas of metaphysics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 220.

**LPS 221. Topics in Epistemology. 4 Units.**

Studies in selected areas of epistemology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 221.

**LPS 221A. Medical Epistemology. 4 Units.**

Analysis of epistemological issues concerning medical research and healthcare. Topics may include medical evidence, transmission of medical knowledge in the doctor-patient interaction, medical expertise, epistemology of medical disagreement, classification of illness, well-being, philosophy of pain, or medical decision making.

Same as PHIL 221A.

Restriction: Graduate students only.

**LPS 232. Topics in Political and Social Philosophy. 4 Units.**

Studies in selected areas of political and social philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 232.

**LPS 240. Topics in Philosophy of Science. 4 Units.**

Studies in selected areas of philosophy of science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 240.

**LPS 241. Topics in Philosophy of Physics. 4 Units.**

Studies in selected areas of philosophy of physics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 241.

**LPS 242. Topics in Philosophy of Biology. 4 Units.**

Studies in selected areas of philosophy of biology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 242.

**LPS 243. Topics in Philosophy of Psychology. 4 Units.**

Selected topics in the philosophy of psychology, e.g., the nature of psychological explanation, reductionism, issues in cognitive, behavioral, and neuroscience.

Repeatability: Unlimited as topics vary.

Same as PHIL 243, PSYC 231P.

**LPS 244. Topics in Philosophy of Social Science. 4 Units.**

Studies in selected areas of philosophy and social science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 244.

**LPS 245. Topics in Philosophy of Language. 4 Units.**

Studies in selected areas of philosophy of language. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 245.

**LPS 246. Topics in Philosophy of Logic. 4 Units.**

Studies in selected areas of philosophy of logic. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 246.

**LPS 247. Topics in Philosophy of Mathematics. 4 Units.**

Studies in selected areas of philosophy of mathematics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 247.

**LPS 289. Logic and Philosophy of Science Workshop. 1-4 Units.**

A two- or three-quarter-long workshop on selected topics in logic and philosophy of science.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**LPS 298. Independent Study. 4-12 Units.**

Independent research with Logic and Philosophy of Science Faculty.

Repeatability: May be taken for credit for 12 units.

**LPS 299. Directed Research. 1-12 Units.**

Directed study with Logic and Philosophy of Science Faculty.

Repeatability: May be repeated for credit unlimited times.

**LPS 399. University Teaching. 4-12 Units.**

Required of and limited to Teaching Assistants.

Repeatability: May be taken for credit for 12 units.

## Management (MGMT)

### Courses

**MGMT 1. Introduction to Business and Management. 4 Units.**

Rigorous overview of major business functions and management topics. Addresses the global and fast-changing environment in which modern business enterprises operate as well as the challenges posed by concerns about sustainable growth, ethics, and social responsibility.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 4A. Basic Economics for Managers I. 4 Units.**

Microeconomic principles for managers. Useful applications of basic economic principles to situations in business as well as in various professions. Materials fee.

Overlaps with ECON 23, ECON 20A.

Restriction: Business Administration Majors have first consideration for enrollment. For School of Social Sciences majors, MGMT 4A may not be used as a substitute for ECON 20A.

(III)

**MGMT 4B. Basic Economics for Managers II. 4 Units.**

Macroeconomic principles for managers. Useful applications of basic economic principles to situations in business as well as in various professions.

Prerequisite: MGMT 4A or ECON 20A

Overlaps with ECON 20B.

Restriction: Business Administration Majors have first consideration for enrollment. For School of Social Sciences majors, MGMT 4B may not be used as a substitute for ECON 20B.

(III)

**MGMT 5. Management of Contemporary Organizations. 4 Units.**

Equips students with working knowledge of several major subject areas within the context of business and society studies. Topics include: role of management in organizations, corporate social responsibility and responsiveness, ethics and values in business, government regulation, and international business.



**MGMT 7. Statistics for Business Decision Making. 4 Units.**

Basics of data analysis and the fundamental notion of statistical inference emphasizing applications to administrative and management decision problems. Classical estimation and hypotheses testing, regression, correlation, analysis of variance, nonparametric methods, and statistical probability.

Overlaps with STAT 7, STAT 8, ECON 15A, ECON 15B.

Restriction: Business Administration Majors have first consideration for enrollment.

(Va)

**MGMT 10. Business Management in the World Today. 4 Units.**

Accounting scandals, e-commerce, and globalization are only a few examples that show the profound impact of business practices on individuals and on society at large. Provides students with a broad overview of business functions and management practices.

**MGMT 30A. Principles of Accounting I. 4 Units.**

First in a two course introductory series. Emphasis on financial accounting concepts and practices essential to the administration of business enterprises; including recording and valuation of financial transactions, and preparation, analysis, and interpretation of financial statements.

Overlaps with ECON 25.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 30B. Principles of Accounting II. 4 Units.**

Second in a two-course introductory series. Emphasis is on the introduction of managerial accounting concepts and techniques as tools to aid management in carrying out the primary internal functions of planning, control, and decision-making.

Prerequisite: MGMT 30A

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 90. Special Topics in Management. 1 Unit.**

Studies in selected areas of management. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**MGMT 101. Management Science. 4 Units.**

Concepts and methods of management science, which applies mathematical modeling and analysis to management problems. Topics include linear and integer programming, project scheduling, inventory management, queuing analysis, decision analysis, and simulation.

Prerequisite: MGMT 7

Restriction: Upper-division students only. Business Administration Majors have first consideration for enrollment.

**MGMT 102. Managing Organizational Behavior. 4 Units.**

Basic theory and concepts which provide the manager with tools for understanding behavior of people in organizations. Areas such as individual, group, and organizational determinants of attitudes, turnover, and job performance.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 105. Introduction to Marketing. 4 Units.**

Basic marketing concepts; discussion of the role marketing plays in modern society. Topics include industrial and consumer marketing, promotion, distribution, and pricing theory.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 107. Introduction to Management Information Systems. 4 Units.**

Information Technology (IT) continues to drive rapid productivity growth and structural changes in the economy. Topics include what IT is, and how companies can use IT to improve business processes, enhance customer services, and gain competitive advantage over rivals.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 109. Introduction to Managerial Finance. 4 Units.**

Basics of financial administration. Capital budgeting, cost of capital, cash budgeting, working capital management, and long-term sources of funds. Provides a basic understanding of issues and techniques involved in financial decision making.

Prerequisite: MATH 2B and MGMT 30A

Overlaps with ECON 134A.

Restriction: Upper-division students only. Business Administration Majors have first consideration for enrollment.

**MGMT 110. Strategic Management. 4 Units.**

Addresses management of the entire business. Role of the general manager in organizations, industry analysis, core competencies, growth through vertical integration, innovation, acquisition and diversification, globalization, strategy implementation, and the ethical and moral responsibility of a manager.

Prerequisite: MGMT 102 and MGMT 105 and MGMT 109

Overlaps with ECON 147B.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 111. China and the Global Order. 4 Units.**

Introduces students to China's economic and military relations with the world, assessment of likelihood for conflict, and how to strategically manage business risk from regional conflict. Includes an original documentary series and engaging discussion.

**(VIII)****MGMT 113. New Ventures: A Course in Entrepreneurship. 4 Units.**

Introduction to the survival and growth of new ventures. Methods include analysis of live cases, guest speakers, discussion, and field projects with contemporary new ventures to learn about new venture management and surviving the liabilities of newness.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 115. Lean Startup. 4 Units.**

Based on the well-known Lean Launchpad course currently used by a growing segment of the startup world. Students work in teams to ideate, develop a Business Model Canvas, and gather customer/market feedback.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 123. Learning to Think Creatively and Innovate. 4 Units.**

Learn about your own thinking process; develop the ability to think both logically and creatively and to understand how emotions affect your thinking. Class sessions involve discussion and experiential exercises. Business problems and issues are used for discussion and exercises.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 124. Human Resources Management. 4 Units.**

Theory and practice of managing human resources. Students will identify and analyze HR dilemmas, apply labor law, and design systems and processes to develop the human resources needed to help organizations achieve their goals.

Restriction: Business Administration Majors have first consideration for enrollment. Business Information Mgmt Majors have first consideration for enrollment.

**MGMT 125. Negotiations. 4 Units.**

The objective is to assist students in developing an understanding of different theoretical perspectives and develop their skills in negotiating. Exploration of feelings and beliefs about negotiation, negotiation skills, and putting theory into action by practicing new negotiation skills.

Prerequisite: MGMT 102

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 126. Foundations of Teams. 4 Units.**

Social and psychological processes that detract from effective teamwork and collaboration. Tools to understand how to be a better team member are introduced. Provides the foundation for students to become effective team leaders and to manage difficult team situations.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 128. International Management. 4 Units.**

Impact of different cultures and political/economic systems on assumptions, expectations, and organizational practices relevant to conducting business in different national settings. Understanding of the challenges of cross-national management and resources utilized to work and conduct business outside the United States.

Restriction: Business Administration Majors have first consideration for enrollment.

**(VIII)****MGMT 129. Leadership. 4 Units.**

Case analyses, free-form discussion, and written assignments designed to develop critical thinking skills, as well as knowledge of approaches to differing leadership challenges. Experiential exercises encourage students to develop their ability to innovate, foster collaboration, manage conflict, and value diversity.

Prerequisite: MGMT 102

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 131A. Intermediate Accounting I. 4 Units.**

First course in a series of two intermediate-level courses in financial accounting theory and practice. Concepts include the measurement, valuation and reporting of current and long-term assets, current liabilities, and revenue recognition issues.

Prerequisite: MGMT 30A and MGMT 30B

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 131B. Intermediate Accounting II. 4 Units.**

Second course in a series of two intermediate-level courses in financial accounting theory and practice. Concepts include the measurement, valuation, and reporting of long-term liabilities and contingencies, accounting for stockholders' equity, and the Statement of Cash Flows.

Prerequisite: MGMT 131A

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 131C. Intermediate Accounting III. 4 Units.**

Third in a three-part series (A, B, and C). Focuses on developing knowledge related to investments, debt/equity issues, accounting for income taxes, pensions, leases, and revenue recognition.

Prerequisite: MGMT 131B

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 132A. Individual Taxation. 4 Units.**

Fundamentals of federal income taxation pertaining to individuals. Topics include income, deductions, credits, property transactions, and the impact of taxes on business and investment decisions.

Prerequisite: MGMT 30B

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 133. Corporate and Partnership Taxation. 4 Units.**

Fundamentals of federal income taxation pertaining to partnerships and corporations, including subchapter S corporations. Emphasis on the tax issues associated with formation, operation, and termination of these entities.

Prerequisite: MGMT 132A

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 136. Accounting Information Systems & Spreadsheets. 4 Units.**

Fundamentals of accounting information systems including internal controls and transaction processing cycles. Development of efficient spreadsheets as applied to financial and managerial accounting concepts.

Prerequisite: MGMT 30B

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 137. Advanced Accounting. 4 Units.**

Covers advanced concepts in accounting theory and practice. Topics include business combinations, consolidated financial statements, foreign exchange transactions, international, and governmental/nonprofit accounting standards.

Prerequisite: MGMT 131B

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 138. Auditing. 4 Units.**

An introduction to auditing practice with emphasis on the verification of financial statements and related information. Topics include professional ethics, assessment of audit risk, study and evaluation of internal control, gathering and evaluating audit evidence, and audit reporting.

Prerequisite: MGMT 131B

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 141. Investments. 4 Units.**

Foundations of investment management. Theory and empirical evidence related to portfolio theory, market efficiency, asset pricing models, factor models, and option pricing theory. Students are expected to combine market research results and electronic information sources to create optimal investment strategies.

Prerequisite: MGMT 109

Overlaps with ECON 132A.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 144. Multinational Finance. 4 Units.**

Focuses on financial issues facing multinational corporations, the most important of which is the management of foreign exchange risk. Introduction to investments and financing decisions in international capital markets.

Prerequisite: MGMT 109 and (ECON 20A or MGMT 4A) and (ECON 20B or MGMT 4B)

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 146A. Introduction to the Real Estate Process. 4 Units.**

Introductory survey course providing a working knowledge of the real estate market, both residential and commercial. Topics include real estate economics, appraisal, feasibility, investment, tax considerations, financing, and development. Lectures and cases, with supplemental presentations by real estate professionals.

Restriction: Upper-division students only. Business Administration Majors have first consideration for enrollment.

**MGMT 147. Applied Financial Valuation. 4 Units.**

Case study course designed to confront students with real-world financial valuation problems. Situations are chosen to enhance students' understanding of the application of finance theory. The principal focus is on estimating the value of firms and projects in diverse settings.

Prerequisite: MGMT 109 and MGMT 141

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 149. Derivatives. 4 Units.**

Introduction to financial derivatives. Covers forward contracts, futures, swaps, and options. Applications of these instruments, including pricing and risk management, are emphasized.

Prerequisite: MGMT 109

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 150. Consumer Behavior. 4 Units.**

Application of the behavioral sciences to understanding buyer behavior. Topics include perception, memory, affect, learning, persuasion, motivation, behavioral decision theory, social and culture influences, and managerial implications.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 151. Marketing Research. 4 Units.**

Research to aid managerial decisions for products and services; problem formulation, research design, data collection, sampling, statistical analyses, managerial recommendations, and implementation in several real-world settings.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 153. Sales Management. 4 Units.**

Designed for students interested in learning about sales force management and personal selling by firms engaged in business-to-business and consumer goods/services marketing. Covers advantages of personal selling, how to perform sales calls, challenges of sales managers, roles of buying centers.

Restriction: Business Information Mgmt Majors have first consideration for enrollment. Business Administration Majors have first consideration for enrollment.

**MGMT 154. Global Marketing. 4 Units.**

Students are exposed to the challenges and opportunities facing marketers in the international marketplace. Special attention is given to the management of cultural differences in product development, distribution systems, pricing, and promotion.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 155. Brand Management. 4 Units.**

Introduction to issues in planning, implementing, and evaluating brand strategies, relevant theories, models, and tools for the making of brand decisions; application of these principles.

Prerequisite: MGMT 105

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 156. Pricing Strategy . 4 Units.**

Provides a framework for designing and analyzing pricing strategies. Emphasizes role of pricing in the marketing-mix decisions and broader marketing strategy of a firm. Incorporates study of various economic, psychological, competitive, and organizational foundations that enter into effective pricing decisions.

Prerequisite: MGMT 105

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 157. Marketing on the Internet. 4 Units.**

Recent developments in interactive technologies indicate that marketing on the internet is becoming a serious business activity, with exponential growth. How to do marketing on the Internet and identify the key issues pertaining to the marketing process.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 165. U.S. Healthcare Systems. 4 Units.**

Providers, suppliers, payers, consumers, and the unique market dynamics among these players. Structure, organization, and financing of health care. The health care industry's relationship to the overall economy will be explored.

Restriction: Business Administration Majors have first consideration for enrollment. Business Information Mgmt Majors have first consideration for enrollment.

**MGMT 166. Business of Medicine. 4 Units.**

In order to improve the quality and efficiency of health care delivery one must understand the design and management of health care operations. Opportunities for innovation and changes needed to design a simple, accessible, fair, and effective health care system.

Restriction: Business Administration Majors have first consideration for enrollment. Business Information Mgmt Majors have first consideration for enrollment.

**MGMT 171. Social Media. 4 Units.**

Covers theoretical aspects and business applications of social media tools including blogs, wikis, social networking platforms, immersive environments, and other social computing technologies. Also covers business value of social-media-enabled processes.

Restriction: Business Administration Majors have first consideration for enrollment. Business Information Mgmt Majors have first consideration for enrollment.

**MGMT 173. Business Intelligence for Analytical Decisions. 4 Units.**

BI from both managerial and technical perspectives. Learn to apply a variety of data mining techniques to learn business intelligence embedded in data, and apply that intelligence to run your business more efficiently. These techniques are useful in different areas.

Prerequisite: MGMT 107

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 174. Database Management and Applications. 4 Units.**

Query, manipulate, and understand data and learn about leading edge applications for databases. Database fundamentals including entity relationship design, creating database tables, normalization, and data querying. Contemporary applications of database using case studies. Applications include data warehousing, data mining.

Prerequisite: MGMT 107

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 176. Digital Strategies. 4 Units.**

Covers business strategies for firms that make technology products. Insights are applicable not only to industries that make information and technology goods but also to industries that leverage digitization and network effects for their products.

Restriction: Business Administration Majors only.

**MGMT 178. Management of Information Technology. 4 Units.**

Strategic use and impact of information technology (IT) in organizations. Covers what IT is, and how it works, business value of IT, and IT strategies that organizations can employ to create value.

Prerequisite: MGMT 107

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 182. Supply Chain Management. 4 Units.**

Flows of materials and information among all of the firms that contribute to a product or service. Forecasting, demand management, logistical networks, inventory management, supplier contracting, sourcing, information technology, flexibility, globalization, and performance management.

Prerequisite: MGMT 101

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 189. Operations Management. 4 Units.**

Managing the productive resources, from which raw materials as inputs are being transformed into useful outputs of final products and services. Explanation of issues pertaining to both manufacturing and services-oriented systems.

Prerequisite: MGMT 101

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 190. Special Topics in Management. 2-4 Units.**

Studies in selected areas of management. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 191W. Business Communication. 4 Units.**

Provides students with a solid foundation in business communication. Emphasis is placed on improving students' written and oral communication skills to help them succeed in (1) upper-division Business Administration courses, (2) graduate school, and (3) work and career activities.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Business Administration Majors only.

(Ib)

**MGMT 192. Business Law. 4 Units.**

A study of the legal environment of business. Topics include contracts, agency, partnerships, corporations, and other basic principles of law as they relate to business transactions.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 194. Financial Statement Analysis. 4 Units.**

Study of financial statements and their related footnotes; tools and procedures common to financial statement analysis; relationships among business transactions, environmental forces (political, economic, social), and reported financial statement information; how financial statement information can help solve certain business problems.

Prerequisite: MGMT 30A and MGMT 30B

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 198A. Administrative Internship. 4 Units.**

Selected undergraduates serve as managers within administrative units on campus with a three-quarter course which complements the intern experience. Topics include management ethics, study of non- and for-profit institutions, career management, and the changing nature of the workforce.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**MGMT 198B. Administrative Internship. 4 Units.**

Selected undergraduates serve as managers within administrative units on campus with a three-quarter course which complements the intern experience. Topics include management ethics, study of non- and for-profit institutions, career management, and the changing nature of the workforce.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**MGMT 198C. Administrative Internship. 4 Units.**

Selected undergraduates serve as managers within administrative units on campus with a three-quarter course which complements the intern experience. Topics include management ethics, study of non- and for-profit institutions, career management, and the changing nature of the workforce.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**MGMT 199. Independent Study. 1-4 Units.**

Individual study under the direction of a selected faculty member.

Repeatability: May be repeated for credit unlimited times.

## Management MBA (MGMTMBA)

### Courses

**MGMTMBA 200. Thinking Strategically in the Digital Age. 4 Units.**

Focuses on the strategic and organizational challenges that a rapidly changing environment poses to the firm's management and frames them according to Merage's strategic emphasis on analytical decision making, innovation, and information technology.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Business Administration Majors only.

**MGMTMBA 201A. Business Analytics: Decision-Making. 4 Units.**

Methods of statistical inference, emphasizing applications to administrative and management decision problems. Topics include classical estimation and hypothesis testing, regression, correlation, analysis of variance, decision analysis, and forecasting.

Prerequisite: Courses in basic statistics with probability.

Restriction: Graduate students only. Business Administration Majors only.

**MGMTMBA 201B. Management Science. 4 Units.**

An introduction to computer-based models for decision making. Topics include optimization (linear programming, integer programming, network flow models) and computer simulation. Uses spreadsheets extensively, including Excel built-in and add-in packages.

Restriction: Graduate students only. Business Administration Majors only.

**MGMTMBA 202. Organizational Leadership for Management. 4 Units.**

Develops a better understanding of the causes and consequences of individual and group behavior, and the frameworks by which to analyze and understand complex organizations; and enhances the skills required to manage and lead an organization.

Restriction: Graduate students only. Business Administration Majors only.

**MGMTMBA 203A. Financial Reporting. 4 Units.**

Involves the development, analysis, and interpretation of financial accounting information for external reporting purposes.

Restriction: Graduate students only. Business Administration Majors only.

**MGMTMBA 203B. Driving Profitability Through Management Accounting. 4 Units.**

Teaches core skills for making vital strategic and tactical decisions (e.g., outsourcing; adding/dropping product lines), to maximize profitability while managing risk. Also covers operational and managerial tools (e.g., budgeting, planning, cost-volume-profit analysis) to drive strategy implementation and incentivize employees.

Prerequisite: MGMTMBA 203A or MGMT FE 203A

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 204A. Microeconomics for Management in the Digital Age. 4 Units.**

Provides basic tools for analyzing economic decisions of consumers and firms. Topics include demand and supply analysis, production and cost theory, perfect competition, monopoly, market failures, and introductory game theory.

Restriction: Graduate students only. Business Administration Majors only.

**MGMTMBA 204B. Macroeconomics for Management. 4 Units.**

Introduces use of macroeconomic analysis to manage the business cycle for competitive advantage. Such 'business cycle-sensitive' management is explored within the context of marketing, operations management, HRM, merger and acquisition activity, and capital financing and expenditures.

Prerequisite: MGMTMBA 204A or MGMT FE 204A

Restriction: Graduate students only. Business Administration Majors only.

**MGMTMBA 205. Marketing Principles. 4 Units.**

Introduction to the field of marketing. Objectives include developing familiarity with fundamental concepts, theories, and techniques in marketing, and acquainting students with the type of decisions made by marketing managers including customer targeting, product, pricing, distribution, promotion, and research.

Restriction: Graduate students only. Business Administration Majors only.

**MGMTMBA 207. Competing with Digital: Technology, Analytics, and Platforms. 4 Units.**

Focuses on the technological and managerial issues surrounding the development and use of IT in organizations. Examines role of technology in organizations, how technology can be used to execute an organization's business strategy and to enable new, innovative business strategies.

Restriction: Graduate students only. Business Administration Majors only.

**MGMTMBA 208. Operational Excellence: Processes, Models, and Analytics. 4 Units.**

Introduction to strategic and tactical issues in production and operations management. A blend of quantitative and qualitative considerations. Topics include product planning, process design, capacity management, production planning, inventory control, distribution management, just-in-time manufacturing, quality management.

Restriction: Graduate students only. Business Administration Majors only.

**MGMTMBA 209A. Managerial Finance. 4 Units.**

Introduces students to financial theory and concepts. The main topics covered are time value of money, valuation of stocks and bonds, capital budgeting, portfolio theory, capital structure choice.

Prerequisite: MGMTMBA 201A and MGMTMBA 203A and MGMTMBA 204A

Restriction: Graduate students only. Business Administration Majors only.



**MGMTMBA 209B. Investments. 4 Units.**

Foundations of investment management. Theory and empirical evidence related to portfolio theory, market efficiency, asset pricing models, factor models, and option pricing theory. Students are expected to combine market research results and electronic information sources to create optimal investment strategies.

Prerequisite: MGMTMBA 209A or MGMT FE 209A

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 210. Strategy: Foundations and Dynamics. 4 Units.**

Provides conceptual frameworks and techniques to analyze and develop firm strategies. Through case analysis and discussion, helps improve strategic thinking by developing frameworks by which to assess, evaluate, and respond to different business situations.

Prerequisite: MGMTMBA 200 and MGMTMBA 202 and MGMTMBA 205 and MGMTMBA 209A

Restriction: Graduate students only. Business Administration Majors only.

**MGMTMBA 211. MBA Proseminar.**

Provides students in the Merage School Full-time MBA Program with information and practical skills for success in the MBA program, and for business career planning.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 213. New Venture Management. 4 Units.**

Teaches students how to launch and manage a new business by providing an overview of the start-up process, including how to identify new business opportunities and how to develop a sound operating model, value new ventures, and understand capital financing.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 214. Entrepreneurship: Planning the New Venture. 4 Units.**

Project course in which student teams develop a business plan to launch a new venture. The final business plan is presented to an expert panel.

Prerequisite: (MGMTMBA 202 or MGMT FE 202) and (MGMTMBA 205 or MGMT FE 205) and (MGMTMBA 210 or MGMT FE 210)

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 215. Global Competitive Strategy. 4 Units.**

Explores advanced topics in managing the geographic scope of the firm: locating activities in the right places, which markets to penetrate, horizontal integration across countries, and multinational partnering.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 217. Competitive Intelligence. 4 Units.**

The course focuses on how to design a competitive intelligence program which is a core foundation upon which competitive strategies and execution tactics are developed, assessed, and modified.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 218. Business Dynamics. 4 Units.**

Enhances students' analytical skills by analyzing complex challenges that businesses face and to quickly implement a winning response.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 220. Organizational Change. 4 Units.**

Focuses on the implementation of change, including identifying the features of successful change in organizations of varying sizes and configurations, with an emphasis on the reasons why individuals resist or embrace change.

Prerequisite: MGMTMBA 202 or MGMT FE 202

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 225. Negotiations. 4 Units.**

Using a combination of theory and practice via negotiation simulations, students expand their repertoire of negotiating skills and develop their ability to analyze different negotiation situations and contexts.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 228. International Management. 4 Units.**

Introduction to the effects of different national cultures, political and economic systems on the assumptions, expectations, organizational practices, and organizational forms needed to conduct cross-national organizational work.

Prerequisite: MGMTMBA 202 or MGMT FE 202

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 229. Leadership Strategies. 4 Units.**

Provides insight/perspectives about the study and development of leadership. Helps students answer three questions: Where am I currently as a leader? What tools can I use to improve my leadership? What is my plan for the future as a leader. Materials fee.

Prerequisite: MGMTMBA 202 or MGMT FE 202. MGMTMBA 202 with a grade of C or better. MGMT FE 202 with a grade of C or better

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 231A. Financial Statement Analysis and Valuation I. 4 Units.**

Develops skills essential to using financial statements for business analysis by examining financial information quality, profitability and risk analysis, earnings management, revenue recognition, asset recognition and valuation, and how financial reporting is related to the business environment and managerial incentives.

Prerequisite: MGMTMBA 203A or MGMT FE 203A. MGMTMBA 203A with a grade of C or better. MGMT FE 203A with a grade of C or better

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 243. Bonds and Fixed Income. 4 Units.**

Fixed-income markets include treasury bonds, corporate bonds, and asset-backed securities. Focuses on techniques and methodologies for valuing different types of debt as well as their uses.

Prerequisite: (MGMTMBA 209A or MGMT FE 209A) and (MGMTMBA 209B or MGMT FE 209B)

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 244. Multinational Finance. 4 Units.**

Focuses on financial issues facing multinational corporations, the most important of which is the management of foreign exchange risk. Other topics include investments and financing decisions in international capital markets.

Prerequisite: MGMTMBA 209A or MGMT FE 209A

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 245. FinTech and the Digital Economy for Business. 4 Units.**

Provides working knowledge of the role of IT-enabled innovation in financial markets to help students acquire an understanding of broad economic issues that are of wide applicability in many areas of FinTech. Both qualitative analysis and quantitative applications are explored.

Restriction: Master of Business Admin Degree students only.

**MGMTMBA 247. Venture Capital and Private Equity. 4 Units.**

Geared to students who are seeking a career in finance and/or in working with venture capital firms, private equity/buyout firms, investment banks, commercial lenders, mezzanine fund investors, corporate finance, and entrepreneurial firms.

Restriction: Master of Business Admin Degree students only.

**MGMTMBA 248. Corporate Valuation. 4 Units.**

Studies cases that expand concepts covered in the introductory corporate finance course and focuses on estimating the value of firms and projects in diverse settings.

Prerequisite: (MGMTMBA 209A or MGMT FE 209A) and (MGMTMBA 209B or MGMT FE 209B)

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 249. Derivatives. 4 Units.**

Studies financial derivatives instruments, including forward contracts, futures, swaps, and options. Advanced applications of these instruments, including pricing and risk management, are emphasized.

Prerequisite: MGMTMBA 209A or MGMT FE 209A

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 250. Consumer Behavior. 4 Units.**

Examines the consumer decision-making process with an emphasis on application of concepts and research findings from behavioral sciences for solution of marketing problems. Includes models of consumer decision-making, information processing theories, and sociological influences on consumer decision-making.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 251A. Marketing Research. 4 Units.**

Covers conducting marketing research to generate consumer insights that will drive sales, market share, and profitability and/or realize other quantitative objectives. Discusses problem formulation, data collection, statistical analyses, formulating managerial recommendations, implementation, and how research is used by companies.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 252D. New Product Development. 4 Units.**

Designed to introduce the new product development process and techniques to identify markets, develop new product ideas, measure consumer preferences, position and design new products, as well as test them prior to launch. Analytical thinking and techniques are emphasized.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 254. Global Marketing. 4 Units.**

Provides an understanding of the problems and perspectives of marketing across national boundaries, and develops analytical abilities for structuring and controlling marketing programs related to overseas business. Financial, legal, and cultural barriers to international marketing are emphasized.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 257. Marketing on the Internet. 4 Units.**

Examines the impact of the Internet on traditional methods of doing marketing, and explores its existing and future uses. Discusses how to capitalize on and increase the Internet's utility as a tool that can increase marketing effectiveness, efficiency, and competitiveness.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 262. Managing Nonprofits. 4 Units.**

Focuses on the similarities and differences between for-profit and nonprofit organizations, with emphasis on the management of nonprofits. Topics include: marketing, fundraising, staffing, management/director relationships, use of volunteers, and emerging career opportunities.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 263. Economics of Information. 4 Units.**

Provides students with an understanding of fundamental economic principles governing information technology industries. Particularly, implications for optimal pricing strategies, determinants/consequences of market structure, and the role and rationale for government intervention and the implications for business strategy.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 270. Data Camp for Managers. 2 Units.**

Provides an overview of R for basic data analytics and visualization with hands-on training using Data Camp. This project is meant to foreshadow the analysis that students will be doing in their electives.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 274. Data and Programming for Analytics. 4 Units.**

Challenges and teaches students to handle data that come in a variety of forms and sizes. Guides students through the whole data management process, from initial data acquisition to final data analysis.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 276. Analytics and Technology Consulting. 4 Units.**

Focuses on elements of analytics and personalized engagement. Students work on a project using a real-life business problem and data to get hands-on understanding.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 277. Blockchain and Cryptocurrency. 2 Units.**

Provides students with an introduction to and an architectural understanding of 'why' and 'how' Blockchain was created, an overview of altcoins, and provide an understanding of the challenges and risks involved with this new Blockchain technology and cryptocurrency landscape.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 279. Digital Strategies and Markets. 4 Units.**

Examines how online social media are impacting organizations and markets. Topics include collective intelligence, online social influence, social networks, and social media monetization. The target audience consists of students interested in IT consulting, competitive strategy, marketing, and entrepreneurship.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 283. Decision Analysis. 4 Units.**

Models of preferences and uncertainty; exercises in creative problem solving. Assessment and use of preference models (von Neumann-Morgenstern expected utility and measurable value functions) for private, public, and not-for-profit decision making. Assessment and use of subjective probabilities in decision making.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 285. Supply Chain Analytics. 4 Units.**

Introduces students to the use of advanced analytics and data-driven methods to successfully manage uncertainty in supply chains, meeting customer needs in the most timely and cost effective manner, and driving business disruptions through innovations.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 286. Fundamentals of Business Analytics. 4 Units.**

Focuses on the business understanding, on the process of business analytics, and teaching a framework to understand the key drivers that could be fed into a mathematical model. Emphasizes how to make use of information to drive digital change.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 287. Project Management. 4 Units.**

Examines the fundamental components of project management and its role in the modern corporation. Emphasis on how to initiate, implement, control, and terminate a project. Use of computer package for project management.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 288. Predictive Analytics for Business. 4 Units.**

Deals with predicting entities, such as demand for a product or service (forecasting) and predicting membership of known groups (classification). Blends methodologies of forecasting and data mining and focuses on the application of these methods to managerial problems and decision-making.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 290. Field Studies in Management. 2-4 Units.**

Each quarter a number of special topic seminars are offered in the 290 series. Examples of possible topics include Communication in Organizations, Power and Authority in Organizations, International Management, Health Care Administration, Real Estate Development.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 292. Business Law. 4 Units.**

Detailed study from a business viewpoint of contract theories, assignments, delegation of duties, third-party beneficiary contracts, defenses to consensual contracts, types of conditions, methods of excusing conditions, remedies, and types of damages.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 293. Biotech Management . 5 Units.**

Taught jointly by Bio Sci and Merage School faculty, the course addresses fundamental aspects within, and associated with, the biotechnology industry. Curriculum is focused largely on management issues, including finance, product development, pharmaceuticals, project management, regulatory affairs, and ethics.

Same as MOL BIO 253.

Restriction: Graduate students only. Biotechnology Majors only.

**MGMTMBA 294. Edge. 4 Units.**

Edge explores the crucial roles of external forces - globalization, technology, shifting demographics - as transformative catalysts for change - opening markets, erasing boundaries, and transforming industries. This course prepares future business leaders to innovate and compete successfully.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 295B. Micromarketing with Digital Footprints. 2-4 Units.**

How businesses use digital footprints from household data and point-of-purchase data to customize product offerings and delivery, store locations, advertising, and promotions to households and neighborhoods with the highest market potential. Hands-on experience with Geographic Information System (GIS) mapping software.

Corequisite: MGMTMBA 205 or MGMT FE 205.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 298. Merage Consulting Projects. 4 Units.**

Provides students the opportunity to put into practice concepts, skills, and tools acquired in other parts of the M.B.A. program. Seminars augment internship experiences with analyses of relevant administrative issues.

Restriction: Second-year MBA students only.

**MGMTMBA 299. Individual Study . 1-12 Units.**

Individual study under the direction of the selected faculty member.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Management PhD (MGMTPHD)

### Courses

**MGMTPHD 291. Ph.D. Special Topics Seminar. 2-12 Units.**

Each quarter a number of special topic seminars are offered in the 291 series for Ph.D. students. Examples include topics such as methods seminar, experimental design, qualitative research, structural equation modeling.

Repeatability: Unlimited as topics vary.

**MGMTPHD 292. Pre-Colloquium Seminar . 0-2 Units.**

Seeks to facilitate discussion of upcoming Colloquium research papers increasing the likelihood that Ph.D. students are active participants in all of the Colloquia. Active participation enhances exposure of Ph.D. students to visiting scholars.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only. Management Majors only.

**MGMTPHD 297A. Doctoral Proseminar. 2 Units.**

Analysis of the central theories and theoretical controversies in the field of management. Examination of the formal education for managerial careers and exploration of issues relating to professional careers in research and scholarship in the field of management.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**MGMTPHD 297B. University Teaching.**

Designed to prepare students for teaching career; incorporates seminars addressing topics of classroom dynamics, syllabus preparation, teaching techniques; establishes mentor relationship with faculty member in student's teaching area, provides classroom experience and includes option of videotape analysis of teaching style.

Restriction: Graduate students only.

**MGMTPHD 297D. Philosophy of Science. 4 Units.**

Provides exposure to fundamental issues regarding how knowledge is created, defended, and replaced both in the natural and social sciences. Covers current debates on the meaning of the term "scientific" and the validity of the scientific method.

Restriction: Graduate students only.

**MGMTPHD 297F. Doctoral Research Methods. 4 Units.**

An introduction to the fundamentals of social science research: theory development, research design, methods, data management, and writing for scholarly publications; for doctoral students intending scholarly research careers. Involves hands-on practice in formulating hypotheses, designing research, and conducting journal reviews.

Restriction: Graduate students only. Management Majors only.

**MGMTPHD 297H. Experimental Design. 4 Units.**

Advanced course provides experience in planning and implementing an experiment or quasi-experiment, including choice of topic, study design, data analysis, and manuscript preparation. Data analysis topics include ANOVA, ANCOVA, repeated measures, logistic regression, chi-square, and tests of mediation.

Restriction: Graduate students only.

**MGMTPHD 297I. Applied Multivariate Statistics. 2-4 Units.**

Provides an overview of the most common techniques for multivariate analysis: principal component analysis, factor analysis, cluster analysis, MANOVA, regression with continuous variables, and regression with discrete variables.

Restriction: Graduate students only.

**MGMTPHD 297K. Advanced Qualitative Methods: Analyzing Qualitative Data. 4 Units.**

Introduction to the theory and practice of analyzing qualitative data. Students must have already learned about data collection and research design for qualitative research and must have qualitative data they can analyze.

Same as UPPP 213, POL SCI 273A.

Restriction: Graduate students only.

**MGMTPHD 297L. Writing for Scholarly Publication. 4 Units.**

Introduces methods for planning and carrying out scholarly writing.

Restriction: Graduate students only.

**MGMTPHD 297M. SAS Boot Camp . 2 Units.**

Teaches basics of SAS programming for empirical research. No prior knowledge of SAS or other computer programming language is required. Provides knowledge and tools to replicate an empirical study and learn how to perform very advanced data procedures.

Restriction: Graduate students only.

**MGMTPHD 297Q. Game-Theoretic Models for Management Research. 4 Units.**

Introduces some classic game-theoretic models for management research. It is about modeling strategic interactions between business competitors and/or partners in an analytical framework. Various applications will be discussed, e.g., pricing strategies, business alliances, e-commerce, negotiations, and contracts, etc.

Restriction: Graduate students only.

**MGMTPHD 297R. Theories of Power and Empowerment. 4 Units.**

Studies different ways of thinking about power and its uses. Explores theories of power that inform various notions of empowerment, including resistance, participatory democracy, and workplace empowerment.

Same as UPPP 279, POL SCI 223A.

Restriction: Graduate students only.

**MGMTPHD 297T. Decision Theory. 2-4 Units.**

Decision theories and preference models: How models are elicited or theories are experimentally tested, relevance to different management research areas, alternative theories, applications in management practice, and interpretations for the general public.

Restriction: Graduate students only.

**MGMTPHD 297U. Foundational Theories of Organizations. 4 Units.**

Covers major economic and sociological perspectives guiding the study of organizations (i.e., transaction cost economics, agency theory, institutional theories, organizational ecology, network and diffusion theories, behavioral theories, resource dependence), and examines how different theoretical perspectives are tested.

Restriction: Graduate students only.

**MGMTPHD 297V. Information, Psychology, and Social Processes. 4 Units.**

In the marketplace for ideas, which succeed and which fail? How do ideas and information spread between individuals, and how do populations of ideas evolve? This course reviews recent research on these issues and applications to business.

Restriction: Graduate students only.

**MGMTPHD 297W. Establishing Your Academic Career. 4 Units.**

Overview of the best practices for succeeding in an academic career. Presenting oneself in conversation, in written documents, in research talks, and in teaching.

Restriction: Graduate students only.

**MGMTPHD 299. Individual Directed Study. 1-12 Units.**

Individual study under the direction of a selected faculty member.

Repeatability: May be taken for credit for 12 units.

Restriction: Graduate students only.

**MGMTPHD 399. University Teaching. 2-4 Units.**

Limited to teaching assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Master of Professional Accountancy (MAC)

## Master of Professional Accountancy (MPAC)

### Courses

**MPAC 200A. Intermediate Accounting Intensive I. 4 Units.**

Designed to provide students with technical U.S. accounting theory and principles background necessary for graduate work in accounting. Current international accounting convergence issues and standards will be discussed on emerging topics.

Repeatability: May be taken for credit 2 times.

Restriction: Accountancy Majors only.

**MPAC 200B. Foundations of Taxation Intensive. 4 Units.**

Provides students with the basic concepts of federal income taxation applicable to all taxpayers. Specifically, principles of taxation for individuals, corporations, and partnerships are discussed.

Repeatability: May be taken for credit 2 times.

Restriction: Accountancy Majors only.



**MPAC 200C. Intermediate Accounting Intensive II and Special Topics. 4 Units.**

Designed to provide students with the technical U.S. accounting theory and principles background necessary for graduate work in accounting. Current international accounting convergence issues and standards will be discussed on emerging topics.

Repeatability: May be taken for credit 2 times.

Restriction: Accountancy Majors only.

**MPAC 200D. Auditing Intensive. 4 Units.**

Designed to provide students with an understanding of the fundamental principles, processes, and ethical considerations involved in the performance of a financial statement audit under U.S. auditing standards.

Repeatability: May be taken for credit 2 times.

Restriction: Accountancy Majors only.

**MPAC 230. Accounting ProSeminar: Career and Professional Development. 2 Units.**

Provides students with information and practical skills for success in the program and for professional accounting and business career planning, and with discussions of current issues confronting the accounting profession.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 2 times.

Restriction: Accountancy Majors only.

**MPAC 231A. Financial Statement Analysis and Forecasting. 4 Units.**

Develops skills to analyze corporate financial reports. Topics include profitability, risk analysis, cash flow analysis, revenue and asset recognition, and forecasting. The skills are useful for students to evaluate financial reporting quality, detect earnings management, and predict firms' financial performance.

Prerequisite: Intermediate accounting.

Restriction: Accountancy Majors only.

**MPAC 231B. Advanced Financial Statement Analysis. 4 Units.**

Develops skills to analyze corporate financial reports with a focus on liabilities, stockholders' equity, and valuation. Topics include forecasting financial statements, cash flows- and earnings-based equity, and valuation models, accounting analysis of mergers and acquisitions, lease pensions, and derivatives.

Restriction: Accountancy Majors only.

**MPAC 232. Taxes and Business Strategy. 4 Units.**

Develops a student's ability to identify, understand, and evaluate tax-planning opportunities. The focus is on tax planning concepts and the effects of taxes on business decisions rather than on detailed tax rules, compliance, or legal research.

Restriction: Accountancy Majors only.

**MPAC 233. Non-for-Profit Accounting. 4 Units.**

Focuses on the accounting and reporting for governmental and non-for-profit entities. Topics include preparation of fund basis financial statements and related reporting and auditing issues. Use of non-financial performance measures for non-for-profit entities is also discussed.

Restriction: Accountancy Majors only.

**MPAC 234. Accounting Policy and Research. 2 Units.**

Considers issues in contemporary accounting standard setting and regulation by examining academic accounting research of the various issues. Enables students to develop their knowledge and better appreciate current debates in accounting.

Restriction: Accountancy Majors only.

**MPAC 235. Advanced Managerial Accounting. 4 Units.**

Design of cost information and systems used to plan and control organizational activities; procedures used to account for unit, process, and program costs; cybernetic evaluation of costing procedures; cost estimation, analysis, and accounting via computers.

Restriction: Accountancy Majors only.



**MPAC 236. Forensic Accounting . 2 Units.**

Elective course focuses on the principles, and application of forensic accounting. Topics include the identification, detection, and prevention of fraud, valuations, damage calculations, and litigation support. The role of forensic accountants in the legal system will also be discussed.

Restriction: Accountancy Majors only.

**MPAC 237. International Accounting. 4 Units.**

An online course. A comprehensive study of differences between US GAAP and International Financial Reporting Standards (IFRS).

Prerequisite: Intermediate accounting.

Restriction: Accountancy Majors only.

**MPAC 238. Advanced Auditing and Assurance Services. 4 Units.**

Designed to provide advanced coverage of topics and emerging issues in auditing and assurance services. Provides a deeper understanding of the fundamental concepts of auditing, assurance services, and developing hot-topics within the auditing profession.

Prerequisite: Intermediate accounting and basic auditing.

Restriction: Accountancy Majors only.

**MPAC 239. Ethics in Accounting and Business. 4 Units.**

Designed to introduce students to the intellectual principles of ethical decision making by emphasizing the theories of ethics and their application in the business, and specifically, accounting professions. MPAC capstone course with a final comprehensive exam for the program.

Restriction: Accountancy Majors only.

**MPAC 241. Accounting Internship. 2-4 Units.**

Provides students with the opportunity to apply accounting knowledge through actual work experiences. The internship experience will provide students with knowledge of career opportunities, an understanding of how accounting plays in today's business environment, and prepare students for success.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Accountancy Majors only.

**MPAC 290. Special Topic Seminars. 2-4 Units.**

Studies in selected area of Accounting. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Accountancy Majors only.

**MPAC 291. Professional Research and Communication. 4 Units.**

Combines research of the professional accounting literature on a range of technical topics with a written communication and oral presentations of the findings.

Restriction: Accountancy Majors only.

**MPAC 299. Individual Study. 1-4 Units.**

Individual study under the direction of a selected faculty member.

Repeatability: May be repeated for credit unlimited times.

Restriction: Accountancy Majors only.

# Materials Science and Engineering (MSE)

## Courses

### **MSE 60. Laboratory in Synthesis and Characterization of Materials. 4 Units.**

Synthesis and characterization of ceramic, polymer, and semiconductor materials. Connect the process, structure, properties, and performance to materials science knowledge in a hands-on laboratory setting. Materials fee.

Prerequisite: ENGR 54 and CHEM 1C

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

### **MSE 69. Electronic and Optical Properties in Materials. 4 Units.**

Covers the electronic, optical, and dielectric properties of crystalline and amorphous materials to provide a foundation of the underlying physical principles governing the properties of existing and emerging electronic and photonic materials.

Prerequisite: PHYS 7D and PHYS 7E and (MATH 3A or ICS 6N) and MATH 3D and ENGR 54

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

### **MSE 141. Nano-Scale Materials and Applications. 4 Units.**

Overview of the chemistry, physics, and applications of nanometer-scale materials. Explore the effects of composition, bonding, and confinement on physical properties of nanomaterials, their chemical syntheses, and their device physics in electronic, optoelectronic, and energy technologies.

Prerequisite: (ENGR 1A or CHEM 1A or CHEM H2A) and ENGR 54 and MSE 69

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

Concurrent with MSE 241.

### **MSE 151. Polymeric Materials. 4 Units.**

An introduction to physical aspects of polymers, including polymer molecular size and configuration, solution and bulk phase structural properties, mechanical properties including viscoelasticity and rheology, polymer synthesis methods, characterization techniques, processing methods, and examples from existing and emerging polymeric materials.

Prerequisite: ENGR 54 and (MSE 165A or CBE 40C or MAE 91)

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

### **MSE 155. Mechanical Behavior and Design Principles. 4 Units.**

Principles governing structure and mechanical behavior of materials, relationship relating microstructure and mechanical response with application to elasticity, plasticity, yielding, necking, creep, and fracture of materials. Introduction to experimental techniques to characterize the properties of materials. Design parameters.

Prerequisite: ENGR 54

Same as MAE 156.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Aerospace Engineering majors have second consideration for enrollment.

### **MSE 155L. Mechanical Behavior Laboratory. 1 Unit.**

Introduction to experimental techniques to characterize mechanical properties of materials. Emphasis on correlations between property and microstructure. Experiments include: plastic stability in tension, effect of grain size on flow stress, microstructural engineering. Materials fee.

Corequisite: MSE 155

Prerequisite: ENGR 54

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 158. Ceramic Materials for Sustainable Energy. 4 Units.**

A technical elective for students interested in materials. Topics covered include structure and properties of ceramic materials, and design for sustainable energy applications.

Prerequisite: ENGR 54

Restriction: Materials Science and Engr Majors have first consideration for enrollment. Chemical Engineering majors have second consideration for enrollment.

**MSE 163. Computer Techniques in Experimental Research. 4 Units.**

Principles and practical guidelines of automated materials testing. Computer fundamentals, programming languages, data acquisition and control hardware, interfacing techniques, programming strategies, data analysis, data storage, safeguard procedures.

Restriction: Materials Science and Engr Majors have first consideration for enrollment. Chemical Engineering majors have second consideration for enrollment.

**MSE 164. X-ray Diffraction, Electron Microscopy, and Microanalysis. 4 Units.**

Material characterization using X-ray diffraction and scanning electron microscopy (SEM). Topics include X-ray diffraction and analysis; SEM imaging and microanalysis. Materials fee.

Prerequisite: ENGR 54 and PHYS 7D

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 164L. X-ray Diffraction, Electron Microscopy, and Microanalysis Lab. 1 Unit.**

Material characterization using X-ray diffraction and scanning electron microscopy (SEM). Topics include X-ray diffraction and analysis; SEM imaging and microanalysis.

Prerequisite: ENGR 54 and PHYS 7D

Restriction: Materials Science and Engr Majors only.

**MSE 165A. Thermodynamics of Materials. 4 Units.**

Treatment of the laws of thermodynamics and their application in understanding properties and equilibrium states of engineering materials. Develops relationships pertaining to multiphase equilibrium and presents graphical constructions for interpretation of phase diagrams. Statistical thermodynamics in relation to materials phenomena.

Prerequisite: CHEM 1C and PHYS 7C

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 165B. Diffusion and Heat Transport in Materials. 4 Units.**

Examines how kinetics affect materials development, behavior, and processing. Highlights the ways in which kinetics and diffusion are key to designing materials processing and heat treating strategies, with examples in various applied topics.

Prerequisite: MSE 165A or CBE 40C or MAE 91. MSE 165A with a grade of C- or better

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 165C. Materials Kinetics and Phase Transformations. 4 Units.**

Treatment of the kinetics of solid-state reactions and reactions at interfaces. Thermodynamics and kinetics of phase transformations, including solidification processes, diffusional and diffusionless phase transformations.

Prerequisite: ENGR 54 and (MSE 165B or (CBE 120B and CBE 120C) or MAE 120). MSE 165B with a grade of C- or better

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 165CL. Laboratory in Materials Kinetics and Phase Transformations. 1 Unit.**

Covers topics of practical application of the kinetics of solid state reactions, reactions at interfaces, and the thermodynamics and kinetics of phase transformations to common materials systems.

Prerequisite: ENGR 54 and (MSE 165B or (CBE 120B and CBE 120C) or MAE 120). MSE 165B with a grade of C- or better

Restriction: Materials Science and Engr Majors only.

**MSE 171. Green Engineering: Theory and Practice. 4 Units.**

Methods and impacts of selecting alternative technologies, processes, materials, chemicals, to reduce pollution, waste, and use of toxic substances, thereby creating "green," environmentally responsible, sustainable solutions. Topics include environmental regulations, recycling, life-cycle assessment, economic analysis, design, green chemistry, and toxicology.

Restriction: Seniors only. Materials Science and Engr Majors have first consideration for enrollment.

**MSE 173. Fundamentals of Materials Processing: How are Materials Processed to Make Things?. 4 Units.**

An in-depth knowledge of manufacturing processes with focus on the fundamentals of materials processing (heat flow, mass flow, fluid flow, etc.). Processing fundamentals that apply to the three main classes of engineering materials: metals, ceramics, and polymers.

Prerequisite: ENGR 54

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 174. Composite Materials Design. 3 Units.**

Introduction to fiber-reinforced composites for mechanical applications. Properties of reinforcing fibers. Manufacture of fibers and composites. Micromechanics of fiber composites. Strength criteria and failure modes. Macromechanics in design of laminated composite structures.

Prerequisite: ENGR 54 and ENGR 150

**MSE 175. Design Failure Investigation. 4 Units.**

Survey of mechanisms by which devices fail, including overload, fatigue, corrosion, and wear. Use of fractography and other evidence to interpret failure modes and specify design/manufacturing changes. Students redesign failed parts or structures based on actual parts and/or case histories.

Prerequisite: ENGR 54

Restriction: Materials Science and Engr Majors have first consideration for enrollment. Chemical Engineering majors have second consideration for enrollment.

**MSE 176. Surface and Adhesion Science. 4 Units.**

Structure, thermodynamics of, kinetics, and reactions on surfaces. Surface electronic and mechanical properties and characterization of all classes of materials including metals, semiconductors, ceramics, polymers, and soft materials. Adhesion between different materials is also addressed.

Prerequisite: (CBE 110 or MSE 165C) and (MSE 141 or MSE 69)

Same as CBE 183.

Restriction: Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

Concurrent with MSE 276 and CBE 283.

**MSE 189A. Senior Design Project I. 3 Units.**

Group supervised senior design projects that deal with materials selection in engineering design and that involve case studies in ethics, safety, design, failure modes, new products, and patents. Activities conclude with a presentation of the projects. Materials fee.

Prerequisite: ENGR 54 and MSE 155 and MSE 60 and MSE 165C

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Seniors only. Materials Science and Engr Majors only. MSE 189A, MSE 189B, and MSE 189C must be taken in the same academic year.

**MSE 189B. Senior Design Project II. 3 Units.**

Group supervised senior design projects that deal with materials selection in engineering design and that involve case studies in ethics, safety, design, failure modes, new products, and patents. Activities conclude with a presentation of the projects. Materials fee.

Prerequisite: MSE 189A

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Seniors only. Materials Science and Engr Majors only. MSE 189A, MSE 189B, and MSE 189C must be taken in the same academic year.

**MSE 189C. Senior Design Project III. 3 Units.**

Group supervised senior design projects that deal with materials selection in engineering design and that involve case studies in ethics, safety, design, failure modes, new products, and patents. Activities conclude with a presentation of the projects. Materials fee.

Prerequisite: MSE 189B

Restriction: Seniors only. Materials Science and Engr Majors only. MSE 189A, MSE 189B, and MSE 189C must be taken in the same academic year.

**MSE 190. Materials Selection and Design. 4 Units.**

Meaning and phases of design; design considerations; properties of engineering materials; materials property charts; materials selection; process selection; multi-constraint and multi-objective design. Selection of shape in mechanical components. Designing with hybrid materials: challenges and opportunities. Environmental considerations; case studies.

Prerequisite: ENGR 54 and ENGR 150

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 191. Materials Outreach. 3 Units.**

Demonstrates major concepts in Materials Science and Engineering. Concepts of materials engineering covered include deformation in crystalline solids, effects of heat treatment on mechanical properties, thermal barrier materials, composites design, mechanical behavior of polymers, superconductivity in ceramics.

Prerequisite: ENGR 54

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 195. Special Topics in Materials Science and Engineering. 1-4 Units.**

Studies in selected areas of Materials Science and Engineering. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**MSE 198. Group Study. 1-4 Units.**

Group study of selected topics in engineering.

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**MSE 199. Individual Study. 1-4 Units.**

Supervised independent reading, research, or design for undergraduate Engineering majors. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

Repeatability: May be taken for credit for 8 units.

Restriction: Materials Science and Engr Majors only.

**MSE 199P. Individual Study. 1-4 Units.**

Supervised independent reading, research, or design for undergraduate Engineering majors. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**MSE 200. Crystalline Solids: Structure, Imperfections, and Properties. 4 Units.**

Principles and concepts underlying the study of advanced materials including alloys, composites, ceramics, semiconductors, polymers, ferroelectrics, and magnetism. Crystal structure and defects, surface and interface properties, thermodynamics and kinetics of phase transformations, and material processing, related to fundamental material properties.

Restriction: Graduate students only.

**MSE 201A. Critical Analysis and Technical Communication I. 2 Units.**

Develop an understanding of the process to conduct research. Topics include performing analytical analysis of the scientific literature, formation of a hypothesis, defining investigations to validate hypothesis, communicating analysis in written form, writing a research proposal.

Restriction: Graduate students only.

**MSE 201B. Critical Analysis and Technical Communication II. 2 Units.**

Develop oral presentation skills and skills to understand significance of published research. Topics include performing critical and analytical analysis of the scientific literature, connecting core course content with experimental/theoretical methods in the scientific literature, and communicating analysis in oral form.

Prerequisite: MSE 201A

Restriction: Graduate students only.

**MSE 205. Materials Physics. 4 Units.**

Covers the electronic, optical, and dielectric properties of crystalline materials to provide a foundation of the underlying physical principles of governing the properties of existing and emerging electronic and photonic materials.

Prerequisite: MSE 200

Restriction: Graduate students only.

**MSE 241. Nano-Scale Materials and Applications. 4 Units.**

Overview of the chemistry, physics, and applications of nanometer-scale materials. Explore the effects of composition, bonding, and confinement on physical properties of nanomaterials, their chemical syntheses, and their device physics in electronic, optoelectronic, and energy technologies.

Prerequisite: MSE 200 and MSE 205

Restriction: Graduate students only.

Concurrent with MSE 141.

**MSE 249. Special Topics in Materials Science and Engineering. 1-4 Units.**

Studies in selected areas of Materials Science and Engineering. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**MSE 254. Polymer Science and Engineering. 4 Units.**

An introduction to physical aspects of polymers, including configuration and conformation of polymer chains and characterization techniques; crystallinity viscoelasticity, rheology, and processing.

Restriction: Graduate students only.

**MSE 255A. Design with Ceramic Materials. 4 Units.**

Dependence of ceramic properties on bonding, crystal structure, defects, and microstructure. Ceramic manufacturing technology. Survey of physical properties. Strength, deformation, and fracture of ceramics. Mechanical design with brittle, environment-sensitive materials exhibiting time-dependent strengths.

Prerequisite: ENGR 54

Restriction: Graduate students only.

**MSE 256A. Mechanical Behavior of Engineering Materials. 4 Units.**

Principles governing structure and mechanical behavior of materials, relationship relating microstructure and mechanical response with application to elasticity, plasticity, creep, and fatigue, study of rate-controlling mechanisms and failure modes, fracture of materials.

Restriction: Graduate students only.

**MSE 256B. Fracture of Engineering Materials. 4 Units.**

Fracture mechanics and its application to engineering materials. Elastic properties of cracks, the stress intensity factor, the crack tip plastic zone, the J integral approach, fracture toughness testing, the crack tip opening displacement, fracture at high temperatures, fatigue crack growth.

Restriction: Graduate students only.

**MSE 259. Transmission Electron Microscopy. 4 Units.**

The theory and operation of the transmission electron microscope (TEM), including the basic construction, electron optics, electron diffraction and reciprocal space, formation of image and electron diffraction information, microanalysis, and specimen preparation.

Prerequisite: MSE 200

Restriction: Graduate students only.

**MSE 262. Grain Boundaries and Interfaces in Nanocrystalline Materials. 4 Units.**

Structure and character of grain boundaries and interfaces in solids including nanocrystalline materials. Role of grain boundaries in chemical segregation, fracture, deformation, creep, conductivity, diffusion, and grain growth. Experimental techniques and computational methods used to characterize and model grain boundaries.

Prerequisite: MSE 200

**MSE 264. Scanning Electron Microscopy. 4 Units.**

The theory and operation of the scanning electron microscope (SEM) and X-ray microanalysis. Topics covered include the basic design and electron optics, electron beam - specimen interactions, image formation and interpretation, X-ray spectrometry, and other related topics and techniques.

Prerequisite: MSE 200

Restriction: Graduate students only.

**MSE 265. Phase Transformations. 4 Units.**

Advanced thermodynamics and kinetics of phase transformations and phase transitions.

Prerequisite: MSE 200

Restriction: Graduate students only.

**MSE 267. Seminar in Systems Microbiology Research. 1 Unit.**

A research and journal club seminar that covers topics on bacteria and phage using approaches and principles from biology, engineering, and physics.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Same as MBB 268, PHYS 268.

Restriction: Upper-division students only. Graduate students only.

**MSE 271. Green Engineering: Theory and Practice. 4 Units.**

Methods and impacts of selecting alternative technologies, processes, materials, chemicals, to reduce pollution, waste, and use of toxic substances, thereby creating "green," environmentally responsible, sustainable solutions. Topics include environmental regulations, recycling, life-cycle assessment, economic analysis, design, green chemistry, and toxicology.

Restriction: Graduate students only.

**MSE 273. Electroceramics & Solid State Electrochemical Systems. 4 Units.**

Theory, underlying principles, experimental techniques, and applications of electroceramics and solid-state electrochemical systems. Links solid state physics, atomic structure, thermodynamics, defect chemistry, and transport processes to electrical properties of ceramics - spanning from insulators to fast-ion conductors and HT superconductors.

Prerequisite: MSE 200

**MSE 276. Surface and Adhesion Science. 4 Units.**

Structure, thermodynamics of, kinetics, and reactions on surfaces. Surface electronic and mechanical properties and characterization of all classes of materials including metals, semiconductors, ceramics, polymers, and soft materials. Adhesion between different materials is also addressed.

Same as CBE 283.

Restriction: Graduate students only.

Concurrent with MSE 176 and CBE 183.

**MSE 295. Seminar in Engineering. 1-4 Units.**

Seminars by individual faculty in major fields of interest.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**MSE 296. Master of Science Thesis Research. 1-16 Units.**

Individual research or investigation conducted in preparation for the thesis required for the M.S. degree in Engineering.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**MSE 297. Doctor of Philosophy Dissertation Research. 1-16 Units.**

Individual research or investigation conducted in preparation for the dissertation required for the Ph.D. degree in Engineering.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**MSE 298. Seminars in Materials Science and Engineering. 2 Units.**

Presentation of advanced topics and reports of current research efforts in Materials Science and Engineering.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**MSE 299. Individual Research. 1-16 Units.**

Individual research or investigation under the direction of an individual faculty member.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Mathematics (MATH)

### Courses

**MATH 1A. Pre-Calculus. 4 Workload Units.**

Basic equations and inequalities, linear and quadratic functions, and systems of simultaneous equations.

Grading Option: Workload Credit Letter Grade with P/NP.

**MATH 1B. Pre-Calculus. 4 Units.**

Preparation for calculus and other mathematics courses. Exponentials, logarithms, trigonometry, polynomials, and rational functions. Satisfies no requirements other than contribution to the 180 units required for graduation.

Prerequisite: MATH 1A. Placement into MATH 1B via the Calculus Placement exam, or a score of 450 or higher on the Mathematics section of the SAT Reasoning Test.

Restriction: MATH 1B may not be taken for credit if taken after MATH 2A.



**MATH 2A. Single-Variable Calculus. 4 Units.**

Introduction to derivatives, calculation of derivatives of algebraic and trigonometric functions; applications including curve sketching, related rates, and optimization. Exponential and logarithm functions.

Prerequisite: MATH 1B or AP Calculus AB or SAT Mathematics or ACT Mathematics. MATH 1B with a grade of C or better. AP Calculus AB with a minimum score of 3. SAT Mathematics with a minimum score of 650. ACT Mathematics with a minimum score of 29. Placement via the Calculus Placement exam (fee required) is also accepted.

Overlaps with MATH 5A.

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment.

**(Vb)**

**MATH 2B. Single-Variable Calculus. 4 Units.**

Definite integrals; the fundamental theorem of calculus. Applications of integration including finding areas and volumes. Techniques of integration. Infinite sequences and series.

Prerequisite: MATH 2A or MATH 5A or AP Calculus AB or AP Calculus BC. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 3

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment.

**(Vb)**

**MATH 2D. Multivariable Calculus. 4 Units.**

Differential and integral calculus of real-valued functions of several real variables, including applications. Polar coordinates.

Prerequisite: MATH 2B or MATH 5B or AP Calculus BC. AP Calculus BC with a minimum score of 4

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

**(Vb)**

**MATH 2E. Multivariable Calculus. 4 Units.**

The differential and integral calculus of vector-valued functions. Implicit and inverse function theorems. Line and surface integrals, divergence and curl, theorems of Greens, Gauss, and Stokes.

Prerequisite: MATH 2D or MATH H2D

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment.

**MATH H2D. Honors Multivariable Calculus. 4 Units.**

Differential and integral calculus of real-valued functions of several real variables, including applications. Polar coordinates. Covers the same material as MATH 2D-E, but with a greater emphasis on the theoretical structure of the subject matter.

Prerequisite: MATH 2B or MATH 5B or (AP Calculus BC and (MATH H3A) or (MATH 3A and MATH 13)). MATH 2B with a grade of A or better. MATH 5B with a grade of A or better. AP Calculus BC with a minimum score of 5. MATH H3A with a grade of B- or better. MATH 3A with a grade of A or better. MATH 13 with a grade of A or better

Overlaps with MATH 2D.

**(Vb)**

**MATH H2E. Honors Multivariable Calculus. 4 Units.**

Differential and integral calculus of real-valued functions of several real variables, including applications. Polar coordinates. Covers the same material as MATH 2D-E, but with a greater emphasis on the theoretical structure of the subject matter.

Prerequisite: MATH H2D. MATH H2D with a grade of B- or better

Overlaps with MATH 2E.

**MATH 3A. Introduction to Linear Algebra. 4 Units.**

Systems of linear equations, matrix operations, determinants, eigenvalues and eigenvectors, vector spaces, subspaces, and dimension.

Prerequisite: MATH 2B or MATH 5B or AP Calculus BC. AP Calculus BC with a minimum score of 4

Overlaps with ICS 6N.

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

(Vb)

**MATH 3D. Elementary Differential Equations. 4 Units.**

Linear differential equations, variation of parameters, constant coefficient cookbook, systems of equations, Laplace transforms, series solutions.

Prerequisite: (MATH 3A or MATH H3A) and (MATH 2D or MATH H2D) and (MATH 2B or AP Calculus BC). AP Calculus BC with a minimum score of 4

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment.

**MATH H3A. Honors Introduction to Linear Algebra. 4 Units.**

Systems of linear equations, matrix operations, determinants, eigenvalues, eigenvectors, vector spaces, subspaces, and dimension.

Prerequisite: MATH 2B or MATH 5B or AP Calculus BC. MATH 2B with a grade of A or better. MATH 5B with a grade of A or better. AP Calculus BC with a minimum score of 5

Overlaps with MATH 3A, ICS 6N.

Restriction: School of Physical Sciences students only. School of Engineering students only. Mathematics Majors only. Undeclared Majors only.

**MATH 5A. Calculus for Life Sciences. 4 Units.**

Differential calculus with applications to life sciences. Exponential, logarithmic, and trigonometric functions. Limits, differentiation techniques, optimization and difference equations.

Prerequisite: MATH 1B or AP Calculus AB or SAT Mathematics or ACT Mathematics. MATH 1B with a grade of C or better. AP Calculus AB with a minimum score of 3. SAT Mathematics with a minimum score of 650. ACT Mathematics with a minimum score of 29. Placement via the Calculus Placement exam (fee required) is also accepted.

Overlaps with MATH 2A.

Restriction: School of Biological Sciences students have first consideration for enrollment.

(Vb)

**MATH 5B. Calculus for Life Sciences. 4 Units.**

Integral calculus and multivariable calculus with applications to life sciences. Integration techniques, applications of the integral, phase plane methods and basic modeling, basic multivariable methods.

Prerequisite: MATH 5A or MATH 2A or AP Calculus AB or AP Calculus BC. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 3

Restriction: School of Biological Sciences students have first consideration for enrollment. Cannot be taken for credit after MATH 2B.

(Vb)

**MATH 7A. Single-Variable Calculus I. 4 Units.**

Introduction to derivatives, calculation of derivatives of algebraic and trigonometric functions; applications including curve sketching, related rates, and optimization. Exponential and logarithm functions.

Prerequisite: MATH 1B or AP Calculus AB or SAT Mathematics or ACT Mathematics. MATH 1B with a grade of C or better. AP Calculus AB with a minimum score of 3. SAT Mathematics with a minimum score of 650. ACT Mathematics with a minimum score of 29. Placement via the Calculus Placement exam (fee required) is also accepted.

Overlaps with MATH 2A, MATH 5A.

Restriction: Mathematics Majors only.

(Vb)

**MATH 7B. Single-Variable Calculus II. 4 Units.**

Definite integrals; the fundamental theorem of calculus. Applications of integration including finding areas and volumes. Techniques of integration. Infinite sequences and series.

Prerequisite: MATH 2A or MATH 5A or AP Calculus AB or AP Calculus BC or MATH 7A. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 3

Overlaps with MATH 2B, MATH 5B.

Restriction: Mathematics Majors only.

**(Vb)**

**MATH 8. Explorations in Functions and Modeling. 4 Units.**

Explorations of applications and connections in topics in algebra, geometry, calculus, and statistics for future secondary math educators. Emphasis on nonstandard modeling problems.

Prerequisite or corequisite: MATH 2A or AP Calculus AB or AP Calculus BC. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 3

**MATH 9. Introduction to Programming for Numerical Analysis. 4 Units.**

Introduction to computers and programming using Matlab and Mathematica. Representation of numbers and precision, input/output, functions, custom data types, testing/debugging, reading exceptions, plotting data, numerical differentiation, basics of algorithms. Analysis of random processes using computer simulations.

Prerequisite: MATH 2A

Restriction: Mathematics Majors have first consideration for enrollment.

**(II and Vb ).**

**MATH 10. Introduction to Programming for Data Science. 4 Units.**

Intro to algorithms in data science using Python and R. Basic concepts of Python, store, access, and manipulate data in lists; functions, methods, and packages; NumPy, Numerical stability, and accuracy. Gradient descent and Newton's method. Basics of R Programming.

Prerequisite or corequisite: (MATH 2D or MATH H2D) and (MATH 3A or MATH H3A) and MATH 9

Restriction: Mathematics Majors have first consideration for enrollment.

**(II and VB ).**

**MATH 13. Introduction to Abstract Mathematics. 4 Units.**

Introduction to formal definition and rigorous proof writing in mathematics. Topics include basic logic, set theory, equivalence relations, and various proof techniques such as direct, induction, contradiction, contrapositive, and exhaustion.

Prerequisite: MATH 2A or ICS 6D

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 105A. Numerical Analysis I. 4 Units.**

Introduction to the theory and practice of numerical computation with an emphasis on solving equations. Solving transcendental equations; linear systems, Gaussian elimination, QR factorization, iterative methods, eigenvalue computation, power method.

Corequisite: MATH 105LA

Prerequisite: MATH 3A or MATH H3A. Familiarity with computer programming is required.

Overlaps with MAE 185.

**MATH 105B. Numerical Analysis II. 4 Units.**

Introduction to the theory and practice of numerical computation with an emphasis on topics from calculus and approximation theory. Lagrange interpolation; Gaussian quadrature; Fourier series and transforms; Methods from data science including least squares and L1 regression.

Corequisite: MATH 105LB

Prerequisite: MATH 105A

**MATH 105LA. Numerical Analysis Laboratory. 1 Unit.**

Provides practical experience to complement the theory developed in Mathematics 105A.

Corequisite: MATH 105A

**MATH 105LB. Numerical Analysis Laboratory. 1 Unit.**

Provides practical experience to complement the theory developed in Mathematics 105B.

Corequisite: MATH 105B

**MATH 107. Numerical Differential Equations. 4 Units.**

Theory and applications of numerical methods to initial and boundary-value problems for ordinary and partial differential equations.

Corequisite: MATH 107L

Prerequisite: MATH 3D and MATH 105A and MATH 105B

**MATH 107L. Numerical Differential Equations Laboratory. 1 Unit.**

Provides practical experience to complement the theory developed in Mathematics 107.

Corequisite: MATH 107

**MATH 110A. Optimization I. 4 Units.**

Introduction to optimization, linear search method, trust region method, Newton method, linear programming, linear, and non-linear least square methods.

Prerequisite or corequisite: (MATH 2D or MATH H2D) and (MATH 3A or MATH H3A) and MATH 10 and MATH 121A and MATH 121B

**MATH 110B. Optimization II. 4 Units.**

The simplex method, interior point method, penalty barrier method, primal dual method, augmented Lagrangian method, and stochastic gradient method.

Prerequisite: MATH 110A. MATH 110A with a grade of C or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 112A. Introduction to Partial Differential Equations and Applications. 4 Units.**

Introduction to ordinary and partial differential equations and their applications in engineering and science. Basic methods for classical PDEs (potential, heat, and wave equations). Classification of PDEs, separation of variables and series expansions, special functions, eigenvalue problems.

Prerequisite: (MATH 2E or MATH H2E) and MATH 3D

**MATH 112B. Introduction to Partial Differential Equations and Applications. 4 Units.**

Introduction to partial differential equations and their applications in engineering and science. Basic methods for classical PDEs (potential, heat, and wave equations). Green functions and integral representations, method of characteristics.

Prerequisite: MATH 112A

**MATH 112C. Introduction to Partial Differential Equations and Applications. 4 Units.**

Nonhomogeneous problems and Green's functions, Sturm-Liouville theory, general Fourier expansions, applications of partial differential equations in different areas of science.

Prerequisite: MATH 112B

**MATH 113A. Mathematical Modeling in Biology. 4 Units.**

Discrete mathematical and statistical models; difference equations, population dynamics, Markov chains, and statistical models in biology.

Prerequisite: MATH 2B or MATH 5B

**MATH 113B. Mathematical Modeling in Biology. 4 Units.**

Linear algebra; differential equations models; dynamical systems; stability; hysteresis; phase plane analysis; applications to cell biology, viral dynamics, and infectious diseases.

Prerequisite: MATH 2B or AP Calculus BC or MATH 5B. AP Calculus BC with a minimum score of 4

**MATH 115. Mathematical Modeling. 4 Units.**

Mathematical modeling and analysis of phenomena that arise in engineering physical sciences, biology, economics, or social sciences.

Prerequisite: MATH 112A and (MATH 2D or MATH H2D) and (MATH 3A or MATH H3A) and MATH 3D

**MATH 117. Dynamical Systems. 4 Units.**

Introduction to the modern theory of dynamical systems including contraction mapping principle, fractals and chaos, conservative systems, Kepler problem, billiard models, expanding maps, Smale's horseshoe, topological entropy.

Prerequisite: MATH 3D and MATH 140A

**MATH 118. The Theory of Differential Equations. 4 Units.**

Existence and uniqueness of solutions, continuous dependence of solutions on initial conditions and parameters, Lyapunov and asymptotic stability, Floquet theory, nonlinear systems, and bifurcations.

Prerequisite: MATH 3D and MATH 140A

**MATH 120A. Introduction to Abstract Algebra: Groups. 4 Units.**

Axioms for group theory; permutation groups, matrix groups. Isomorphisms, homomorphisms, quotient groups. Advanced topics as time permits. Special emphasis on doing proofs.

Prerequisite: (MATH 3A or MATH H3A) and MATH 13. MATH 13 with a grade of C or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 120B. Introduction to Abstract Algebra: Rings and Fields. 4 Units.**

Basic properties of rings; ideals, quotient rings; polynomial and matrix rings. Elements of field theory.

Prerequisite: MATH 120A. MATH 120A with a grade of C- or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 120C. Introduction to Abstract Algebra: Galois Theory. 4 Units.**

Galois Theory: proof of the impossibility of certain ruler-and-compass constructions (squaring the circle, trisecting angles); nonexistence of analogues to the 'quadratic formula' for polynomial equations of degree 5 or higher.

Prerequisite: MATH 120B

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH H120A. Honors Introduction to Graduate Algebra I. 5 Units.**

Introduction to abstract linear algebra, including bases, linear transformation, eigenvectors, canonical forms, inner products, and symmetric operators. Introduction to groups, rings, and fields, including examples of groups, group actions, Sylow theorems, modules over principal ideal domains, polynomials, and Galois groups.

Prerequisite: (MATH 3A or MATH H3A) and MATH 13 and (MATH 120A or MATH 121A). MATH 13 with a grade of A or better. MATH 120A with a grade of A or better. MATH 121A with a grade of A or better

Restriction: Mathematics Honors students only.

Concurrent with MATH 206A.

**MATH H120B. Honors Introduction to Graduate Algebra II. 5 Units.**

Introduction to abstract linear algebra, including bases, linear transformation, eigenvectors, canonical forms, inner products, and symmetric operators. Introduction to groups, rings, and fields, including examples of groups, group actions, Sylow theorems, modules over principal ideal domains, polynomials, and Galois groups.

Prerequisite: MATH H120A

Restriction: Mathematics Honors students only.

Concurrent with MATH 206B.

**MATH H120C. Honors Introduction to Graduate Algebra III. 5 Units.**

Introduction to abstract linear algebra, including bases, linear transformation, eigenvectors, canonical forms, inner products, and symmetric operators. Introduction to groups, rings, and fields, including examples of groups, group actions, Sylow theorems, modules over principal ideal domains, polynomials, and Galois groups.

Prerequisite: MATH H120B

Restriction: Mathematics Honors students only.

Concurrent with MATH 206C.

**MATH 121A. Linear Algebra. 4 Units.**

Introduction to modern abstract linear algebra. Special emphasis on students doing proofs. Vector spaces, linear independence, bases, dimension. Linear transformations and their matrix representations. Theory of determinants.

Prerequisite: (MATH 3A or MATH H3A) and MATH 13. MATH 13 with a grade of C or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 121B. Linear Algebra. 4 Units.**

Introduction to modern abstract linear algebra. Special emphasis on students doing proofs. Canonical forms; inner products; similarity of matrices.

Prerequisite: MATH 121A

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 130A. Probability I. 4 Units.**

Combinatorial probability, conditional probabilities, independence, discrete and continuous random variables, expectation and variance, common probability distributions.

Prerequisite: (MATH 2A or AP Calculus BC or AP Calculus AB) and (MATH 2B or AP Calculus BC) and (MATH 3A or MATH H3A). AP Calculus BC with a minimum score of 3. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 4

**MATH 130B. Probability II. 4 Units.**

Joint distributions, sums of independent random variables, conditional distributions and conditional expectation, covariances, moment generating functions, limit theorems.

Prerequisite: MATH 130A or MATH 131A or STAT 120A

**MATH 130C. Stochastic Processes. 4 Units.**

Markov chains, Brownian motion, Gaussian processes, applications to option pricing and Markov chain Monte Carlo methods.

Prerequisite: MATH 130B

**MATH 133A. Statistical Methods with Applications to Finance. 4 Units.**

Overview of probability, statistics, and financial concepts: distribution, point estimation, confidence interval, linear regression, hypothesis testing, principal component analysis, financial applications.

Prerequisite: MATH 130A or MATH 131A or STAT 120A

**MATH 133B. Statistical Methods with Applications to Finance. 4 Units.**

Overview of markets and options: asset modeling, Brownian motion, risk neutrality, option pricing, value at risk, MC simulations.

Prerequisite: MATH 133A

**MATH 133C. Statistical Methods with Applications to Finance. 4 Units.**

Overview of interest theory, time value of money, annuities/cash flows with payments that are not contingent, loans, sinking funds, bonds, general cash flow and portfolios, immunization, duration and convexity, swaps.

Prerequisite: MATH 133B

**MATH 134A. Fixed Income. 4 Units.**

Overview of interest theory, time value of money, annuities/cash flows with payments that are not contingent, loans, sinking funds, bonds, general cash flow and portfolios, immunization, duration and convexity, swaps.

Prerequisite: MATH 130A or STAT 120A

Overlaps with MATH 133C.

**MATH 134B. Mathematics of Financial Derivatives. 4 Units.**

General derivatives; call/put options; hedging and investment strategies: spreads and collars; risk management; forwards and futures; bonds.

Prerequisite: MATH 134A or MATH 133C

Overlaps with MATH 133A.

**MATH 134C. Mathematical Models for Finance. 4 Units.**

General properties of options: option contracts (call and put options, European, American and exotic options); binomial option pricing model, Black-Scholes option pricing model; risk-neutral pricing formula using Monte-Carlo simulation; option greeks and risk management; interest rate derivatives, Markowitz portfolio theory.

Prerequisite: MATH 134B or MATH 133A

Overlaps with MATH 133B.

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 140A. Elementary Analysis. 4 Units.**

Introduction to real analysis, including convergence of sequence, infinite series, differentiation and integration, and sequences of functions. Students are expected to do proofs.

Prerequisite: (MATH 2B or AP Calculus BC) and (MATH 2D or MATH H2D) and (MATH 3A or MATH H3A) and MATH 13. AP Calculus BC with a minimum score of 4. MATH 13 with a grade of C or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 140B. Elementary Analysis. 4 Units.**

Introduction to real analysis including convergence of sequences, infinite series, differentiation and integration, and sequences of functions. Students are expected to do proofs.

Prerequisite: MATH 140A. MATH 140A with a grade of C- or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 140C. Analysis in Several Variables . 4 Units.**

Rigorous treatment of multivariable differential calculus. Jacobians, Inverse and Implicit Function theorems.

Prerequisite: MATH 140B

**MATH H140A. Honors Introduction to Graduate Analysis I. 5 Units.**

Construction of the real number system, topology of the real line, concepts of continuity, differential and integral calculus, sequences and series of functions, equicontinuity, metric spaces, multivariable differential and integral calculus, implicit functions, curves and surfaces.

Prerequisite: (MATH 2E or MATH H2E) and (MATH 3A or MATH H3A) and MATH 13 and MATH 121A and MATH 140A and MATH 140B. MATH 2E with a grade of A or better. MATH H2E with a grade of A or better. MATH 13 with a grade of A or better. MATH 140A with a grade of A or better. MATH 140B with a grade of A or better

Restriction: Mathematics Honors students only.

Concurrent with MATH 205A.

**MATH H140B. Honors Introduction to Graduate Analysis II. 5 Units.**

Construction of the real number system, topology of the real line, concepts of continuity, differential and integral calculus, sequences and series of functions, equicontinuity, metric spaces, multivariable differential and integral calculus, implicit functions, curves and surfaces.

Prerequisite: MATH H140A

Restriction: Mathematics Honors students only.

Concurrent with MATH 205B.

**MATH H140C. Honors Introduction to Graduate Analysis III. 5 Units.**

Construction of the real number system; topology of the real line; concepts of continuity, differential, and integral calculus; sequences and series of functions, equicontinuity, metric spaces, multivariable differential, and integral calculus; implicit functions, curves and surfaces.

Prerequisite: MATH H140B

Restriction: Mathematics Honors students only.

Concurrent with MATH 205C.

**MATH 141. Introduction to Topology. 4 Units.**

The elements of naive set theory and the basic properties of metric spaces. Introduction to topological properties.

Prerequisite: MATH 140A

**MATH 147. Complex Analysis. 4 Units.**

Rigorous treatment of basic complex analysis: analytic functions, Cauchy integral theory and its consequences, power series, residue calculus, harmonic functions, conformal mapping. Students are expected to do proofs.

Prerequisite or corequisite: MATH 140A and MATH 140B

Restriction: MATH 114A may not be taken for credit after MATH 147.

**MATH 150. Introduction to Mathematical Logic. 4 Units.**

First order logic through the Completeness Theorem for predicate logic.

Prerequisite: MATH 13 or (ICS 6B and ICS 6D). MATH 13 with a grade of C- or better

Overlaps with LPS 105B, PHIL 105B.

**MATH 161. Modern Geometry. 4 Units.**

Euclidean Geometry; Hilbert's Axioms; Absolute Geometry; Hyperbolic Geometry; the Poincare Models; and Geometric Transformations.

Prerequisite: MATH 13 or (ICS 6B and ICS 6D). MATH 13 with a grade of C- or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 162A. Introduction to Differential Geometry. 4 Units.**

Applications of advanced calculus and linear algebra to the geometry of curves and surfaces in space.

Prerequisite: (MATH 2E or MATH H2E) and (MATH 3A or MATH H3A) and MATH 3D

**MATH 162B. Introduction to Differential Geometry. 4 Units.**

Applications of advanced calculus and linear algebra to the geometry of curves and surfaces in space.

Prerequisite: MATH 162A

**MATH 173A. Introduction to Cryptology. 4 Units.**

Introduction to some of the mathematics used in the making and breaking of codes, with applications to classical ciphers and public key systems. Includes topics from number theory, probability, and abstract algebra.

Prerequisite: (MATH 2B or AP Calculus BC) and (MATH 3A or MATH H3A) and MATH 13 or (ICS 6B and ICS 6D). AP Calculus BC with a minimum score of 4. MATH 13 with a grade of C or better

**MATH 173B. Introduction to Cryptology. 4 Units.**

Introduction to some of the mathematics used in the making and breaking of codes, with applications to classical ciphers and public key systems. The mathematics which is covered includes topics from number theory, probability, and abstract algebra.

Prerequisite: MATH 173A

**MATH 175. Combinatorics . 4 Units.**

Introduction to combinatorics including basic counting principles, permutations, combinations, binomial coefficients, inclusion-exclusion, derangements, ordinary and exponential generating functions, recurrence relations, Catalan numbers, Stirling numbers, and partition numbers.

Prerequisite: (MATH 2B or AP Calculus BC) and MATH 13. AP Calculus BC with a minimum score of 4. MATH 13 with a grade of C or better

**MATH 176. Mathematics of Finance. 4 Units.**

After reviewing tools from probability, statistics, and elementary differential and partial differential equations, concepts such as hedging, arbitrage, Puts, Calls, the design of portfolios, the derivation and solution of the Blac-Scholes, and other equations are discussed.

Prerequisite: MATH 3A or MATH H3A

Same as ECON 135.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Mathematics Majors have first consideration for enrollment.



**MATH 180A. Number Theory. 4 Units.**

Introduction to number theory and applications. Divisibility, prime numbers, factorization. Arithmetic functions. Congruences. Quadratic residue. Diophantine equations. Introduction to cryptography.

Prerequisite: (MATH 3A or MATH H3A) and MATH 13. MATH 13 with a grade of C or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 180B. Number Theory. 4 Units.**

Introduction to number theory and applications. Analytic number theory, character sums, finite fields, discrete logarithm, computational complexity. Introduction to coding theory. Other topics as time permits.

Prerequisite: MATH 180A

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 184. History of Mathematics. 4 Units.**

Topics vary from year to year. Some possible topics: mathematics in ancient times; the development of modern analysis; the evolution of geometric ideas. Students will be assigned individual topics for term papers.

Corequisite: MATH 184L

Prerequisite: MATH 120A and MATH 140A

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 184L. History of Mathematics Lesson Lab. 1 Unit.**

Aspiring math teachers research, design, present, and peer review middle school or high school math lessons that draw from history of mathematics topics.

Corequisite: MATH 184

Prerequisite: PS 5

**MATH 192. Studies in the Learning and Teaching of Secondary Mathematics. 2 Units.**

Focus is on historic and current mathematical concepts related to student learning and effective math pedagogy, with fieldwork in grades 6-14.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**MATH 194. Problem Solving Seminar. 2 Units.**

Develops ability in analytical thinking and problem solving, using problems of the type found in the Mathematics Olympiad and the Putnam Mathematical Competition. Students taking the course in fall will prepare for and take the Putnam examination in December.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**MATH 195W. Mathematical Writing. 4 Units.**

Techniques of mathematical writing and communication. Covers effectively writing mathematical papers, creating effective presentations, and communicating mathematics in a variety of media. Focuses on utilizing LaTeX for typesetting mathematics.

Prerequisite: MATH 120A or MATH 121A or MATH 140A. MATH 120A with a grade of C or better. MATH 121A with a grade of C or better. MATH 140A with a grade of C or better. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Mathematics Majors have first consideration for enrollment.

**(Ib)****MATH 199A. Special Studies in Mathematics. 2-4 Units.**

Supervised reading. For outstanding undergraduate Mathematics majors in supervised but independent reading or research of mathematical topics.

Repeatability: Unlimited as topics vary.

**MATH 199B. Special Studies in Mathematics. 2-4 Units.**

Supervised reading. For outstanding undergraduate Mathematics majors in supervised but independent reading or research of mathematical topics.

Repeatability: Unlimited as topics vary.

**MATH 199C. Special Studies in Mathematics. 2-4 Units.**

Supervised reading. For outstanding undergraduate Mathematics majors in supervised but independent reading or research of mathematical topics.

Repeatability: Unlimited as topics vary.

**MATH 205A. Introduction to Graduate Analysis. 5 Units.**

Construction of the real number system, topology of the real line, concepts of continuity, differential and integral calculus, sequences and series of functions, equicontinuity, metric spaces, multivariable differential and integral calculus, implicit functions, curves and surfaces.

Prerequisite: (MATH 2E or MATH H2E) and (MATH 3A MATH H3A) and MATH 13. MATH 2E with a grade of A or better. MATH H2E with a grade of A or better. MATH 13 with a grade of C or better

Concurrent with MATH H140A.

**MATH 205B. Introduction to Graduate Analysis. 5 Units.**

Construction of the real number system, topology of the real line, concepts of continuity, differential and integral calculus, sequences and series of functions, equicontinuity, metric spaces, multivariable differential and integral calculus, implicit functions, curves and surfaces.

Prerequisite: MATH 205A

Concurrent with MATH H140B.

**MATH 205C. Introduction to Graduate Analysis. 5 Units.**

Construction of the real number system, topology of the real line, concepts of continuity, differential and integral calculus, sequences and series of functions, equicontinuity, metric spaces, multivariable differential and integral calculus, implicit functions, curves and surfaces.

Prerequisite: MATH 205B

Concurrent with MATH H140C.

**MATH 206A. Introduction to Graduate Algebra. 5 Units.**

Introduction to abstract linear algebra, including bases, linear transformation, eigenvectors, canonical forms, inner products, symmetric operators. Introduction to groups, rings, and fields including examples of groups, group actions, Sylow theorems, modules over principal ideal domains, polynomials, and Galois groups.

Prerequisite: MATH 3A or MATH H3A

Concurrent with MATH H120A.

**MATH 206B. Introduction to Graduate Algebra. 5 Units.**

Introduction to abstract linear algebra, including bases, linear transformation, eigenvectors, canonical forms, inner products, symmetric operators. Introduction to groups, rings, and fields including examples of groups, group actions, Sylow theorems, modules over principal ideal domains, polynomials, and Galois groups.

Prerequisite: MATH 206A

Concurrent with MATH H120B.

**MATH 206C. Introduction to Graduate Algebra. 5 Units.**

Introduction to abstract linear algebra, including bases, linear transformation, eigenvectors, canonical forms, inner products, symmetric operators. Introduction to groups, rings, and fields including examples of groups, group actions, Sylow theorems, modules over principal ideal domains, polynomials, and Galois groups.

Prerequisite: MATH 206B

Concurrent with MATH H120C.

**MATH 210A. Real Analysis. 4 Units.**

Measure theory, Lebesgue integral, signed measures, Radon-Nikodym theorem, functions of bounded variation and absolutely continuous functions, classical Banach spaces,  $L_p$  spaces, integration on locally compact spaces and the Riesz-Markov theorem, measure and outer measure, product measure spaces.

Prerequisite: MATH 140C

**MATH 210B. Real Analysis. 4 Units.**

Measure theory, Lebesgue integral, signed measures, Radon-Nikodym theorem, functions of bounded variation and absolutely continuous functions, classical Banach spaces,  $L_p$  spaces, integration on locally compact spaces and the Riesz-Markov theorem, measure and outer measure, product measure spaces.

Prerequisite: MATH 210A

**MATH 210C. Real Analysis. 4 Units.**

Measure theory, Lebesgue integral, signed measures, Radon-Nikodym theorem, functions of bounded variation and absolutely continuous functions, classical Banach spaces,  $L_p$  spaces, integration on locally compact spaces and the Riesz-Markov theorem, measure and outer measure, product measure spaces.

Prerequisite: MATH 210B

**MATH 218A. Introduction to Manifolds and Geometry. 4 Units.**

General topology and fundamental groups, covering space; Stokes theorem on manifolds, selected topics on abstract manifold theory.

Prerequisite: MATH 205C

**MATH 218B. Introduction to Manifolds and Geometry. 4 Units.**

General topology and fundamental groups, covering space; Stokes theorem on manifolds, selected topics on abstract manifold theory.

Prerequisite: MATH 218A

**MATH 218C. Introduction to Manifolds and Geometry. 4 Units.**

General topology and fundamental groups, covering space; Stokes theorem on manifolds, selected topics on abstract manifold theory.

Prerequisite: MATH 218B

**MATH 220A. Analytic Function Theory. 4 Units.**

Standard theorems about analytic functions. Harmonic functions. Normal families. Conformal mapping.

Prerequisite: MATH 140C

**MATH 220B. Analytic Function Theory. 4 Units.**

Standard theorems about analytic functions. Harmonic functions. Normal families. Conformal mapping.

Prerequisite: MATH 220A

**MATH 220C. Analytic Function Theory. 4 Units.**

Standard theorems about analytic functions. Harmonic functions. Normal families. Conformal mapping.

Prerequisite: MATH 220B

**MATH 222A. Several Complex Variables and Complex Geometry. 4 Units.**

Several Complex variables,  $\bar{\partial}$ -bar problems, mappings, Kaehler geometry, de Rham and Dolbeault Theorems, Chern Classes, Hodge Theorems, Calabi conjecture, Kahler-Einstein geometry, Monge-Ampere.

Prerequisite: MATH 218C and MATH 220C

**MATH 225A. Introduction to Numerical Analysis and Scientific Computing. 4 Units.**

Introduction to fundamentals of numerical analysis from an advanced viewpoint. Error analysis, approximation of functions, nonlinear equations.

Prerequisite: MATH 3D and (MATH 105A and MATH 105B) or (MATH 140A and MATH 140B) and MATH 121A and (MATH 112A or MAE 140)

Restriction: Graduate students only.

**MATH 225B. Introduction to Numerical Analysis and Scientific Computing. 4 Units.**

Introduction to fundamentals of numerical analysis from an advanced viewpoint. Numerical linear algebra, numerical solutions of differential equations; stability.

Prerequisite: MATH 225A

Restriction: Graduate students only.

**MATH 225C. Introduction to Numerical Analysis and Scientific Computing. 4 Units.**

Introduction to fundamentals of numerical analysis from an advanced viewpoint. Numerical linear algebra, numerical solutions of differential equations; stability.

Prerequisite: MATH 225B

Restriction: Graduate students only.

**MATH 226A. Computational Differential Equations. 4 Units.**

Finite difference and finite element methods. Quick treatment of functional and nonlinear analysis background: weak solution,  $L_p$  spaces, Sobolev spaces. Approximation theory. Fourier and Petrov-Galerkin methods; mesh generation. Elliptic, parabolic, hyperbolic cases in 226A-B-C, respectively.

Prerequisite: MATH 3D and (MATH 112A or MAE 140) and (MATH 140B or MATH 105B)

**MATH 226B. Computational Differential Equations. 4 Units.**

Finite difference and finite element methods. Quick treatment of functional and nonlinear analysis background: weak solution,  $L_p$  spaces, Sobolev spaces. Approximation theory. Fourier and Petrov-Galerkin methods; mesh generation. Elliptic, parabolic, hyperbolic cases in 226A-B-C, respectively.

Prerequisite: MATH 226A

**MATH 226C. Computational Differential Equations. 4 Units.**

Finite difference and finite element methods. Quick treatment of functional and nonlinear analysis background: weak solution,  $L_p$  spaces, Sobolev spaces. Approximation theory. Fourier and Petrov-Galerkin methods; mesh generation. Elliptic, parabolic, hyperbolic cases in 226A-B-C, respectively.

Prerequisite: MATH 226B

**MATH 227A. Mathematical and Computational Biology. 4 Units.**

Analytical and numerical methods for dynamical systems, temporal-spatial dynamics, steady state, stability, stochasticity. Application to life sciences: genetics, tissue growth and patterning, cancers, ion channels gating, signaling networks, morphogen gradients. Analytical methods.

Prerequisite: (MATH 2A or AP Calculus BC or AP Calculus AB) and (MATH 2B or AP Calculus BC or MATH 5B) and (MATH 3A or MATH H3A). AP Calculus BC with a minimum score of 3. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 4

**MATH 227B. Mathematical and Computational Biology. 4 Units.**

Analytical and numerical methods for dynamical systems, temporal-spatial dynamics, steady state, stability, stochasticity. Application to life sciences: genetics, tissue growth and patterning, cancers, ion channels gating, signaling networks, morphogen gradients. Numerical simulations.

Prerequisite: MATH 227A

**MATH 227C. Mathematical and Computational Biology . 4 Units.**

Analytical and numerical methods for dynamical systems, temporal-spatial dynamics, steady state, stability, stochasticity. Application to life sciences: genetics, tissue growth and patterning, cancers, ion channels gating, signaling networks, morphogen gradients. Probabilistic methods.

Prerequisite: MATH 227A

Same as CS 285.

**MATH 230A. Algebra. 4 Units.**

Elements of the theories of groups, rings, fields, modules. Galois theory. Modules over principal ideal domains. Artinian, Noetherian, and semisimple rings and modules.

Prerequisite: MATH 120A and MATH 121A and MATH 121B

**MATH 230B. Algebra. 4 Units.**

Elements of the theories of groups, rings, fields, modules. Galois theory. Modules over principal ideal domains. Artinian, Noetherian, and semisimple rings and modules.

Prerequisite: MATH 230A

**MATH 230C. Algebra. 4 Units.**

Elements of the theories of groups, rings, fields, modules. Galois theory. Modules over principal ideal domains. Artinian, Noetherian, and semisimple rings and modules.

Prerequisite: MATH 230B

**MATH 232A. Algebraic Number Theory. 4 Units.**

Algebraic integers, prime ideals, class groups, Dirichlet unit theorem, localization, completion, Cebotarev density theorem, L-functions, Gauss sums, diophantine equations, zeta functions over finite fields. Introduction to class field theory.

Prerequisite: MATH 230C

**MATH 232B. Algebraic Number Theory. 4 Units.**

Algebraic integers, prime ideals, class groups, Dirichlet unit theorem, localization, completion, Cebotarev density theorem, L-functions, Gauss sums, diophantine equations, zeta functions over finite fields. Introduction to class field theory.

Prerequisite: MATH 232A

**MATH 232C. Algebraic Number Theory. 4 Units.**

Algebraic integers, prime ideals, class groups, Dirichlet unit theorem, localization, completion, Cebotarev density theorem, L-functions, Gauss sums, diophantine equations, zeta functions over finite fields. Introduction to class field theory.

Prerequisite: MATH 232B

**MATH 233A. Algebraic Geometry. 4 Units.**

Basic commutative algebra and classical algebraic geometry. Algebraic varieties, morphisms, rational maps, blow ups. Theory of schemes, sheaves, divisors, cohomology. Algebraic curves and surfaces, Riemann-Roch theorem, Jacobians, classification of curves and surfaces.

Prerequisite: MATH 230C

**MATH 233B. Algebraic Geometry. 4 Units.**

Basic commutative algebra and classical algebraic geometry. Algebraic varieties, morphisms, rational maps, blow ups. Theory of schemes, sheaves, divisors, cohomology. Algebraic curves and surfaces, Riemann-Roch theorem, Jacobians, classification of curves and surfaces.

Prerequisite: MATH 233A

**MATH 233C. Algebraic Geometry. 4 Units.**

Basic commutative algebra and classical algebraic geometry. Algebraic varieties, morphisms, rational maps, blow ups. Theory of schemes, sheaves, divisors, cohomology. Algebraic curves and surfaces, Riemann-Roch theorem, Jacobians, classification of curves and surfaces.

Prerequisite: MATH 233B

**MATH 235A. Mathematics of Cryptography. 4 Units.**

Mathematics of public key cryptography: encryption and signature schemes; RSA; factoring; primality testing; discrete log based cryptosystems, elliptic and hyperelliptic curve cryptography and additional topics as determined by the instructor.

Prerequisite: MATH 230C

**MATH 239A. Analytic Methods in Arithmetic Geometry. 4 Units.**

Riemann zeta function, Dirichlet L-functions, prime number theorem, zeta functions over finite fields, sieve methods, zeta functions of algebraic curves, algebraic coding theory, L-Functions over number fields, L-functions of modular forms, Eisenstein series.

Prerequisite: MATH 220C and MATH 230C

**MATH 239B. Analytic Methods in Arithmetic Geometry. 4 Units.**

Riemann zeta function, Dirichlet L-functions, prime number theorem, zeta functions over finite fields, sieve methods, zeta functions of algebraic curves, algebraic coding theory, L-Functions over number fields, L-functions of modular forms, Eisenstein series.

Prerequisite: MATH 239A

**MATH 239C. Analytic Methods in Arithmetic Geometry. 4 Units.**

Riemann zeta function, Dirichlet L-functions, prime number theorem, zeta functions over finite fields, sieve methods, zeta functions of algebraic curves, algebraic coding theory, L-Functions over number fields, L-functions of modular forms, Eisenstein series.

Prerequisite: MATH 239B

**MATH 240A. Differential Geometry. 4 Units.**

Riemannian manifolds, connections, curvature and torsion. Submanifolds, mean curvature, Gauss curvature equation. Geodesics, minimal submanifolds, first and second fundamental forms, variational formulas. Comparison theorems and their geometric applications. Hodge theory applications to geometry and topology.

**MATH 240B. Differential Geometry. 4 Units.**

Riemannian manifolds, connections, curvature and torsion. Submanifolds, mean curvature, Gauss curvature equation. Geodesics, minimal submanifolds, first and second fundamental forms, variational formulas. Comparison theorems and their geometric applications. Hodge theory applications to geometry and topology.

Prerequisite: MATH 240A

**MATH 240C. Differential Geometry. 4 Units.**

Riemannian manifolds, connections, curvature and torsion. Submanifolds, mean curvature, Gauss curvature equation. Geodesics, minimal submanifolds, first and second fundamental forms, variational formulas. Comparison theorems and their geometric applications. Hodge theory applications to geometry and topology.

Prerequisite: MATH 240B

**MATH 245A. Topics in Differential Geometry. 4 Units.**

Studies in selected areas of differential geometry, a continuation of MATH 240A-MATH 240B-MATH 240C. Topics addressed vary each quarter.

Prerequisite: MATH 240C

Repeatability: Unlimited as topics vary.

**MATH 245B. Topics in Differential Geometry. 4 Units.**

Studies in selected areas of differential geometry, a continuation of MATH 240A-MATH 240B-MATH 240C. Topics addressed vary each quarter.

Prerequisite: MATH 245A

Repeatability: Unlimited as topics vary.

**MATH 245C. Topics in Differential Geometry. 4 Units.**

Studies in selected areas of differential geometry, a continuation of MATH 240A-MATH 240B-MATH 240C. Topics addressed vary each quarter.

Prerequisite: MATH 245B

Repeatability: Unlimited as topics vary.

**MATH 250A. Algebraic Topology. 4 Units.**

Provides fundamental materials in algebraic topology: fundamental group and covering space, homology and cohomology theory, and homotopy group.

Prerequisite: MATH 230A

**MATH 250B. Algebraic Topology. 4 Units.**

Provides fundamental materials in algebraic topology: fundamental group and covering space, homology and cohomology theory, and homotopy group.

Prerequisite: MATH 250A

**MATH 250C. Algebraic Topology. 4 Units.**

Provides fundamental materials in algebraic topology: fundamental group and covering space, homology and cohomology theory, and homotopy group.

Prerequisite: MATH 250B

**MATH 260A. Functional Analysis. 4 Units.**

Normed linear spaces, Hilbert spaces, Banach spaces, Stone-Weierstrass Theorem, locally convex spaces, bounded operators on Banach and Hilbert spaces, the Gelfand-Neumark Theorem for commutative  $C^*$ -algebras, the spectral theorem for bounded self-adjoint operators, unbounded operators on Hilbert spaces.

Prerequisite: MATH 210C and MATH 220C

**MATH 260B. Functional Analysis. 4 Units.**

Normed linear spaces, Hilbert spaces, Banach spaces, Stone-Weierstrass Theorem, locally convex spaces, bounded operators on Banach and Hilbert spaces, the Gelfand-Neumark Theorem for commutative  $C^*$ -algebras, the spectral theorem for bounded self-adjoint operators, unbounded operators on Hilbert spaces.

Prerequisite: MATH 260A

**MATH 260C. Functional Analysis. 4 Units.**

Normed linear spaces, Hilbert spaces, Banach spaces, Stone-Weierstrass Theorem, locally convex spaces, bounded operators on Banach and Hilbert spaces, the Gelfand-Neumark Theorem for commutative  $C^*$ -algebras, the spectral theorem for bounded self-adjoint operators, unbounded operators on Hilbert spaces.

Prerequisite: MATH 260B

**MATH 270A. Probability. 4 Units.**

Probability spaces, distribution and characteristic functions. Strong limit theorems. Limit distributions for sums of independent random variables. Conditional expectation and martingale theory. Stochastic processes.

Prerequisite: MATH 130C and MATH 210C

**MATH 270B. Probability. 4 Units.**

Probability spaces, distribution and characteristic functions. Strong limit theorems. Limit distributions for sums of independent random variables. Conditional expectation and martingale theory. Stochastic processes.

Prerequisite: MATH 270A

**MATH 270C. Probability. 4 Units.**

Probability spaces, distribution and characteristic functions. Strong limit theorems. Limit distributions for sums of independent random variables. Conditional expectation and martingale theory. Stochastic processes.

Prerequisite: MATH 270B

**MATH 271A. Stochastic Processes. 4 Units.**

Processes with independent increments, Wiener and Gaussian processes, function space integrals, stationary processes, Markov processes.

Prerequisite: MATH 210C

Overlaps with STAT 270.

**MATH 271B. Stochastic Processes. 4 Units.**

Processes with independent increments, Wiener and Gaussian processes, function space integrals, stationary processes, Markov processes.

Prerequisite: MATH 271A

Overlaps with STAT 270.

**MATH 271C. Stochastic Processes. 4 Units.**

Processes with independent increments, Wiener and Gaussian processes, function space integrals, stationary processes, Markov processes.

Prerequisite: MATH 271B

Overlaps with STAT 270.

**MATH 280A. Mathematical Logic. 4 Units.**

Basic set theory; models, compactness, and completeness; basic model theory; Incompleteness and Gödel's Theorems; basic recursion theory; constructible sets.

**MATH 280B. Mathematical Logic. 4 Units.**

Basic set theory; models, compactness, and completeness; basic model theory; Incompleteness and Gödel's Theorems; basic recursion theory; constructible sets.

Prerequisite: MATH 280A

**MATH 280C. Mathematical Logic. 4 Units.**

Basic set theory; models, compactness, and completeness; basic model theory; Incompleteness and Gödel's Theorems; basic recursion theory; constructible sets.

Prerequisite: MATH 280B

**MATH 281A. Set Theory. 4 Units.**

Ordinals, cardinals, cardinal arithmetic, combinatorial set theory, models of set theory, Gödel's constructible universe, forcing, large cardinals, iterate forcing, inner model theory, fine structure.

Prerequisite: MATH 280C

**MATH 281B. Set Theory. 4 Units.**

Ordinals, cardinals, cardinal arithmetic, combinatorial set theory, models of set theory, Gödel's constructible universe, forcing, large cardinals, iterate forcing, inner model theory, fine structure.

Prerequisite: MATH 281A

**MATH 281C. Set Theory. 4 Units.**

Ordinals, cardinals, cardinal arithmetic, combinatorial set theory, models of set theory, Gödel's constructible universe, forcing, large cardinals, iterate forcing, inner model theory, fine structure.

Prerequisite: MATH 281B

**MATH 282A. Model Theory. 4 Units.**

Languages, structures, compactness and completeness. Model-theoretic constructions. Omitting types theorems. Morley's theorem. Ranks, forking. Model completeness. O-minimality. Applications to algebra.

Prerequisite: MATH 280C

**MATH 282B. Model Theory. 4 Units.**

Languages, structures, compactness and completeness. Model-theoretic constructions. Omitting types theorems. Morley's theorem. Ranks, forking. Model completeness. O-minimality. Applications to algebra.

Prerequisite: MATH 282A

**MATH 282C. Model Theory. 4 Units.**

Languages, structures, compactness and completeness. Model-theoretic constructions. Omitting types theorems. Morley's theorem. Ranks, forking. Model completeness. O-minimality. Applications to algebra.

Prerequisite: MATH 282B

**MATH 285A. Topics in Mathematical Logic. 4 Units.**

Studies in selected areas of mathematical logic, a continuation of MATH 280A-MATH 280B-MATH 280C. Topics addressed vary each quarter.

Prerequisite: MATH 280C

Repeatability: Unlimited as topics vary.

**MATH 290A. Methods in Applied Mathematics. 4 Units.**

Introduction to ODEs and dynamical systems: existence and uniqueness. Equilibria and periodic solutions. Bifurcation theory. Perturbation methods: approximate solution of differential equations. Multiple scales and WKB. Matched asymptotic. Calculus of variations: direct methods, Euler-Lagrange equation. Second variation and Legendre condition.

**MATH 290B. Methods in Applied Mathematics. 4 Units.**

Introduction to ODEs and dynamical systems: existence and uniqueness. Equilibria and periodic solutions. Bifurcation theory. Perturbation methods: approximate solution of differential equations. Multiple scales and WKB. Matched asymptotic. Calculus of variations: direct methods, Euler-Lagrange equation. Second variation and Legendre condition.

Prerequisite: MATH 290A

**MATH 290C. Methods in Applied Mathematics. 4 Units.**

Introduction to ODEs and dynamical systems: existence and uniqueness. Equilibria and periodic solutions. Bifurcation theory. Perturbation methods: approximate solution of differential equations. Multiple scales and WKB. Matched asymptotic. Calculus of variations: direct methods, Euler-Lagrange equation. Second variation and Legendre condition.

Prerequisite: MATH 290B

**MATH 295A. Partial Differential Equations. 4 Units.**

Theory and techniques for linear and nonlinear partial differential equations. Local and global theory of partial differential equations: analytic, geometric, and functional analytic methods.

Prerequisite: MATH 210C and MATH 112B and MATH 112C

**MATH 295B. Partial Differential Equations. 4 Units.**

Theory and techniques for linear and nonlinear partial differential equations. Local and global theory of partial differential equations: analytic, geometric, and functional analytic methods.

Prerequisite: MATH 295A



**MATH 295C. Partial Differential Equations. 4 Units.**

Theory and techniques for linear and nonlinear partial differential equations. Local and global theory of partial differential equations: analytic, geometric, and functional analytic methods.

Prerequisite: MATH 295B

**MATH 296. Topics in Partial Differential Equations. 4 Units.**

Studies in selected areas of partial differential equations, a continuation of MATH 295A-MATH 295B-MATH 295C. Topics addressed vary each quarter.

Prerequisite: MATH 295C

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**MATH 297. Mathematics Colloquium. 1 Unit.**

Weekly colloquia on topics of current interest in mathematics.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**MATH 298A. Seminar . 2 Units.**

Seminars organized for detailed discussion of research problems of current interest in the Department. The format, content, frequency, and course value are variable.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

**MATH 298B. Seminar . 2 Units.**

Seminars organized for detailed discussion of research problems of current interest in the Department. The format, content, frequency, and course value are variable.

Prerequisite: MATH 298A

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

**MATH 298C. Seminar . 2 Units.**

Seminars organized for detailed discussion of research problems of current interest in the Department. The format, content, frequency, and course value are variable.

Prerequisite: MATH 298B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

**MATH 299A. Supervised Reading and Research. 1-12 Units.**

Supervised reading and research with Mathematics faculty.

Repeatability: May be repeated for credit unlimited times.

**MATH 299B. Supervised Reading and Research. 1-12 Units.**

Supervised reading and research with Mathematics faculty.

Prerequisite: MATH 299A

Repeatability: May be repeated for credit unlimited times.

**MATH 299C. Supervised Reading and Research. 1-12 Units.**

Supervised reading and research with Mathematics faculty.

Prerequisite: MATH 299B

Repeatability: May be repeated for credit unlimited times.

**MATH 399. University Teaching. 1-4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Mechanical and Aerospace Engineering (ENGRMAE)

### Courses

**ENGRMAE 10. Introduction to Engineering Computations. 4 Units.**

Introduction to the solution of engineering problems through the use of the computer. Elementary programming, numerical analysis, and data visualization with a high-level programming language such as MATLAB.

(Design units: 1)

Corequisite: MATH 2A

Prerequisite: MATH 2A or MATH 5A

Overlaps with EECS 10, EECS 12, BME 60B.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 30. Statics. 4 Units.**

Addition and resolution of forces, distributed forces, equivalent system of forces centroids, first moments, moments and products on inertia, equilibrium of rigid bodies, trusses, beams, cables. Course may be offered online.

(Design units: 0)

Corequisite: MATH 2D

Prerequisite: MATH 2D and PHYSICS 7C

Same as ENGRCEE 30, ENGR 30.

Restriction: School of Engineering students have first consideration for enrollment.

**ENGRMAE 52. Computer-Aided Design. 4 Units.**

Develops skills for interpretation and presentation of mechanical design drawings and the use of CAD in engineering design. An integrated approach to drafting based on sketching, manual drawing, and three-dimensional CAD techniques is presented.

(Design units: 0.5)

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 57. Manufacturing Processes in Engineering. 2 Units.**

With laboratory. Machines and processes of mechanical manufacturing. Safety and professional procedures emphasized. Use of measuring instruments, hand tools, lathe, mill, drill press, bandsaw, grinder, welding equipment.

(Design units: 0)

Grading Option: Pass/no pass only.

Restriction: School of Engineering students have first consideration for enrollment.

**ENGRMAE 60. Electric Circuits. 4 Units.**

Design and analysis of analog circuits based on lumped circuit elements with emphasis on the use of operational amplifiers. Sinusoidal and transient response. Constructional and laboratory testing of analog circuits, and introduction to data acquisition. Materials fee.

(Design units: 2)

Corequisite: MATH 3D

Prerequisite: PHYSICS 7D and PHYSICS 7LD

Overlaps with EECS 70A.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Materials Science Engineering Majors have first consideration for enrollment.

**ENGRMAE 80. Dynamics. 4 Units.**

Introduction to the kinematics and dynamics of particles and rigid bodies. The Newton-Euler, Work/Energy, and Impulse/Momentum methods are explored for ascertaining the dynamics of particles and rigid bodies. An engineering design problem using these fundamental principles is also undertaken.

(Design units: 0.5)

Prerequisite: MATH 2D and PHYSICS 7C

Same as ENGRCEE 80, ENGR 80.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRMAE 91. Introduction to Thermodynamics. 4 Units.**

Thermodynamic principles; open and closed systems representative of engineering problems. First and second law of thermodynamics with applications to engineering systems and design.

(Design units: 0.5)

Prerequisite: PHYSICS 7C and MATH 2D

Overlaps with CBE 40B.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRMAE 93. Topics in Design Project . 1-4 Units.**

Early-stage design/hands-on experience for students, and allows them to participate alongside seniors in the design project.

(Design units: 1)

Repeatability: Unlimited as topics vary.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

**ENGRMAE 106. Mechanical Systems Laboratory. 4 Units.**

Experiments in linear systems, including op-amp circuits, vibrations, and control systems. Emphasis on demonstrating that mathematical models can be useful tools for the analysis and design of electro-mechanical systems. Materials fee.

(Design units: 2)

Prerequisite: ENGRMAE 60 or EECS 70A

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRMAE 107. Fluid Thermal Science Laboratory. 4 Units.**

Fluid and thermal engineering laboratory. Experimental analysis of fluid flow, heat transfer, and thermodynamic systems. Probability, statistics, and uncertainty analysis. Report writing is emphasized and a design project is required. Materials fee.

(Design units: 1)

Corequisite: ENGRMAE 120

Restriction: Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 108. Aerospace Laboratory. 4 Units.**

Analytical and experimental investigation in aerodynamics, fluid dynamics, and heat transfer. Emphasis on study of flow over objects and lift and drag on airfoils. Introduction to basic diagnostic techniques. Report writing is emphasized. Design project is required.

(Design units: 2)

Prerequisite: ENGRMAE 130B

Restriction: Aerospace Engineering Majors have first consideration for enrollment. Mechanical Engineering majors have second consideration for enrollment.

**ENGRMAE 110. Combustion and Fuel Cell Systems. 4 Units.**

Fundamentals of gaseous, liquid, and coal-fired combustion and fuel cell systems. Fuels, fuel-air mixing, aerodynamics, and combustion and fuel cell thermodynamics. Operating and design aspects of practical systems including engines, power generators, boilers, furnaces, and incinerators.

(Design units: 2)

Prerequisite: ENGRMAE 115

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRMAE 112. Propulsion. 4 Units.**

Application of thermodynamics and fluid mechanics to basic flow processes and cycle performance in propulsion systems: gas turbines, ramjets, scramjets, and rockets.

(Design units: 1)

Prerequisite: ENGRMAE 135

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

**ENGRMAE 113. Electric Propulsion. 4 Units.**

Space propulsion requirements and maneuvers, stressing those best suited to electric propulsion. An introduction to plasma physics. Electrothermal, electromagnetic, and electrostatic accelerators, with emphasis in technologies (ion engines, Hall thrusters, and colloidal thrusters) belonging to the latter family.

(Design units: 1)

Prerequisite: ENGRMAE 112

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

Concurrent with ENGRMAE 213.

**ENGRMAE 114. Fuel Cell Fundamentals and Technology. 4 Units.**

Introduction to electrochemistry and electrocatalysis; nature of fuel-cell electrodes and electrolytes; charge transfer reactions at interfaces; charge transport and mass transport processes; fuel processing reactions; determination of fuel cell efficiency, fuel flexibility, emissions, and other characteristics.

(Design units: 0)

Prerequisite: ENGRMAE 115

Restriction: Seniors only. Mechanical Engineering Majors have first consideration for enrollment. Chemical Engineering majors have second consideration for enrollment.

Concurrent with ENGRMAE 214A.

**ENGRMAE 115. Applied Engineering Thermodynamics. 4 Units.**

Application of thermodynamic principles to compressible and incompressible processes representative of practical engineering problems; power cycles, refrigeration cycles, multicomponent mixtures, air conditioning systems, combustion, and compressible flow. Design of a thermodynamic process.

(Design units: 2)

Prerequisite: ENGRMAE 91 or CBE 40B or ENGRMSE 65A

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRMAE 117. Solar and Renewable Energy Systems. 4 Units.**

Basic principles, design, and operation of solar and other renewable energy systems including solar photo-voltaic, solar thermal, wind, and PEM fuel cell. Includes power generation and storage, and renewable fuels for transportation and stationary power generation.

(Design units: 1)

Prerequisite: (ENGRMAE 91 or CBE 40B)

Restriction: Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 118. Sustainable Energy Systems. 4 Units.**

Basic principles, design, and operation of sustainable energy systems including wind, solar photo-voltaic and thermal, hydroelectric, geothermal, oceanic, biomass combustion, advanced coal, and next generation nuclear. Includes power generation, storage, and transmission for stationary power generation.

(Design units: 1)

Prerequisite: ENGRMAE 115

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

Concurrent with ENGRMAE 218.

**ENGRMAE 119. Climate Solutions. 4 Units.**

Focuses on carbon neutrality and climate stability, addressing.

Same as EARTHSS 179, UPPP 111.

Restriction: Upper-division students only.

**ENGRMAE 120. Heat and Mass Transfer. 4 Units.**

Fundamentals of heat and mass transfer. Conduction, heat and mass transfer by convection in laminar and turbulent flows, radiation heat transfer, and combined modes of heat and mass transfer. Practical engineering applications.

(Design units: 0)

Prerequisite: ENGRMAE 130B

Overlaps with CBE 120B.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 130A. Introduction to Fluid Mechanics. 4 Units.**

Fundamental concepts; fluid statics; fluid dynamics; Bernoulli's equation; control-volume analysis; basic flow equations of conservation of mass, momentum, and energy; differential analysis; potential flow; viscous incompressible flow.

(Design units: 0)

Corequisite: ENGRMAE 91

Prerequisite: PHYSICS 7C and MATH 2D and MATH 2E and MATH 3D and (ENGRMAE 30 or ENGRCEE 30 or ENGR 30) and (ENGRMAE 80 or ENGRCEE 80 or ENGR 80). PHYSICS 7C with a grade of C- or better. MATH 2D with a grade of C- or better. MATH 2E with a grade of C- or better. MATH 3D with a grade of C- or better. ENGRMAE 30 with a grade of C- or better. ENGRCEE 30 with a grade of C- or better. ENGR 30 with a grade of C- or better. ENGRMAE 80 with a grade of C- or better. ENGRCEE 80 with a grade of C- or better. ENGR 80 with a grade of C- or better

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

**ENGRMAE 130B. Introduction to Viscous and Compressible Flows. 4 Units.**

Introduction to the analysis of viscous flows including fully developed laminar and turbulent flow in a pipe, viscous flow over immersed bodies, evaluation of boundary layer characteristics, lift and drag, compressible flow in a duct and normal shock waves.

(Design units: 1)

Prerequisite: ENGRMAE 130A

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

**ENGRMAE 132. Computational Fluid Dynamics. 4 Units.**

Introduction to computational fluid dynamics in simple engineering devices. The numerical simulations will be performed via the widely-used software ANSYS-Fluent. While Fluent is the choice of software, all major CFD packages are based on a similar numerical method.

(Design units: 0)

Prerequisite: ENGRMAE 130B. ENGRMAE 130B with a grade of C- or better

Restriction: Aerospace Engineering Majors only. Mechanical Engineering Majors only.

**ENGRMAE 135. Compressible Flow. 4 Units.**

Compressibility effects in fluid mechanics. One-dimensional flow with area variation, friction, heat transfer, and shocks. Design of gas supply systems. Two-dimensional flow with oblique shocks and isentropic waves. Supersonic airfoil theory and design, wind tunnel design. Basic diagnostics.

(Design units: 1)

Prerequisite: ENGRMAE 130A

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

**ENGRMAE 136. Aerodynamics. 4 Units.**

Analysis of flow over aircraft wings and airfoils, prediction of lift, moment, and drag. Topics: fluid dynamics equations; flow similitude; viscous effects; vorticity, circulation, Kelvin's theorem, potential flow; superposition principle, Kutta-Joukowski theorem; thin airfoil theory; finite wing theory; compressibility.

(Design units: 1)

Prerequisite: ENGRMAE 130B

Restriction: Aerospace Engineering Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 145. Theory of Machines and Mechanisms. 4 Units.**

Presents the basic mathematical theory of machines. Focuses on the principles of cam design, gearing and gear train analysis, and the kinematic and dynamic analysis of linkages, together with an introduction to robotics.

(Design units: 2)

Prerequisite: ENGRMAE 52 and (ENGRMAE 80 or ENGRCEE 80 or ENGR 80) and (MATH 3A or I&C SCI 6N)

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Materials Science and Engineering majors have second consideration for enrollment.

**ENGRMAE 146. Astronautics. 4 Units.**

Motion in gravitational force fields, orbit transfers, rocketry, interplanetary trajectories, attitude dynamics and stabilization, navigation, reentry, the space environment.

(Design units: 1)

Prerequisite: ENGRMAE 80 or ENGRCEE 80 or ENGR 80

Restriction: Aerospace Engineering Majors have first consideration for enrollment.

**ENGRMAE 147. Vibrations. 4 Units.**

Analysis of structural vibrations of mechanical systems. Modeling for lumped and distributed parameter systems. Topics include single and multi-degree of freedom systems, free and forced vibrations, Fourier series, convolution integral, mass/stiffness matrices, and normal modes with design project.

(Design units: 1)

Prerequisite: (ENGR 80 or ENGRCEE 80 or ENGRMAE 80) and MATH 2E and MATH 3D

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 150. Mechanics of Structures. 4 Units.**

Stresses and strains. Torsion. Bending. Beam deflection. Shear force and moment distributions in beams. Yielding and buckling of columns. Combined loading. Transformation of stresses and strain. Yielding criteria. Finite elements analysis of frames. Dynamic of two-bar truss.

(Design units: 2)

Prerequisite: (ENGRCEE 30 or ENGR 30 or ENGRMAE 30) and MATH 3A

Same as ENGR 150.

Overlaps with ENGRCEE 150.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 150L. Mechanics of Structures Laboratory. 1 Unit.**

Experimental techniques for the measurement of mechanical properties of materials and structures. Methods for load, displacement, and strain measurements. Tension, bending, compression tests. Determination of strength, stiffness, toughness for metals, polymers, ceramics, and composites. Deformation of structures. Materials fee.

(Design units: 0)

Corequisite: ENGRMAE 150

Prerequisite: ENGRMAE 30 or ENGR 30 or ENGRCEE 30

Overlaps with ENGRCEE 150L.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 151. Mechanical Engineering Design. 4 Units.**

A comprehensive group design project experience that involves identifying customer needs, idea generation, reverse engineering, preliminary design, standards, prototype development, testing, analysis, and redesign of a product involving fluid, thermal, and mechanical components. Introduces design for manufacturing and the environment. Materials fee.

(Design units: 3)

Corequisite: ENGRMAE 170

Prerequisite: ENGRMAE 120 and ENGRMAE 145

Restriction: Seniors only. Mechanical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 152. Introduction to Computer-Aided Engineering. 4 Units.**

Elements and principles of computer-aided engineering with modern hardware and software are presented with a design focus. Case studies are used to assist in finite-element method techniques. Not offered every year.

(Design units: 2)

Prerequisite: (ENGRMAE 150 or ENGR 150) and ENGRMAE 120

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 153. Advanced BIOMEMS Manufacturing Techniques. 4 Units.**

Introduction to BIOMEMS. Advanced biotechnology/biomedicine equipment based on MEMS and NEMS. Fundamentals of MEMS/NEMS sensing techniques and the biological and physics principles involved and the preferred MEMS and NEMS manufacturing techniques.

(Design units: 0)

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Biomedical Engineering Majors have first consideration for enrollment.

Concurrent with ENGRMAE 253.

**ENGRMAE 155. Composite Materials and Structures. 4 Units.**

Motivation for composite materials. Different classifications according to the nature of the matrix (PMC, MMC, CMC) and the reinforcement topology (fibers, whiskers, particulates). Mechanical properties. Failure mechanisms. Designing with composite materials. Advantages and limitations of homogenization techniques for numerical modeling.

(Design units: 0)

Prerequisite: ENGR 54 and (ENGRMAE 150 or ENGRCEE 150 or ENGR 150)

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering majors have second consideration for enrollment. Chemical Engineering majors have second consideration for enrollment. Civil Engineering majors have second consideration for enrollment. Materials Science and Engineering majors have second consideration for enrollment.

Concurrent with ENGRMAE 255.

**ENGRMAE 156. Mechanical Behavior and Design Principles. 4 Units.**

Principles governing structure and mechanical behavior of materials, relationship relating microstructure and mechanical response with application to elasticity, plasticity, yielding, necking, creep, and fracture of materials. Introduction to experimental techniques to characterize the properties of materials. Design parameters.

(Design units: 2)

Prerequisite: ENGR 54

Same as ENGRMSE 155.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Aerospace Engineering majors have second consideration for enrollment.



**ENGRMAE 157. Lightweight Structures. 4 Units.**

Fundamentals of torsion and bending. Analysis and design of thin-wall and composite beams. Stress analysis of aircraft components. Stiffness, strength, and buckling. Introduction to the Finite Element method and its application to plates and shells.

(Design units: 2)

Prerequisite: ENGR 150 or ENGRCEE 150 or ENGRMAE 150

Restriction: Aerospace Engineering Majors have first consideration for enrollment. Mechanical Engineering majors have second consideration for enrollment. Civil Engineering majors have second consideration for enrollment. Materials Science and Engineering majors have second consideration for enrollment.

**ENGRMAE 158. Aircraft Performance. 4 Units.**

Flight theory applied to subsonic propeller and jet aircraft. Nature of aerodynamic forces, drag and lift of wing and fuselage, high-lift devices, level-flight performance, climb and glide performance, range, endurance, take-off and landing distances, static and dynamic stability and control.

(Design units: 2)

Prerequisite: ENGRMAE 130A

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

**ENGRMAE 159. Aircraft Design. 4 Units.**

Preliminary design of subsonic general aviation and transport aircraft with emphasis on layout, aerodynamic design, propulsion, and performance. Estimation of total weight and weight distribution, design of wings, fuselage, and tail, selection and location of engines, prediction of overall performance.

(Design units: 4)

Prerequisite: ENGRMAE 112 and ENGRMAE 136 and ENGRMAE 158

Restriction: Aerospace Engineering Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 164. Air Pollution and Control. 4 Units.**

Sources, dispersion, and effects of air pollutants. Topics include emission factors, emission inventory, air pollution, meteorology, air chemistry, air quality modeling, impact assessment, source and ambient monitoring, regional control strategies.

(Design units: 2)

Prerequisite: (ENGRMAE 91 or CBE 40B) and ENGRMAE 130A

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRMAE 170. Introduction to Control Systems. 4 Units.**

Feedback control systems. Modeling, stability, and systems specifications. Root locus, Nyquist, and Bode methods of analysis and design.

(Design units: 2)

Prerequisite: (ENGRMAE 80 or ENGRCEE 80 or ENGR 80) and ENGRMAE 106

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 171. Digital Control Systems. 4 Units.**

Methods for analysis and design of discrete-time control systems. Z-transforms, difference equations, discrete Fourier transforms. Sampling theorem and applications. Z-plane stability, frequency response. Digital controller design. Introduction to digital filters.

(Design units: 2)

Prerequisite: ENGRMAE 170

Restriction: Civil Engineering Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 172. Design of Computer-Controlled Robots. 4 Units.**

Students design a small robotic device and program it to exhibit sentient behaviors. The basic aspects of mechatronic design are covered, including motor and sensor selection, control strategies, and microcomputer programming for the implementation of control paradigms. Materials fee.

(Design units: 3)

Corequisite: ENGRMAE 60

Prerequisite: ENGRMAE 170

Restriction: Mechanical Engineering Majors have first consideration for enrollment.

Concurrent with ENGRMAE 280.

**ENGRMAE 175. Dynamics and Control of Aerospace Vehicles. 4 Units.**

Equations of motion, linearization, stability derivatives, and longitudinal and lateral modes of motion. Handling qualities, sensors and actuators, and effects of various feedbacks on stability and performance. Stability augmentation. Autopilot design.

(Design units: 3)

Prerequisite: ENGRMAE 106

Restriction: Aerospace Engineering Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 182. Introduction to Machine Learning. 4 Units.**

Fundamental principles necessary to understand statistical learning methods. Introduction to the R programming language. Mathematical foundation for various machine learning algorithms. Computer implementation.

**ENGRMAE 183. Computer-Aided Mechanism Design. 4 Units.**

Focuses on design of planar, spherical, and spatial mechanisms using computer algebra and graphics. Topics include exact and approximate analytical design techniques. Students are required to use existing software (or develop new algorithms) to design various mechanisms for new applications.

(Design units: 4)

Prerequisite: MATH 3A or I&C SCI 6N

Restriction: Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 184. Fundamentals of Experimental Design. 4 Units.**

Review of statistics as applied to experimental research. Fundamentals and principles of statistical experimental design and analysis with emphasis on understanding and use of designed experiments, response surfaces, linear regression modeling, and process optimization.

(Design units: 1)

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

Concurrent with ENGRMAE 284.

**ENGRMAE 185. Numerical Analysis in Mechanical Engineering. 4 Units.**

Solution of mechanical-engineering equations by means of numerical methods. Errors in numerical analysis. Nonlinear equation and sets of equations. Numerical differentiation and integration. Ordinary differential equations. Boundary-value problems. Partial differential equations.

(Design units: 2)

Prerequisite: (ENGRMAE 10 or EECS 10 or EECS 12 or BME 60B) and MATH 3D and MATH 2E

Overlaps with MATH 105A.

**ENGRMAE 188. Engineering Design in Industry. 4 Units.**

Principles of engineering design in the context of an industrial application. Local manufacturing firms define an engineering design project to be completed in 10 weeks. Projects include initial brainstorming to final design, with a formal presentation.

(Design units: 4)

Repeatability: May be taken for credit 3 times.

Restriction: Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 189. Senior Project - Special Topics. 1-4 Units.**

Group or individual senior project of theoretical or applied nature involving design. Materials fee.

(Design units: 1-4)

Repeatability: May be taken for credit for 12 units as topics vary.

Restriction: Seniors only. Mechanical Engineering Majors only.

**ENGRMAE 193. Topics in MAE Design. 1-4 Units.**

Provides early-stage design/hands-on experience for upper-division students, and allows them to participate in senior design projects course ENGRMAE 189.

(Design units: 1)

Repeatability: May be taken for credit for 12 units as topics vary.

Restriction: Aerospace Engineering Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 195. Seminars in Engineering. 1-4 Units.**

Seminars by individual faculty in major fields of interest. Materials fee.

(Design units: 1-4)

Repeatability: Unlimited as topics vary.

**ENGRMAE 198. Group Study. 1-4 Units.**

Group study of selected topics in Aerospace and Mechanical Engineering.

(Design units: 1-4)

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**ENGRMAE 199. Individual Study. 1-4 Units.**

For undergraduate Engineering majors in supervised but independent reading, research, or design. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Repeatability: May be taken for credit for 8 units.

**ENGRMAE 199P. Individual Study. 1-4 Units.**

For undergraduate Engineering majors in supervised but independent reading, research, or design. Students taking individual study for design are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**ENGRMAE 200A. Engineering Analysis I. 4 Units.**

Linear algebra, including vector spaces, matrices, linear systems of equations, least squares, and the eigenvalue problem. Ordinary differential equations, including analytical and numerical solution methods, stability, and phase portraits.

Restriction: Graduate students only.

**ENGRMAE 200B. Engineering Analysis II. 4 Units.**

Review of ordinary differential equations, including Bessel and Legendre functions. Partial differential equations, including the diffusion equation, Laplace's equation, and the wave equation. Fourier series, Fourier and Laplace transforms and their applications.

Restriction: Graduate students only.

**ENGRMAE 205. Perturbation Methods in Engineering. 4 Units.**

Asymptotic Expansions of integrals. Regular and singular perturbations. Perturbation methods for ordinary and partial differential equations. Matched asymptotic expansions. Multiple-scale asymptotic expansion schemes. Not offered every year.

Prerequisite: ENGRMAE 200A and ENGRMAE 200B. Knowledge of linear differential equations.

Restriction: Graduate students only.

**ENGRMAE 206. Nonlinear Optimization Methods. 4 Units.**

Numerical methods for constrained and unconstrained optimization. Necessary and sufficient conditions for optimality. Conjugate gradient, variable metric algorithms. Gradient projection, penalty functions, and Lagrange methods. Not offered every year.

Prerequisite: ENGRMAE 200A

Restriction: Graduate students only.

**ENGRMAE 207. Methods of Computer Modeling in Engineering and the Sciences. 4 Units.**

Unified introduction to finite volume, finite element, field-boundary element, meshless, primal, dual, and mixed methods. Nonlinear problems posed by ordinary as well as partial differential equations. Computer implementations and comparisons of accuracy and convergence.

Restriction: Graduate students only.

**ENGRMAE 209P. Energy Efficiency Technology. 4 Units.**

Principles, design, operation of energy efficient technology in the built environment, including solar energy, green building design, low waste/emissions construction materials, energy harvesting, built environment energy conversion and storage, high efficiency lighting, daylighting, heat pumps, cooling systems, renewable power systems.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 210. Advanced Fundamentals of Combustion. 4 Units.**

Premixed, nonpremixed, and heterogeneous reactions, with emphasis on kinetics, thermal ignition, turbulent flame propagation, detonations, explosions, flammability limits, diffusion flame, quenching, flame stabilization, and particle and spray combustion. Not offered every year.

Prerequisite: ENGRMAE 224 or ENGRMAE 230B

Restriction: Graduate students only.

**ENGRMAE 211P. Energy Storage Systems and Technology. 4 Units.**

Basic principles, design, and operation of energy storage systems and technology including lithium ion battery systems for transportation and stationary applications, for flow batteries (e.g., vanadium redox, sodium sulfur), and for reversible fuel cell electrolyzer systems and hydrogen energy storage.

Prerequisite: Required: Undergraduate-level knowledge of applied engineering thermodynamics.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 212. Engineering Electrochemistry: Fundamentals and Applications. 4 Units.**

Introduction to engineering electrochemistry fundamentals and applications. Examine thermodynamics and transport principles in typical electrochemical systems. Electrochemical sensors, batteries, fuel cells, and supercapacitors. Manufacturing aspects will also be covered.

Restriction: Graduate students only.

**ENGRMAE 212P. Engineering Electrochemistry: Fundamentals and Applications. 4 Units.**

Introduction to engineering electrochemistry fundamentals and applications. Examine thermodynamics and transport principles in typical electrochemical systems. Electrochemical sensors, batteries, fuel cells, and supercapacitors. Manufacturing aspects are also covered.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 213. Electric Propulsion. 4 Units.**

Space propulsion requirements and maneuvers, stressing those best suited to electric propulsion. An introduction to plasma physics. Electrothermal, electromagnetic and electrostatic accelerators, with emphasis in technologies (ion engines, Hall thrusters and colloidal thrusters) belonging to the latter family.

Restriction: Graduate students only.

Concurrent with ENGRMAE 113.

**ENGRMAE 214A. Fuel Cell Fundamentals and Technology. 4 Units.**

Introduction to electrochemistry and electrocatalysis; nature of fuel-cell electrodes and electrolytes; charge transfer reactions at interfaces; charge transport and mass transport processes; fuel processing reactions; determination of fuel cell efficiency, fuel flexibility, emissions and other characteristics.

Restriction: Graduate students only.

Concurrent with ENGRMAE 114.

**ENGRMAE 214AP. Fuel Cell Fundamentals and Technology. 4 Units.**

Introduction to electrochemistry and electrocatalysis; nature of fuel-cell electrodes and electrolytes; charge transfer reactions at interfaces; charge transport and mass transport processes; fuel processing reactions; determination of fuel cell efficiency, fuel flexibility, emissions, and other characteristics.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 214B. Fuel Cell Systems and Degradation. 4 Units.**

Fuel cell systems design; impacts of operating conditions; experimental and theoretical analysis methods for fuel cells systems; introduction to degradation mechanisms and mitigation techniques; provides broad insight into fuel-cell science, technology, system design and operation. Offered every other year.

Prerequisite: ENGRMAE 214A

Restriction: Graduate students only.

**ENGRMAE 214C. PEM Fuel Cells . 4 Units.**

An in-depth introduction to the fundamentals of PEM fuel cells, including thermodynamics, kinetics, and transport in electrochemical systems. Topics of specific interest to mechanical engineers will include water/heat management and dynamic responses.

Prerequisite: ENGRMAE 214A

Restriction: Graduate students only.

**ENGRMAE 215. Advanced Combustion Technology. 4 Units.**

Pollutant formation and experimental methods. Formation of gaseous pollutants and soot; transformation and emission of fuel contaminants in gas, liquid, and solid fuel combustion; methods employed to measure velocity, turbulence intensity, temperature, composition, particle size; methods to visualize reacting flows.

Prerequisite: ENGRMAE 200A and (ENGRMAE 230A or ENGRMAE 270A)

Restriction: Graduate students only.

**ENGRMAE 216. Statistical Thermodynamics. 4 Units.**

Statistics of independent particles, development of quantum mechanical description of atoms and molecules, application of quantum mechanics, evaluation of thermodynamics properties for solids, liquids, and gases, statistical mechanics of dependent particles (ensembles).

Restriction: Graduate students only.

**ENGRMAE 217. Generalized Thermodynamics. 4 Units.**

Generalized thermodynamics develops the laws of continuum thermodynamics from a set of plausible and intuitive postulates. The postulates are motivated qualitatively by a statistical description of matter and are justified by a posterior success for the resulting theory.

Restriction: Graduate students only.

**ENGRMAE 217P. Generalized Thermodynamics. 4 Units.**

Generalized thermodynamics develops the laws of continuum thermodynamics from a set of plausible and intuitive postulates. The postulates are motivated qualitatively by a statistical description of matter and are justified by a posterior success for the resulting theory.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 218. Sustainable Energy Systems. 4 Units.**

Basic principles, design and operation of sustainable energy systems including wind, solar photo-voltaic and thermal, hydroelectric, geothermal, oceanic, biomass combustion, advanced coal and next generation nuclear. Includes power generation, storage, and transmission for stationary power generation.

Restriction: Graduate students only.

Concurrent with ENGRMAE 118.

**ENGRMAE 218P. Sustainable Energy Systems. 4 Units.**

Basic principles, design, and operation of sustainable energy systems including wind, solar photo-voltaic and thermal, hydroelectric, geothermal, oceanic, biomass combustion, advanced coal, and next generation nuclear. Includes power generation, storage, and transmission for stationary power generation.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 219P. Solar and Renewable Energy Systems. 4 Units.**

Basic principles, design, and operation of solar and other renewable energy systems including solar photo-voltaic, solar thermal, wind, and PEM fuel cell. Includes power generation and storage, and renewable fuels for transportation and stationary power generation.

Prerequisite: Required: Knowledge of applied engineering thermodynamics.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 220. Conduction Heat Transfer. 4 Units.**

Steady state and transient conduction heat transfer in one- and multi-dimensional geometries. Analytical methods, exact and approximate. Numerical techniques are also included.

Restriction: Graduate students only.

**ENGRMAE 221. Convective Heat and Mass Transfer. 4 Units.**

Laminar and turbulent convective heat and mass transfer in external and internal flows. Forced and free convection. Exact and approximate solutions. Similarity solutions. Variable properties. Concentration boundary layer theory. Mass transfer conductance.

Prerequisite: ENGRMAE 230B

Restriction: Graduate students only.

**ENGRMAE 222. Radiative Heat Transfer. 4 Units.**

Black body radiation. Radiative transport equations for surfaces separated by non-participating media. Radiant energy transfer through absorbing, emitting, and scattering media. Radiation-conduction interaction. Radiation-convection interaction. Introduction to finite-difference solutions.

Restriction: Graduate students only.

**ENGRMAE 223A. Numerical Methods in Heat, Mass, and Momentum Transport (Laminar Flows) I. 4 Units.**

Introduction to the discretization of various types of partial differential equations (parabolic, elliptic, hyperbolic). Finite-volume discretization for one- and two-dimensional flows. Use of a two-dimensional elliptic procedure to predict sample laminar flows.

Prerequisite or corequisite: ENGRMAE 230A

Restriction: Graduate students only.

**ENGRMAE 223B. Numerical Methods in Heat, Mass, and Momentum II. 4 Units.**

Introduction to turbulence. Reynolds-averaging of Navier-Stokes equations. Second-order closure of the average equations. Use of two-dimensional elliptic procedure to predict confined turbulent flows. Not offered every year.

Prerequisite: ENGRMAE 223A

Restriction: Graduate students only.

**ENGRMAE 224. Advanced Transport Phenomena. 4 Units.**

Fundamentals of transport phenomena in fluid (gas and liquid), solid, and nano systems. Conservation equations, fundamentals of diffusion, ion transport, dispersion in turbulent/laminar flows, absorption, differential/staged distillation, transport in membranes, and nano/microscale transport phenomena. Not offered every year.

Restriction: Graduate students only.

**ENGRMAE 226. Special Topics in Fluid and Thermal Sciences. 1-4 Units.**

Special topics of current interest in fluid mechanics, heat and mass transfer, multiphase flows, or combustion. Emphasis could be placed on theory, computational methods, or experimental techniques.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ENGRMAE 227. Thermal Resistance Analysis in Microdevices and Nanomaterials. 4 Units.**

Heat transfer and thermal resistance analysis relevant for microdevices and nanomaterials. Overview of recent progress in nanotechnology and materials science. Thermal modeling strategies for novel electronic devices and energy conversion systems.

Restriction: Graduate students only.

**ENGRMAE 228. Nanoscale Phase Change Transport Physics. 4 Units.**

Discusses a wide range of phase change processes (i.e., evaporation, boiling, condensation, and freezing) through the use of novel thermal metamaterials with the aim of enhancing phase change performances.

Prerequisite: Undergraduate-level heat transfer is recommended.

Restriction: Graduate students only.

**ENGRMAE 229P. Nanoscale Materials for Modern Electronics. 4 Units.**

Introduction to design and synthesis of nanomaterials. Topics include thermal and liquid transport in materials systems, phase change heat transfer physics, and mechanical properties in materials systems.

Prerequisite: Required: Undergraduate-level knowledge of heat transfer.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 230A. Inviscid Incompressible Fluid Mechanics I. 4 Units.**

Equations of motion. Vector notation. Flow kinematics. Potential flow and complex potential. Vorticity and circulation. Bernoulli's theorem. Crocco's theorem. Conformal, Joukowski, and Schwarz-Christoffel transformations.

Restriction: Graduate students only.

**ENGRMAE 230B. Viscous Incompressible Fluid Mechanics II. 4 Units.**

Review of mass, momentum, energy equations. Stress tensor, constitutive relations. Laminar flows. Stokes and Oseen flows. Self-similarity. Boundary layer theory: thin-layer approximation, Falkner-Skan, Blasius solutions, integral methods. Jet, wake, cavity flows. Introduction to turbulence: instability, Reynolds averaging, mixing length.

Restriction: Graduate students only.

**ENGRMAE 230C. Compressible Fluid Dynamics. 4 Units.**

One-dimensional unsteady flow; Riemann invariants, acoustics, shock tube. Two-dimensional flow: shock polars, linear theory, similarity rules, method of characteristics. Three dimensional flow: slender-body theory. Effects of viscosity and conductivity: laminar boundary layer, Crocco-Busemann relations.

Prerequisite: ENGRMAE 230A or ENGRMAE 230B

Restriction: Graduate students only.

**ENGRMAE 230D. Theoretical Foundations of Fluid Mechanics. 4 Units.**

Well-posed problems and boundary, initial, and interface conditions; strong and weak solutions. Similarity, perturbation theory and limit behavior, bifurcations. Dispersive and nondispersive wave propagation, acoustics, ship waves, internal gravity waves, water waves. Vortices: mutual interactions and stability. Jets, wakes, cavities.

Prerequisite: ENGRMAE 230A and ENGRMAE 230B

Restriction: Graduate students only.

**ENGRMAE 231. Fundamentals of Turbulence. 4 Units.**

Phenomenon of turbulence. Reynolds equations. Dynamics of turbulence. Free turbulent shear flows. Wall-bounded turbulent shear flows. Turbulent transport of scalar quantities. Spectral dynamics. Mathematical models of turbulence.

Prerequisite: ENGRMAE 230A and ENGRMAE 230B

Restriction: Graduate students only.

**ENGRMAE 233. Turbulent Free Shear Flows. 4 Units.**

Practical and theoretical aspects of turbulent free shear flows. Instability, global scaling laws, mixing, and noise generation in incompressible and compressible shear layers, jets, and wakes. Kelvin-Helmholtz instability, near- and far-field growth rates, effect of compressibility, aeroacoustics of jets.

Prerequisite: ENGRMAE 200B and ENGRMAE 230A and ENGRMAE 230B

Restriction: Graduate students only.

**ENGRMAE 236. Nonequilibrium Gas Dynamics. 4 Units.**

Molecular description of fluid flow. Boltzmann equation. Chapman-Enskog expansion for flows with translational nonequilibrium. Shock structure. Inviscid flows with chemical and vibrational nonequilibrium. Not offered every year.

Prerequisite: ENGRMAE 230C

Restriction: Graduate students only.

**ENGRMAE 237. Computational Fluid Dynamics. 4 Units.**

Mathematical, physical, and computational fundamentals of computational fluid dynamics, numerical methods for solving the Euler and Navier-Stokes equations. Topics include: finite-difference and finite-volume discretization, time marching methods, von Neumann analysis, upwinding, flux splitting, TVD, and other high-resolution shock-capturing schemes.

Prerequisite: ENGRMAE 230C

Restriction: Graduate students only.

**ENGRMAE 238. Experimental Fluid Dynamics. 4 Units.**

Concepts and techniques for measurement of fluid motion. Quantitative and qualitative flow visualization. Flow facilities, shadowgraph, schlieren, interferometer, thermal anemometer. Laser diagnostics, fluorescence, Rayleigh, Raman, Mie scattering. Laser-Doppler, particle-image, and image-correlation velocimetry. Three- and four-dimensional digital imaging.

Prerequisite: ENGRMAE 230A and ENGRMAE 230B

Restriction: Graduate students only.

**ENGRMAE 239. Dynamics of Unsteady Flows. 4 Units.**

Unsteady potential flow modeling (Kelvin's circulation theorem, unsteady Bernoulli's equation). Theodorsen's frequency response, Wagner's step response, and the Kussner sharp-edged gust. State Space approximations for Unsteady Loads. Vortex Lattice. Flutter.

Prerequisite: ENGRMAE 230A is recommended.

Restriction: Graduate students only.

**ENGRMAE 241. Dynamics. 4 Units.**

Kinematics and dynamics of three-dimensional motions. Lagrange's equations, Newton-Euler equations. Applications include robot systems and spinning satellites.

Restriction: Graduate students only.

**ENGRMAE 242. Robotics. 4 Units.**

Spatial rigid-body transformations. Forward and inverse kinematics. Jacobian of serial and parallel chains. Screw coordinates and transformations. Rate and static analyses using screw theory. Singularity analysis. Trajectory generation. Not offered every year.

Restriction: Graduate students only.

**ENGRMAE 244. Theoretical Kinematics. 4 Units.**

Spatial rigid body kinematics is presented with applications to robotics. Orthogonal Matrices, Rodrigues' formula, Quaternions, Plucker coordinates, screw theory, and dual numbers are studied using modern projective geometry and multi-linear algebra. Applications include trajectory planning, inverse kinematics, and workspace analysis.

Restriction: Graduate students only.

**ENGRMAE 245. Spatial Mechanism Design. 4 Units.**

Fundamental kinematic theory required for planar, spherical, and spatial mechanism design. The focus is on algebraic methods for the exact solution of constraint equations. Not offered every year.

Restriction: Graduate students only.

**ENGRMAE 247. Micro-System Design. 4 Units.**

Covers the fundamentals of the many disciplines needed for design of Micro-Electro-Mechanical Systems (MEMS): microfabrication technology, structural mechanics on micro-scale, electrostatics, circuit interface, control, computer-aided design, and system integration.

Same as EECS 278.

Restriction: Graduate students only.



**ENGRMAE 247P. Micro-System Design. 4 Units.**

Covers the fundamentals of the many disciplines needed for design of Micro-Electro-Mechanical Systems (MEMS): microfabrication technology, structural mechanics on micro-scale, electrostatics, circuit interface, control, computer-aided design, and system integration.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 249. Micro-Sensors and Actuators. 4 Units.**

Introduction to the technology of Micro-Electro-Mechanical Systems (MEMS). Fundamental principles and applications of important microsensors, actuation principles on microscale. Introduction to the elements of signal processing; processing of materials for micro sensor/actuator fabrication; smart sensors and microsensor/microactuator array devices.

Same as EECS 279.

Restriction: Graduate students only.

**ENGRMAE 250. Biorobotics. 4 Units.**

Sensors, actuators, and neural circuits for biological movement control from an engineering perspective. Current approaches to robotic and mechatronic devices that support and enhance human movement in health and following neurologic injuries like stroke and spinal cord injury.

Restriction: Graduate students only.

**ENGRMAE 252. Fundamentals of Microfabrication. 4 Units.**

Introduces Engineering and Science students to the science of miniaturization. Different options to make very small machines (micro and nano size) are reviewed, materials choices are discussed, scaling laws are analyzed, and many practical applications are listed.

Restriction: Graduate students only.

**ENGRMAE 252P. Fundamentals of Microfabrication. 4 Units.**

Introduces engineering and science students to the science of miniaturization. Different options to make very small machines (micro and nano size) are reviewed, materials choices are discussed, scaling laws are analyzed, and many practical applications are listed.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 253. Advanced BIOMEMS Manufacturing Techniques. 4 Units.**

Introduction to BIOMEMS. Advanced biotechnology/biomedicine equipment based on MEMS and NEMS. Fundamentals of MEMS/NEMS sensing techniques and the biological and physics principles involved and the preferred MEMS and NEMS manufacturing techniques.

Restriction: Graduate students only.

Concurrent with ENGRMAE 153.

**ENGRMAE 254. Mechanics of Solids and Structures. 4 Units.**

Finite deformation kinematics; stress and strain measures; invariance in solid mechanics; objective rates; constitutive theory of elastic and inelastic solids; rate formulations; computational approaches; theories of plates and shells; applications to aerospace vehicles.

Restriction: Graduate students only.

**ENGRMAE 254P. Mechanics of Solids and Structures. 4 Units.**

Finite deformation kinematics; stress and strain measures; invariance in solid mechanics; objective rates; constitutive theory of elastic and inelastic solids; rate formulations; computational approaches; theories of plates and shells; applications to aerospace vehicles.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 255. Composite Materials and Structures. 4 Units.**

Motivation for composite materials. Different classifications according to the nature of the matrix (PMC, MMC, CMC) and the reinforcement topology (fibers, whiskers, particulates). Mechanical properties. Failure mechanisms. Designing with composite materials. Advantages and limitations of homogenization techniques for numerical modeling.

Restriction: Graduate students only.

Concurrent with ENGRMAE 155.

**ENGRMAE 256. Nanomechanics. 4 Units.**

Nanoscale materials and the experimental and computational techniques used to measure their properties. Mechanical behavior is the main focus, but other material properties such as diffusion and electron transport are discussed.

Restriction: Graduate students only.

**ENGRMAE 257P. Fabrication and Characterization of Nanomaterials . 4 Units.**

Introduction to nanoscale materials and experimental and computational techniques. Topics materials synthesis techniques, thin film deposition, nanoparticle and nanowire growth, characterization with electrons and X-rays, forces and surface interactions at the nanoscale, structure-property scaling laws, and atomistic/multiscale computer modeling.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 258. Mechanical Behavior of Solids - Continuum Theories. 4 Units.**

Presents a continuum, macroscopic view of deformation and failure of solids. Covers elasticity, plasticity, visco-elasticity, visco-plasticity, fracture and fatigue. Topics include discussions of physical behavior, mathematical formalism and measurement techniques.

Prerequisite: ENGRMAE 254

Restriction: Graduate students only.

**ENGRMAE 259. Mechanical Behavior of Solids - Atomistic Theories. 4 Units.**

Presents atomistic mechanisms that control mechanical behavior of materials. Covers plasticity, dislocation theory, strengthening mechanisms, high-temperature diffusion and grain boundary sliding, shear localization, void formation, ductile rupture, brittle fracture and fatigue.

Restriction: Graduate students only.

**ENGRMAE 259P. Mechanical Behavior of Solids - Atomistic Theories. 4 Units.**

Presents atomistic mechanisms that control mechanical behavior of materials. Covers plasticity, dislocation theory, strengthening mechanisms, high-temperature diffusion and grain boundary sliding, shear localization, void formation, ductile rupture, brittle fracture, and fatigue.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 260. Current Issues Related to Air Quality, Climate, and Energy. 4 Units.**

Current issues related to the atmosphere, climate, and air quality in the context of energy conversion and sustainability. Topics include transportation systems; building design; impacts on humans and ecosystems; modeling and meteorology; economics; and application to public policies.

Prerequisite: ENGRMAE 261 or CHEM 245 or EARTHSS 240

Same as CHEM 241.

Restriction: Graduate students only.

**ENGRMAE 270A. Linear Systems I. 4 Units.**

Input-output and state-space representations of continuous-time linear systems. State transition matrices, Controllability and observability. Irreducible realizations. State feedback and observer design.

Restriction: Graduate students only.

**ENGRMAE 270B. Linear Systems II. 4 Units.**

Advanced topics in linear systems: bases, linear operator representations, and Jordan forms. Review of dynamical systems, and stability. Time-varying systems, discrete-time representations, and multi-input/multi-output systems. Introduction to continuous and discrete time linear regulator (LQR) problems. Not offered every year.

Prerequisite: ENGRMAE 270A

Restriction: Graduate students only.

**ENGRMAE 272. Robust Control Theory. 4 Units.**

Methods for control design of systems with uncertainty. Feedback stability and small gain theorem. Multivariable stability margins and multiplier theory. H-infinity-optimal control, linear matrix inequalities. Not offered every year.

Prerequisite: ENGRMAE 270A

Restriction: Graduate students only.

**ENGRMAE 274. Optimal Control. 4 Units.**

Principles and methods of optimal control. Topics include objectives and issues in controlling nonlinear systems; linear variational and adjoint equations; optimality conditions via variational calculus, maximum principle, and dynamic programming; solution methods; applications to control robots and aerospace vehicles.

Prerequisite: ENGRMAE 200A and ENGRMAE 270A

Restriction: Graduate students only.

**ENGRMAE 275. Nonlinear Feedback Systems. 4 Units.**

Advanced tools for feedback control system analysis and synthesis. Norms, operators,  $L_p$  spaces, contraction mapping theorem, Lyapunov techniques along with their extensions. Circle criterion positivity and passivity. Applications to nonlinear control methods, such as sliding mode or adaptive techniques.

Prerequisite: ENGRMAE 270B

Restriction: Graduate students only.

**ENGRMAE 276. Geometric Nonlinear Control. 4 Units.**

Using the mathematics of differential geometry, a number of the concepts and results of linear systems theory have been extended to nonlinear systems. Describes these extensions and illustrate their use in nonlinear system analysis and design. Not offered every year.

Prerequisite: ENGRMAE 200A and ENGRMAE 270A

Restriction: Graduate students only.

**ENGRMAE 277. Learning Control Systems. 4 Units.**

Supervised learning for classification and regression: perceptrons, support vector machines, feed-forward neural networks, Gaussian processes. Generalization and model selection: cross-validation, regularization, and Bayesian methods. Unsupervised learning: clustering and dimensionality reduction. Learning control systems. Introduction to reinforcement learning.

Restriction: Graduate students only.

**ENGRMAE 278. Parameter and State Estimation. 4 Units.**

Bayesian and frequentist approaches to parameter and state estimation. Properties of estimators. Linear Gaussian systems and the Kalman Filter. Nonlinear state estimation, extended and unscented Kalman Filters. Introduction to Monte Carlo methods and particle filtering. Application to tracking and navigation.

Prerequisite: ENGRMAE 200A and ENGRMAE 270A

Restriction: Graduate students only.

**ENGRMAE 279. Special Topics in Mechanical Systems. 4 Units.**

Selected topics of current interest in mechanical systems. Topics include robotics, kinematics, control, dynamics, and geometric modeling.

Prerequisite: ENGRMAE 270A and ENGRMAE 241

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ENGRMAE 280. Design of Computer-Controlled Robots. 4 Units.**

The basic aspects of mechatronic design are covered, including motor and sensor selection, control strategies, finite state machines, inertial measurement units, and implementation of advanced feedback control laws. Students work in groups to create their own mechatronic device. Materials fee.

Restriction: Graduate students only.

Concurrent with ENGRMAE 172.

**ENGRMAE 284. Fundamentals of Experimental Design. 4 Units.**

Fundamentals and principles of statistical experimental design and analysis. Emphasis addresses understanding and use of designed experiments, response surfaces, linear regression modeling, process optimization, and development of links between empirical and theoretical models.

Restriction: Graduate students only.

Concurrent with ENGRMAE 184.

**ENGRMAE 294. Master of Science Thesis Project. 4 Units.**

Tutorial in which masters-level students taking the comprehensive examination option undertake a masters-level research project.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ENGRMAE 295. Special Topics in Mechanical and Aerospace Engineering. 1-4 Units.**

Special topics by individual faculty in major fields of interest.

Repeatability: Unlimited as topics vary.

**ENGRMAE 295P. Special Topics in Mechanical and Aerospace Engineering. 4 Units.**

Studies in selected areas of Mechanical and Aerospace Engineering. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 296. Master of Science Thesis Research. 1-16 Units.**

Individual research or investigation conducted in the pursuit of preparing and completing the thesis required for the M.S. in Engineering.

Repeatability: May be repeated for credit unlimited times.

**ENGRMAE 297. Doctor of Philosophy Dissertation Research. 1-16 Units.**

Individual research or investigation conducted in the pursuit of preparing and completing the dissertation required for the Ph.D. in Engineering.

Repeatability: May be repeated for credit unlimited times.

**ENGRMAE 298. Seminars in Mechanical and Aerospace Engineering. 1 Unit.**

Presentation of advanced topics and reports of current research efforts in mechanical engineering. Required of all graduate students in mechanical engineering.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**ENGRMAE 299. Individual Research. 1-16 Units.**

Individual research or investigation under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

Restriction: Consent of instructor to enroll

## Medical Education (MED ED)

## Medical Humanities (MED HUM)

### Courses

**MED HUM 1. Health, Wellness, and Conception of the Body. 4 Units.**

Asks what is health and who gets to have it? What is considered a “healthy” or “sick” body? We analyze historical and contemporary experiences of illness, medicine, and caregiving, including how patients represent their bodies and healing.

(GE III or IV ).

**MED HUM 3. Art and Medicine . 4 Units.**

Analyzes the relationship between medicine and the visual arts from the late medieval to modern periods, covering topics such as anatomy, optical medical technologies, gender and race in medicine, and popular representations of disease and doctors.

(GE II or IV ).

**MED HUM 195. Capstone Seminar: The Clinical Moral Laboratory. 4 Units.**

Interdisciplinary exploration of the clinical encounter, and the importance of meaning making in these “moral laboratories.” Students enter the clinical space as participant observers, and reflect on how the clinical site informs and challenges reading practices.

Prerequisite: MED HUM 1 or MED HUM 3 or GEN&SEX 60A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only.

**MED HUM 200. Critical Perspectives in Medical Humanities. 4 Units.**

Analyzes social and cultural understandings of the body, health, illness, medicine, and disease. Themes include critical histories of the body; non-compliant subjects interacting with medicine; racial-sexual hierarchies of health; and theories and expressions of pain and suffering.

Restriction: Graduate students only.

## Medical Pharmacology (PHARM)

### Courses

**PHARM 241. Advanced Topics in Pharmacology. 2 Units.**

Application of pharmacological principles in disease therapy. Advanced pharmacological mechanisms and in-depth study of drug action. Discussion of several major drug classes/therapeutic strategies: molecular mechanisms of action, physiological consequences of administration, and clinical use.

**PHARM 251. Experimental Pharmacology. 4 Units.**

Introduction to the concepts and techniques used in pharmacological science. Molecular biology, quantitative and biochemical pharmacology, fluorescent probes, behavior, genetics, animal handling, anatomical and receptor binding analysis, methods for ion channel study, the absorption, distribution, metabolism and elimination of drugs.

**PHARM 254. Introduction to Pharmacology. 4 Units.**

Ligand-gated ion channels, G protein-coupled receptors, receptor tyrosine kinases, ligand-regulated transcription factors, their signaling mechanisms, trafficking, macromolecular complexes, and physiological responses.

**PHARM 255. Neuropharmacology. 2 Units.**

Mechanisms underlying chemical signaling processes in the brain and periphery. Molecular biology, signal transduction, transmitter synthesis, and inactivation of major neurotransmitter systems. Drugs that act on these major neurotransmitters.

Restriction: Graduate students only.

**PHARM 256. Experimental Design for Pharmacologists. 1 Unit.**

Population and sample statistics, hypothesis testing, analysis of variance, nonparametric statistics, experimental design, power, and the use of statistical computer software.

Prerequisite: PHARM 251

**PHARM 257. Ethics in Research. 1 Unit.**

Ethical conduct in research including data handling, authorship, conflict of interest, animal rights, handling of misconduct.

Prerequisite: PHARM 299

Repeatability: May be taken for credit 2 times.

**PHARM 270. Applied Pharmacology . 3 Units.**

One week (five days, 40 hours) in-residence course offered on the UCI campus. Introduction to pharmacological techniques and current research problems; includes laboratory demonstrations and research seminars.

Restriction: Pharmacology Majors only.

**PHARM 271. Principles of Pharmacology . 3 Units.**

Principles of pharmacology: pharmacodynamics, pharmacokinetics, pharmacogenetics, drug interactions, and toxicity.

Restriction: Pharmacology Majors only.

**PHARM 272. Receptors and Drug Targets . 3 Units.**

Molecular basis of drug-receptor interaction. Receptor properties including gene and protein structure, signaling mechanisms, trafficking and physiological effects: G-protein linked receptors, ligand-gated ion channels, receptor tyrosine kinases, nuclear receptors, and ligand regulated transcription factors.

Restriction: Pharmacology Majors only.

**PHARM 274. Research Techniques in Pharmacology. 3 Units.**

Experimental techniques and model systems used in pharmacological research. Receptor analysis, bioassay, molecular biology, in vitro pharmacology, biochemical pharmacology, imaging, electrophysiology, in vivo pharmacology, disease models.

Restriction: Pharmacology Majors only.

**PHARM 276. Experimental Design and Data Analysis . 3 Units.**

Experimental design, data analysis and interpretation. Population and sample statistics, hypothesis testing, analysis of variance, nonparametric statistics, and power calculations.

Restriction: Pharmacology Majors only.

**PHARM 277. Ethics in Scientific Research. 3 Units.**

Ethical conduct in research including data handling, authorship, conflict of interest, animal rights, and handling of misconduct.

Restriction: Pharmacology Majors only.

**PHARM 278. Concepts in Drug Discovery. 3 Units.**

Critical steps involved in discovery and optimization of a new drug. Target selection, relationship of molecular structure to pharmacological activities, screening methods, strategies to identify lead compounds, and preclinical characterization necessary for development of the drug for clinical trials.

Restriction: Pharmacology Majors only.

**PHARM 279. Special Topics in Pharmacology. 3 Units.**

Topics of current interest in pharmacology; discussion of recent research publications.

Restriction: Pharmacology Majors only.

**PHARM 280. Master's Project in Pharmacology. 3 Units.**

Capstone research paper on topic of interest in pharmacology.

Restriction: Pharmacology Majors only.

**PHARM 281. Neuropharmacology . 3 Units.**

Autonomic and central nervous system pharmacology, including major drug classes and therapeutic uses. Mechanisms underlying chemical signaling processes in the brain and peripheral nervous system, including neurotransmitter synthesis, inactivation, and receptor action.

Restriction: Pharmacology Majors only.

**PHARM 282. Behavioral Pharmacology. 3 Units.**

Pharmacology of integrative function and behavior. Drug treatment of pain. Mechanisms of reward, addiction, and drugs of abuse.

Restriction: Pharmacology Majors only.

**PHARM 283. Cardiovascular Pharmacology. 3 Units.**

Basic understanding of drugs used in the prevention and treatment of cardiovascular disease. Mechanisms of action, clinical and adverse effects.

Restriction: Pharmacology Majors only.

**PHARM 284. Endocrine, Respiratory, and Gastrointestinal Pharmacology . 3 Units.**

Basic understanding of drugs used in endocrine, respiratory, and gastrointestinal conditions, including hormone replacement, contraceptives, and drugs for diabetes, asthma, obesity, ulcer, and gastric reflux. Mechanisms of drug action, clinical and adverse effects.

Restriction: Pharmacology Majors only.

**PHARM 298. Seminar. 2 Units.**

Presentation and discussion of current problems and methods in teaching and research in pharmacology, toxicology, and therapeutics.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHARM 299. Research. 1-12 Units.**

Independent research with Pharmacology and Toxicology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Medicine (MED)

## Microbiology (MIC BIO)

## Microbiology and Molecular Genetics (M&MG)

### Courses

**M&MG 200A. Research in Microbiology and Molecular Genetics. 2-12 Units.**

Individual research supervised by a particular professor.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**M&MG 200B. Research in Microbiology and Molecular Genetics. 2-12 Units.**

Individual research supervised by a particular professor.

Prerequisite: M&MG 200A

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**M&MG 200C. Research in Microbiology and Molecular Genetics. 2-12 Units.**

Individual research supervised by a particular professor.

Prerequisite: M&MG 200B

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**M&MG 200R. Research in Microbiology and Molecular Genetics for First-Year Students. 2-12 Units.**

Independent research within the laboratories of graduate training faculty in the Department of Microbiology and Molecular Genetics for first-year Ph.D. students.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

**M&MG 201A. Research topics in Microbiology and Molecular Genetics. 1 Unit.**

Seminars presented by graduate students and faculty of the Department which explore research topics in specialized areas of microbiology and molecular genetics. Opportunity for students to gain experience in the organization, critical evaluation, and oral presentation of current research developments.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**M&MG 201B. Research topics in Microbiology and Molecular Genetics. 1 Unit.**

Seminars presented by graduate students and faculty of the Department which explore research topics in specialized areas of microbiology and molecular genetics. Opportunity for students to gain experience in the organization, critical evaluation, and oral presentation of current research developments.

Prerequisite: M&MG 201A

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**M&MG 201C. Research topics in Microbiology and Molecular Genetics. 1 Unit.**

Seminars presented by graduate students and faculty of the Department which explore research topics in specialized areas of microbiology and molecular genetics. Opportunity for students to gain experience in the organization, critical evaluation, and oral presentation of current research developments.

Prerequisite: M&MG 201B

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**M&MG 203A. Advanced Studies in Microbiology and Molecular Genetics. 1 Unit.**

Organized within each laboratory group, one to four hours. Advanced study in areas related to faculty research interests. Involves small group study based on readings, discussions, and guest speakers. May be conducted as journal clubs.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**M&MG 203B. Advanced Studies in Microbiology and Molecular Genetics. 1 Unit.**

Organized within each laboratory group, one to four hours. Advanced study in areas related to faculty research interests. Involves small group study based on readings, discussions, and guest speakers. May be conducted as journal clubs.

Prerequisite: M&MG 203B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**M&MG 203C. Advanced Studies in Microbiology and Molecular Genetics. 1 Unit.**

Organized within each laboratory group, one to four hours. Advanced study in areas related to faculty research interests. Involves small group study based on readings, discussions, and guest speakers. May be conducted as journal clubs.

Prerequisite: M&MG 203B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**M&MG 205A. Basic Immunology Core Lectures. 1 Unit.**

Basic concepts in human immunology including development of the immune system, innate immunity, immunoglobulin structure and genetics, antigen-antibody reactions, the major histocompatibility complex and antigen presentation, T cell and B cell development, initiation of the immune response, effector mechanisms.

Grading Option: Satisfactory/unsatisfactory only.



**M&MG 205B. Basic Immunology Core Lectures. 1 Unit.**

Basic concepts in human immunology including development of the immune system, innate immunity, immunoglobulin structure and genetics, antigen-antibody reactions, the major histocompatibility complex and antigen presentation, T cell and B cell development, initiation of the immune response, effector mechanisms.

Prerequisite: M&MG 205A

Grading Option: Satisfactory/unsatisfactory only.

**M&MG 205C. Basic Immunology Core Lectures. 1 Unit.**

Basic concepts in human immunology including development of the immune system, innate immunity, immunoglobulin structure and genetics, antigen-antibody reactions, the major histocompatibility complex and antigen presentation, T cell and B cell development, initiation of the immune response, effector mechanisms.

Prerequisite: M&MG 205C

Grading Option: Satisfactory/unsatisfactory only.

**M&MG 206. Regulation of Gene Expression. 4 Units.**

Aspects of gene expression including the organization of the eukaryotic nucleus in terms of protein-nucleic acid interaction (i.e., chromatin and chromosome structure); the enzymology and regulation of RNA transcription and pre-mRNA processing in eukaryotes; mechanisms of RNAi and translation.

**M&MG 210A. Medical Microbiology. 4-6 Units.**

Biology of microbial pathogens (viruses, bacteria, fungi, parasites) as foundation for subsequent study of infectious diseases. Topics: molecular basis of microbial pathogenesis; clinical presentation and epidemiology; diagnostic testing; antimicrobial therapy; prevention strategies. Format: lectures, laboratory, clinical cases, liveclasstech interactive questions.

**M&MG 210B. Medical Immunology. 6 Units.**

Cellular and molecular basis of immune response and roles of the immune system in both maintaining health and contributing to disease.

Prerequisite: M&MG 210A

Restriction: Medical students only.

**M&MG 215. Integrative Immunology. 4 Units.**

Lectures and student presentations of primary literature. The main goal is to achieve a basic understanding of the cellular and molecular basis of innate and adaptive immunity, and how immune function is coordinated at a systems level.

Same as MOL BIO 215.

**M&MG 216. Pathogenic Microbiology. 4 Units.**

Biochemical and genetic properties of infectious agents; identification and behavior of pathogens; activities of toxins; the chemotherapy, biochemistry, and genetics of drug resistance; and epidemiology of infectious diseases.

**M&MG 219. Medical Virology. 4 Units.**

Animal viruses as disease causing agents, including mechanisms of infection at both the cellular and organismic levels. Topics include comparative studies of different groups of viruses, viral transformation, and mechanisms of viral gene expression.

**M&MG 221. Immunopathogenic Mechanisms of Disease. 3 Units.**

Examination of the mechanisms underlying disease states mediated by immune dysregulation. Topics include mechanisms of immune evasion by cancer, diseases mediated by cytokine dysregulation, role of the microbiome of the GI tract and other disease sites, and adoptive T-cell therapy.

Prerequisite: M&MG 215

Same as PATH 221.

Restriction: Graduate students only.

**M&MG 222. Molecular Pathogenesis of Microbial Infections. 4 Units.**

Features lectures by faculty on the molecular aspects of microbial pathogenesis, highlighting both microbe and cellular functions. In addition to lectures, students review papers and discuss them. There will be two written exams, one on viruses and one on microbes.

**M&MG 225. Molecular Mechanisms of Human Disease. 3 Units.**

Provides an overview of the molecular mechanisms of human diseases, including neurologic, hematologic, neoplastic, and infectious diseases. Students gain an understanding of these mechanisms, as well as models of human diseases.

Same as PATH 225.

**M&MG 227. Immunology Journal Club. 2 Units.**

Advanced topics in immunology as related to an understanding of human disease.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**M&MG 230. Topics in Stem Cells. 2-4 Units.**

One-hour seminar presentation by participating faculty or guest lecturer and open to the science community, followed by one-hour discussion of the lecture topic or related topic. Students are responsible for presentations and readings.

**M&MG 240. M.D./PH.D. Tutorial. 1 Unit.**

Explores a variety of topics that impact careers of medical scientists (M.D./Ph.D students). Topics range from scientific, such as recent advances in particular research areas, to ethical problems brought on by increased technology and intervention in the disease process.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**M&MG 250. Responsible Conduct of Research. 2 Units.**

Each session includes a formal presentation by faculty/invited speaker followed by a discussion of case studies related to the topic under consideration.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**M&MG 270. Career Development. 2 Units.**

Topics include preparation of papers, grants and fellowships, scientific presentations, and curriculum vitae, and career opportunities.

Repeatability: May be repeated for credit unlimited times.

**M&MG 280. Tutorial in Microbiology and Molecular Genetics. 2 Units.**

Tutorial in Microbiology and Molecular Genetics. Presented by the department chair; relates current laboratory research to the literature.

Repeatability: May be repeated for credit unlimited times.

**M&MG 292A. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**M&MG 292B. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**M&MG 292C. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**M&MG 298. Independent Study. 1-12 Units.**

Provided for MSTP students to synthesize the basic science information learned during the basic science years of medical school and learn how to apply that knowledge toward graduate research directed at understanding the basis of human disease.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**M&MG 299. Dissertation—Microbiology and Molecular Genetics . 1-12 Units.**

Course provided for Ph.D. students to prepare and complete the dissertation required for a Ph.D. degree.

Repeatability: May be repeated for credit unlimited times.

## Molecular Biology and Biochemistry (MOL BIO)

### Courses

**MOL BIO 200A. Research in Molecular Biology and Biochemistry. 2-12 Units.**

Individual research with Molecular Biology and Biochemistry faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**MOL BIO 200B. Research in Molecular Biology and Biochemistry. 2-12 Units.**

Individual research with Molecular Biology and Biochemistry faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**MOL BIO 200C. Research in Molecular Biology and Biochemistry. 2-12 Units.**

Individual research with Molecular Biology and Biochemistry faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**MOL BIO 200R. Research in Developmental & Cell Biology for First-year Students. 2-12 Units.**

Independent research within the laboratories of graduate training faculty in the Department of Molecular Biology and Biochemistry for first-year Ph.D. students.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

**MOL BIO 201A. Seminars in Molecular Biology & Biochemistry. 2 Units.**

Presentation of research from department laboratories or, when pertinent, of other recent developments.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**MOL BIO 201B. Seminars in Molecular Biology & Biochemistry. 2 Units.**

Presentation of research from department laboratories or, when pertinent, of other recent developments.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**MOL BIO 201C. Seminars in Molecular Biology & Biochemistry. 2 Units.**

Presentation of research from department laboratories or, when pertinent, of other recent developments.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**MOL BIO 202A. Tutorial in Molecular Biology and Biochemistry. 2 Units.**

Tutorials in the area of research of a particular professor which relate current research to the literature. May be conducted as journal clubs.

Repeatability: Unlimited as topics vary.

**MOL BIO 202B. Tutorial in Molecular Biology and Biochemistry. 2 Units.**

Tutorials in the area of research of a particular professor which relate current research to the literature. May be conducted as journal clubs.

Repeatability: Unlimited as topics vary.

**MOL BIO 202C. Tutorial in Molecular Biology and Biochemistry. 2 Units.**

Tutorials in the area of research of a particular professor which relate current research to the literature. May be conducted as journal clubs.

Repeatability: Unlimited as topics vary.

**MOL BIO 203. Nucleic Acid Structure and Function. 4 Units.**

Structure and chemistry of nucleic acids. Relationship between these properties and the mechanisms of fundamental processes such as replication and repair, RNA-mediated catalysis, formation and regulation of higher order chromatin structure and recombination.

Prerequisite: BIO SCI 98 and BIO SCI 99 and CHEM 51A and CHEM 51B and CHEM 51C

**MOL BIO 204. Protein Structure and Function. 4 Units.**

The structure and properties of proteins, enzymes, and their kinetic properties.

Prerequisite: BIO SCI 98 and BIO SCI 99 and CHEM 51C

**MOL BIO 205. Molecular Virology. 4 Units.**

Primary research data on the major DNA and RNA viruses emphasizing strategies of regulation of gene expression. Utilization of viruses as molecular biological tools. Graduate-level knowledge of the biochemistry and molecular biology of macromolecules is required.

Prerequisite: MOL BIO 203 and MOL BIO 204

Restriction: Graduate students only.

**MOL BIO 211. High-Resolution Structures: NMR and X-ray. 4 Units.**

Basic principles of magnetic resonance and x-ray crystallography toward the determination of high-resolution biomolecular structures.

Prerequisite: MATH 2B

Restriction: Graduate students only.

Concurrent with BIO SCI M133.

**MOL BIO 213. Literature in Nucleic Acid Structure and Function. 2 Units.**

Exploration and critical analysis of recent primary scientific literature in structure, properties, and biological mechanisms involving nucleic acids.

Corequisite: MOL BIO 203

Grading Option: Satisfactory/unsatisfactory only.

**MOL BIO 214. Literature in Protein Structure and Function. 2 Units.**

Exploration and critical analysis of recent primary scientific literature in structure and properties of proteins, enzymes, and their kinetic properties.

Corequisite: MOL BIO 204

Grading Option: Satisfactory/unsatisfactory only.

**MOL BIO 215. Integrative Immunology. 4 Units.**

Lectures and student presentations of primary literature. The main goal is to achieve a basic understanding of the cellular and molecular basis of innate and adaptive immunity, and how immune function is coordinated at a systems level.

Same as M&MG 215.

**MOL BIO 217A. Principles of Cancer Biology I. 4 Units.**

Oncogenes and tumor suppressor genes are studied from molecular viewpoints. Also studies their role in cancer; viral carcinogenesis. Designed for graduate students interested in cancer research. Format includes lectures and student-led discussions.

Prerequisite: MOL BIO 203 and MOL BIO 204

Restriction: Graduate students only.

**MOL BIO 217B. Principles of Cancer Biology II. 4 Units.**

Topics include cancer cell growth and metastasis, chemical carcinogenesis, and cancer genetics and epidemiology. Designed for graduate students interested in cancer research. Format includes lectures and student-led discussions.

Prerequisite: MOL BIO 203 and MOL BIO 204

Restriction: Graduate students only.

**MOL BIO 218. Clinical Cancer. 3 Units.**

Designed to acquaint students in basic life science with clinical cancer.

Restriction: Graduate students only.

**MOL BIO 220. Structure & Synthesis of Biological Macromolecules Journal Club. 2 Units.**

Advanced topics in macromolecular structure and synthesis as related to biological problems.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**MOL BIO 221. Advanced Topics in Immunology. 4 Units.**

Literature-based, interactive discussions focused on review of seminal historic and recent immunology literature. Student responsibilities include reading, critical evaluation, and discussion of manuscripts.

Prerequisite: M&MG 215

Restriction: Graduate students only.

**MOL BIO 221L. Advanced Immunology Laboratory. 4 Units.**

An advanced course in immunology for graduate students enrolled in the Biotechnology master's program. Emphasis is placed on learning modern techniques in immunology such as ELISAs, western blotting, immunofluorescent staining assays.

Restriction: Graduate students only.

Concurrent with BIO SCI M121L.

**MOL BIO 223. Introduction to Computational Biology. 4 Units.**

The use of theories and methods based on computer science, mathematics, and physics in molecular biology and biochemistry. Basics in biomolecular modeling. Analysis of sequence and structural data of biomolecules. Analysis of biomolecular functions.

Same as BME 232.

Restriction: Graduate students only.

Concurrent with BIO SCI M123 and COMPSCI 183 and BME 132.

**MOL BIO 227. Immunology Journal Club. 2 Units.**

Advanced topics in immunology as related to an understanding of human disease.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 15 times.

Restriction: Graduate students only.

**MOL BIO 229. Research-in-Progress Seminars. 1 Unit.**

Two half-hour presentations by graduate students and postdoctorals to the department on their current research projects.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 15 times.

Restriction: Graduate students only.

**MOL BIO 235. Literature in Chemical and Structural Biology. 1 Unit.**

Exploration and critical analysis of recent primary scientific literature in chemical and structural biology.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**MOL BIO 243. Topics in Stem Cells. 2-4 Units.**

Presentation by participating faculty or guest lecturer that is open to the science community, followed by discussion of the lecture topic or a related topic. Students are responsible for presentations and readings.

**MOL BIO 244. Principles of Genomics. 4 Units.**

A survey course of the principal subfields of genomics and their applications to biological and health sciences that will cover genome assembly and annotation, genome structure, comparative genomics, population genomics, functional genomics, and medical genomics.

Same as DEV BIO 214.

Restriction: Graduate students only.

**MOL BIO 248. Metallobiochemistry . 4 Units.**

A review of the biochemistry of metallic elements emphasizing: methods for studying metals in biological systems; the chemical basis for nature's exploitation of specific elements; structures of active sites; mechanisms; solid-state structures and devices; metals in medicine.

Prerequisite or corequisite: CHEM 131C or CHEM 132C

Same as CHEM 218.

**MOL BIO 250. Advanced Topics in Biotechnology - Nucleic Acids. 2 Units.**

Supplements laboratory curriculum with scientific background behind experimental methods. Format consists of lectures and the presentation and analysis of relevant papers from the scientific literature.

Corequisite: MOL BIO 250L

Restriction: Graduate students only. Biotechnology Majors only.

**MOL BIO 250L. Biotechnology Laboratory - Nucleic Acids. 8 Units.**

Nucleic acid techniques and recombinant DNA technology. Extraction and purification of nucleic acids, cloning and subcloning, PCR, site-directed mutagenesis, nucleic acid hybridization, additional associated procedures. Students must demonstrate accurate documentation of data (laboratory notebook) detailing experience and results.

Corequisite: MOL BIO 250

Restriction: Graduate students only. Biotechnology Majors only.

**MOL BIO 251. Advanced Topics in Biotechnology - Protein Purification and Characterization. 2 Units.**

Supplements laboratory curriculum with scientific background behind experimental methods. Format consists of lectures and the presentation and analysis of relevant papers from the scientific literature.

Corequisite: MOL BIO 251L

Prerequisite: MOL BIO 250L and MOL BIO 250

Restriction: Graduate students only. Biotechnology Majors only.

**MOL BIO 251L. Biotechnology Laboratory - Protein Purification and Characterization. 8 Units.**

Major techniques of handling proteins and antibodies. Protein engineering, expression and large-scale purification of recombinant proteins from bacteria, HPLC, antibody purification, western blotting, additional associated procedures. Students must demonstrate accurate documentation of data (laboratory notebook) detailing experience and results.

Corequisite: MOL BIO 251

Prerequisite: MOL BIO 250L and MOL BIO 250

Restriction: Graduate students only. Biotechnology Majors only.

**MOL BIO 252L. Biotechnology Management Laboratory. 8 Units.**

Overview of current methods in biotechnology, designed specifically for biotechnology graduate students. Organized into four distinct sections (nucleic acids, proteins, virology, and immunology). Students must demonstrate accurate documentation of data (laboratory notebooks) detailing experience and results.

Restriction: Graduate students only. Biotechnology Majors only.

**MOL BIO 253. Biotech Management . 5 Units.**

Taught jointly by Bio Sci and Merage School faculty, the course addresses fundamental aspects within, and associated with, the biotechnology industry. Curriculum is focused largely on management issues, including finance, product development, pharmaceuticals, project management, regulatory affairs, and ethics.

Same as MGMTMBA 293.

Restriction: Graduate students only. Biotechnology Majors only.

**MOL BIO 253L. Stem Cell Laboratory. 4 Units.**

Designed to prepare M.S. Biotechnology program students for a career in stem cell research. Laboratory training utilizes tissue culture, mouse and human embryonic stem cells, and is enhanced with didactic material and discussion.

Prerequisite: MOL BIO 250L and MOL BIO 251L

Restriction: Graduate students only. Biotechnology Majors only.

**MOL BIO 268. Seminar in Systems Microbiology Research. 1 Unit.**

A research and journal club seminar that covers topics on bacteria and phage using approaches and principles from biology, engineering, and physics.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Same as PHYSICS 268, ENGRMSE 267.

Restriction: Upper-division students only. Graduate students only.

**MOL BIO 270. Science Communication Skills. 2 Units.**

Development of effective communication skills, oral and written presentations. Topics range from the art of creating keynote slides to strategically crafting a personal story, culminating in a live presentation to an invited audience.

**MOL BIO 291. Graduate School Fundamentals. 2 Units.**

Lectures and discussions providing basic skills needed for success in Ph.D. graduate studies. Topics include formulating a hypothesis, experimental design, literature review, grant writing, oral communication, biostatistics, time management, and professional development.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Cellular and Molecular Biosci Majors only.

**MOL BIO 292A. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**MOL BIO 292B. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**MOL BIO 292C. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**MOL BIO 293A. Cancer Biology Journal Club. 1 Unit.**

Focuses on molecular mechanisms that underlie the development and progression of cancers. Covers a variety of cancer-related research areas, such as cell cycle control, apoptosis, DNA repair, metastasis, angiogenesis, and others.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**MOL BIO 293B. Cancer Biology Journal Club. 1 Unit.**

Focuses on molecular mechanisms that underlie the development and progression of cancers. Covers a variety of cancer-related research areas, such as cell cycle control, apoptosis, DNA repair, metastasis, angiogenesis, and others.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**MOL BIO 293C. Cancer Biology Journal Club. 1 Unit.**

Focuses on molecular mechanisms that underlie the development and progression of cancers. Covers a variety of cancer-related research areas, such as cell cycle control, apoptosis, DNA repair, metastasis, angiogenesis, and others.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**MOL BIO 295. Biomedical Research Methods. 2 Units.**

Lectures and interactive discussions of research methods in modern biomedical science. Each week will focus on a different class of techniques, including molecular, biochemical, immunological, genomic, bioinformatics, microscopy, cancer biology, genome editing. One hour per week, grading based on attendance.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Cellular and Molecular Biosci Majors only.

**MOL BIO 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Restriction: Graduate students only.

## Music (MUSIC)

### Courses

**MUSIC 3. Introduction to Music. 4 Units.**

Introduction to musical concepts and active listening skills. Students develop musical understanding through critical readings, selected repertoire, fundamental concepts related to rhythm, pitch, and genre. Students apply those concepts to music from a wide range of historical and cultural origins.

(IV)

**MUSIC 4. Introduction to Opera. 4 Units.**

Introduces students with no musical background to the dramatic and performance conventions of opera, and suggests ways of developing a critical stance vis-a-vis the social, political, gender-related and moral conflicts that are presented by composers and librettists.

(IV)



**MUSIC 5. Popular Music in the United States. 4 Units.**

Examines the cultural, social, political, and economic dimensions of popular music in the United States over the last century and a half, with an emphasis on matters related to class, race, ethnicity, and gender.

(IV)

**MUSIC 8. The Beatles and the Sixties. 4 Units.**

Through a study of the music of the Beatles, students are introduced to selected broader historical and cultural themes (e.g., race and music, gender and music, music and the counterculture) while developing an understanding of the basic elements of music.

(IV)

**MUSIC 9. Rock: The Early Years. 4 Units.**

Surveys the social and cultural fabric of the post-World War II United States (from the late 1940s through the early 1970s) as seen through the prism of music - rock and roll music.

(IV)

**MUSIC 10. Piano for Majors. 1 Unit.**

For Music majors with little or no piano experience. Provides the necessary background for realizing keyboard exercises required in the theory and harmony courses, and develops skills to play and sight-read simple music from different periods.

Repeatability: May be taken for credit 3 times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 15A. Musicianship I. 2 Units.**

Interval and chord quality identification, melodic and harmonic dictation, tonal and chromatic sight-singing, and rhythmic reading and dictation.

Corequisite: MUSIC 16A

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 15B. Musicianship II. 2 Units.**

Interval and chord quality identification, melodic and harmonic dictation, tonal and chromatic sight-singing, and rhythmic reading and dictation.

Corequisite: MUSIC 16B

Prerequisite: MUSIC 15A and MUSIC 16A. MUSIC 15A with a grade of C- or better. MUSIC 16A with a grade of C- or better

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 15C. Musicianship III. 2 Units.**

Interval and chord quality identification, melodic and harmonic dictation, tonal and chromatic sight-singing, and rhythmic reading and dictation.

Corequisite: MUSIC 16C

Prerequisite: MUSIC 15B and MUSIC 16B. MUSIC 15B with a grade of C- or better. MUSIC 16B with a grade of C- or better

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 16A. Music Theory. 4 Units.**

Review of music fundamentals. Triad and seventh chords, musical texture, chord spacing, embellishing tones, and introduction to diatonic harmony. Part-writing and model composition with tonic, dominant seventh, and subdominant harmonies.

Corequisite: MUSIC 15A

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 16B. Music Theory. 4 Units.**

Introduction to phrase structure. Part-writing and harmonization with predominants, linear dominants, 6/4 embellishing chords, leading-tone and other diatonic seventh chords. Advanced meters and rhythmic-metric dissonance. Diatonic sequence. Introduction to tonicization and modulation through motion to V and III.

Corequisite: MUSIC 15B

Prerequisite: MUSIC 15A and MUSIC 16A. MUSIC 15A with a grade of C- or better. MUSIC 16A with a grade of C- or better

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 16C. Music Theory. 4 Units.**

Tonicization and modulation to closely related keys. Simple binary and ternary forms. Voice-leading reductions and simple forms. Diatonic sequence with seventh chords. Introduction to chromatic harmony I: modal exchange and mixture chords, the Neapolitan and augmented sixth chords.

Corequisite: MUSIC 15C

Prerequisite: MUSIC 15B and MUSIC 16B. MUSIC 15B with a grade of C- or better. MUSIC 16B with a grade of C- or better

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 16D. Theory/Musicianship. 4 Units.**

Extended homophonic and contrapuntal formal designs (continuous variations, rondo form, sonata form, invention, fugue). Embellishing chromatic chords, dominant prolongation, modulations to foreign keys, extended harmonies, chromatic sequence, chromatic voice-leading and symmetrical divisions of the octave.

Prerequisite: MUSIC 15C and MUSIC 16C. MUSIC 15C with a grade of C- or better. MUSIC 16C with a grade of C- or better

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 21A. Keyboard Skills. 1 Unit.**

Designed to develop the foundational skills of sight-reading, harmonization, transposition, improvisation, figured bass realization, and score reading.

Repeatability: May be taken for credit 6 times.

Restriction: Lower-division students only. Music Majors only. Music - Performance Majors only.

**MUSIC 21B. Keyboard Skills. 1 Unit.**

Designed to develop the foundational skills of sight-reading, harmonization, transposition, improvisation, figured bass realization, and score reading.

Repeatability: May be taken for credit 6 times.

Restriction: Lower-division students only. Music Majors only. Music - Performance Majors only.

**MUSIC 21C. Keyboard Skills. 1 Unit.**

Designed to develop the foundational skills of sight-reading, harmonization, transposition, improvisation, figured bass realization, and score reading.

Repeatability: May be taken for credit 6 times.

Restriction: Lower-division students only. Music Majors only. Music - Performance Majors only.

**MUSIC 25. Fundamentals of Music. 4 Units.**

Gain comprehensive insight into the fundamental concepts of music theory, including notation, harmony, and score analysis. Designed for students of all levels to improve their understanding of how music is composed, performed, and heard. Formerly MUSIC 25A.

**(IV)****MUSIC 40B. History of European Music: From the Renaissance through the Baroque. 4 Units.**

An introduction to the analysis of musical styles and forms, to the sources for constructing music history and reconstructing historical music, and to J.S. Bach.

Prerequisite: MUSIC 16C. MUSIC 16C with a grade of C- or better

Restriction: Music Majors have first consideration for enrollment. Music - Performance Majors have first consideration for enrollment.

**(IV and VIII ).****MUSIC 40C. History of European Music: Hasse to Mahler. 4 Units.**

An introduction to the analysis of musical styles and forms, and to the sources for constructing music history and reconstructing historical music, to Richard Wagner.

Prerequisite: MUSIC 40B. MUSIC 40B with a grade of D or better. Recommended: MUSIC 16D

Restriction: Music Majors have first consideration for enrollment. Music - Performance Majors have first consideration for enrollment.

**(IV and VIII ).**

**MUSIC 40D. 20th Century Music. 4 Units.**

Survey of principal composers, movements, and compositional techniques of Western art music of the modern era.

Prerequisite: MUSIC 16C. MUSIC 16C with a grade of C- or better

Restriction: Music Majors have first consideration for enrollment. Music - Performance Majors have first consideration for enrollment.

(IV and VIII ).

**MUSIC 41. Major Composer. 4 Units.**

Study of the works of an important composer with emphasis on their significance in historical and social contexts. Composers selected represent a wide variety of historical periods, nationalities, and stylistic orientations.

Repeatability: May be taken for credit 2 times as topics vary.

(IV)

**MUSIC 42. Music and Gender. 4 Units.**

Explores various intersections between music and gender. Examines ways in which gender and sexuality have played a vital role in the creation, dissemination, and consumption of music ranging from medieval Christian mysticism to contemporary hip-hop artists.

(IV, VIII)

**MUSIC 44. Classical Music in Society. 4 Units.**

Examines some ways in which classical music has played an integral role in aspects of society. Studies pieces from different cultural, political, and historical contexts in order to understand how musical meaning is created and interpreted.

(IV, VIII)

**MUSIC 45. History of Film Music. 4 Units.**

Course provides an overview of film music history. Special emphasis will be placed on developing an analytic vocabulary for musical elements and cultivating an understanding of how music can function within a film.

(IV)

**MUSIC 46. Music in Multimedia. 4 Units.**

Students explore intersections between music and other media forms through creating multimedia projects, readings, lectures, and discussion. Students produce music, edit video, increase media literacy, and study theories behind how music communicates meaning.

(IV)

**MUSIC 47. Introductory Topics in Music Technology. 4 Units.**

Introductory topics in electronic music, digital audio, and other aspects of music technology.

Repeatability: Unlimited as topics vary.

(IV)

**MUSIC 48. Introductory Topics in Music and Culture. 4 Units.**

Examines music and musical practices in different historical periods, societies, and cultural settings.

Repeatability: Unlimited as topics vary.

(IV)

**MUSIC 51. Music Technology and Computers. 4 Units.**

A study of the influence of technology on the musical culture and aesthetics from the 20th century to the present, with particular emphasis on the role of the computer. Work includes lectures, readings, listenings, discussions, demonstrations, writing, and experimentation.

(IV)

**MUSIC 65. Piano for Music Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times as topics vary.

Restriction: Music Majors only.

**MUSIC 66. Strings for Music Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times as topics vary.

Restriction: Music Majors only.

**MUSIC 67. Winds for Music Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times as topics vary.

Restriction: Music Majors only.

**MUSIC 68. Voice for Music Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music Majors only.

**MUSIC 69. Percussion for Music Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times as topics vary.

Restriction: Music Majors only.

**MUSIC 70. Guitar, Lute, and Other Plucked Instruments for Music Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music Majors only.

**MUSIC 78. History of Jazz. 4 Units.**

Development of jazz from African and African American folk origins through blues, early jazz, swing, bebop, 'cool' jazz, fusion, free jazz, and contemporary trends.

Restriction: Music Majors have first consideration for enrollment. Music - Performance Majors have first consideration for enrollment.

(IV and VII ).

**MUSIC H80. Experiments in Music. 4 Units.**

Scientists explain the cognition of music using experimental methodology; artists expand the domain of music by trying previously unknown ways of making it. These two types of experiment deepen our understanding of music, from both scientific and artistic vantage points.

Restriction: Campuswide Honors Collegium students only.

(IV)

**MUSIC 82A. MAHUR-Pish Radif: Introduction to Classical Persian Music. 4 Units.**

Survey of art music in Iran and basic structures of classical Persian music, with emphasis on MAHUR modal system and different instruments of classical Persian music. No musical experience required, but interest in vocal music is strongly recommended.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 82B. HOMAYUN-Pish Radif: Introduction to Classical Persian Music. 4 Units.**

Survey of art music in Iran and basic structures of classical Persian music, with emphasis on HOMAYUN modal system and famous musicians and performers of classical Persian music. No musical experience required, but interest in vocal music is strongly recommended.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 82C. SHUR-Pish Radif: Introduction to Classical Persian Music. 4 Units.**

Survey of art music in Iran and basic structures of classical Persian music, with emphasis on the SHUR modal system and different poetic rhythms in classical Persian music. No musical experience required, but interest in vocal music is strongly recommended.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 122A. Piano Literature. 2 Units.**

Survey of stringed keyboard literature from the English Virginalists through twentieth-century composers. Historical, formal, and stylistic considerations of music presented. Performances by class participants and occasional outside guests.

Prerequisite: MUSIC 16A and MUSIC 16B and MUSIC 16C

Restriction: Upper-division students only. Music Majors only. Music - Performance Majors only.

**MUSIC 122B. Piano Literature. 2 Units.**

Survey of stringed keyboard literature from the English Virginalists through twentieth-century composers. Historical, formal, and stylistic considerations of music presented. Performances by class participants and occasional outside guests.

Prerequisite: MUSIC 16A and MUSIC 16B and MUSIC 16C

Restriction: Upper-division students only. Music Majors only. Music - Performance Majors only.

**MUSIC 122C. Piano Literature. 2 Units.**

Survey of stringed keyboard literature from the English Virginalists through twentieth-century composers. Historical, formal, and stylistic considerations of music presented. Performances by class participants and occasional outside guests.

Prerequisite: MUSIC 16A and MUSIC 16B and MUSIC 16C

Restriction: Upper-division students only. Music Majors only. Music - Performance Majors only.

**MUSIC 126. Piano Pedagogy. 2 Units.**

The materials and methods of piano instruction are examined and evaluated.

Restriction: Upper-division students only. Music Majors only. Music - Performance Majors only.

**MUSIC 131. Post-Tonal Theory. 4 Units.**

Significant harmonic, rhythmic, and structural practices since 1900. Analysis and written work exploring free atonality and serialism; neo-tonal practices such as use of extended tertian harmonies, modalism, pandiatonicism, and non-tertian harmonies; structural principles such as aleatory, metric modulation and minimalism.

Prerequisite: MUSIC 16D

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 132. Jazz Theory. 4 Units.**

Study of jazz harmony and melody construction in improvisation. Covered topics include terminology, chord symbols, notation, voicings, and scales as commonly used in jazz and popular music. Issues regarding tonality and ramifications of the blue scale are also examined.

Prerequisite: MUSIC 16D

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 136. Instrumentation. 4 Units.**

Ranges and capabilities of modern orchestral instruments. Exercise in writing for various combinations of wind, string, and percussion instruments and for full orchestra.

Prerequisite: MUSIC 16C

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 140. Topics in Medieval Music. 4 Units.**

Topics in medieval music.

Prerequisite: MUSIC 40B. MUSIC 40B with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 141. Topics in Renaissance Music. 4 Units.**

Topics in renaissance music.

Prerequisite: MUSIC 40B. MUSIC 40B with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 142. Topics in Baroque Music. 4 Units.**

Topics in Baroque music.

Prerequisite: MUSIC 40B. MUSIC 40B with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 142W. Topics in Baroque Music . 4 Units.**

Topics in Baroque music.

Prerequisite: MUSIC 40B. MUSIC 40B with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**(Ib)**

**MUSIC 143. Topics in Classical Music. 4 Units.**

Topics in Classical music.

Prerequisite: MUSIC 40C. MUSIC 40C with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 143W. Topics in Classical Music. 4 Units.**

Topics in Classical music.

Prerequisite: MUSIC 40C. MUSIC 40C with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**(Ib)**

**MUSIC 144. Topics in Romantic Music. 4 Units.**

Topics in Romantic music.

Prerequisite: MUSIC 40C. MUSIC 40C with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 144W. Topics in Romantic Music. 4 Units.**

Topics in Romantic music.

Prerequisite: MUSIC 40C. MUSIC 40C with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only.

**(Ib)**

**MUSIC 145. Topics in 20th Century Music. 4 Units.**

Topics in 20th century music.

Prerequisite: MUSIC 40D. MUSIC 40D with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 145W. Topics in 20th Century Music. 4 Units.**

Topics in 20th century music.

Prerequisite: MUSIC 40D. MUSIC 40D with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Upper-division students only. Music Majors only. Music - Performance Majors only.

**(Ib)****MUSIC 146. Studies in Jazz Music. 4 Units.**

Topics in Jazz Music.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 147. Studies in Music Technology. 4 Units.**

Specialized topics in electronic music, computer-aided music, and other aspects of music technology.

Repeatability: May be taken for credit 2 times as topics vary.

**MUSIC 148. Studies in Ethnomusicology. 4 Units.**

Topics in Ethnomusicology.

Repeatability: May be taken for credit 2 times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 149. Studies in Music History. 4 Units.**

Specialized topics in musical genres; culture and social issues; performance practices; and interrelated arts.

Prerequisite: MUSIC 40B and MUSIC 40C and MUSIC 40D. Satisfactory completion of the lower-division writing requirement.

Repeatability: May be taken for credit 3 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 150. Composition. 4 Units.**

Exercises and projects for diverse instrumental-vocal combinations; contemporary techniques and problems. Participation in the improvisation ensemble and working with electronic media.

Prerequisite: MUSIC 16C

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 151. Computer Music Composition. 4 Units.**

Exercises in the composition of music uniquely possible by computer, including digital signal processing, computer control of synthesizers and processors, and algorithmic composition. Demonstrations and musical analyses in class; considerable studio work outside class.

Prerequisite: MUSIC 51

**MUSIC 152. Interactive Arts Programming. 4 Units.**

Study of artistic issues and programming techniques involved in the development of interactive computer art and music. Theoretical background, basic tenets of programming, and practical exercises in programming interactive computer multimedia art.

Prerequisite: MUSIC 51 or ART 65A or DANCE 163

**MUSIC 153. Counterpoint. 4 Units.**

Studies in contrapuntal practices of various style periods such as the 16th, 18th, and 20th centuries.

Prerequisite: MUSIC 16B. MUSIC 16B with a grade of C- or better

Restriction: Music Majors only.

**MUSIC 155. Analysis. 4 Units.**

Methods of formal analysis applicable to all Western musical styles: additive, continuous, transformational, and hierarchic forms; rhythm, texture, and sonority as form and process.

Prerequisite: MUSIC 16D

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 156A. Song Literature. 2 Units.**

A survey of song literature. Designed as an overview of the song repertoire, German Lieder.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 156B. Song Literature. 2 Units.**

A survey of song literature. Designed as an overview of the song repertoire, French mélodie.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 157. Advanced Study in Composition. 4 Units.**

Individual weekly lessons in composition.

Prerequisite: MUSIC 150. MUSIC 150 with a grade of C- or better

Repeatability: May be taken for credit 6 times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 158A. Diction. 2 Units.**

In-depth study of the International Phonetic Alphabet (IPA), including its transcription and pronunciation, and its application for singers. Introduction to IPA and Italian Diction.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 158B. Diction. 2 Units.**

In-depth study of the International Phonetic Alphabet (IPA), including its transcription and pronunciation, and its application for singers. German Diction.

Prerequisite: MUSIC 158A

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 158C. Diction. 2 Units.**

In-depth study of the International Phonetic Alphabet (IPA), including its transcription and pronunciation, and its application for singers. French Diction.

Prerequisite: MUSIC 158A and MUSIC 158B

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 159. Vocal Pedagogy. 2 Units.**

Survey about the physical structure of the singing mechanism, science, and philosophy of studio instruction.

Restriction: Music - Performance Majors only.

**MUSIC 160. University Orchestra. 2 Units.**

Study and performance of standard orchestral repertory and works by contemporary composers. Membership is open to all qualified students by audition only.

Prerequisite: Audition required.

Repeatability: May be repeated for credit unlimited times.



**MUSIC 161. Wind Ensemble. 2 Units.**

Study and performance of works written for varying combinations of wind and percussion instruments. Membership is open to all qualified students by audition only.

Prerequisite: Audition required.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 162. University Chorus. 2 Units.**

Make-up of the ensembles varies and may include University Chorus, Chamber Choir, Madrigal Singers, Women's Chorus, and Reading Choir. Membership is open to all qualified students by audition only.

Corequisite: MUSIC 162L

Prerequisite: Audition required.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 162P. University Chorus: Accompanying. 2 Units.**

Keyboard accompanying for one of the UCI choral organizations, with individual coaching in sight reading, score reading, and other accompanying skills.

Repeatability: May be taken for credit 12 times.

**MUSIC 164. Opera Workshop. 2-4 Units.**

Preparation and performance of operatic repertoire, including arias, scenes, and fully staged operas, and/or stage training and role analysis.

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 164P. Opera Workshop: Accompanying. 2-4 Units.**

Training in techniques and operatic repertory for keyboard players.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 165. Piano for Music Performance Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music - Performance Majors only.

**MUSIC 166. Strings for Music Performance Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music - Performance Majors only.

**MUSIC 166P. String Accompaniment. 2 Units.**

Chamber ensemble experience with the solo string repertory for keyboard, participation in the weekly string master class, performance in public recitals.

Repeatability: May be taken for credit 3 times.

**MUSIC 167. Winds for Music Performance Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music - Performance Majors only.

**MUSIC 168. Voice for Music Performance Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music - Performance Majors only.

**MUSIC 169. Percussion for Music Performance Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music - Performance Majors only.

**MUSIC 170. Guitar, Lute, and Other Plucked Instruments for Music Performance Majors. 2 Units.**

Private weekly lessons and a weekly master class/workshop for the discussion of solo repertory and performance practice, including special topics such as historical notational systems, traditional American guitar styles, and demonstrations of period plucked instruments. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music - Performance Majors only.

**MUSIC 171. Chamber Singers. 2 Units.**

A select ensemble specializing in vocal chamber music from all periods. Frequent performances on and off campus. Membership is open to all singers by audition.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 176. Chamber Ensembles . 2 Units.**

Make-up of the ensembles varies and may include various Classical ensembles, Latin Jazz Ensemble, Small Jazz Combos, Percussion Ensemble, and Guitar Ensemble. Membership is open to all qualified students by audition only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Majors have first consideration for enrollment. Music - Performance Majors have first consideration for enrollment.

**MUSIC 178. Jazz Orchestra. 2 Units.**

Rehearsal and performance of literature written for large jazz ensemble with emphasis on methods and materials. Laboratory setting for new arrangers and/or composers of modern jazz pieces.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 181. Improvisation. 4 Units.**

Improvisation has been central to all music traditions. Course explores real-time music-making in a variety of non-notated contexts. Different improvisational styles are presented, including jazz, Asian improvisation, and experimental modern music. Emphasis on actual classroom performance.

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 182. Advanced Jazz Combo. 2 Units.**

Small-group jazz ensemble and improvisational workshop. Range of music covered encompasses the full traditional jazz from improvised ragtime up through the most current avant-garde musical techniques.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 183A. Jazz Composition I. 4 Units.**

Performance and lecture course for writing and performing original jazz compositions. Emphasis is placed on composing as a way to create new improvisational frameworks. Cyclical forms, modal compositions, blues-oriented compositions, and ballad writing.

Prerequisite: MUSIC 78 and MUSIC 132

Restriction: Music Majors only.

**MUSIC 183B. Jazz Composition II. 4 Units.**

Performance and lecture course for writing and performing original jazz compositions. Emphasis is placed on composing as a way to create new improvisational frameworks. Non-functional harmony, contemporary forms, free-bop, and current trends.

Prerequisite: MUSIC 78 and MUSIC 132 and MUSIC 183A

Restriction: Music Majors only.

**MUSIC 183C. Jazz Composition III. 4 Units.**

Performance and lecture course for writing and performing original jazz compositions. Emphasis is placed on composing as a way to create new improvisational frameworks. Study of modern tonal-center compositions, intervallic compositions, and alternate rhythms.

Prerequisite: MUSIC 78 and MUSIC 132 and MUSIC 183A and MUSIC 183B

Restriction: Music Majors only.

**MUSIC 189. Accompanying for Plucked Strings: Continuo and Changes. 2 Units.**

Students apply theory to their instruments as they learn the basics of pre-1800 continuo playing and post-1900 jazz charts. Includes discussions of appropriate repertoire, treatment of harmonic progressions, and finer points of style and technique.

Prerequisite: MUSIC 16C

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 191. Tutorial in Music. 1-4 Units.**

Supplemental instruction related to student's area of study. Taken only when the materials studied lie outside regular departmental offerings, and when the student has no formal chance to pursue the subject.

Prerequisite: Undergraduate advisor approval required.

Repeatability: May be taken for credit 3 times.

**MUSIC 193. Conducting. 4 Units.**

Introduces students to the basic techniques employed in the practice of conducting and includes score study and development of leadership skills.

Prerequisite: MUSIC 16D and MUSIC 40B and MUSIC 40C

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 195A. Senior Thesis. 2 Units.**

With consultation in regularly scheduled meetings, students identify and study relevant texts and materials and prepare a prospectus for an original thesis.

Prerequisite: Senior standing in the Honors Program in Music and Culture.

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 195B. Senior Thesis. 2 Units.**

Students submit an outline and preliminary drafts of section of their thesis to the instructor, on a schedule supervised by the instructor. The final version will address the instructor's comments and criticisms.

Prerequisite: MUSIC 195A

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 197. Word and Music. 2 Units.**

Performance class for advanced singers and pianists with emphasis on collaborative approach to vocal literature.

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 199. Independent Study. 2-4 Units.**

Student-devised research/composition project, with faculty guidance, resulting in a formal paper/project. Taken only when materials studied lie outside regular departmental offerings or when students have no formal chance to pursue the subject.

Prerequisite: Undergraduate or graduate advisor approval required.

Repeatability: May be taken for credit 3 times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 200. Bibliography and Research. 4 Units.**

Required of all entering students. A systematic introduction to the bibliographical tools both in the general field of music and in the student's areas of specialization.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 201. Topics in Analysis . 4 Units.**

Seminar focusing on different analytical methods, modal, tonal, and post-tonal, and their applications to repertoires drawn from various historical periods through to the present day.

Prerequisite: Placement into MUSIC 201.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 202. Proseminar in Musicology. 4 Units.**

Introduces significant issues and recent developments in musicology and music criticism, including exposure to the controversies that have brought change and reflection to the discipline.

Corequisite: Recommended for musicology students: MUSIC 200

Prerequisite or corequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Restriction: Graduate students only.

**MUSIC 203. Music Thesis . 4 Units.**

Intensive work dedicated to researching and writing a Master's thesis under the supervision of a faculty advisor.

Prerequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 204. Proseminar in Music Theory and Analysis. 4 Units.**

Introduction to music theories, analytic approaches, and methodologies as applied to repertoires drawn from Western art and popular music.

Corequisite: Recommended for musicology students: MUSIC 200

Prerequisite or corequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Restriction: Graduate students only.

**MUSIC 209. Seminar in Creative Practices. 1-4 Units.**

Core first-year seminar required for graduate students in the Integrated Composition, Improvisation, and Technology emphasis of the M.A. and Ph.D. programs. Composition and presentation of original student works, lecture, and discussion.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 210. Choral Conducting . 4 Units.**

Intensive private instruction and study of the various choral literatures.

Repeatability: May be taken for credit 6 times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 211. Performance . 4 Units.**

Contents vary according to the student's major instrument. Intensive private instruction and study of the various literatures.

Repeatability: May be taken for credit 6 times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 212. Composition. 4 Units.**

Intensive work in composition geared to each student's level of competence.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 213. Orchestral Conducting. 4 Units.**

Intensive private instruction in instrumental conducting.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 214. Graduate Recital.**

Performance of public recital.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 215A. Computer Music Composition and Production. 4 Units.**

Study of the composition and production of music made uniquely possible by the computer, including usage of prevalent digital music technology, techniques of digital signal processing, and computer control of synthesizers and audio processors.

Restriction: Graduate students only. Music Majors only.

**MUSIC 215B. Computer Music Programming. 4 Units.**

Study of the artistic issues and programming techniques involved in the development of original applications for computer music composition and interactive performance.

Restriction: Graduate students only. Music Majors only.

**MUSIC 220. Seminar in Music History. 4 Units.**

Topics in music history.

Corequisite: MUSIC 200

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 222. Seminar in Musicology . 4 Units.**

Focuses on current scholarship in musicology and related fields with a strong critical content. Addresses topics relative to their historical and stylistic periods. Recent topics have included Stravinsky, Holy Women, Mahler, Historiography, Issues in Performance Practice, and Brahms's Chamber Music.

Corequisite: Recommended for musicology students: MUSIC 200

Prerequisite or corequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Repeatability: May be taken for credit for 4 units as topics vary.

Restriction: Graduate students only.

**MUSIC 224. Seminar in Music Theory and Analysis. 4 Units.**

Typical topics include Schenkerian theory and analysis, contemporary form theory, and advanced techniques in the analysis of late 19th-century and contemporary music (e.g., transformational theory, Neo-Riemannian, and scale network theory).

Corequisite: Recommended for musicology students: MUSIC 200

Prerequisite or corequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**MUSIC 230. Seminar in Contemporary Music. 4 Units.**

Special seminar projects dealing with contemporary music with emphasis on analytical techniques and style criticism.

Prerequisite or corequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 231. Improvisation. 4 Units.**

Introduces the practice and history of improvisation in diverse fields of Western music since 1950. Performance projects and group critiques, weekly reading and listening assignments, participation in a class concert, and a research paper.

Restriction: Graduate students only. Music Majors only.

**MUSIC 235. Critical Studies in Music. 4 Units.**

A critical examination of music traditions, institutions, and aesthetics, employing new scholarship in music and new critical studies in other disciplines.

Corequisite: Recommended for musicology students: MUSIC 200

Prerequisite or corequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 236. Theoretical ICIT Seminar. 1-4 Units.**

Seminar studying new genres and topics that integrate composition, improvisation, new technologies, and non-classical cultures.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 237. Practical ICIT Seminar. 1-4 Units.**

Study of new practices and techniques that integrate composition, improvisation, new technologies, and non-classical cultures.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 239. Thesis Colloquium. 1-2 Units.**

ICIT students present their thesis work-in-progress for discussion and criticism. Faculty and visiting artists/scholars also present their current work.

Repeatability: May be taken for credit for 8 units.

Restriction: Graduate students only. Music Majors only.

**MUSIC 240. Graduate Projects . 4 Units.**

Substantial projects in performance, conducting, or composition (other than those specifically required for the degree), accompanied by a summary paper.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 242A. First-Year Research and Writing Seminar I. 4 Units.**

Guided reading for one quarter on a broad subject selected by the instructor, followed by one quarter in which the student undertakes independent research on the selected topic, leading to a substantial term paper.

Prerequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Restriction: Graduate students only.

**MUSIC 242B. First-Year Research and Writing Seminar II. 4 Units.**

Guided reading for one quarter on a broad subject selected by the instructor, followed by one quarter in which the student undertakes independent research on the selected topic, leading to a substantial term paper.

Prerequisite: MUSIC 200 and MUSIC 242A. MUSIC 200 with a grade of B or better. MUSIC 242A with a grade of B or better

Restriction: Graduate students only.

**MUSIC 243A. Second-Year Research and Writing Tutorial I. 4 Units.**

In this two-quarter sequence, students gain expertise in a first area of research concentration by undertaking directed reading on a topic of their choice and then writing a paper of near-publishable length and quality on that topic.

Prerequisite: MUSIC 242B. MUSIC 242B with a grade of B or better

Restriction: Graduate students only.

**MUSIC 243B. Second-Year Research and Writing Tutorial II. 4 Units.**

In this two-quarter sequence, students gain expertise in a first area of research concentration by undertaking directed reading on a topic of their choice and then writing a paper of near-publishable length and quality on that topic.

Prerequisite: MUSIC 243A. MUSIC 243A with a grade of B or better

Restriction: Graduate students only.

**MUSIC 244. Readings for the Qualifying Examination. 4-12 Units.**

Directed reading in preparation for the Qualifying Examination.

Prerequisite: MUSIC 243B. MUSIC 243B with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**MUSIC 245. Prospectus Research. 4-12 Units.**

Research and writing of the Dissertation Prospectus.

Prerequisite: MUSIC 244. MUSIC 244 with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**MUSIC 250. Directed Research. 4 Units.**

Preparation for qualifying exams and dissertation, or an individual research project resulting in a substantial paper or comparable documentation of the research results.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 276. Contemporary Ensemble. 2 Units.**

Chamber ensemble for the performance of contemporary music, including newly composed and improvised forms.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 290. Dissertation Research. 4-12 Units.**

Research and writing of the dissertation for the History and Music Theory Ph.D.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**MUSIC 299. Independent Study. 2-4 Units.**

Student-devised research/composition project, with faculty guidance, resulting in a formal paper/project. Taken only when materials studied lie outside regular departmental offerings or when students have no formal chance to pursue the subject.

Prerequisite: Graduate advisor approval required.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 399. University Teaching. 1-4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Networked Systems (NET SYS)

### Courses

**NET SYS 201. Computer and Communication Networks. 4 Units.**

Network architecture of the Internet, telephone networks, cable networks, and cell phone networks. Network performance models. Network performance models. Advanced concepts and implementations of flow and congestion control, addressing, internetworking, forwarding, routing, multiple access, streaming, and quality-of-service.

Prerequisite: EECS 148 or COMPSCI 132

Same as COMPSCI 232, EECS 248A.

Restriction: Graduate students only.

**NET SYS 202. Networking Laboratory. 4 Units.**

A laboratory-based introduction to basic networking concepts such as addressing, sub-netting, bridging, ARP, and routing. Network simulation and design. Structured around weekly readings and laboratory assignments.

Prerequisite: EECS 148 or COMPSCI 132

Same as COMPSCI 233.

**NET SYS 210. Advanced Networks. 4 Units.**

Design principles of networked systems, advanced routing and congestion control algorithms, network algorithms, network measurement, management, security, Internet economics, and emerging networks.

Prerequisite: NET SYS 201 or COMPSCI 232 or EECS 248A

Same as COMPSCI 234.

**NET SYS 230. Wireless and Mobile Networking. 4 Units.**

Introduction to wireless networking. The focus is on layers 2 and 3 of the OSI reference model, design, performance analysis, and protocols. Topics covered include: an introduction to wireless networking, digital cellular, next generation cellular, wireless LANs, and mobile IP.

Prerequisite: EECS 148 or COMPSCI 132

Same as COMPSCI 236.

**NET SYS 240. Network and Distributed Systems Security. 4 Units.**

Modern computer and networks security: attacks and countermeasures, authentication, identification, data secrecy, data integrity, authorization, access control, computer viruses, network security. Group communication and multicast security techniques. Covers secure e-commerce and applications of public key methods, digital certificates, and credentials.

Prerequisite: EECS 148 or COMPSCI 132

Same as COMPSCI 203.



**NET SYS 260. Middleware for Networked and Distributed Systems. 4 Units.**

Discusses concepts, techniques, and issues in developing distributed systems middleware that provides high performance and Quality of Service for emerging applications. Also covers existing standards (e.g., CORBA, DCOM, Jini, Espeak) and their relative advantages and shortcomings.

Prerequisite: An undergraduate-level course in operating systems and networks.

Same as COMPSCI 237.

**NET SYS 270. Topics in Networked Systems. 4 Units.**

Study of Networked concepts.

Repeatability: Unlimited as topics vary.

**NET SYS 295. Networked Systems Seminar. 1 Unit.**

Current research in networked systems. Includes talks by UCI faculty, visiting researchers, and Networked Systems graduate students.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Neurobiology and Behavior (NEURBIO)

### Courses

**NEURBIO 200A. Research in Neurobiology and Behavior. 2-12 Units.**

Individual research with Neurobiology and Behavior faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 200B. Research in Neurobiology and Behavior. 2-12 Units.**

Individual research with Neurobiology and Behavior faculty.

Prerequisite: NEURBIO 200A

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 200C. Research in Neurobiology and Behavior. 2-12 Units.**

Individual research with Neurobiology and Behavior faculty.

Prerequisite: NEURBIO 200B

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 201A. Research in Neurobiology and Behavior. 2-12 Units.**

Individual research with Neurobiology and Behavior faculty.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 201B. Research in Neurobiology and Behavior. 2-12 Units.**

Individual research with Neurobiology and Behavior faculty.

Prerequisite: NEURBIO 201A

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 201C. Research in Neurobiology and Behavior. 2-12 Units.**

Individual research with Neurobiology and Behavior faculty.

Prerequisite: NEURBIO 201B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 202A. Foundations of Neuroscience. 2 Units.**

Intended to expose students to critical reading and analysis of the primary neuroscience literature. Instructors from departments associated with the Interdepartmental Neuroscience Program participate and discuss topics of current interest.

Grading Option: Satisfactory/unsatisfactory only.

**NEURBIO 202B. Foundations of Neuroscience. 2 Units.**

Intended to expose students to critical reading and analysis of the primary neuroscience literature. Instructors from departments associated with the Interdepartmental Neuroscience Program participate and discuss topics of current interest.

Prerequisite: NEURBIO 202A

Grading Option: Satisfactory/unsatisfactory only.

**NEURBIO 206. Molecular Neuroscience. 5 Units.**

Surveys molecular and cellular mechanisms involved in neuronal function, including control of gene expression, post-transcriptional and post-translational processing, RNA and protein targeting, cell death mechanisms, and molecular genetic basis of neurological disorders. Overview of the molecular aspects of developmental neurobiology.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 207. Cellular Neuroscience. 5 Units.**

Neurophysiological and neurochemical mechanisms of electrical and chemical signaling in neurons. Topics include generation of resting- and action-potentials, voltage- and ligand-gated ion channels, second messenger systems, and synaptic transmission and integration.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 207L. Cellular Neuroscience Laboratory. 2 Units.**

Intensive hands-on laboratory experience of contemporary techniques for studying ion channels and synaptic function. Experiments include microelectrode recording, patch clamp, quantal analysis of synaptic transmission, heterologous expression of genes for channels and receptors, brain slice, and fluorescence calcium imaging.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 208. Systems Neuroscience. 5 Units.**

Study of the mammalian nervous system at the systems level. Anatomy and physiology of sensory, motor, and integrative functions.

Repeatability: May be taken for credit 2 times.

Same as ANATOMY 210A.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 209. Behavioral Neuroscience. 5 Units.**

Overview of fundamental conceptual and experimental issues in the neurobiology of learning and memory. The approach is a cross-level integration of research in molecular-genetic, cellular, circuit, systems, and behavioral analyses.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 220. Neural Coding, Computation, and Dynamics. 4 Units.**

Theoretical principles and biological mechanisms underlying how brains acquire, assimilate, store, and retrieve information, compute adaptive responses to external inputs, and how knowledge is extracted from experience to generate an internal model of the world.

Prerequisite: At least one upper-division course in the field of Neuroscience or one upper-division course in Cognitive Science or Machine Learning.

Concurrent with BIO SCI N174.

**NEURBIO 221. Scientific Presentation Skills. 1 Unit.**

A tutorial seminar on developing skills for presenting research to scientific audiences.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**NEURBIO 225. Rigor, Reproducibility, and Research Methods. 1 Unit.**

Understanding key concepts in experimental design, execution, and analysis that enhance or detract from scientific rigor.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**NEURBIO 227. Bioinformatics and Systems Biology. 4 Units.**

Students learn the fundamentals of bioinformatics, genomic approaches, and Linux and R program in order to analyze RNA-sequencing data.

Overlaps with ECO EVO 282, ECO EVO 283.

Restriction: Graduate students only.

**NEURBIO 228. Psychophysiological Methods in Clinical Research . 4 Units.**

Introduces the principal signals of psychophysiology and outlines how measures calculated from these signals can be applied in clinical research and practice.

Prerequisite: One graduate or undergraduate course in statistics.

Restriction: Graduate students only.

**NEURBIO 230. Epigenetics in Health and Disease . 4 Units.**

Focuses on the role of chromatin/nuclear structure organization (histone and DNA modification, chromatin remodeling, higher order chromatin structure and nuclear organization) on gene regulation, DNA replication and repair, relevant to development, metabolism, learning and memory, and human disease.

Prerequisite: MOL BIO 203 or MOL BIO 204 or NEURBIO 206

Same as BIOCHEM 225.

Restriction: Graduate students only.

**NEURBIO 231. Clinical and Epidemiological Aspects of Neurodegenerative Diseases. 4 Units.**

Clinical and epidemiological aspects of neurodegenerative disorders causing dementia will be reviewed, including AD, PD, FTD, HD and cerebrovascular disease. Seminar format will include student presentations and group discussion.

Restriction: Graduate students only.

**NEURBIO 232. Regenerative Neurobiology. 4 Units.**

Surveys the latest research on regenerative neurobiology. Both basic stem cell discoveries and their potential clinical application to brain disorders will be examined.

**NEURBIO 233. Neurobiology of Drug Addiction. 4 Units.**

Provides a comprehensive overview of topics in the addiction field, including drug pharmacology, models/approaches to investigate addiction, brain circuits, genetics, epigenetics, and the cellular and molecular biology of drug addiction.

Restriction: Graduate students only.

Concurrent with BIO SCI N121.

**NEURBIO 236. Cortex: Structure, Function, and Plasticity. 4 Units.**

Structured to include lectures and presentation of papers about cortex with emphasis on sensory-motor cortex. Both historical and current perspectives on cortical structure-function relationship will be critically evaluated.

**NEURBIO 237. Neurobiology of Brain Aging. 4 Units.**

Outlines some of the significant changes that occur in the aging brain, with a special emphasis on risk factors and protective strategies that promote successful brain aging. Topics include changes in synaptic plasticity, neurotrophic factors, and molecular mechanisms in aging.

Prerequisite: NEURBIO 209

**NEURBIO 239. Functional Imaging of the Nervous System. 4 Units.**

Overview of technical and applied aspects of imaging techniques available for studying the nervous system. The areas emphasized are cellular and subcellular imaging of neural function, systems-level imaging of brain function, and imaging of the human brain.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 240. Advanced Analysis of Learning and Memory. 4 Units.**

Advanced analysis of contemporary research concerning the nature and neurobiological bases of learning and memory. Special emphasis is given to time-dependent processes involved in memory storage.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 247. Programming for Neuroscience Research . 4 Units.**

A neuroscience-specific introduction to programming and data analysis using either MATLAB or Scientific PYTHON. Students will learn general programming skills and effective use of programming for data management, statistical analysis, and image analysis.

Overlaps with PSYCH 205A.

**NEURBIO 248. Topics in Neurobiology and Behavior. 4 Units.**

Studies in selected areas of Neurobiology and Behavior. Topics addressed vary each quarter.

Repeatability: May be taken for credit 3 times.

**NEURBIO 249. Electronics for Biologists. 4 Units.**

Basic principles of electricity; properties and use of discrete components and integrated circuits; circuit analysis and design. Intended for advanced students in the life sciences.

Same as PHYSIO 205.

**NEURBIO 254. Molecular Neurobiology. 4 Units.**

The application of genetic and recombinant DNA technology to neurobiology. Topics include the study of neuronal proteins which play important roles in the formation of synapses and synaptic transmission.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 255. Perspectives in Neuroscience: Past, Present, and Future. 4 Units.**

An overview of the conceptual and technical foundations of contemporary neuroscience from ancient times to the present. The subjects include synapses, neurons, brain organization, sensory, motor and regulatory systems, learning and memory, human brain function and dysfunction.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

Concurrent with BIO SCI N119.

**NEURBIO 257. Statistics for Neurobiologists. 4 Units.**

Introduction to common methods for statistical analysis used in neurobiology. Topics covered include t-tests, ANOVAs, correlations and regressions, general linear model, power analysis, and non-parametric tests.

Restriction: Graduate students only.

**NEURBIO 260. Auditory Neuroscience. 4 Units.**

Multidisciplinary overview of brain mechanisms of hearing. Emphasizes breadth of auditory function and research: single neurons to psychoacoustics, the cochlea to the cortex, and basic science to clinic.

Concurrent with BIO SCI N147.

**NEURBIO 290. Colloquium in Neurobiology and Behavior. 1.3 Unit.**

Presentation of contemporary research problems in neurobiology and behavior and related areas by invited speakers.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 292. Scientific Proposals for Neuroscience Trainees. 4 Units.**

Students learn how to effectively communicate scientific ideas and results. Activities include learning how to effectively write a scientific proposal, how to perform a coherent, persuasive slide presentation, and how to give meaningful, constructive review critiques.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 399. University Teaching. 1-4 Units.**

Limited to Teaching Assistants.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Neurology (NEUROL)

## Nursing Science (NUR SCI)

### Courses

**NUR SCI 90. Introduction to Pain Medicine. 2 Units.**

Gives students introductory knowledge in pain medicine.

**NUR SCI 92. Compassion in Health Care. 1 Unit.**

An overview of the importance of compassion in health care, providing examples from a variety of health care professions through lectures and discussion.

Grading Option: Pass/no pass only.

**NUR SCI 110W. Frameworks for Professional Nursing Practice. 5 Units.**

Conceptual frameworks for professional practice. Scope of professional nursing, jurisprudence and ethics, professional interpersonal relationships, and health care delivery systems in the context of the social, political, and economic environments. Socialization of the student for professional roles in nursing.

Corequisite: NUR SCI 112LA and NUR SCI 114A and NUR SCI 118A

Prerequisite: BIO SCI D170 and BIO SCI E109. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Nursing Science Majors only.

**(Ib)****NUR SCI 112LA. Foundations of Professional Practice. 3 Units.**

Development of skills in communication, interviewing, functional and physical health assessment across the life span, the art and science of human care, and clinical judgment.

Corequisite: NUR SCI 110W and NUR SCI 114A and NUR SCI 118A

Prerequisite: BIO SCI E109 and BIO SCI D170

Restriction: Nursing Science Majors only.

**NUR SCI 112LB. Foundations of Professional Practice. 4 Units.**

Development of skills in communication, interviewing, functional and physical health assessment across the life span, the art and science of human care, and clinical judgment.

Corequisite: NUR SCI 114B and NUR SCI 118B and NUR SCI 125 and NUR SCI 135

Prerequisite: NUR SCI 112LA and NUR SCI 110W and NUR SCI 114A and NUR SCI 118A

Restriction: Nursing Science Majors only.

**NUR SCI 114A. Applied Pharmacology I. 2 Units.**

Presents principles of pharmacology applied to interventions in pathophysiologic states across the life span. Discussion of the major drug groups with implications for monitoring, drug administration, toxicity, and patient education are included.

Corequisite: NUR SCI 110W and NUR SCI 118A and NUR SCI 112LA

Prerequisite: BIO SCI E109 and BIO SCI D170

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 264A.

**NUR SCI 114B. Applied Pharmacology II. 2 Units.**

Presents principles of pharmacology applied to interventions in pathophysiologic states across the life span. Discussion of the major drug groups with implications for monitoring, drug administration, toxicity, and patient education are included.

Corequisite: NUR SCI 118B and NUR SCI 112LB and NUR SCI 125 and NUR SCI 135

Prerequisite: NUR SCI 114A and NUR SCI 118A and NUR SCI 110W and NUR SCI 112LA

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 264B.

**NUR SCI 116. Human Growth and Development through the Lifespan. 4 Units.**

Examines theories and concepts of typical human development throughout the life cycle, from the time of conception through adulthood, and familiarizes students with the many forces that shape individual development, including family, society, and culture.

Prerequisite: PSYCH 7A or PSY BEH 9. PSYCH 7A with a grade of C or better. PSY BEH 9 with a grade of C or better

Repeatability: May be taken for credit 2 times.

Restriction: Program in Nursing Science students only.

**NUR SCI 118A. Human Health and Disease I. 2 Units.**

Presents content on pathologic alterations in physiologic processes in cells, tissues, organs, and systems across the life span. Emphasis on critical thinking, application of concepts to clinical practice, and related research.

Corequisite: NUR SCI 114A and NUR SCI 112LA and NUR SCI 110W

Prerequisite: BIO SCI E109 and BIO SCI D170

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 268A.

**NUR SCI 118B. Human Health and Disease II. 2 Units.**

Presents content on pathologic alterations in physiologic processes in cells, tissues, organs, and systems across the life span. Emphasis on critical thinking, application of concepts to clinical practice, and related research.

Corequisite: NUR SCI 114B and NUR SCI 112LB and NUR SCI 125 and NUR SCI 135

Prerequisite: NUR SCI 112LA and NUR SCI 114A and NUR SCI 118A and NUR SCI 110W

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 268B.

**NUR SCI 120. Adult Health Care. 8 Units.**

Restorative, perioperative, supportive care of adults with acute/chronic alterations in oxygenation, regulation, immune response, elimination, metabolism, mobility, cognition, and substance abuse. Concurrent practicum occurs in inpatient medical-surgical units, perioperative units and outpatient clinics utilizing critical thinking and research skills.

Corequisite: NUR SCI 140

Prerequisite: NUR SCI 112LB and NUR SCI 114B and NUR SCI 118B and NUR SCI 125 and NUR SCI 135

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 266.

**NUR SCI 125. Research Methods and Applications in Health Care. 4 Units.**

Foundational concepts of research in health care. Emphasizes critical evaluation and interpretation of research for application in practice.

Corequisite: NUR SCI 112LB and NUR SCI 114B and NUR SCI 118B and NUR SCI 135

Prerequisite: NUR SCI 110W and NUR SCI 112LA and NUR SCI 114A and NUR SCI 118A. And a basic statistics course.

Restriction: Nursing Science Majors only.

**NUR SCI 130. Maternity and Women's Health Care. 8 Units.**

Provides didactic and clinical experiences in nursing management of women's wellness across the lifespan, the childbirth process, and newborn care. Incorporates concepts of family-centered care, teamwork and collaboration, patient safety, quality improvement and informatics, utilizing an evidence-based practice approach.

Corequisite: NUR SCI 132

Prerequisite: NUR SCI 120 and NUR SCI 140 and PSYCH 120D

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 273.

**NUR SCI 132. Pediatrics: Care of Children and Families. 7 Units.**

Provides didactic and clinical experiences in nursing management of infants, children, and adolescents with acute, chronic and/or life-threatening conditions. Incorporates concepts of family-centered care, teamwork and collaboration, patient safety, quality improvement and informatics, utilizing an evidence-based practice approach.

Corequisite: NUR SCI 130

Prerequisite: NUR SCI 120 and NUR SCI 140 and PSYCH 120D

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 272.

**NUR SCI 133. Complementary and Integrative Health . 2 Units.**

Complementary and integrative healthcare emphasized a holistic, patient-focused approach to healthcare and wellness. Key research is critically evaluated and applications for improving patient care emphasized. Knowledge and skills are developed through lectures, guest speakers, and discussion.

**NUR SCI 135. Older Adult Health Care. 2 Units.**

Theories of aging and application of principles of gerontology in health maintenance of older adults. Concepts and principles of rehabilitation and palliative care.

Corequisite: NUR SCI 112LB and NUR SCI 114B and NUR SCI 118B and NUR SCI 125

Prerequisite: NUR SCI 112LA and NUR SCI 114A and NUR SCI 118A and NUR SCI 110W

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 265.

**NUR SCI 140. Human Behavior and Mental Health Care. 7 Units.**

Biopsychosocial and cultural influences on promotion and restoration of mental health in adults and adolescents. Assessment, classification, and care of clients with mental health problems and/or substance abuse. Concurrent practicum in adult/adolescent inpatient psychiatric units and outpatient mental health clinics.

Corequisite: NUR SCI 120

Prerequisite: NUR SCI 112LB and NUR SCI 114B and NUR SCI 118B and NUR SCI 125 and NUR SCI 135

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 267.

**NUR SCI 150. Critical and Specialty Health Care. 6 Units.**

Delivery of patient-centered care for individuals with life-threatening alterations in health status utilizing technology and pharmacology for life support. Concurrent practicum in critical care units emphasizes collaboration, team work, and quality improvement in safe care delivery.

Corequisite: NUR SCI 160 and NUR SCI 179A

Prerequisite: NUR SCI 130 and NUR SCI 132

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 274.

**NUR SCI 160. Leadership and Management in Health Care. 4 Units.**

Principles, concepts, and theories related to organizations, management, leadership, decision-making, and group process applied to the delivery of health care. The professional nurse using evidenced-based practice, collaboration, and informatics is incorporated in concurrent practicum emphasizing safe patient care delivery.

Corequisite: NUR SCI 150 and NUR SCI 179A

Prerequisite: NUR SCI 130 and NUR SCI 132

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 276.

**NUR SCI 170. Community-Based Health Care. 6 Units.**

Epidemiology, primary health care promotion, and disease prevention applied to nursing care of individuals, families, groups, and communities. Includes sociocultural, political, economic, and environmental influences. Concepts and methods of assessing populations and communities incorporated in concurrent practicum.

Corequisite: NUR SCI 175L and NUR SCI 179BW

Prerequisite: NUR SCI 150 and NUR SCI 160 and NUR SCI 179A

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 271.

**NUR SCI 175L. Clinical Preceptorship. 6 Units.**

Independent study course focusing on critical thinking skills for nursing practice in selected clinical areas of interest to the student. The clinical experience focuses on core competencies: patient-centered care, evidence-based practice, quality improvement, safety, and informatics.

Corequisite: NUR SCI 170 and NUR SCI 179BW

Prerequisite: NUR SCI 150 and NUR SCI 160 and NUR SCI 179A

Grading Option: Pass/no pass only.

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 275.

**NUR SCI 179AW. Scholarly Concentration I. 2 Units.**

Focuses on analysis and use of evidence to improve nursing practice. Emphasis is to develop critical analysis skills synthesizing a body of research evidence for clinical issues on a formal, collaborative written paper.

Corequisite: NUR SCI 150 and NUR SCI 160

Prerequisite: NUR SCI 130 and NUR SCI 132

Restriction: Nursing Science Majors only.

**(Ib)****NUR SCI 179B. Scholarly Concentration II. 2 Units.**

Continuation of evidence-based research and application for nursing practice. Emphasis is to develop a collaborative quality improvement project with clinical nurses applying the evidence to improve nursing practice.

Corequisite: NUR SCI 170 and NUR SCI 175L

Prerequisite: NUR SCI 179A

Restriction: Nursing Science Majors only.



**NUR SCI 199. Independent Study in Nursing Science. 1-4 Units.**

Original research with Nursing Science faculty.

Repeatability: May be repeated for credit unlimited times.

**NUR SCI 200. Research Methods and Evaluation for Evidence-Based Practice. 3 Units.**

Clinical research methods and evaluation procedures relevant to evidence-based advanced nursing practice.

Prerequisite: Undergraduate statistics course; undergraduate nursing research course.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 210. Advanced Pathophysiology. 3 Units.**

Principles of normal body functioning and pathophysiologic changes that occur as a result of compensatory mechanisms and disease. Physical and psychological aspects of altered health are explored from the cellular to the level of the total body system.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 212. Philosophy of Science for Nursing Scholarship. 4 Units.**

Development of philosophy of science in relation to nursing science, scholarship, and practice; emphasis on inquiry, scientific reasoning, and contemporary philosophical thought; historical and contemporary influences on nursing science theory development; evaluation/analysis of interdisciplinary theory and application to nursing research.

Restriction: Graduate students only.

**NUR SCI 215. Health Promotion/Disease Prevention. 3 Units.**

Covers the evidence-based national clinical preventive services guidelines for health promotion and disease prevention. Emphasizes counseling about personal health behaviors, screening tests for the early detection of risk factors and disease, immunizations and chemo-prophylaxis.

Restriction: Graduate students only.

**NUR SCI 220. The Ecology of Healthy Communities. 2 Units.**

Nursing science research contributions and opportunities as they pertain to the ecology of health in local, national, and global communities. Emphasis on methodological and ethical issues, research gaps, and clinical translational opportunities.

Restriction: Graduate students only.

**NUR SCI 222A. Seminar in Clinical Translational Science. 2 Units.**

Discussion of clinical translational science methods in the context of nursing science research. Emphasis placed on interdisciplinary and community participatory research approaches.

Prerequisite: Consent of the instructor is required.

Restriction: Graduate students only.

**NUR SCI 222B. Seminar in Clinical Translational Science. 2 Units.**

Discussion of clinical translational science methods in the context of nursing science research. Emphasis placed on interdisciplinary and community participatory research approaches. Course may be offered online.

Prerequisite: NUR SCI 222A

Restriction: Graduate students only.

**NUR SCI 223A. Biostatistics for Health Sciences I. 4 Units.**

Helps students to develop skills necessary for applying statistical principles and practices in health research. This is achieved through in-depth review of existing research articles and hands-on statistical programming exercises.

Restriction: Graduate students only.

**NUR SCI 223B. Biostatistics for Health Sciences II. 4 Units.**

Introduces advanced methods of statistical analysis and research design used in health research. These include linear, logistic, Poisson regression, and a brief introduction to regression models for correlated data.

Prerequisite: NUR SCI 223A

Restriction: Graduate students only.

**NUR SCI 224. Research Designs in Nursing Science. 4 Units.**

Provides an introduction to qualitative and quantitative research designs, methods, and analyses in nursing science. Evaluation of measurement and population issues, data management, ethics, analytical approaches, mixed methods work, and translational potential in the context of research.

Restriction: Graduate students only. Nursing Science Majors only.

**NUR SCI 225A. Advanced Pharmacology I. 3 Units.**

Principles of pharmacology that serve as a foundation for the pharmacotherapeutic management of patients evaluated and treated by advanced practice nurses. Emphasis includes the application of pharmacokinetic and pharmacodynamic principles.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 225B. Advanced Pharmacology II. 2 Units.**

Principles of pharmacology that serve as a foundation for the pharmacotherapeutic management of patients evaluated and treated by advanced practice nurses. Emphasis includes the application of pharmacokinetic and pharmacodynamic principles.

Prerequisite: NUR SCI 225A. NUR SCI 225A with a grade of B or better

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 226. Theoretical and Conceptual Frameworks. 4 Units.**

Explores the history, roles, and uses of theory in nursing and health scholarship. Students examine, analyze, and utilize the components of theory, theory construction, concept analysis, and theory evaluation.

Restriction: Graduate students only.

**NUR SCI 227A. Grant Writing I. 4 Units.**

Introduction to the principles and methods of proposal writing used in preparing grant proposals. Provides content on the process for good proposal development, key elements and sections of proposal, necessary information to include in grant proposal and development of budget.

Prerequisite: NUR SCI 212 and NUR SCI 233 and NUR SCI 226 and NUR SCI 246 and NUR SCI 247

Restriction: Graduate students only.

**NUR SCI 227B. Grant Writing II. 2 Units.**

Provides a continuation of skill building in preparing a grant proposal, with emphasis on developing the educational training plan, budget and budget justification, the IRB and ethics component, and letters of support for a career-development grant.

Prerequisite: NUR SCI 227A. NUR SCI 227A with a grade of B or better

Restriction: Graduate students only.

**NUR SCI 230. Advanced Health and Physical Assessment. 3 Units.**

Application of theoretical concepts related to comprehensive health assessment of patients across the lifespan. Analysis, synthesis, and application of comprehensive health assessment data.

Corequisite: NUR SCI 230L

Restriction: Graduate students only.

**NUR SCI 230L. Advanced Health and Physical Assessment Laboratory. 1 Unit.**

Clinical laboratory course for the application of concepts related to comprehensive health assessment of patients across the lifespan.

Corequisite: NUR SCI 230

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 231. DNP Prologue . 2 Units.**

An onsite 2 ½ day immersive experience that provides an introduction to DNP scholarship and foundations essential for academic success in a doctoral program. Preparatory activities and onsite individual and group assignments are completed.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 232. Leadership and Professional Collaboration in Healthcare. 4 Units.**

Explore and debate the relationship between various leadership and collaboration models, theories health care practice, and outcomes. Prepares DNP graduates to assume leadership roles across the healthcare spectrum.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 233. Appraisal and Translation of Evidence for Practice . 3-4 Units.**

Provides advanced concepts on research methods and measurement strategies that are applicable to support the advanced practice nurse to access, evaluate, and utilize data from various sources including research, quality improvement initiatives, and information technology origins to achieve improvements.

Prerequisite: Consent of the instructor is required.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 234. Health Politics and Policy. 4 Units.**

Participants will analyze, apply, and evaluate current health policy-related literature, engage in the process of health policy development within professional, regulatory, or administrative environments, and develop an evidence-based health policy proposal across the spectrum of health care systems.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 235. DNP Scholarly Project I: Conceptualization and Planning . 1 Unit.**

Students gain the knowledge, skills, and abilities necessary to develop an evidence-based project plan and proposal. Structured didactic content and application of the Student's DNP Scholarly Project. First of four DNP Scholarly Project courses.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 236. Social Determinants of Health and Health Equity . 3 Units.**

The four components of the Clinical Prevention and Population Health Framework: evidence-based practice, clinical preventive service and health promotion, health systems and policy, and population health and community aspects of practice with emphasis on ethical care delivery.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 237. DNP Intersession. 2 Units.**

Provides DNP students an opportunity to present and receive faculty and peer feedback on their DNP project plan. Recommendations related to practical data collection and information gathering approaches and data analysis are also emphasized.

Prerequisite: NUR SCI 235. NUR SCI 235 with a grade of B or better

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 238. Foundations of Health Systems and Health Economics. 3 Units.**

Foundational understanding of how healthcare is financed in the U.S. Explores economic theories and policies, various types of healthcare organizations, and healthcare delivery systems. Healthcare finance is discussed at national and practice levels.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 239. The Science of Change, Quality Improvement, and Program Evaluation. 4 Units.**

Intro to science of quality improvement and program evaluation. Focus on info system technology and its application in quality improvement. Focus placed on the role of the advanced practice nurse leader in developing and leading clinical quality and safety initiatives.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 240. DNP Scholarly Project II: Proposal. 1 Unit.**

Developing a full proposal that reflects synthesis of the student's knowledge from prior coursework and work in an area of interest or expertise under the direction of a faculty mentor. Second of four DNP Scholarly Project course sequence.

Prerequisite: NUR SCI 237. NUR SCI 237 with a grade of B or better

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 241. DNP Scholarly Project III: Implementation and Evaluation. 1 Unit.**

Continued development of knowledge, skills, and abilities to implement the chosen DNP proposal. Students receive direction from a faculty mentor and peer feedback as they become engaged in the microsystem where they are implementing their DNP Scholarly Project.

Prerequisite: NUR SCI 240. NUR SCI 240 with a grade of B or better

Restriction: Graduate students only.

**NUR SCI 242. DNP Scholarly Project IV: Implications . 1 Unit.**

Selection and implementation of evidence-based interventions supported through informatics and technological advances and measurement of outcomes in a selected practicum site as applicable. Includes reflection and mapping of the DNP Scholarly Project with DNP Essentials as published.

Prerequisite: NUR SCI 241. NUR SCI 241 with a grade of B or better

Restriction: Graduate students only.

**NUR SCI 243. DNP Epilogue. 2 Units.**

DNP students develop DNP competency through the presentation of their project and development of a professional manuscript. Individual direction from the DNP Project Team and peer feedback are provided throughout the course.

Prerequisite: NUR SCI 242. NUR SCI 242 with a grade of B or better

Restriction: Graduate students only.

**NUR SCI 245. Primary Care Adult/Gerontology Acute Common Conditions . 3 Units.**

Assessment and management of acute or episodic problems affecting patients and families across the lifespan. Diagnostics, pharmacology, pathophysiology, and therapeutics are integrated. Concepts of quality health care, resource management, and shared-decision making are emphasized.

Prerequisite: NUR SCI 210 and NUR SCI 230. NUR SCI 210 with a grade of B or better. NUR SCI 230 with a grade of B or better

Restriction: Graduate students only.

**NUR SCI 246. Qualitative Research Designs in Nursing Science. 4 Units.**

Seminar in qualitative research philosophies, methods, and analysis in nursing science clinical research. Consideration of population access and sampling, ethics, data management, analytical approaches, and translational potential.

Restriction: Graduate students only.

**NUR SCI 247. Quantitative Research Designs in Nursing Science. 4 Units.**

Seminar in experimental and survey research designs, methods, and analysis in nursing science clinical research. Consideration of measurement issues, mixed methods models, population access and sampling, data management, analytical approaches, and translational potential.

Prerequisite: NUR SCI 212

Restriction: Graduate students only.

**NUR SCI 248. Curricular Design for the Health Professions. 3 Units.**

Introduces students to the theoretical foundations, essential components, and accreditation standards for curriculum development at the program level. Outcome competencies are addressed as they apply to the development and evaluation of an educational program to meet society's diverse healthcare needs.

Restriction: Graduate students only.

**NUR SCI 249. Transformational Leadership in Education for the Health Professions. 4 Units.**

Students are introduced to the role of the nurse educator as change agent, leader, and scholar and provided experience in planning learner-centered learning activities that are engaging and effective in achieving desired student performance.

Restriction: Graduate students only.

**NUR SCI 250. Primary Care Women's Health. 2 Units.**

Primary health care needs of women including adolescent, adult, and aging adults. Emphasizes assessment, diagnosis, prevention, management, and education of common gynecologic and family planning health care needs.

Prerequisite: NUR SCI 210 and NUR SCI 230. NUR SCI 210 with a grade of B or better. NUR SCI 230 with a grade of B or better

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 251. Nursing Informatics . 4 Units.**

Provides an overview of nursing informatics topics for practice.

Restriction: Graduate students only.

**NUR SCI 255. Primary Care Obstetrics. 2 Units.**

Assessment and management of women during pregnancy. Diagnostics, pharmacology, pathophysiology and therapeutics are integrated. Includes assessment, differential diagnosis, management, patient/family education, and counseling related to normal pregnancy care.

Prerequisite: NUR SCI 210 NUR SCI 230. NUR SCI 210 with a grade of B or better. NUR SCI 230 with a grade of B or better

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 260A. Primary Care Adult/Gerontology Chronic Conditions . 3 Units.**

Assessment and management of acute or episodic problems affecting adult and geriatric patients and their families. Diagnostics, pharmacology, pathophysiology, and therapeutic are integrated.

Prerequisite: NUR SCI 245. NUR SCI 245 with a grade of B or better

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 262. Foundations of Professional Nursing Practice. 4 Units.**

Focuses on the development of skills in therapeutic communication, interviewing, functional assessment across the lifespan, the art and science of human care, and clinical judgment. Faculty-facilitated, participatory peer group, and self-learning laboratory activities are included.

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

**NUR SCI 263. Frameworks for Professional Nursing Practice. 4 Units.**

A theory-intensive course focused on conceptual frameworks for professional nursing practice. Topics address the professional, political, and economic contexts of nursing practice, with an emphasis on jurisprudence and ethics, professional interpersonal relationships, and nursing's role in the care delivery system.

Restriction: Graduate students only.

**NUR SCI 264A. Applied Pharmacology I. 2 Units.**

Principles of pharmacology applied to intervention in pathophysiologic states across the life span. Discussion of the major drug groups with implications for monitoring, drug administration, toxicity, and patient education included. Physical, psychological, social, and cultural factors affecting drug administration.

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 114A.

**NUR SCI 264B. Applied Pharmacology II. 2 Units.**

Principles of pharmacology applied to intervention in pathophysiologic states across the life span. Discussion of the major drug groups with implications for monitoring, drug administration, toxicity, and patient education included. Physical, psychological, social, and cultural factors affecting drug administration.

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 114B.

**NUR SCI 265. Older Adult Health Care. 2 Units.**

Analyzes the interaction of physical, pathophysiological, psychological, social, cultural, and health care policy factors influencing the health and health care of older adults. Topics include health risk factors, health assessment, acute illness and chronic conditions, and ethical issues.

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 135.

**NUR SCI 266. Adult Health Care . 8 Units.**

Focuses on the restorative, peri-operative, and supportive nursing management of adults with acute or chronic alterations in oxygenation, regulation, immune response, elimination, metabolism, mobility, cognition, and substance abuse. Diagnostics, pharmacology, pathophysiology, and therapeutics will be integrated.

Prerequisite: NUR SCI 200 and NUR SCI 262 and NUR SCI 264A and NUR SCI 264B and NUR SCI 268A and NUR SCI 268B and NUR SCI 265 and NUR SCI 281

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 120.

**NUR SCI 267. Human Behavior and Mental Health Nursing . 7 Units.**

Focuses on nursing management of individuals across the lifespan with alterations in mental health. Mental health promotion and crisis intervention, chemical dependency, acute and chronic care for psychiatric conditions, rehabilitation, and recovery will be addressed.

Prerequisite: NUR SCI 200 and NUR SCI 262 and NUR SCI 264A and NUR SCI 264B and NUR SCI 268A and NUR SCI 268B and NUR SCI 265 and NUR SCI 281

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 140.

**NUR SCI 268A. Pathophysiology I . 2 Units.**

Focuses on pathologic alterations in physiologic processes in cells, tissues, organs, and systems across the life span. Content includes disease processes, linkage of relevant physiology to disease states, and factors that influence epidemiology and pathophysiology.

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 118A.

**NUR SCI 268B. Pathophysiology II . 2 Units.**

Focuses on pathologic alterations in physiologic processes in cells, tissues, organs, and systems across the life span. Content includes disease processes, linkage of relevant physiology to disease states, and factors that influence epidemiology and pathophysiology.

Prerequisite: NUR SCI 268A

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 118B.

**NUR SCI 270. Primary Care Pediatrics. 2 Units.**

Assessment and management of acute or episodic problems affecting pediatric patients and their families. Diagnostics, pharmacology, pathophysiology, and therapeutics are integrated.

Prerequisite: NUR SCI 210 and NUR SCI 230. NUR SCI 210 with a grade of B or better. NUR SCI 230 with a grade of B or better

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 271. Community-Based Health Care . 6 Units.**

Epidemiology, primary health care promotion, and disease prevention applied to nursing care of individuals, families, groups, and communities. Includes sociocultural, political, economic, and environmental influences. Concepts and methods of assessing populations and communities incorporated in concurrent practicum.

Prerequisite: NUR SCI 215 and NUR SCI 274 and NUR SCI 276

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 170.

**NUR SCI 272. Pediatrics: Care of Children and Families. 7 Units.**

Provides didactic and clinical experiences in nursing management of infants, children, and adolescents with acute, chronic, and/or life-threatening conditions. Incorporates concepts of family-centered care, teamwork and collaboration, patient safety, quality improvement and informatics, utilizing an evidence-based practice approach.

Prerequisite: NUR SCI 266 and NUR SCI 267

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 132.

**NUR SCI 273. Maternity and Women's Health Care. 8 Units.**

Provides didactic and clinical experiences in nursing management of women's wellness across the lifespan, the childbirth process, and newborn care. Incorporates concepts of family-centered care, teamwork and collaboration, patient safety, quality improvement and informatics, utilizing an evidence-based practice approach.

Prerequisite: NUR SCI 266 and NUR SCI 267

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 130.

**NUR SCI 274. Critical and Specialty Health Care. 6 Units.**

Focuses on the restorative, supportive care of individuals with life-threatening alterations in health status utilizing technology and pharmacology for life support. The course includes pathophysiology, diagnostics, monitoring, pharmacology, therapeutics, and evidence-based management interventions will be integrated.

Prerequisite: NUR SCI 272 and NUR SCI 273

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 150.

**NUR SCI 275. Clinical Preceptorship. 6 Units.**

Independent study course focusing on in-depth clinical nursing practice in a selected clinical area of interest to the graduate student. Students are mentored by a preceptor who is an expert clinician in the area.

Prerequisite: NUR SCI 215 and NUR SCI 274 and NUR SCI 276

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 175L.

**NUR SCI 276. Leadership and Management in Health Care. 4 Units.**

Explores the professional nurse as leader and manager of a health care team. Principles and theories related to organizations, leadership, decision-making, and group process are applied to the delivery of health care at the individual and population levels.

Prerequisite: NUR SCI 272 and NUR SCI 273

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 160.

**NUR SCI 279A. Frameworks for the Advanced Practice Registered Nursing Role: Nurse Practitioner . 2 Units.**

Orientation to the scope and standards of advanced practice registered nursing pertinent to the APRN role. Principles of jurisprudence, ethics, and advocacy will be introduced along with conceptual frameworks for advanced nursing practice.

Restriction: Graduate students only.

**NUR SCI 281. Professional Issues in Nursing . 3 Units.**

Provides an orientation to the scope and standards of professional nursing practice for master's students. The social, political, and economic environments affecting health care delivery systems and the ethics of professional nursing practice are analyzed.

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

**NUR SCI 282. Compassionate Care with Underserved Populations. 2-3 Units.**

Addresses theory/research on health risk factors (e.g., psychiatric illness, sociocultural and economic characteristics) that impact patient health and well-being across the lifespan. Emphasis is on cultural awareness, lifestyle modification, community resources, and communication/coping strategies to promote well-being.

Restriction: Graduate students only.

**NUR SCI 283. Primary Care Procedures. 2 Units.**

Introduces the theoretical basis for common procedures performed in primary care clinical practice. Focus includes EKG interpretation, x-ray interpretation, minor surgery, and orthopaedic procedures.

Prerequisite: NUR SCI 245. NUR SCI 245 with a grade of B or better

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 284. Scholarly Concentration. 3 Units.**

Independent study focusing on critique, analysis, and synthesis of research evidence as a basis for graduate practice nursing in an area of interest to the student.

Prerequisite: NUR SCI 200

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

**NUR SCI 285. DNP APRN Practicum I. 2 Units.**

Clinical application of theory and research related to the advanced assessment and health promotion of patients across the lifespan.

Prerequisite: NUR SCI 210 and NUR SCI 230 and (NUR SCI 230L or NUR SCI 231L). NUR SCI 210 with a grade of B or better. NUR SCI 230 with a grade of B or better. NUR SCI 230L with a grade of B or better. NUR SCI 231L with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.



**NUR SCI 286. DNP APRN Practicum II. 2 Units.**

Clinical field study applying theory, research, and developing clinical skills related to the provision of care to patients and their families in increasingly complex clinical situations.

Prerequisite: NUR SCI 285. NUR SCI 285 with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 287. DNP APRN Practicum III. 6 Units.**

Clinical application of theory and research through clinical experiences in selected primary care settings designed to provide students with competencies in the assessment, diagnosis, management, and education/counseling in selected populations.

Prerequisite: NUR SCI 286. NUR SCI 286 with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 288. DNP APRN Practicum IV. 7 Units.**

Continued clinical application of theory and research through clinical experiences in selected primary care settings designed to provide students with competencies in the assessment, diagnosis, management, and education/counseling in selected populations.

Prerequisite: NUR SCI 287. NUR SCI 287 with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 289. DNP APRN Practicum V. 8 Units.**

Culminating clinical experience serves as a transition from the student role to that of the advanced practice nurse.

Prerequisite: NUR SCI 288. NUR SCI 288 with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 290. DNP APRN Practicum VI. 4 Units.**

Through continued clinical experience, students demonstrate increased responsibility and accountability for performance as an advanced practice nurse and clinical scholar, synthesizing knowledge of pathophysiology and disease management, evidence-based guidelines, anticipatory guidance, models of provider-patient communication, and provision of educational resources.

Prerequisite: NUR SCI 289. NUR SCI 289 with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 291. DNP Practicum I. 4-8 Units.**

Implementation and evaluation of an evidence-based, DNP project in an area of advanced practice in partnership with a selected agency or organization that solves a practice problem or improves population health, educational, or performance outcomes.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**NUR SCI 292. DNP Practicum II. 5-10 Units.**

Implementation and evaluation of an evidence-based, DNP project in an area of advanced practice in partnership with a selected agency or organization that solves a practice problem or improves population health, educational, or performance outcomes.

Prerequisite: NUR SCI 291. NUR SCI 291 with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 293. DNP Practicum III. 4-8 Units.**

Implementation and evaluation of an evidence-based, DNP project in an area of advanced practice in partnership with a selected agency or organization that solves a practice problem or improves population health, educational, or performance outcomes.

Prerequisite: NUR SCI 292. NUR SCI 292 with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 294. Directed Study in Vulnerable Populations. 1-4 Units.**

Independent study that focuses on individually designed clinical learning experiences and goals within a selected vulnerable population, such as the homeless, veterans, minority groups, etc. Students work in a clinical setting addressing health care needs of the vulnerable population(s).

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 2 times.

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

**NUR SCI 296. Doctoral Dissertation Reading and Writing. 4-12 Units.**

Dissertation research with Nursing Sciences faculty.

Prerequisite: Advancement to candidacy.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**NUR SCI 298. Directed Studies in Nursing Science. 1-12 Units.**

Directed study with Nursing Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**NUR SCI 299. Independent Study in Nursing Science. 1-12 Units.**

Independent research with Nursing Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**NUR SCI 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Ophthalmology (OPHTHAL)

## Pathology and Laboratory Medicine (PATH)

### Courses

**PATH 200A. Research in Experimental Pathology. 2-12 Units.**

Independent research for the Ph.D. program within the laboratories of graduate training faculty in Experimental Pathology.

Corequisite: PATH 203A

Repeatability: Unlimited as topics vary.

**PATH 200B. Research in Experimental Pathology. 2-12 Units.**

Independent research for the Ph.D. program within the laboratories of graduate training faculty in Experimental Pathology.

Corequisite: PATH 203B

Repeatability: Unlimited as topics vary.

**PATH 200C. Research in Experimental Pathology. 2-12 Units.**

Independent research for the Ph.D. program within the laboratories of graduate training faculty in Experimental Pathology.

Corequisite: PATH 203C

Repeatability: Unlimited as topics vary.

**PATH 200R. Research in Experimental Pathology for First-Year Students. 2-12 Units.**

Independent research within the laboratories of graduate training faculty in Experimental Pathology for first-year Ph.D. students.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

**PATH 203A. Advanced Studies in Experimental Pathology. 1 Unit.**

A tutorial course for Ph.D. students in Experimental Pathology entailing attendance at Departmental seminars and critical reading of the scientific literature.

Corequisite: PATH 200A

Repeatability: May be repeated for credit unlimited times.

**PATH 203B. Advanced Studies in Experimental Pathology. 1 Unit.**

A tutorial course for Ph.D. students in Experimental Pathology entailing attendance at Departmental seminars and critical reading of the scientific literature.

Corequisite: PATH 200B

Repeatability: May be repeated for credit unlimited times.

**PATH 203C. Advanced Studies in Experimental Pathology. 1 Unit.**

A tutorial course for Ph.D. students in Experimental Pathology entailing attendance at Departmental seminars and critical reading of the scientific literature.

Corequisite: PATH 200C

Repeatability: May be repeated for credit unlimited times.

**PATH 204A. Experimental Pathology Research Seminar. 1 Unit.**

Seminar series for graduate students in Experimental Pathology. Students attend seminars and, beginning in their third year of graduate study, present one formal seminar on their graduate research.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PATH 204B. Experimental Pathology Research Seminar. 1 Unit.**

Seminar series for graduate students in Experimental Pathology. Students attend seminars and, beginning in their third year of graduate study, present one formal seminar on their graduate research.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PATH 204C. Experimental Pathology Research Seminar. 1 Unit.**

Seminar series for graduate students in Experimental Pathology. Students attend seminars and, beginning in their third year of graduate study, present one formal seminar on their graduate research.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PATH 221. Immunopathogenic Mechanisms of Disease. 3 Units.**

Examination of the mechanisms underlying disease states mediated by immune dysregulation. Topics include mechanisms of immune evasion by cancer, diseases mediated by cytokine dysregulation, role of the microbiome of the GI tract and other disease sites, and adoptive T-cell therapy.

Prerequisite: MMG 215

Same as MMG 221.

Restriction: Graduate students only.

**PATH 225. Molecular Mechanisms of Human Disease. 3 Units.**

Provides an overview of the molecular mechanisms of human diseases, including neurologic, hematologic, neoplastic, and infectious diseases. Students gain an understanding of these mechanisms, as well as models of human diseases.

Same as MMG 225.

**PATH 227. Experimental Pathology Journal Club. 1 Unit.**

Graduate-level course, which is open to all years, will involve the reading and discussion of papers, preferably written by the invited seminar speaker. Discussions will cover advanced topics in experimental pathology as related to an understanding of human disease.

Corequisite: PATH 204A and PATH 204B and PATH 204C

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PATH 292A. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PATH 292B. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PATH 292C. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PATH 299. Dissertation in Experimental Pathology. 1-12 Units.**

Provided for the preparation and completion of the dissertation required for the Ph.D. degree.

Repeatability: May be repeated for credit unlimited times.

## Pediatrics (PEDS)

## Pediatrics Genetics (PED GEN)

### Courses

**PED GEN 200A. Introduction to Medical Genetics and Cytogenetics. 4 Units.**

Covers current concepts regarding mitosis, meiosis, the cell cycle, and chromosome ultrastructure and function. Clinical disorders caused by chromosomal aneuploidy, duplication, and deletion, and principles of Mendelian, chromosomal, and multifactorial and nontraditional inheritance are presented and illustrated.

Restriction: Graduate students only.

**PED GEN 200B. Genetic Screening, Prenatal Development, and Human Teratology. 4 Units.**

Principles and techniques of prenatal, neonatal, and carrier screening. Infertility, pregnancy, and delivery. Normal and abnormal prenatal growth and development. Reproductive and fetal effects of drugs, radiation, infections, and other environmental factors.

Prerequisite: PED GEN 200A

Restriction: Medical students only. Genetic Counseling Majors only.

**PED GEN 200C. Human Genetic Disorders. 4 Units.**

Inheritance, diagnosis, natural history, management, and counseling considerations for commonly encountered genetic diseases, birth defects, and dysmorphic syndromes.

Prerequisite: PED GEN 200B

Restriction: Medical students only. Genetic Counseling Majors only.

**PED GEN 200D. Disorders due to Inborn Errors of Metabolism. 4 Units.**

Aspects of biochemistry and metabolism are reviewed with special emphasis on genetic abnormalities which lead to inborn errors of metabolism. Diagnostic procedures, heterozygote detection, treatment, counseling issues, and prenatal diagnosis are reviewed.

Prerequisite: PED GEN 200A

**PED GEN 200E. Molecular Genetics, Gene Mapping, and Genetic Linkage. 4 Units.**

Derivation of different types of DNA probes and DNA libraries, restriction endonuclease polymorphisms, assignment of genes to chromosomes, and genetic linkage. Emphasis on the use of recombinant DNA technologies and genetic analysis for diagnosis of human genetic disease.

Prerequisite: PED GEN 200A and PED GEN 200D

**PED GEN 200F. Quantitative Genetics. 2 Units.**

Quantitative aspects of human genetics, including population studies, segregation analysis, linkage, mapping, and genetic risk determination.

Prerequisite or corequisite: PED GEN 200A

Overlaps with PED GEN 200B.

**PED GEN 200G. Hereditary Cancer Counseling. 4 Units.**

Issues in genetic counseling for cancer. Cancer biology; genetic mechanisms and environmental influences in carcinogenesis; tumor pathology; cancer gene mapping; epidemiology. Features natural history, diagnosis, prevention, surveillance, and management of heredity cancers. Psychosocial, ethical, legal aspects of cancer risk assessment.

Prerequisite: PED GEN 200B

Restriction: Medical students only. Genetic Counseling Majors only.

**PED GEN 200H. Genetic Counselin Research Design. 4 Units.**

Quantitative and qualitative methods for genetic counseling research. Reference management; statistics: sample size, power, and data analysis; reliability and validity; surveys, questionnaires, interviews, focus groups; quality of life and genetic epidemiology research; designing a research protocol; IRB issues; grant writing.

**PED GEN 200L. Cytogenetics Laboratory. 4 Units.**

Practicum introducing methods of specimen collection, short-term lymphocyte and bone marrow culture, long-term fibroblast and amniocyte culture, harvesting and slide preparation, chromosome staining, microphotography, and darkroom techniques. Microscopic chromosome analysis, photographic karyotyping, and appropriate use of cytogenetic nomenclature are emphasized.

Restriction: Graduate students only.

**PED GEN 201A. Introduction to Genetic Counseling. 4 Units.**

Through directed readings, observing patient evaluations, role-playing, and conducting intake interviews, students are introduced to the process of diagnosis, management, and counseling for genetic disease. Psychosocial issues, interviewing techniques, pedigree construction, clinical photography, and various other skills are addressed.

Restriction: Medical students only. Genetic Counseling Majors only.

**PED GEN 201B. Clinical Rotation I. 4 Units.**

Provides extensive supervised experience in history taking, interviewing, and psychosocial assessment in the clinical genetics setting. Students independently perform telephone, office, and home-visit intake interviews, participate in counseling, and present cases at patient management conferences.

Restriction: Medical students only. Genetic Counseling Majors only.

**PED GEN 201C. Clinical Rotation II. 4 Units.**

Provides further supervised experience in genetic counseling, case management, clinic administration and organization, and the use of community resources. Emphasis is on sharpening counseling skills and on developing a professional identity and code of ethics.

Restriction: Medical students only. Genetic Counseling Majors only.

**PED GEN 201D. Prenatal Diagnosis Counseling. 4 Units.**

A practicum with extensive supervised experience in prenatal diagnosis counseling which provides the student with the opportunity to conduct genetic counseling sessions semi-independently and to further develop clinical skills.

Prerequisite: PED GEN 200A and PED GEN 200B and PED GEN 200C

Restriction: Medical students only. Genetic Counseling Majors only.

**PED GEN 202A. Counseling in Human Genetics: Theory and Methods. 3 Units.**

Theoretical approaches, counseling models and methods, and bio-psychosocial assessment strategies are examined in the context of genetic counseling. Contract-setting, working alliance, the use of self and evaluation methods. Beginning counseling and peer supervision skills are practiced in class.

Restriction: Medical students only. Genetic Counseling Majors only.

**PED GEN 202B. Community Resources. 1-2 Units.**

Lectures, guest speakers, and community visits acquaint genetic counselors with public and private health care and funding agencies, parent support and advocacy groups, and other resources to assist individuals and families confronted with genetic disorders, developmental disabilities, and birth defects.

Repeatability: May be taken for credit 2 times.

Restriction: Medical students only. Genetic Counseling Majors only.

**PED GEN 202C. Ethical Issues in Human Genetics. 1-2 Units.**

Explores major social, legal, and ethical issues in genetic counseling including those arising in genetic screening, prenatal diagnosis, informed consent, privacy and confidentiality, rights of the disabled, new genetic and reproductive technologies, treatment, and access to services.

Repeatability: May be taken for credit 2 times.

Restriction: Medical students only. Genetic Counseling Majors only.

**PED GEN 203A. Counseling in Human Genetics: Putting Thought to Practice. 4 Units.**

Builds upon the skills learned in previous courses emphasizing advanced counseling methods such as listening, empathy, and collaboration. The counselor's own self-awareness, ethical behaviors, and limits are explored. Individual, team, and group exercises are performed.

Prerequisite: PED GEN 202A

Restriction: Medical students only. Genetic Counseling Majors only.

**PED GEN 204A. Professional Skills Development. 4 Units.**

Hones and augments existing competencies in genetic counseling through ongoing clinical experiences. Develops skills using computers for genetics applications, provision of community and professional education, and clinic administration. Further experience in genetics laboratories or specialty clinics may be elected.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**PED GEN 204B. Professional Skills Development. 4 Units.**

Hones and augments existing competencies in genetic counseling through ongoing clinical experiences. Develops skills using computers for genetics applications, provision of community and professional education, and clinic administration. Further experience in genetics laboratories or specialty clinics may be elected.

Prerequisite: PED GEN 204A

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**PED GEN 204C. Professional Skills Development. 4 Units.**

Hones and augments existing competencies in genetic counseling through ongoing clinical experiences. Develops skills using computers for genetics applications, provision of community and professional education, and clinic administration. Further experience in genetics laboratories or specialty clinics may be elected.

Prerequisite: PED GEN 204B

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**PED GEN 295. Master's Thesis and Research Writing. 4-8 Units.**

Under the supervision of one or more faculty members, the student designs and conducts a research project or completes a case report. A problem in the cytogenetics, biochemical, clinical, psychosocial, or behavioral areas of medical genetics may be investigated.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

## Persian (PERSIAN)

### Courses

**PERSIAN 1A. Fundamentals in Persian. 5 Units.**

Designed for students with little or no exposure to Persian. Students learn the modern writing system and grammar of Persian. Facilitates basic reading, writing, and speaking skills and fosters college-level literacy in Persian culture.

Prerequisite: Placement into PERSIAN 1A.

Overlaps with PERSIAN S1AB.

Restriction: PERSIAN 1A and PERSIAN S1AB may not be taken for full credit.

**PERSIAN 1B. Fundamentals in Persian. 5 Units.**

Designed for students with little or no exposure to Persian. Students learn the modern writing system and grammar of Persian. Facilitates basic reading, writing, and speaking skills and fosters college-level literacy in Persian culture.

Prerequisite: PERSIAN 1A. PERSIAN 1A with a grade of C or better. Placement into PERSIAN 1B is also accepted.

Overlaps with PERSIAN S1AB, PERSIAN S1BC.

Restriction: PERSIAN 1B and PERSIAN S1AB and PERSIAN S1BC may not be taken for full credit.

**PERSIAN 1C. Fundamentals in Persian. 5 Units.**

Designed for students with little or no exposure to Persian. Students learn the modern writing system and grammar of Persian. Facilitates basic reading, writing, and speaking skills and fosters college-level literacy in Persian culture.

Prerequisite: PERSIAN 1B or PERSIAN S1AB. PERSIAN 1B with a grade of C or better. PERSIAN S1AB with a grade of C or better. Placement into PERSIAN 1C is also accepted.

Overlaps with PERSIAN S1BC.

Restriction: PERSIAN 1C and PERSIAN S1BC may not be taken for full credit.

(VI)

**PERSIAN 2A. Intermediate Persian. 4 Units.**

Designed for students to advance their Persian language skills from introductory to intermediate level. Student will advance their understanding of grammar and syntax. Facilitates intermediate-level reading, writing, and speaking skills. Fosters college-level cultural literacy.

Prerequisite: PERSIAN 1C or PERSIAN S1BC. PERSIAN 1C with a grade of C or better. PERSIAN S1BC with a grade of C or better. Placement into PERSIAN 2A is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(VIII)

**PERSIAN 2B. Intermediate Persian. 4 Units.**

Designed for students to advance their Persian language skills from introductory to intermediate level. Students will advance their understanding of grammar and syntax. Facilitates intermediate-level reading, writing, and speaking skills. Fosters college-level cultural literacy.

Prerequisite: PERSIAN 2A. PERSIAN 2A with a grade of C or better. Placement into PERSIAN 2B is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(VIII)

**PERSIAN 2C. Intermediate Persian. 4 Units.**

Designed for students to advance their Persian language skills from introductory to intermediate level. Students will advance their understanding of grammar and syntax. Facilitates intermediate-level reading, writing, and speaking skills. Fosters college-level cultural literacy.

Prerequisite: PERSIAN 2B. PERSIAN 2B with a grade of C or better. Placement into PERSIAN 2C is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(VIII)

**PERSIAN 10A. Persian Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. PERSIAN 10A is for language mentors.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**PERSIAN 10B. Persian Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. PERSIAN 10B is for language mentees.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**PERSIAN 50. Persian Culture. 4 Units.**

Study of varied topics in Persian culture, area studies, and society, both in the present and in historical perspective. Topics are not normally repeated for a two-year period.

Repeatability: Unlimited as topics vary.

(IV, VIII)



**PERSIAN 150. Topics in Advanced Persian Culture. 4 Units.**

In-depth examination of major works in premodern and modern Persian literature and/or the arts, with specific emphasis upon historical and cultural context and relevant societal issues and trends. Course is conducted in English.

Repeatability: May be taken for credit for 4 units as topics vary.

**PERSIAN 165A. Modern Iran: Cinema and the City. 4 Units.**

Exploring modern Iran through film, literature, photography, travel writing, and philosophy and social science texts that introduce students to important concepts in post-colonial studies, social thought, war culture, religion, and media as experienced through the paradigm of a non-Western modernity.

Same as ANTHRO 165A.

**PERSIAN 199. Independent Study. 4 Units.**

Independent research with Persian faculty.

Repeatability: May be repeated for credit unlimited times.

## Pharmaceutical Sciences (PHRMSCI)

### Courses

**PHRMSCI 1. New Student Seminar. 1 Unit.**

Weekly meetings consisting of presentations by faculty, professional staff, and Peer Academic Advisors provide information about the Pharmaceutical Sciences major, campus resources, learning skills, and special programs and opportunities.

Grading Option: Pass/no pass only.

Restriction: Pharmaceutical Sciences Majors only. New students only.

**PHRMSCI 3. Professional Development and Careers in the Pharmaceutical Sciences. 1 Workload Unit.**

Designed to help Pharmaceutical Science majors select a career track and prepare for graduate program applications and careers in industry.

Grading Option: Workload Credit Letter Grade with P/NP.

Restriction: Juniors only. Pharmaceutical Sciences Majors only.

**PHRMSCI 42. Life 101 . 2 Units.**

Covers the latest scientific work on the impact of nutrition, exercise, and lifestyle choices on mental and physical health. Motivates students to make positive changes by fostering personal growth.

**PHRMSCI 76. Ethical Conduct of Research. 2 Units.**

Covers the ethical responsibilities of biomedical scientists. Topics include, as discussions and case studies, the high standards of science, the responsible conduct of research, animal experimentation, and clinical trials as they relate to the pharmaceutical sciences.

**PHRMSCI H80. Drugs and Society. 4 Units.**

Where drugs come from, how drugs work, how and why people abuse drugs, the costs of drug abuse on society, which drugs are commonly abused, and how drug abuse can be prevented and treated. Course intended for non-science majors.

Prerequisite: Recommended: High school chemistry and biology.

Restriction: Campuswide Honors Collegium students only.

### (II)

**PHRMSCI 90. Speaking about Science. 4 Units.**

Students learn to effectively prepare and present public speeches and slide presentations. Included are storytelling, informative, commemorative, and persuasive speeches, and scientific presentation. Evaluating speeches and strategies to reduce speaker apprehension is also covered.

Restriction: Pharmaceutical Sciences Majors have first consideration for enrollment.

**PHRMSCI 120. Human Physiology. 4 Units.**

Covers the function of the human body. All major organ systems are discussed. Designed to prepare students for healthcare careers, such as medicine, pharmacy, dentistry, and for research careers which require basic knowledge of how the human body functions.

Corequisite: PHRMSCI 120L

Prerequisite: BIO SCI 99

Overlaps with BIO SCI E109.

**PHRMSCI 120L. Human Physiology Lab. 3 Units.**

Designed to complement PHRMSCI 120. Computer-based lab simulations will be used to study the function of the human body. Class will physically meet for review sessions and exams.

Corequisite: PHRMSCI 120

Prerequisite: BIO SCI E109

Overlaps with BIO SCI E112L.

**PHRMSCI 142. Healthspan Sciences. 4 Units.**

Covers the complex and multi-factorial process of aging and increases the understanding of factors that contribute to enhanced lifespan, including basic principles of health and wellness and scientifically proven interventions, both pharmacological and non-pharmacological.

Prerequisite: BIO SCI 98 and BIO SCI 99 and PHRMSCI 120

Restriction: Upper-division students only.

**PHRMSCI 155. Neuropsychopharmacology. 4 Units.**

Mechanisms underlying chemical signaling processes in the nervous system. Fundamental knowledge for understanding the cellular and molecular actions of drugs and their mechanisms of action on synaptic transmission. Applied neuropsychopharmacology including major drug classes and therapeutic uses.

Prerequisite: PHRMSCI 170A. PHRMSCI 170A with a grade of C- or better

Restriction: Upper-division students only.

**PHRMSCI 163. Pharmacogenomics and Epigenetics. 4 Units.**

Survey of the genetic and epigenetic basis of inter-subject variability in response to drugs. Covers drug efficacy, safety, and need for their optimization in pharmacotherapy. Emphasizes genetic mechanisms of polymorphisms in the pharmacokinetics and pharmacodynamics of representative therapeutic drugs.

Prerequisite: BIO SCI 99

Concurrent with PHRMSCI 263.

**PHRMSCI 170A. Molecular Pharmacology I. 4 Units.**

Molecular basis of drug-receptor action at the molecular and cellular levels. Structure-function of drug targets emphasizing enzymes, ion channels, and membrane transport proteins. Understanding how the drugs' mechanisms of action contribute to the development of more efficacious and safer drugs.

Prerequisite or corequisite: (CHEM 51C or CHEM H52C) and (PHRMSCI 120 or BIO SCI E109)

Restriction: Pharmaceutical Sciences Majors have first consideration for enrollment.

**PHRMSCI 170B. Molecular Pharmacology II. 4 Units.**

Introductory survey covering the molecular mechanisms of drugs that target the nervous system, such as anxiolytics, antidepressants, antipsychotics, hypnotics, muscle relaxants, and recreational drugs; drugs related to the immune system, including antibiotics, antihistamines, and immunosuppressants; drugs used to treat cancer.

Prerequisite: PHRMSCI 170A

**PHRMSCI 171. Physical Biochemistry. 4 Units.**

Thermodynamics and kinetic fundamentals as applied to problems relevant to pharmaceutical sciences such as receptor/enzyme-ligand interactions. Fundamentals of biophysical methods used in the pharmaceutical sciences including structure determination and biomolecular spectroscopy.

Prerequisite: MATH 2B and PHYSICS 3C and (CHEM 1C or CHEM H2C) and BIO SCI 99

Restriction: Pharmaceutical Sciences Majors have first consideration for enrollment.

**PHRMSCI 172. Topics in Pharmaceutical Sciences. 2 Units.**

Presents information about various fields of research, study, careers, and graduate school opportunities in pharmaceutical sciences. Taught by guest lecturers from various disciplines including 199 research course faculty. Helps Pharmaceutical Sciences students select electives appropriate to their future goals.

Prerequisite or corequisite: BIO SCI 99 and (CHEM 51C or CHEM H52C)

Grading Option: Pass/no pass only.

**PHRMSCI 173. Pharmacotherapy. 4 Units.**

An exploration of the clinical application of medications to selected disease states. Focus is on an understanding of underlying principles of pharmacology and how this knowledge can be applied to treatment of diseases.

Prerequisite or corequisite: PHRMSCI 170B

**PHRMSCI 174. Biopharmaceutics and Nanomedicine. 4 Units.**

Introduces theories and tools of new drug formulations. Particularly new novel therapeutics based on biological materials, pathological characteristics utilized to achieve the maximum efficacy and specificity, and drug delivery systems based on emerging nanotechnology are extensively discussed.

Prerequisite: PHRMSCI 170B

Restriction: Pharmaceutical Sciences Majors have first consideration for enrollment.

**PHRMSCI 174L. Biopharmaceutics and Nanomedicine Lab. 3 Units.**

Introduction to cancer drug screening using cellular models, and confirmation of comprehensive therapeutic efficacy using a live animal model. Includes basic cell culture, cytotoxicity assays, cell analysis, drug circulation test, and tumor eradication and imaging experiments. Materials fee.

Prerequisite: PHRMSCI 170B and BIO SCI 100

(Ib)

**PHRMSCI 175. Drug Discovery Computing Techniques. 4 Units.**

Techniques used in computer-aided drug discovery, including theory behind these techniques and practical applications. Topics include scientific computing; python; classical force fields and simulations; visualization and movie-making; quantum mechanics in drug discovery; molecular dynamics; solvation models; and several others.

Prerequisite: CSE 41 or I&C SCI 31. CSE 42 or I&C SCI 32 is recommended.

Concurrent with PHRMSCI 275.

**PHRMSCI 177. Medicinal Chemistry. 4 Units.**

An introduction of the basics of drug activity and mechanisms. Strategies used to identify lead compounds such as natural product chemistry, combinatorial chemistry, molecular modeling, and high-through put screening. Relationship of molecular structure to pharmacological activity.

Prerequisite: CHEM 51A and CHEM 51B and CHEM 51C and (BIO SCI 98 or CHEM 128)

Same as CHEM 177.

Restriction: Pharmaceutical Sciences Majors have first consideration for enrollment.

**PHRMSCI 177L. Medicinal Chemistry Laboratory. 3 Units.**

An introduction of the basics of drug activity and mechanisms. Strategies used to identify lead compounds such as natural product chemistry, combinatorial chemistry, molecular modeling, and high-through put screening. Relationship of molecular structure to pharmacological activity. Materials fee.

Corequisite: PHRMSCI 177 or CHEM 177.

Prerequisite: CHEM 51A and CHEM 51B and CHEM 51C and BIO SCI 100 and (BIO SCI 98 or CHEM 128)

Same as CHEM 177L.

Restriction: Pharmaceutical Sciences Majors have first consideration for enrollment.

(Ib)

**PHRMSCI 178. Stem Cell Therapy . 4 Units.**

Introduces new paradigms in regenerative medicine involving stem cells, and emerging molecular, nano- and micro-engineered tools for in vivo imaging that is critical for studying and monitoring regeneration. Selected topics include stem cell biology and in vivo imaging modalities.

Prerequisite: BIO SCI D103

Concurrent with PHRMSCI 278.

**PHRMSCI 179. Emerging Technologies in Pharmaceutical Sciences and Medicine. 4 Units.**

Introduces emerging, ground-breaking technologies in pharmaceutical sciences and medicine, including pharmacogenomics, genome editing, and stem cell and engineered T cell therapies. Explores these novel technologies with both their underlying theories and forward-thinking applications.

Concurrent with PHRMSCI 279.

**PHRMSCI 197. Professional Internship. 4 Units.**

Provides students with opportunity to develop leadership and professional skills necessary for competitive placement in their chosen industry. Students gain new and field-specific skills outside the classroom environment while participating in a supervised internship for a total of 100 hours.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Seniors only.

**PHRMSCI 198. Independent Study in Pharmaceutical Sciences. 1-4 Units.**

Students interested in independent study should arrange with a faculty member to sponsor and supervise such work. A time commitment of three hours per week per unit is expected. A written report is required at the end of each quarter.

Repeatability: May be taken for credit for 4 units.

**PHRMSCI 199. Undergraduate Research. 1-4 Units.**

Original research in the laboratory of Pharmaceutical Sciences faculty. Attendance at regular research group meetings is also generally expected, and a quarterly written report is required. Strongly recommended for students considering research careers and/or graduate degree programs.

Repeatability: May be repeated for credit unlimited times.

**PHRMSCI H199. Honors Research in Pharmaceutical Sciences. 1-4 Units.**

Undergraduate honors research in Pharmaceutical Sciences. A student time commitment of 10-15 hours per week is required.

Repeatability: May be repeated for credit unlimited times.

**PHRMSCI 223. Biological Macromolecules. 4 Units.**

Introduction to nucleic acid and protein structure, dynamics, and function. Topics include analytical methods, molecular evolution, folding, and catalysis.

Same as CHEM 223.

**PHRMSCI 250A. Current Topics in Pharmaceutical Sciences. 1 Unit.**

Intended to expose students to the primary literature and current research in the field of Pharmaceutical Sciences. Students analyze and present information for discussion. Guest speakers from academia and industry may participate throughout the quarter.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only. Math and Computational Biology Majors only.

**PHRMSCI 250B. Current Topics in Pharmaceutical Sciences. 1 Unit.**

Intended to expose students to the primary literature and current research in the field of Pharmaceutical Sciences. Students analyze and present information for discussion. Guest speakers from academia and industry may participate throughout the quarter.

Prerequisite: PHRMSCI 250A

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only. Math and Computational Biology Majors only.

**PHRMSCI 250C. Current Topics in Pharmaceutical Sciences. 1 Unit.**

Intended to expose students to the primary literature and current research in the field of Pharmaceutical Sciences. Students analyze and present information for discussion. Guest speakers from academia and industry may participate throughout the quarter.

Prerequisite: PHRMSCI 250B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only. Math and Computational Biology Majors only.

**PHRMSCI 263. Pharmacogenomics and Epigenetics. 4 Units.**

Survey of the genetic and epigenetic basis of inter-subject variability in response to drugs. Covers drug efficacy, safety, and the need for their optimization in pharmacotherapy. Emphasizes genetic mechanisms of polymorphisms in the pharmacokinetics and pharmacodynamics of representative therapeutic drugs.

Restriction: Graduate students only.

Concurrent with PHRMSCI 163.

**PHRMSCI 264. The RNA World: From Discovery to Mechanism. 4 Units.**

Provides a comprehensive understanding of RNA in biology. Use of knowledge gained in organic chemistry, biochemistry, genomics, and molecular biology to understand how RNA is integrated into contemporary biology.

Restriction: Graduate students only.

**PHRMSCI 265. New Frontiers in Chemical and Synthetic Biology. 4 Units.**

Explores new developments in chemical and synthetic biology that span the areas of chemistry, molecular biology, genetics, bioengineering, systems biology, and computational genomics.

Restriction: Graduate students only.

**PHRMSCI 270. Advanced Pharmacology. 4 Units.**

Provides a mechanism-based overview of pharmacology with strong emphasis on clinical application of pharmacology. Students learn the most recent advances in pharmacology as they relate to drug discovery, development, and clinical application.

Restriction: Graduate students only.

Concurrent with PHRMSCI 170A.

**PHRMSCI 272. Special Topics in Pharmaceutical Sciences. 2-4 Units.**

Reserved for current topics of particular interest in areas of pharmaceutical sciences that are not covered by other courses. The subject will vary from year to year, highlighting, for example, significant emerging fields or highly specialized but vital research areas.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PHRMSCI 275. Drug Discovery Computing Techniques. 4 Units.**

Techniques used in computer-aided drug discovery, including theory behind these techniques and practical applications. Topics include scientific computing; python; classical force fields and simulations; visualization and movie-making; quantum mechanics in drug discovery; molecular dynamics; solvation models; and several others.

Restriction: Graduate students only.

Concurrent with PHRMSCI 175.

**PHRMSCI 277. Medicinal Chemistry. 4 Units.**

Fundamentals of medicinal chemistry covering diverse aspects of drug design, discovery, synthesis, and development. Molecular basis of drug action with an emphasis on the structure-to-function continuum.

**PHRMSCI 278. Stem Cell Therapy . 4 Units.**

Introduces new paradigms in regenerative medicine particularly those that involve stem cells, and emerging molecular, nano- and micro-engineered tools for in vivo imaging that is critical for studying and monitoring regeneration.

Restriction: Graduate students only.

**PHRMSCI 279. Emerging Technologies in Pharmaceutical Sciences and Medicine. 4 Units.**

Introduces emerging, ground-breaking technologies in pharmaceutical sciences and medicine, including pharmacogenomics, genome editing, and stem cell and engineered T cell therapies. Explores these novel technologies with both their underlying theories and forward-thinking applications.

Concurrent with PHRMSCI 179.

**PHRMSCI 298. Research Seminar . 2 Units.**

Presentation and discussion of current problems and methods in teaching and research in pharmaceutical sciences.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHRMSCI 299. Graduate Research. 1-12 Units.**

Supervised original research or investigation under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

**PHRMSCI 399. University Teaching. 1-4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Philosophy (PHILOS)

### Courses

**PHILOS 1. Introduction to Philosophy. 4 Units.**

A selection of philosophical problems, concepts, and methods, e.g., free will, cause and substance, personal identity, the nature of philosophy itself. Materials fee.

(IV)

**PHILOS 2. Puzzles and Paradoxes. 4 Units.**

Introduction to the formal tools needed to comprehend and evaluate philosophical arguments and theoretical reasoning in general.

(IV and VB ).

**PHILOS 3. Technology and Society. 4 Units.**

A study of the nature of technology, its relation to human values, the philosophical assumptions in its development, and the philosophical implications of technology.

(II)

**PHILOS 4. Introduction to Ethics. 4 Units.**

Selected topics from the history of ethics, e.g., the nature of the good life and the moral justification of conduct.

(IV)

**PHILOS 5. Contemporary Moral Problems. 4 Units.**

Selected moral issues of current interest, e.g., abortion, sexual morality, euthanasia, capital punishment, reverse discrimination, civil disobedience, or violence.

(IV)

**PHILOS 7. Introduction to Existentialism. 4 Units.**

An analysis of themes in phenomenology and existentialism and their philosophical origins, e.g., consciousness, self and other, freedom and individuality.

(IV)

**PHILOS 10. History of Ancient Philosophy. 4 Units.**

Examination of the central philosophical themes developed by the pre-Socratics, Socrates, Plato, Aristotle, the Stoics, the Epicureans, and the Skeptics.

(IV)

**PHILOS 11. History of Medieval Philosophy. 4 Units.**

A study of some of the major theological and philosophical texts from the Medieval period.

Prerequisite: Recommended: PHILOS 10.

(IV)

**PHILOS 12. History of Modern Philosophy. 4 Units.**

A study of major developments in western philosophy from Descartes to Kant with readings from Descartes, Leibniz, Locke, Berkeley, Hume, and Kant.

Prerequisite: Recommended: PHILOS 10 or PHILOS 11.

(IV)

**PHILOS 13. History of Contemporary Philosophy. 4 Units.**

A study of recent philosophical developments in Anglo-American and Continental philosophy with readings from such figures as Russell, Moore, Wittgenstein, Quine, Heidegger, and Sartre.

Prerequisite: Recommended: PHILOS 12.

(IV)

**PHILOS 21. Philosophy and Religion. 4 Units.**

Examines the intersection of religion and philosophy from a standpoint that does not presuppose previous academic study of either. Both Western and Eastern traditions and perspectives may be explored.

Repeatability: Unlimited as topics vary.

Same as REL STD 21.

(IV)

**PHILOS 22. Introduction to Law and Society. 4 Units.**

What constitutes a legal system? What does it mean for a society to have a system as a part of the social fabric. Examines the social status of law and its use as a tool for fashioning society.

(III)

**PHILOS 29. Critical Reasoning. 4 Units.**

Introduction to analysis and reasoning. The concepts of argument, premise, and conclusion, validity and invalidity, consistency and inconsistency. Identifying and assessing premises and inferences. Deductive versus inductive reasoning, and introduction to the probability calculus. Evaluating definitions. Informal fallacies.

Same as LPS 29.

(II and Vb ).

**PHILOS 30. Introduction to Symbolic Logic. 4 Units.**

An introduction to the symbolism and methods of the logic of statements, including evaluation of arguments by truth tables, the techniques of natural deduction, and semantic tableaux.

Same as LPS 30, LSCI 43.

(Vb)

**PHILOS 31. Introduction to Inductive Logic. 4 Units.**

Philosophical questions concerning the foundations of scientific inference, e.g., the traditional problem of induction, the Goodman paradox, the concept of cause, Mill's method of inductive reasoning, probability calculus, different interpretations of probability, and their interaction in inductive reasoning.

Same as LPS 31.

(II, Va)

**PHILOS 40. Special Topics in Philosophy. 4 Units.**

Lectures on selected topics at the lower-division level.

Repeatability: Unlimited as topics vary.

**PHILOS 91. The Philosophy of Sex. 4 Units.**

Discusses the origins of biological sex, dynamics of sexual selection, sex differences in humans, and the construction of gender in human societies. Seeks to understand the role social values play in the creation of science.

Same as LPS 91.

Overlaps with LPS H91.

**(III)****PHILOS 100W. Writing Philosophy. 4 Units.**

Discussion of those aspects of writing of special importance in philosophy, e.g., philosophical terminology, techniques for evaluating arguments, philosophical definitions and theories. At least 4,000 words of assigned composition based on philosophical readings.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as LPS 100W.

Restriction: Upper-division students only.

**(Ib)****PHILOS 101. Introduction to Metaphysics. 4 Units.**

A study of one or more of the problems of 'first philosophy,' e.g., substance, free will, causation, abstract entities, identity.

**PHILOS 102. Introduction to the Theory of Knowledge. 4 Units.**

A study of one or more of the basic issues in epistemology, e.g., the role of perception in the acquisition of knowledge, the nature of evidence, the distinction between belief and knowledge, and the nature of truth and certainty.

Same as LPS 102.

**PHILOS 102W. Introduction to the Theory of Knowledge. 4 Units.**

A study of one or more of the basic issues in epistemology, e.g., the role of perception in the acquisition of knowledge, the nature of evidence, the distinction between belief and knowledge, and the nature of truth and certainty.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Overlaps with PHILOS 102, LPS 102.

**(Ib)****PHILOS 103. Introduction to Moral Philosophy. 4 Units.**

A study of one or more of the problems of contemporary moral philosophy, e.g., the nature of justice, liberalism versus conservatism, happiness and its relation to virtue and right conduct, the objectivity of moral standards.

**PHILOS 104. Introduction to Logic. 4 Units.**

Introduction to sentence logic, including truth tables and natural deduction; and to predicate logic, including semantics and natural deduction.

Same as LPS 104, LSCI 142.

**PHILOS 105A. Elementary Set Theory. 4 Units.**

An introduction to the basic working vocabulary of mathematical reasoning. Topics include sets, Boolean operations, ordered n-tuples, relations, functions, ordinal and cardinal numbers.

Same as LPS 105A, LSCI 145A.

**PHILOS 105B. Metalogic. 4 Units.**

Introduction to formal syntax (proof theory) and semantics (model theory) for first-order logic, including the deduction, completeness, compactness, and Löwenheim-Skolem theorems.

Prerequisite: PHILOS 105A

Same as LPS 105B, LSCI 145B.

Overlaps with MATH 150.



**PHILOS 105C. Undecidability and Incompleteness. 4 Units.**

Introduction to the formal theory of effective processes, including recursive functions, Turing machines, Church's thesis, and proofs of Gödel's incompleteness theorem for arithmetic, and Church's undecidability theorem for first-order logic.

Prerequisite: PHILOS 105B

Same as LPS 105C, LSCI 145C.  
Overlaps with MATH 152.

Concurrent with LPS 205C.

**PHILOS 106. Topics in Logic . 4 Units.**

Selected topics in mathematical or philosophical logic.

Prerequisite: PHILOS 105B or LPS 105B

Repeatability: Unlimited as topics vary.

Same as LPS 106.

**PHILOS 108. Topics in Induction, Probability, and Decision Theory. 4 Units.**

Selected topics in induction, probability, and decision theory.

Repeatability: Unlimited as topics vary.

Same as LPS 108.

**PHILOS 110. Topics in Ancient Philosophy. 4 Units.**

Selected topics from the writings of Plato and Aristotle, e.g., Aristotle's criticisms of Plato's metaphysics, ethics, or politics.

Repeatability: May be taken for credit 2 times as topics vary.

**PHILOS 111. Topics in Medieval Philosophy. 4 Units.**

Studies of some of the major issues of concern to Medieval philosophers, e.g., universals, the nature and existence of God, faith, and reason.

Repeatability: May be taken for credit 2 times as topics vary.

**PHILOS 113. Topics in Modern Philosophy. 4 Units.**

Focuses on the works of central philosophical figures of modern Philosophy (e.g., Descartes, Leibniz, Hobbes, Locke, Hume, Kant) or on the treatment of one or more central philosophical problems by a number of these figures.

Repeatability: Unlimited as topics vary.

Same as LPS 113.

**PHILOS 114. Topics in Nineteenth-Century Philosophy. 4 Units.**

Studies of some of the major figures after Kant (e.g., Hegel, Nietzsche, Marx, Kierkegaard), especially in German idealism and social thought.

Repeatability: Unlimited as topics vary.

**PHILOS 115. Topics in History of Analytic Philosophy. 4 Units.**

Review of central theories or figures in the history of analytic philosophy. Emphasis on writings of Frege, Russell, Schlick, Carnap, and Quine. Topics include the nature of meaning and truth, the synthetic/analytic distinction, and scientific knowledge.

Repeatability: Unlimited as topics vary.

Same as LPS 115.

**PHILOS 116. Topics in Continental Philosophy. 4 Units.**

Studies of some of the major figures (e.g., Husserl), movements (e.g., phenomenology, existentialism) in early twentieth-century continental European thought.

Repeatability: Unlimited as topics vary.

**PHILOS 117. Topics in Asian Philosophy. 4 Units.**

Selected topics in the philosophies of Asia, e.g. Jainism, Buddhism, Yoga, Vedanta, Confucianism, Taoism, and Shinto.

Repeatability: Unlimited as topics vary.

**PHILOS 120. Topics in Metaphysics. 4 Units.**

Examines central philosophical questions concerning our own fundamental nature and that of the world around us (e.g., causation and necessity, determination, free will, personal identity, the mind-body problem).

Repeatability: Unlimited as topics vary.

Same as LPS 120.

**PHILOS 121. Topics in the Theory of Knowledge . 4 Units.**

One or more topics in the theory of knowledge, e.g., the nature of rational justification, of perceptual knowledge, of a priori knowledge.

Repeatability: Unlimited as topics vary.

Same as LPS 121.

**PHILOS 121A. Medical Epistemology. 4 Units.**

Analysis of epistemological issues concerning medical research and health care. Topics may include medical evidence, transmission of medical knowledge, medical expertise, the epistemology of medical disagreement, classification of illnesses, well-being, philosophy of pain, and medical decision making.

**PHILOS 122. Topics in Philosophy of Mind. 4 Units.**

Selected topics involving the concept of mind, e.g., the relation between mind and body, the self, personal identity, consciousness, the unconscious.

Repeatability: Unlimited as topics vary.

**PHILOS 123. Topics in Philosophy of Religion. 4 Units.**

Critical examination of concepts involved in the theological literature, e.g., the nature and existence of God, miracles, the problem of evil, divine command theories in ethics.

Repeatability: Unlimited as topics vary.

**PHILOS 130. Topics in Moral Philosophy. 4 Units.**

Selected topics in ethics.

Repeatability: Unlimited as topics vary.

**PHILOS 131A. Applied Ethics. 4 Units.**

Topics may include capital punishment, world hunger, obligations to future generations, environmental ethics, animal rights, economic justice, sexual morality, affirmative action, racism and sexism, or legalization of drugs.

**PHILOS 131C. Medical Ethics. 4 Units.**

Analysis of moral issues concerning health care. Topics may include just allocation of scarce medical resources, the doctor/patient relationship, genetic engineering, surrogate motherhood, abortion, euthanasia, or social policy concerning AIDS.

**PHILOS 132. Topics in Political and Social Philosophy. 4 Units.**

Selected topics in social and political philosophy, e.g., the functions of government, the justification of political authority, the nature of democracy, the varieties of liberty, and social justice. Readings from classical and contemporary sources.

Repeatability: Unlimited as topics vary.

**PHILOS 133. Topics in Philosophy of Law. 4 Units.**

Selected topics concerning legal systems and the concept of law, e.g., the nature and purpose of law, the nature of authority, the relationship between law and morality, law and political-economic systems.

Repeatability: Unlimited as topics vary.

**PHILOS 140. Topics in Philosophy of Science. 4 Units.**

Selected topics in contemporary philosophy of science, e.g., the status of theoretical entities, the confirmation of theories, the nature of scientific explanation.

Repeatability: Unlimited as topics vary.

Same as LPS 140.

**PHILOS 141A. Topics in Philosophy of Physics. 4 Units.**

Selected topics in the philosophy of physics, e.g., the interpretation of quantum mechanics, the nature of spacetime, the problem of quantum field theories.

Repeatability: Unlimited as topics vary.

Same as LPS 141A.

**PHILOS 141B. Geometry and Spacetime. 4 Units.**

An examination of the foundations of the special theory of relativity, with emphasis on the geometry of Minkowski spacetime, and its relation to both Euclidean and non-Euclidean (hyperbolic) plane geometries.

Prerequisite: MATH 2D and (MATH 3A or MATH 6G)

Same as LPS 141B.

**PHILOS 141C. Philosophy of Quantum Mechanics. 4 Units.**

An examination of the standard von Neumann-Dirac formulation of quantum mechanics. The quantum measurement problem is discussed along with several proposed solutions, including GRW, many-worlds, man-minds, and Bohm's theory.

Same as LPS 141C.

**PHILOS 141D. Probability and Determinism. 4 Units.**

An examination of a cluster of interrelated issues concerning probability, determinism, logic, and the foundations of quantum mechanics.

Prerequisite: MATH 2D and (MATH 3A or MATH 6G)

Same as LPS 141D.

**PHILOS 142W. Writing/Philosophy of Biology. 4 Units.**

Philosophy of biology, e.g., scientific method in biology, the structure of evolutionary theory, teleology, ethics, and evolution. Course work includes one 4,000-word and four 1,000-word papers.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as LPS 142W, BIO SCI E142W.

Restriction: Juniors only.

(Ib)

**PHILOS 143. Topics in Philosophy of Psychology. 4 Units.**

Selected topics in the philosophy of psychology, e.g., the nature of psychological explanation, reductionism, issues in cognitive, behavioral, and neuroscience.

Repeatability: Unlimited as topics vary.

Same as LPS 143, PSYCH 123P.

Restriction: Psychology Majors have first consideration for enrollment. Philosophy Majors have first consideration for enrollment.

**PHILOS 144. Topics in Philosophy of Social Science. 4 Units.**

Selected topics in the philosophy of the social sciences, e.g., Is their goal to understand behavior or to predict and control it?; Are they normative and the natural sciences not?; Do they incorporate philosophical doctrines about language and mind?.

Repeatability: May be taken for credit for 4 units as topics vary.

Same as LPS 144.

**PHILOS 145. Topics in Philosophy of Language. 4 Units.**

Selected topics in the philosophy of language, e.g., the nature of meaning, mechanisms of reference, speech acts.

Repeatability: Unlimited as topics vary.

Same as LPS 145, LSCI 141.

**PHILOS 146. Topics in Philosophy of Logic. 4 Units.**

Selected topics in the philosophy of logic, e.g., the nature of logical truth and our knowledge of it, the status of propositions, definite descriptions, and existential presuppositions.

Repeatability: Unlimited as topics vary.

Same as LPS 146.

**PHILOS 147. Topics in Philosophy of Mathematics. 4 Units.**

Selected historical and contemporary topics in the philosophy of mathematics, e.g., mathematical truth and ontology, mathematical knowledge, the nature and role of proof, the workings of mathematics in application.

Repeatability: Unlimited as topics vary.

Same as LPS 147.

**PHILOS 150. Phenomenology . 4 Units.**

A study of the foundations of phenomenology in Husserl and its background in Bolzano, Frege, Brentano, Meinong, Kant, and Descartes.

**PHILOS 151. Existentialism. 4 Units.**

A study of such central existentialist thinkers as Heidegger and Sartre.

Prerequisite: Recommended: PHILOS 7 or PHILOS 150.

**PHILOS 162. Social Ontology. 4 Units.**

Examines how things in one's social environment exist. Such things are compared and contrasted to others in what might be regarded as the given, natural environment. Topics discussed include natural kinds; artifacts; essentialism; constructivism; intentionality; agency.

**PHILOS 163. Social Epistemology. 4 Units.**

Social epistemology is specifically concerned with questions concerning knowledge and justification that arise in a social context. Topics discussed include testimony, experts, disagreement, group knowledge, feminist epistemology, legal epistemology, and epistemology of education.

**PHILOS 164. Well-Being. 4 Units.**

Examines what it is that makes a life good (or bad) for the person who lives it. Topics include hedonism, desire-satisfaction theories of well-being (as well as other such theories), the notion of harm, the possibility of posthumous harm.

**PHILOS 165. Philosophy of Action. 4 Units.**

Philosophy of action is specifically concerned with questions concerning the nature of acting, and related phenomena such as intending, willing, trying, and trusting. It deals both with individual and group action and their moral and epistemological underpinnings.

**PHILOS 190. Special Topics in Philosophy. 4 Units.**

Lectures on selected topics to be given by regular faculty and visiting faculty.

Repeatability: Unlimited as topics vary.

**PHILOS 199. Directed Special Studies. 2-4 Units.**

Independent study on a research topic supervised by a faculty member.

Repeatability: May be repeated for credit unlimited times.

**PHILOS 199H. Honors Directed Special Studies. 2 Units.**

Independent study on a research topic supervised by a faculty member, with the objective of preparing the Department of Philosophy honors paper.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**PHILOS 200. Special Topics in Philosophy. 4 Units.**

Seminars on selected topics to be given by regular faculty and visiting faculty.

Repeatability: Unlimited as topics vary.

**PHILOS 201. First-Year Seminar. 4 Units.**

An examination of some standard works in the history of philosophy, value theory, metaphysics, or epistemology; required of all first-year Philosophy graduate students in the School of Humanities.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only. Philosophy Majors only. Logic and Philosophy of Sci Majors only.

**PHILOS 205A. Set Theory. 4 Units.**

The basic working vocabulary of mathematical reasoning. Topics include: sets, Boolean operations, ordered n-tuples, relations, functions, ordinal and cardinal numbers.

Same as LPS 205A.

**PHILOS 205B. Metalogic. 4 Units.**

Formal syntax (proof theory) and semantics (model theory) for first-order logic, including the deduction, completeness, compactness, and Loewenheim-Skolem theorems.

Prerequisite: PHILOS 205A or LPS 205A

Same as LPS 205B.

**PHILOS 205C. Undecidability and Incompleteness. 4 Units.**

Formal theory of effective processes, including recursive function, Turing machines, Church's thesis, proofs of Goedel's incompleteness theorem for arithmetics, and Church's undecidability for first-order logic.

Prerequisite: PHILOS 205B or LPS 205B

Same as LPS 205C.

Restriction: Graduate students only.

Concurrent with LPS 105C.

**PHILOS 206. Topics in Logic . 4 Units.**

Studies in selected areas of logic. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 206.

**PHILOS 210. Topics in Ancient Philosophy. 4 Units.**

Studies in selected areas of ancient philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 211. Topics in Medieval Philosophy. 4 Units.**

Studies in selected areas of medieval philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 212. Topics in Renaissance Philosophy. 4 Units.**

Studies in selected areas of renaissance philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 213. Topics in Modern Philosophy. 4 Units.**

Studies in selected areas of modern philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 213.

**PHILOS 214. Topics in Nineteenth-Century Philosophy. 4 Units.**

Studies in selected areas of nineteenth-century philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 215. Topics in Analytic Philosophy. 4 Units.**

Studies in selected areas of analytic philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 215.

**PHILOS 216. Topics in Continental Philosophy. 4 Units.**

Studies in selected areas of continental philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 218. Topics in Contemporary Philosophy. 4 Units.**

Studies in selected areas of contemporary philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 220. Topics in Metaphysics. 4 Units.**

Studies in selected areas of metaphysics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 220.

**PHILOS 221. Topics in Epistemology. 4 Units.**

Studies in selected areas of epistemology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 221.

**PHILOS 221A. Medical Epistemology. 4 Units.**

Analysis of epistemological issues concerning medical research and healthcare. Topics may include medical evidence, transmission of medical knowledge in the doctor-patient interaction, medical expertise, epistemology of medical disagreement, classification of illness, well-being, philosophy of pain, or medical decision making.

Same as LPS 221A.

Restriction: Graduate students only.

**PHILOS 222. Topics in Mind and Action. 4 Units.**

Studies in selected areas of mind and action. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 230. Topics in Ethics . 4 Units.**

Studies in selected areas of ethics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 232. Topics in Political and Social Philosophy. 4 Units.**

Studies in selected areas of political and social philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 232.

**PHILOS 234. Topics in Aesthetics . 4 Units.**

Studies in selected areas of aesthetics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 240. Topics in Philosophy of Science. 4 Units.**

Studies in selected areas of philosophy of science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 240.

**PHILOS 241. Topics in Philosophy of Physics. 4 Units.**

Studies in selected areas of philosophy of physics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 241.

**PHILOS 242. Topics in Philosophy of Biology. 4 Units.**

Studies in selected areas of philosophy of biology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 242.

**PHILOS 243. Topics in Philosophy of Psychology. 4 Units.**

Selected topics in the philosophy of psychology, e.g., the nature of psychological explanation, reductionism, issues in cognitive, behavioral, and neuroscience.

Repeatability: Unlimited as topics vary.

Same as LPS 243, PSYCH 231P.

**PHILOS 244. Topics in Philosophy of Social Science. 4 Units.**

Studies in selected areas of philosophy and social science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 244.

**PHILOS 245. Topics in Philosophy of Language. 4 Units.**

Studies in selected areas of philosophy of language. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 245.

**PHILOS 246. Topics in Philosophy of Logic. 4 Units.**

Studies in selected areas of philosophy of logic. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 246.

**PHILOS 247. Topics in Philosophy of Mathematics. 4 Units.**

Studies in selected areas of philosophy of mathematics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 247.

**PHILOS 250. Topics in Existentialism and Phenomenology. 4 Units.**

Studies in selected areas of existentialism and phenomenology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 298. Independent Study. 4-12 Units.**

Independent research with Philosophy faculty.

Repeatability: May be repeated for credit unlimited times.

**PHILOS 299. Directed Research. 4-12 Units.**

Directed research with Philosophy faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHILOS 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Physical Science (PHY SCI)

### Courses

**PHY SCI 5. California Teach 1: Introduction to Science and Mathematics Teaching. 3 Units.**

First in a series for students interested in becoming middle or high school teachers of mathematics or science. Students gain an understanding of effective, research-based teaching strategies. Includes supervised field experience in a K-12 classroom.

Same as BIO SCI 14.

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment. School of Engineering students have first consideration for enrollment.

**PHY SCI 80. Skills Development. 1.5 Workload Unit.**

Undergraduates identify, cultivate, and practice relevant soft skills applicable to careers in mathematics and science. The focus is on career readiness, how to market oneself to future employers, and what to expect from the professional world.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Grading Option: Workload Credit Letter Grade with P/NP.

Restriction: School of Physical Sciences students have first consideration for enrollment.

**PHY SCI 105. California Teach 2: Middle School Science and Mathematics Teaching. 3 Units.**

Second in a series for students interested in becoming middle or high school teachers of mathematics or science. Students gain an understanding of effective, research-based teaching strategies for grades 6-8. Includes supervised field experience in a middle school classroom.

Prerequisite: PHY SCI 5

Same as BIO SCI 101.

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment. School of Engineering students have first consideration for enrollment.

**PHY SCI 139W. Technical Writing and Communication Skills. 4 Units.**

Workshop in writing technical reports, journal articles, proposals. Oral presentations. Communicating with the public. May not be used in satisfaction of any School or departmental requirement.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. School of Physical Sciences students have first consideration for enrollment.

**(Ib)****PHY SCI 220. Science Communication Skills. 2 Units.**

Development of effective communication skills, oral and written presentations. Topics range from the art of creating keynote slides to strategically crafting a personal story, culminating in a live presentation to an invited audience.



# Physics (PHYSICS)

## Courses

### **PHYSICS 2. Introduction to Mathematical Methods for Physics. 4 Units.**

Provides the applied mathematics and problem solving/presentation skills necessary for success in an introductory physics sequence. Focuses on practical exercises in problem solving. Covers kinematics in one and two dimensions in detail. Additional topics include vectors, differentiation, and integration.

Prerequisite or corequisite: MATH 2A or MATH 5A or AP Calculus AB or AP Calculus BC. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 3

Restriction: PHYSICS 2 may not be taken for credit if taken after PHYSICS 7C.

### **PHYSICS 3A. Basic Physics I. 4 Units.**

Vectors; motion, force, and energy.

Corequisite: MATH 2A or MATH 5A, or a score of 4 or higher on the AP Calculus AB exam, or a score of 3 or higher on the AP Calculus BC exam.

Restriction: PHYSICS 3A may not be taken for credit if taken after PHYSICS 7C.

(II and VA ).

### **PHYSICS 3B. Basic Physics II. 4 Units.**

Fluids; heat; electricity and magnetism.

Prerequisite: PHYSICS 3A or AP Physics C: Mechanics. AP Physics C: Mechanics with a minimum score of 5

(II and VA ).

### **PHYSICS 3C. Basic Physics III. 4 Units.**

Waves and sound; optics; quantum ideas; atomic and nuclear physics; relativity.

Corequisite: MATH 2B or MATH 5B, or a score of 4 or higher on the AP Calculus BC exam.

Prerequisite: PHYSICS 3A or AP Physics C: Mechanics. AP Physics C: Mechanics with a minimum score of 5

(II and Va ).

### **PHYSICS 3LB. Basic Physics Laboratory. 1.5 Unit.**

Practical applications of electronics and classical physics to biology. Goals include skill to use oscilloscope and other basic instrumentation. Materials fee.

### **PHYSICS 3LC. Basic Physics Laboratory. 1.5 Unit.**

Practical applications of physics to medical imaging. Topics include optics, radioactivity, and acoustics. Materials fee.

### **PHYSICS 7C. Classical Physics. 4 Units.**

Topics include force, energy, momentum, rotation, and gravity.

Corequisite: MATH 2B or AP CALCULUS BC, min score = 4.

Prerequisite: PHYSICS 2 or (MATH 2D and (CHEM 1C or CHEM H2C or CHEM M3C) or CHEM M2C) or AP Physics C: Mechanics or AP Physics C: Electricity and Magnetism or SAT Mathematics or ACT Mathematics. PHYSICS 2 with a grade of C or better. AP Physics C: Mechanics with a minimum score of 4. AP Physics C: Electricity and Magnetism with a minimum score of 4. SAT Mathematics with a minimum score of 650. ACT Mathematics with a minimum score of 27. Recommended: One year of high school physics or equivalent physics background.

Restriction: Physics Majors have first consideration for enrollment.

(II and VA ).

### **PHYSICS 7D. Classical Physics. 4 Units.**

Electricity and magnetism.

Corequisite: PHYSICS 7LD and MATH 2D

Prerequisite: PHYSICS 7C and (MATH 2B or AP Calculus BC). AP Calculus BC with a minimum score of 4

Restriction: Physics Majors have first consideration for enrollment.

(II and Va ).

**PHYSICS 7E. Classical Physics. 4 Units.**

Fluids; oscillations; waves; and optics.

Prerequisite: PHYSICS 7C and MATH 2B

Restriction: Physics Majors have first consideration for enrollment.

(II and VA ).

**PHYSICS 7LC. Classical Physics Laboratory. 1 Unit.**

Experiments related to lecture topics in Physics 7C. Materials fee.

Corequisite: PHYSICS 7C

Restriction: Physics Majors have first consideration for enrollment.

**PHYSICS 7LD. Classical Physics Laboratory. 1 Unit.**

Electricity and magnetism.

Corequisite: PHYSICS 7D

Restriction: Physics Majors have first consideration for enrollment.

**PHYSICS 12. Science Fiction and Science Fact. 4 Units.**

An introduction to fundamental physics principles, the scientific process, and the mathematical language of science, used to analyze topics drawn from superheroes, science fiction works, and current science news to distinguish science fiction and science fact.

Overlaps with PHYSICS 21.

(II and VA ).

**PHYSICS 14. Energy and the Environment. 4 Units.**

The physics of society's energy production and consumption, and of their influences on the environment. Topics include fossil and renewable energy resources; nuclear power; prospects for a hydrogen economy; efficient and environmentally benign transportation; efficient home and commercial energy usage.

(II, Va)

**PHYSICS 15. Physics of Music. 4 Units.**

Introduces basic physical principles underlying generation and properties of music, including basic properties of sound waves, musical scales and temperament, musical instruments, and acoustics of music halls. No mathematics background required, but high school algebra is recommended.

(II)

**PHYSICS 17. Physics of Athletics. 4 Units.**

Introduces basic physical principles behind motion. Examples are drawn from a range of athletic endeavors (such as ice skating, baseball, diving, and dance). No mathematics background required, but high school algebra is recommended.

(II)

**PHYSICS 18. How Things Work. 4 Units.**

Survey of the physical basis of modern technology, with an emphasis on electronics and materials. Topics include power generation and distribution, communication (radio, TV, telephone, computers, tape recorders, CD players), imaging (optics, x-rays, MRI), and modern materials (alloys, semiconductors, superconductors).

(II)

**PHYSICS 19. Great Ideas of Physics. 4 Units.**

Introduces non-science majors to physics, examining important breakthroughs and controversies. Potential topics: Einstein's Relativity; Heisenberg's Uncertainty Principle; black holes; extra-dimensions; antimatter. Case studies illustrate the essential nature of scientific review and independent confirmation of results. No mathematics background required.

(II)

**PHYSICS 20A. Introduction to Astronomy. 4 Units.**

History of astronomy. Underlying physics. Objects in the solar system and how they are studied. Properties of stars: their formation, structure, and evolution. Pulsars and black holes. Galaxies and quasars.

(II and VA ).

**PHYSICS 20B. Cosmology: Humanity's Place in the Universe. 4 Units.**

An overview of the origin, evolution, and ultimate fate of the Universe. Galaxies and dark matter. The Big Bang and dark energy. Ancient world models.

(II and VA ).

**PHYSICS 20D. Space Science. 4 Units.**

Space exploration. Human missions to the moon, Mars, and beyond. Space stations, observatories, and deep-space probes. Robots and drones on distant worlds. Propulsion mechanisms, rockets, space flight, and the dangers of solar radiation.

(II and VA ).

**PHYSICS 20E. Life in the Universe. 4 Units.**

An overview of the scientific quest to discover life elsewhere in the universe. Topics include the origin of life on Earth, Mars, extra-solar planets, interstellar travel, and extra-terrestrial intelligence.

(II, Va)

**PHYSICS 21. Special Topics in Physics. 4 Units.**

Topics addressed vary each quarter. Past topics have included physics and music, Newton, planetary science. Lectures on areas of special interest in physics used to introduce students to scientific method, fundamental laws of science, qualitative and quantitative analysis of data.

Repeatability: Unlimited as topics vary.

Overlaps with PHYSICS 12, PHYSICS XI12.

(II)

**PHYSICS 50. Introductory Mathematical Physics. 4 Units.**

Introduction to math methods for upper-division physics. Taylor and Fourier series; complex algebra; ordinary differential equations; matrices, tensors and vector spaces; eigensystems; orthogonal coordinates; vector calculus and fields. Symbolic computation with Mathematica is incorporated throughout.

Corequisite: MATH 2E

Prerequisite: MATH 3A

Overlaps with PHYSICS 100.

Restriction: Physics Majors have first consideration for enrollment.

**PHYSICS 51A. Modern Physics. 4 Units.**

Wave-particle duality; quantum mechanics; special relativity; statistical mechanics.

Prerequisite: (PHYSICS 7E or PHYSICS 3C) and MATH 2D

Overlaps with PHYSICS 61A.

Restriction: No Physics Majors.

**PHYSICS 52A. Fundamentals of Experimental Physics. 2 Units.**

Optics: lenses, mirrors, polarization, lasers, optical fibers, interference, spectra. Materials fee.

Corequisite: PHYSICS 7E or PHYSICS 3C.

Restriction: Physics Majors have first consideration for enrollment.

**PHYSICS 52B. Fundamentals of Experimental Physics. 2 Units.**

Circuits: oscilloscope, meters, DC and AC circuits. Materials fee.

Prerequisite: PHYSICS 7D or PHYSICS 3B

Restriction: Physics Majors have first consideration for enrollment.

**PHYSICS 52C. Fundamentals of Experimental Physics. 2 Units.**

Data analysis: random and systematic errors, curve fitting; nuclear counting; quantum experiments. Error analysis: random and systematic errors, curve fitting, nuclear counting, and quantum experiments. Materials fee.

Prerequisite: PHYSICS 51A or PHYSICS 61A

Restriction: Physics Majors have first consideration for enrollment.

**PHYSICS 53. Introduction to Programming and Numerical Analysis. 4 Units.**

Introduction to structured programming; in-depth training in python. Elementary numerical methods applied to physics problems.

Prerequisite: MATH 3A and MATH 3D

Restriction: Physics Majors have first consideration for enrollment.

**PHYSICS 60. Thermal Physics. 4 Units.**

Introduction to thermodynamics and systems of many particles. Topics include first and second laws of thermodynamics, ideal gas laws, kinetic theory, heat engines and refrigerators, thermodynamic potentials, phase transitions, dilute solutions, chemical equilibrium, and basic statistical distributions.

Prerequisite: (PHYSICS 7E or PHYSICS 3C) and MATH 2D

Restriction: Physics Majors only.

**PHYSICS 61A. Modern Physics for Majors. 4 Units.**

Wave-particle duality; Schrödinger equation; angular momentum.

Prerequisite: (PHYSICS 7E or PHYSICS 3C) and MATH 2D

Overlaps with PHYSICS 51A.

Restriction: Physics Majors only.

**PHYSICS 61B. Modern Physics for Majors. 4 Units.**

Atomic transitions; molecules; solids; nuclei; elementary particles; cosmological models.

Prerequisite: PHYSICS 61A or PHYSICS 51A

Overlaps with PHYSICS 51B.

Restriction: Physics Majors only.

**PHYSICS 61C. Introduction to Astrophysics. 4 Units.**

Introduction to fundamental topics in astrophysics, including stellar structure and evolution; stellar remnants; detection and characterization of exoplanets; physics of interstellar gas and star-forming regions.

Prerequisite: PHYSICS 61A or PHYSICS 51A

**PHYSICS H80. Impact of World War I on Science. 4 Units.**

Introduction to science in 1914 and WWI. Participants in groups of two or three will pick a preferred science; find out what happened to it during and after the war; write reports and present what they learned.

Restriction: Campuswide Honors Collegium students only.

(II)

**PHYSICS H90. The Idiom and Practice of Science. 4 Units.**

A series of fundamental and applied scientific problems of social relevance. Possible topics include Newton's Law, calculus, earthquake physics, and radiation.

Restriction: Campuswide Honors Collegium students only.

(II, Va)

**PHYSICS 99. Current Topics in Physics. 2 Units.**

Designed to introduce undergraduate students to current topics in physics. Focus is discussion of selected readings on current research issues.

Repeatability: Unlimited as topics vary.

**PHYSICS 100. Computational Methods. 4 Units.**

Mathematical and numerical analysis using Mathematica and C programming, as applied to problems in physical science.

Overlaps with PHYSICS 50.

Concurrent with PHYSICS 229A.

**PHYSICS 106W. Advanced Data Acquisition, Analysis, and Scientific Writing. 4 Units.**

Introduces modern practical laboratory techniques for developing data interface devices, acquiring and analyzing data, and writing up results in manuscript format. Experiments include interfacing with instruments through software and hardware development, PID controller, Fourier analysis, and lock-in amplifier.

Prerequisite: PHYSICS 52B and PHYSICS 194

Concurrent with PHYSICS 206 and CHEM 206.

**(Ib)****PHYSICS 111A. Classical Mechanics. 4 Units.**

One-dimensional motion and oscillations; three-dimensional motion, non-inertial coordinates, conservation laws, and Lagrangian and Hamiltonian dynamics; rigid body motion and relativity.

Corequisite: PHYSICS 50

Prerequisite: (PHYSICS 7E or PHYSICS 3C)

**PHYSICS 111B. Classical Mechanics. 4 Units.**

One-dimensional motion and oscillations; three-dimensional motion, non-inertial coordinates, conservation laws, and Lagrangian and Hamiltonian dynamics; rigid body motion and relativity.

Prerequisite: PHYSICS 111A

**PHYSICS 112A. Electromagnetic Theory. 4 Units.**

Electric, magnetic, and gravitational fields and potentials; electrodynamics; mechanical and electromagnetic waves and radiation.

Prerequisite: (PHYSICS 7D or PHYSICS 3B) and PHYSICS 50

**PHYSICS 112B. Electromagnetic Theory. 4 Units.**

Electric, magnetic, and gravitational fields and potentials; electrodynamics; mechanical and electromagnetic waves and radiation.

Prerequisite: PHYSICS 7E and PHYSICS 112A

**PHYSICS 113A. Quantum Physics. 4 Units.**

Inadequacy of classical physics; time independent and time dependent Schrodinger equation; systems in one, two, and three dimensions; matrices; Hermitian operators; symmetries; angular momentum; perturbation theory; scattering theory; applications to atomic structure; emphasis on phenomenology.

Prerequisite: (PHYSICS 51A or PHYSICS 61A) and PHYSICS 50

**PHYSICS 113B. Quantum Physics. 4 Units.**

Inadequacy of classical physics; time independent and time dependent Schrodinger equation; systems in one, two, and three dimensions; matrices; Hermitian operators; symmetries; angular momentum; perturbation theory; scattering theory; applications to atomic structure; emphasis on phenomenology.

Prerequisite: PHYSICS 111B and PHYSICS 112B and PHYSICS 113A

**PHYSICS 113C. Quantum Physics. 4 Units.**

Inadequacy of classical physics; time independent and time dependent Schrodinger equation; systems in one, two, and three dimensions; matrices; Hermitian operators; symmetries; angular momentum; perturbation theory; scattering theory; applications to atomic structure; emphasis on phenomenology.

Prerequisite: PHYSICS 111B and PHYSICS 112B and PHYSICS 113B

**PHYSICS 115A. Statistical Physics. 4 Units.**

Microscopic theory of temperature, heat, and entropy; kinetic theory; multicomponent systems; quantum statistics.

Prerequisite: PHYSICS 50 and (PHYSICS 60 or CHEM 1C or ENGRMAE 91)

**PHYSICS 116. Relativity and Black Holes. 4 Units.**

Introduces students to both special and general relativity; includes the formalism of four-vectors, equivalence principle, curved space-time, and modern issues with black holes.

Prerequisite: PHYSICS 50 and PHYSICS 111A

**PHYSICS 120. Electronics for Scientists. 4 Units.**

Applications of modern semiconductor devices to physical instrumentation. Characteristics of semiconductor devices, integrated circuits, analog and digital circuits. Materials fee.

Prerequisite: PHYSICS 52B

Concurrent with PHYSICS 220.

**PHYSICS 121W. Advanced Laboratory. 4 Units.**

Experiments in atomic, condensed matter, nuclear, particle, and plasma physics. Introduction to instrumentation and a first experience in the research laboratory.

Prerequisite: (PHYSICS 51B or PHYSICS 61B or PHYSICS 61C) and (PHYSICS 52C or PHYSICS 193) and (PHYSICS 194 or EDUC 143BW)

Repeatability: May be taken for credit 3 times.

Restriction: Physics Majors only.

(Ib)

**PHYSICS 125A. Mathematical Physics. 4 Units.**

Complex variables; Legendre and Bessel functions; complete sets of orthogonal functions; partial differential equations; integral equations; calculus of variations; coordinate transformations; special functions and series.

Prerequisite: PHYSICS 50 and MATH 3D

**PHYSICS 125B. Mathematical Physics. 4 Units.**

Complex variables; Legendre and Bessel functions; complete sets of orthogonal functions; partial differential equations; integral equations; calculus of variations; coordinate transformations; special functions and series.

Prerequisite: PHYSICS 125A and PHYSICS 113A

**PHYSICS 133. Introduction to Condensed Matter Physics. 4 Units.**

Phenomena of solids and their interpretation in terms of quantum theory.

Prerequisite: PHYSICS 113B and PHYSICS 115A

**PHYSICS 134A. Physical and Geometrical Optics. 4 Units.**

Focuses on the practical aspects of optics and optical engineering, starting at the fundamentals. Topics include geometrical optics, ray tracing, polarization optics, interferometers, and diffractive optics.

Corequisite: PHYSICS 112B

Prerequisite: PHYSICS 112A

Concurrent with CBEMS 242A and CHEM 242A.

**PHYSICS 135. Plasma Physics. 4 Units.**

Basic concepts, orbits, kinetic and fluid equations, Coulomb collisions, fluctuations, scattering, radiation.

Prerequisite: PHYSICS 112B

Concurrent with PHYSICS 239A.

**PHYSICS 136. Introduction to Particle Physics. 4 Units.**

Experimental techniques and theoretical concepts of high-energy phenomena: accelerators and detectors; classification of particles and interactions; particle properties; symmetries and mass multiplets; production and decay mechanisms.

Prerequisite: PHYSICS 113B

**PHYSICS 137. Introduction to Cosmology. 4 Units.**

Solution of the differential equations governing the expansion of the Universe. Observational determinations of the parameters governing the expansion. Big Bang inflation, primordial nucleosynthesis, and cosmic microwave background. Dark matter, dark energy, and large-scale structure of the Universe.

Prerequisite or corequisite: PHYSICS 111A

**PHYSICS 138. Astrophysics of Galaxies. 4 Units.**

Introduction to the solar neighborhood, Milky Way, and other galaxies. Interstellar medium. Star formation. Stellar populations. Evolution of spiral, elliptical, and irregular galaxies. Supermassive black holes, quasars, and active galaxies. Galaxies as probes of the expansion rate of the Universe.

Prerequisite: PHYSICS 111A and PHYSICS 61C

**PHYSICS 139. Observational Astrophysics. 4 Units.**

Telescopes and astronomical observations, imaging with CCD detectors and image processing techniques. Photometry and spectroscopy of stars, galaxies, and quasars. Advanced imaging techniques such as deconvolution, adaptive optics, and interferometry.

Corequisite: PHYSICS 194

Prerequisite: PHYSICS 52A and PHYSICS 52B and PHYSICS 52C and PHYSICS 53

**PHYSICS 144. Stellar Astrophysics. 4 Units.**

Stars: their structure and evolution; physical state of the interior; the Hertzsprung- Russell diagram, stellar classification, and physical principles responsible for the classification; star formation; nuclear burning; giant and dwarf stars; neutron stars and black holes.

Prerequisite: (PHYSICS 51A or PHYSICS 61A) and PHYSICS 111A and PHYSICS 112A

**PHYSICS 145. High-Energy Astrophysics. 4 Units.**

Production of radiation by high-energy particles, white dwarfs, neutron stars, and black holes. Evolution of galactic nuclei, radio galaxies, quasars, and pulsars. Cosmic rays and the cosmic background radiation.

Prerequisite: (PHYSICS 51A or PHYSICS 61A) and PHYSICS 111A and PHYSICS 112A

**PHYSICS 146A. Biophysics of Molecules and Molecular Machines. 4 Units.**

Physical concepts and experimental and computational techniques used to study the structure and function of biological molecules and molecular machines with examples from enzyme action, protein folding, molecular motors, photobiology, chemotaxis, and vision.

Prerequisite: PHYSICS 115A

Concurrent with PHYSICS 230A.

**PHYSICS 146B. Biophysics of Molecules and Molecular Machines. 4 Units.**

Physical concepts and experimental and computational techniques used to study the structure and function of biological molecules and molecular machines with examples from enzyme action, protein folding, molecular motors, photobiology, chemotaxis, and vision.

Prerequisite: PHYSICS 115A

Concurrent with PHYSICS 230B.

**PHYSICS 147B. Techniques in Medical Imaging I: X-ray, Nuclear, and NMR Imaging. 4 Units.**

Ionizing radiation, planar and tomographic radiographic and nuclear imaging, magnetism, NMR, MRI imaging.

Prerequisite: PHYSICS 147A

Concurrent with PHYSICS 233B and EECS 202B.

**PHYSICS 147C. Techniques in Medical Imaging II: Ultrasound, Electrophysiological, Optical. 4 Units.**

Sound and ultrasound, ultrasonic imaging, physiological electromagnetism, EEG, MEG, ECG, MCG, optical properties of tissues, fluorescence and bioluminescence, MR impedance imaging, MR spectroscopy, electron spin resonance and ESR imaging.

Prerequisite: PHYSICS 147B

Concurrent with PHYSICS 233C and EECS 202C.

**PHYSICS 150. Special Topics in Physics and Astronomy. 4 Units.**

Current topics in physics. Includes topics from nano-science, biological sciences, astrophysics, and the common use of estimation across subdisciplines within physics.

Repeatability: Unlimited as topics vary.

**PHYSICS 191. Field Experience in Physics Education. 1-4 Units.**

Students develop and perform physics assemblies at neighboring public schools.

Prerequisite: PHYSICS 7C and PHYSICS 7D and PHYSICS 7E

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 8 units.

**PHYSICS 192. Tutoring in Physics. 1-2 Units.**

Formalizes the already existing free tutoring for the lower-division physics courses that is provided by the Society of Physics Students (SPS). Includes instructions on tutoring techniques.

Prerequisite: PHYSICS 7E

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 12 units.

Restriction: Society of Physics Students (SPS) tutoring program students only.

**PHYSICS 193. Research Methods. 4 Units.**

Explores tools of inquiry for developing and implementing science research projects. Students undertake independent projects requiring data collection, analysis, and modeling, and the organization and presentation of results. Additional topics include ethical issues and role of scientific literature.

Prerequisite: BIO SCI 14 or PHY SCI 5

Same as BIO SCI 108, CHEM 193.

**PHYSICS 194. Research Communication for Physics Majors. 2 Units.**

Students learn the fundamentals of communicating about research. Topics include preparing abstracts, proposals, and literature reviews. Provides preparation for presentation of independent research projects in PHYSICS 121 and PHYSICS 196.

Prerequisite: PHYSICS 61A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Physics Majors only.

**PHYSICS 195. Undergraduate Research. 4 Units.**

Independent research under the guidance of a Physics faculty member.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Juniors only. Physics Majors only.

**PHYSICS 196A. Thesis in Physics I. 2 Units.**

Independent research for seniors conducted under the guidance of a faculty member. Students' research results are discussed in oral presentations, and a written proposal, progress report, and thesis are submitted.

Corequisite: PHYSICS 194

Overlaps with PHYSICS H196A.

Restriction: Physics Majors only.

**PHYSICS 196B. Thesis in Physics II. 4 Units.**

Independent research for seniors conducted under the guidance of a faculty member. Students' research results are discussed in oral presentations, and a written proposal, progress report, and thesis are submitted.

Prerequisite: PHYSICS 196A

Overlaps with PHYSICS H196B.

Restriction: Physics Majors only.



**PHYSICS 196C. Thesis in Physics III. 4 Units.**

Independent research for seniors conducted under the guidance of a faculty member. Students' research results are discussed in oral presentations, and a written proposal, progress report, and thesis are submitted.

Prerequisite: PHYSICS 196B

Overlaps with PHYSICS H196C.

Restriction: Physics Majors only.

**PHYSICS H196A. Honors Thesis in Physics I. 2 Units.**

Independent research for seniors conducted under the guidance of a faculty member. Students' research results are discussed in oral presentations, and a written proposal, progress report, and thesis are submitted.

Corequisite: PHYSICS 194

Overlaps with PHYSICS 196A.

Restriction: Physics Majors only. Campuswide Honors Collegium students only. Honors Program in Physics students only.

**PHYSICS H196B. Honors Thesis in Physics II. 4 Units.**

Independent research for seniors conducted under the guidance of a faculty member. Students' research results are discussed in oral presentations, and a written proposal, progress report, and thesis are submitted.

Prerequisite: PHYSICS H196A

Overlaps with PHYSICS 196B.

Restriction: Physics Majors only. Campuswide Honors Collegium students only. Honors Program in Physics students only.

**PHYSICS H196C. Honors Thesis in Physics III. 4 Units.**

Independent research for seniors conducted under the guidance of a faculty member. Students' research results are discussed in oral presentations, and a written proposal, progress report, and thesis are submitted.

Prerequisite: PHYSICS H196B

Overlaps with PHYSICS 196C.

Restriction: Physics Majors only. Campuswide Honors Collegium students only. Honors Program in Physics students only.

**PHYSICS 199. Readings on Special Topics. 1-4 Units.**

Readings in selected areas of Physics. Topics addressed vary each quarter.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**PHYSICS 206. Advanced Data Acquisition and Analysis. 4-6 Units.**

Introduces students to a variety of practical laboratory techniques, including lock-in, boxcar, coincidence counting, noise filtering, PID control, properties of common transducers, computer interfacing to instruments, vacuum technology, laboratory safety, basic mechanical design, and shop skills. Materials fee.

Same as CHEM 206.

Concurrent with PHYSICS 106.

**PHYSICS 207. Applied Physical Chemistry. 4 Units.**

Introduction to fundamental concepts in molecular structure and reactivity: theory of bonding, valence and molecular orbitals; structure and reactivity in inorganic chemistry; elements in molecular group theory; nomenclature in organic chemistry; and survey of macromolecules.

Same as CHEM 207.

**PHYSICS 208. Math Methods. 4 Units.**

Applications of mathematics to physical and chemical problems. Calculus of special functions, complex variables and vectors; linear vector spaces and eigenvalue problems. Differential equations.

Same as CHEM 208.

**PHYSICS 211. Classical Mechanics. 4 Units.**

Variational principles, Lagrange's equations; applications to two body problems, small oscillation theory, and other phenomena. Hamilton's equations. Hamilton-Jacobi theory. Canonical transformations.

Restriction: Graduate students only.

**PHYSICS 212A. Mathematical Physics. 4 Units.**

Complex variables and integration; ordinary and partial differential equations; the eigenvalue problem.

Restriction: Graduate students only.

**PHYSICS 213A. Electromagnetic Theory. 4 Units.**

Electrostatics; magnetostatics; relativity; classical electron theory; fields in vacuum and matter; retardation; radiation and absorption; dispersion; propagation of light; diffraction; geometric optics; theories of the electric and magnetic properties of materials; scattering.

**PHYSICS 213B. Electromagnetic Theory. 4 Units.**

Electrostatics; magnetostatics; relativity; classical electron theory; fields in vacuum and matter; retardation; radiation and absorption; dispersion; propagation of light; diffraction; geometric optics; theories of the electric and magnetic properties of materials; scattering.

Prerequisite: PHYSICS 213A

**PHYSICS 214A. Statistical Physics. 4 Units.**

Maxwell-Boltzmann, Bose-Einstein, Fermi-Dirac statistics; ideal and imperfect gases; thermodynamic properties of solids; transport theory.

Restriction: Graduate students only.

**PHYSICS 214C. Many Body Theory. 4 Units.**

Application of field theory methods, perturbative and non-perturbative, to many particle systems; second quantization, Feynman diagrams, linear response theory, and functional integral methods applied to the ground state and at finite temperature.

Prerequisite: PHYSICS 214A and PHYSICS 215A and PHYSICS 215B

Restriction: Graduate students only.

**PHYSICS 215A. Quantum Mechanics. 4 Units.**

Foundations; Dirac notation; basic operators and their eigenstates; perturbation theory; spin.

Restriction: Graduate students only.

**PHYSICS 215B. Quantum Mechanics. 4 Units.**

Atomic physics; scattering theory, formal collision theory; semi-classical radiation theory; many body systems.

Prerequisite: PHYSICS 215A

Restriction: Graduate students only.

**PHYSICS 220. Electronics for Scientists. 4 Units.**

Applications of modern semiconductor devices to physical instrumentation. Characteristics of semiconductor devices, integrated circuits, analog and digital circuits.

Restriction: Graduate students only.

Concurrent with PHYSICS 120.

**PHYSICS 222. Continuum Mechanics. 4 Units.**

Introduction to the continuum limit and stress and strain tensors. Hydrodynamics of perfect fluids; two-dimensional problems, motion of incompressible viscous fluids, Navier Stokes equations. Basic elasticity theory. Description of viscoelastic materials. Introduction to nonlinear behavior instabilities.

**PHYSICS 223. Numerical Methods. 4 Units.**

Introduction to theory and practice of modern numerical methods. Techniques are drawn from topics such as solution of differential equations, Monte Carlo methods, Fast Fourier transforms, and evaluation of special functions.

**PHYSICS 228. Electromagnetism. 4 Units.**

Maxwell's equations, electrodynamics, electromagnetic waves and radiation, wave propagation in media, interference and quantum optics, coherent and incoherent radiation, with practical applications in interferometry, lasers, waveguides, and optical instrumentation.

Same as CHEM 228.

**PHYSICS 229A. Computational Methods. 4 Units.**

Mathematical and numerical analysis using Mathematica and C programming, as applied to problems in physical science.

Same as CHEM 229A.

Concurrent with PHYSICS 100.

**PHYSICS 230A. Biophysics of Molecules and Molecular Machines. 4 Units.**

Physical concepts and experimental and computational techniques used to study the structure and function of biological molecules and molecular machines with examples from enzyme action, protein folding, molecular motors, photobiology, chemotaxis, and vision.

Concurrent with PHYSICS 146A.

**PHYSICS 230B. Biophysics of Molecules and Molecular Machines. 4 Units.**

Physical concepts and experimental and computational techniques used to study the structure and function of biological molecules and molecular machines with examples from enzyme action, protein folding, molecular motors, photobiology, chemotaxis, and vision.

Concurrent with PHYSICS 146B.

**PHYSICS 233A. Principles of Imaging. 4 Units.**

Linear systems, probability and random processes, image processing, projecting imaging, tomographic imaging.

Same as EECS 202A.

Restriction: Graduate students only.

Concurrent with PHYSICS 147A.

**PHYSICS 233B. Techniques in Medical Imaging I: X-ray, Nuclear, and NMR Imaging. 4 Units.**

Ionizing radiation, planar and tomographic radiographic and nuclear imaging, magnetism, NMR, MRI imaging.

Prerequisite: EECS 202A

Same as EECS 202B.

Restriction: Graduate students only.

Concurrent with PHYSICS 147B.

**PHYSICS 233C. Techniques in Medical Imaging II: Ultrasound, Electrophysiological, Optical. 4 Units.**

Sound and ultrasound, ultrasonic imaging, physiological electromagnetism, EEG, MEG, ECG, MCG, optical properties of tissues, fluorescence and bioluminescence, MR impedance imaging, MR spectroscopy, electron spin resonance and ESR imaging.

Prerequisite: EECS 202B

Same as EECS 202C.

Restriction: Graduate students only.

Concurrent with PHYSICS 147C.

**PHYSICS 234A. Elementary Particle Physics. 4 Units.**

Overview of Standard Model theory and phenomenology. Electromagnetic, strong and weak forces, quark model, interactions with matter, particle detectors and accelerators.

Prerequisite: PHYSICS 215B

**PHYSICS 234B. Advanced Elementary Particle Physics. 4 Units.**

$SU(3) \times SU(2) \times U(1)$  model of strong, weak, and electromagnetic interactions. K-meson system and CP violation, neutrino masses and mixing, grand-unified theories, supersymmetry, introduction to cosmology and its connection to particle physics.

Prerequisite: PHYSICS 234A and PHYSICS 235A

**PHYSICS 234C. Advanced Elementary Particle Physics. 4 Units.**

$SU(3) \times SU(2) \times U(1)$  model of strong, weak, and electromagnetic interactions. K-meson system and CP violation, neutrino masses and mixing, grand-unified theories, supersymmetry, introduction to cosmology and its connection to particle physics.

Prerequisite: PHYSICS 234A and PHYSICS 235A

**PHYSICS 235A. Quantum Field Theory. 4 Units.**

Canonical quantization, scalar field theory, Feynman diagrams, tree-level quantum electrodynamics.

Prerequisite: PHYSICS 215B

Restriction: Graduate students only.

**PHYSICS 235B. Advanced Quantum Field Theory. 4 Units.**

Pathintegral techniques, loop diagrams, regularization and renormalization, anomalies.

Prerequisite: PHYSICS 235A

Restriction: Graduate students only.

**PHYSICS 238A. Condensed Matter Physics. 4 Units.**

Bonding in solids; crystal symmetry and group theory, elastic properties of crystals; lattice vibrations, interaction of radiation with matter; cohesion of solids; the electron gas; electron energy bands in solids; ferromagnetism; transport theory; semiconductors and superconductors; many-body perturbation theory.

Prerequisite: PHYSICS 133 and (PHYSICS 214A or CHEM 232A) and (PHYSICS 215B or CHEM 231B)

**PHYSICS 238B. Condensed Matter Physics. 4 Units.**

Bonding in solids; crystal symmetry and group theory, elastic properties of crystals; lattice vibrations, interaction of radiation with matter; cohesion of solids; the electron gas; electron energy bands in solids; ferromagnetism; transport theory; semiconductors and superconductors; many-body perturbation theory.

Prerequisite: PHYSICS 238A

**PHYSICS 238C. Condensed Matter Physics. 4 Units.**

Bonding in solids; crystal symmetry and group theory, elastic properties of crystals; lattice vibrations, interaction of radiation with matter; cohesion of solids; the electron gas; electron energy bands in solids; ferromagnetism; transport theory; semiconductors and superconductors; many-body perturbation theory.

Prerequisite: PHYSICS 238B

**PHYSICS 239A. Plasma Physics. 4 Units.**

Basic concepts, orbits, kinetic and fluid equations, Coulomb collisions, fluctuations, scattering, radiation.

Restriction: Graduate students only.

Concurrent with PHYSICS 135.

**PHYSICS 239B. Plasma Physics. 4 Units.**

Magnetic confinement, MHD equilibrium and stability, collisional transport.

Prerequisite: PHYSICS 239A

Restriction: Graduate students only.

**PHYSICS 239C. Plasma Physics. 4 Units.**

Linear waves and instabilities, uniform un-magnetized and magnetized plasmas, non-uniform plasmas.

Prerequisite: PHYSICS 239B

Restriction: Graduate students only.

**PHYSICS 240A. Galactic Astrophysics. 4 Units.**

The morphology, kinematics, and evolution of our Milky Way and other galaxies. Topics include stellar formation and stellar evolution, end states of stars (supernovae, neutron stars), the distribution of stars, interstellar gas and mass in galaxies. The Local Group.

**PHYSICS 240B. Cosmology. 4 Units.**

An introduction to modern cosmology set within the context of general relativity. Topics include the expansion history of the Universe, inflation, the cosmic microwave background, density fluctuations, structure formation, dark matter, dark energy, and gravitational lensing.

**PHYSICS 240C. Radiative Processes in Astrophysics. 4 Units.**

Exploration of radiation mechanisms (electron scattering, synchrotron emission, collisional excitation, and more) and radiative transfer through matter including absorption and emission. Includes such observational astrophysics topics as spectroscopic study of atoms and nuclei, X-rays, and cosmic rays.

**PHYSICS 241A. Solar System and Extrasolar Planets. 4 Units.**

Formation, evolution, and habitability of planetary systems. Observational and theoretical study of the origin and evolution of the Solar System, present day dynamical state of the Solar System (asteroids, Kuiper Belt Objects, Oort cloud), planetary atmospheres, processes governing planetary climate.

Corequisite: PHYSICS 242

Restriction: Graduate students only.

**PHYSICS 241B. Stellar Astrophysics. 4 Units.**

Physics of stellar interiors and equations of stellar structure. Stellar atmospheres and absorption processes. Introduction to stellar winds. Thermonuclear reactions, nucleosynthesis, and solar neutrinos. Binary stars and mass accretion. White dwarfs, supernovae, neutron stars, and black holes.

Prerequisite: PHYSICS 211 and PHYSICS 240A

**PHYSICS 241C. Extragalactic Astrophysics. 4 Units.**

The physics and phenomenology of galaxies; star formation, interstellar medium, and intergalactic medium. Galaxy structure and dynamics. Galaxy evolution, stellar populations, and scaling relations; the relationship between galaxy properties and environment. Galaxy clusters and active galactic nuclei.

Prerequisite: PHYSICS 211 and PHYSICS 240A

**PHYSICS 241D. Early Universe Physics. 4 Units.**

Includes a thorough quantum treatment of the generation of perturbations during inflation and various topics related to kinetic theory in an expanding Universe. Other topics include the astrophysics and cosmology of weakly interacting particles.

Prerequisite: PHYSICS 234A and (PHYSICS 240B or PHYSICS 255)

**PHYSICS 242. Astro Fundamentals. 4 Units.**

Introduction to topics in astrophysics including measurement of stellar properties, stellar structure and evolution, stellar remnants and supernovae, the interstellar medium, exoplanets, gravitational lensing, galactic structure, extragalactic distance measurements, and the expanding universe.

Restriction: Graduate students only.

**PHYSICS 246. Special Topics in Astrophysics. 4 Units.**

Outlines and emphasizes a subarea of astrophysics that is undergoing rapid development.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 247. Special Topics in Particle Physics. 4 Units.**

Current topics in particle non-accelerator-based research fields.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 248. Special Topics in Condensed Matter Physics. 4 Units.**

Outlines and emphasizes a subarea of condensed matter physics that is undergoing rapid development.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PHYSICS 249. Special Topics in Plasma Physics. 4 Units.**

Outlines and emphasizes a subarea of plasma physics that is undergoing rapid development.

Prerequisite: PHYSICS 239A and PHYSICS 239B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PHYSICS 250. Physics and Astronomy Communications Skills. 4 Units.**

Fundamentals of effectively communicating research through written and oral platforms. Topics include writing compelling proposals and journal articles for peer review, and the development of engaging oral presentations of science results and significance to a wide range of audiences.

Restriction: Graduate students only.

**PHYSICS 255. General Relativity. 4 Units.**

An introduction to Einstein's theory of gravitation. Tensor analysis, Einstein's field equations, astronomical tests of Einstein's theory, gravitational waves.

**PHYSICS 260A. Seminar in Condensed Matter Physics. 1 Unit.**

Seminar designed to acquaint students with recent advances in solid state physics. Lecturers from the Department of Physics and Astronomy (both faculty and graduate students), other UCI departments, and other institutions.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 260B. Seminar in Condensed Matter Physics. 1 Unit.**

Seminar designed to acquaint students with recent advances in solid state physics. Lecturers from the Department of Physics and Astronomy (both faculty and graduate students), other UCI departments, and other institutions.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 260C. Seminar in Condensed Matter Physics. 1 Unit.**

Seminar designed to acquaint students with recent advances in solid state physics. Lecturers from the Department of Physics and Astronomy (both faculty and graduate students), other UCI departments, and other institutions.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 261A. Seminar in Plasma Physics. 1 Unit.**

Advanced topics in plasma physics: wave propagation, nonlinear effects, kinetic theory and turbulence, stability problems, transport coefficients, containment, and diagnostics. Applications to controlled fusion and astrophysics.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**PHYSICS 261B. Seminar in Plasma Physics. 1 Unit.**

Advanced topics in plasma physics: wave propagation, nonlinear effects, kinetic theory and turbulence, stability problems, transport coefficients, containment, and diagnostics. Applications to controlled fusion and astrophysics.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**PHYSICS 261C. Seminar in Plasma Physics. 1 Unit.**

Advanced topics in plasma physics: wave propagation, nonlinear effects, kinetic theory and turbulence, stability problems, transport coefficients, containment, and diagnostics. Applications to controlled fusion and astrophysics.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**PHYSICS 263A. Seminar in Particle Physics. 1 Unit.**

Discussion of advanced topics and reports of current research results in theoretical and experimental particle physics and cosmic rays.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 263B. Seminar in Particle Physics. 1 Unit.**

Discussion of advanced topics and reports of current research results in theoretical and experimental particle physics and cosmic rays.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 263C. Seminar in Particle Physics. 1 Unit.**

Discussion of advanced topics and reports of current research results in theoretical and experimental particle physics and cosmic rays.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 265A. Seminar in Astrophysics. 1 Unit.**

Acquaints students with current research in astrophysics. Lecturers from the Department of Physics and Astronomy and from other institutions.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 265B. Seminar in Astrophysics. 1 Unit.**

Acquaints students with current research in astrophysics. Lecturers from the Department of Physics and Astronomy and from other institutions.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 265C. Seminar in Astrophysics. 1 Unit.**

Acquaints students with current research in astrophysics. Lecturers from the Department of Physics and Astronomy and from other institutions.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 266. Current Topics in Chemical, Applied, and Materials Physics. 1 Unit.**

The subjects covered vary from year to year. Connection between fundamental principles and implementations in practice in science, industry, and technology.

Repeatability: May be repeated for credit unlimited times.

Same as CHEM 266.

**PHYSICS 267B. Current Problems in Particle Physics. 4 Units.**

Presentation and discussion of current research and theory in particle physics. Lectures given by staff and students.

Repeatability: May be repeated for credit unlimited times.

**PHYSICS 267C. Current Problems in Particle Physics. 4 Units.**

Presentation and discussion of current research and theory in particle physics. Lectures given by staff and students.

Repeatability: May be repeated for credit unlimited times.

**PHYSICS 268. Seminar in Systems Microbiology Research. 1 Unit.**

A research and journal club seminar that covers topics on bacteria and phage using approaches and principles from biology, engineering, and physics.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Same as MOL BIO 268, ENGRMSE 267.

Restriction: Upper-division students only. Graduate students only.

**PHYSICS 269. Seminar in Teaching Physics. 2 Units.**

Techniques for effective teaching. Covers active listening and student engagement, problem-solving skills, peer instruction and collaborative learning, and evaluation. Required of all new Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

**PHYSICS 273. Technical Communication Skills. 2 Units.**

Development of effective communication skills, oral and written presentations, through examples and practice.

Grading Option: Satisfactory/unsatisfactory only.

Same as CHEM 273.

**PHYSICS 291. Research Seminar. 1-4 Units.**

Detailed discussion of research problems of current interest in the Department. Format, content, and frequency of the course are variable.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 295. Experimental Research. 4-12 Units.**

With the approval of a faculty member, a student may pursue a research program in experimental physics. Typical areas include astrophysics, condensed matter physics, elementary particle physics, and plasma physics.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Physical Sciences students only.

**PHYSICS 296. Theoretical Research. 4-12 Units.**

With approval of a faculty member, a student may pursue a research program in theoretical physics. Typical areas include astrophysics, condensed matter physics, elementary particle physics, and plasma physics.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Physical Sciences students only.

**PHYSICS 298. Physics Colloquium. 1 Unit.**

Seminar held each week, in which a current research topic is explored. Frequently, off-campus researchers are invited to present the seminar, and on occasion a faculty member or researcher from the Department will speak.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: School of Physical Sciences students only.



**PHYSICS 299. Reading of Special Topic. 4-12 Units.**

With special consent from a faculty member who will agree to supervise the program, a student may receive course credit for individual study of some area of physics.

Restriction: Graduate students only.

**PHYSICS 395. Laboratory Teaching. 1 Unit.**

Required of and limited to teaching assistants of undergraduate laboratory courses. Designed to teach the necessary skills required of teaching assistants for these courses.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PHYSICS 399. University Teaching. 1-4 Units.**

Required of and limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Physiology and Biophysics (PHYSIO)

### Courses

**PHYSIO 200. Research in Physiology and Biophysics. 2-12 Units.**

Individual research directed toward doctoral dissertation and supervised by a particular professor.

Repeatability: May be repeated for credit unlimited times.

**PHYSIO 200R. Research in Physiology and Biophysics for First-Year Students. 2-12 Units.**

Independent research within the laboratories of graduate training faculty in the Department of Physiology and Biophysics for first-year Ph.D. students.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

**PHYSIO 201. Introduction to Physiology Research. 1-4 Units.**

Introduction to research in physiology and related sciences. Concentrates on techniques emphasized in the various laboratories of the Department of Physiology and Biophysics.

Repeatability: May be repeated for credit unlimited times.

**PHYSIO 204. Concepts of Biophysics. 3 Units.**

Principles of crystallography; introduction to time-resolved absorption and fluorescence spectroscopy; the concepts of kinetic order and kinetic rate theory.

Restriction: Graduate students only.

**PHYSIO 205. Electronics for Biologists. 4 Units.**

Basic principles of electricity; properties and use of discrete components and integrated circuits; circuit analysis and design. Intended for advanced students in the life sciences.

Same as NEURBIO 249.

**PHYSIO 206A. Introduction to Medical Physiology. 5 Units.**

Vertebrate physiology with emphasis on humans and on the relationship between the function of normal tissues and the processes of disease. Fundamental principles of physiology and the interrelationships which control organ function.

Prerequisite: A biochemistry course.

Restriction: Graduate students only.

**PHYSIO 206B. Introduction to Medical Physiology. 6 Units.**

Vertebrate physiology with emphasis on humans and on the relationship between the function of normal tissues and the processes of disease. Fundamental principles of physiology and the interrelationships which control organ function.

Prerequisite: PHYSIO 206A

Restriction: Graduate students only.

**PHYSIO 212. Medical Immunology. 1.5 Unit.**

One of the cornerstones of the MS1 Molecular Basis of Medicine block. Includes temporal coordination of lecture material, regular course director meetings, and combined exams with PHYSIO 544: Medical Immunology.

Restriction: Graduate students only.

**PHYSIO 215. Integrative Immunology . 4 Units.**

Provides an introduction to immunology, but focuses on providing in-depth analysis of selected topics within the broader field of immunology, including relevant research techniques, while improving critical thinking skills.

Restriction: Graduate students only.

**PHYSIO 232. The Physiology of Ion Channels. 4 Units.**

Discusses how ion channels work (molecular/structural biophysics level) and what ion channels do in diverse cell types (cell physiology level).

Restriction: Graduate students only.

**PHYSIO 252. Introduction to Proteomics. 4 Units.**

Introduces students to concepts and methods of proteomics including protein identification, expression proteomics, and protein-protein interactions.

Repeatability: May be taken for credit 2 times.

**PHYSIO 272. Eye: Health and Disease. 3 Units.**

Introduces the anatomic and physiological basis of vertebrate vision and disease states in which the structure and function of the eye is disrupted with emphasis on current and developing research areas.

Restriction: Graduate students only.

**PHYSIO 290. Topics in Physiology. 3 Units.**

Contemporary research problems in physiology. Students review research articles in current literature and present ideas contained therein, focusing on groundbreaking discoveries and methodologies. Students present results of their own research and attend presentations given by other students and departmental researchers.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSIO 292A. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PHYSIO 292B. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PHYSIO 292C. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PHYSIO 299. Dissertation in Physiology and Biophysics. 2-12 Units.**

Preparation and completion of the dissertation required for the Ph.D.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Planning, Policy, and Design (PP&D)

### Courses

**PP&D 221. Public Policy . 4 Units.**

Explores different approaches to public policy analysis, the diverse conceptions of the goals and objectives that should be served by policy, and the appropriate role of the policy analyst. Policy consequences are traced to indirect and subtle incentives and disincentives.

Repeatability: May be taken for credit 2 times.

Same as PUB POL 221.

Restriction: Public Policy Majors have first consideration for enrollment.

## Planning, Policy, and Design (see PP&D) (URBPLAN)

## Political Science (POL SCI)

### Courses

**POL SCI 10A. Probability and Statistics in Political Science I. 4 Units.**

Introduction to the variety of statistical applications in the social sciences. Descriptive statistics. Measures of central tendency and dispersion. Percentile ranks. Standardization and normal approximation. Basic probability theory focuses on application to statistical inference and binomial distribution. Laboratory required.

Prerequisite: SOC SCI 3A

Overlaps with ANTHRO 10A, ECON 15A, PSYCH 10A, SOCECOL 13, SOC SCI 9A, SOCIOL 10A.

Restriction: Lower-division students only.

(Va)

**POL SCI 10B. Probability and Statistics in Political Science II. 4 Units.**

Introduction to statistical inference, sampling distribution, standard error. Hypothesis tests for proportions and means. Inferential techniques for nominal variables including chi-square, study measures of strengths, significance of relationships between variables, assumptions, data requirements, and types of error in significance tests.

Prerequisite: POL SCI 10A

Overlaps with ANTHRO 10B, ECON 15B, PSYCH 10B, SOCECOL 13, SOC SCI 9B, SOC SCI 10B.

(Va)

**POL SCI 10C. Probability and Statistics in Political Science III. 4 Units.**

Focus on correlation, regression, and control for effects of variables. One-way and two-way factorial analysis of variance. A priori and a posteriori comparisons. Introduction to repeated measures design and non-parametric statistics. Discusses use of statistics in newspapers and popular magazines.

Prerequisite: POL SCI 10B

Overlaps with ANTHRO 10C, PSYCH 10C, SOCECOL 13, SOC SCI 9C, SOC SCI 10C, SOCIOL 10C.

(Vb)

**POL SCI 11A. Introduction to Political Science: Political Analysis. 4 Units.**

Presents various modes of understanding politics. Emphasis on basic approaches to political analysis, their uses in constructing theories, and their application to particular national political systems.

(III and VIII ).

**POL SCI 11C. Introduction to Political Science: Micropolitics. 4 Units.**

Introduction to political behavior of individuals and groups within national systems. Three questions addressed: How do individuals come to understand the political world? How do individuals behave within this world? How do groups and individuals engage in the political process.

(III)

**POL SCI 21A. Introduction to American Government. 4 Units.**

Introduction to American political processes and institutions. Topics include elections, political participation, parties, interest groups, the Presidency, Congress, the bureaucracy, and the judiciary.

(III)

**POL SCI 31A. Introduction to Political Theory. 4 Units.**

Types of questions: What is politics? What are the theoretical and philosophical bases for different types of political arrangements? How do these perspectives get translated into reality? Among others, the works of Rousseau, Locke, Mill, and Marx are read.

(III)

**POL SCI 32A. Dilemmas of Diversity. 4 Units.**

Focuses on racial, ethnic, and gender diversity, multiculturalism, and their impact on our social and political ideals. Traces the sources of ideas about difference, equality, and toleration, and examines tensions that occur when forms of identity conflict with one another.

Same as INTL ST 32A.

(VII)

**POL SCI 41A. Introduction to International Relations. 4 Units.**

Analysis of political relations between and among nations with emphasis on explanations of conflict and cooperation. The role of ideologies and their relation to international problems are also examined.

Same as INTL ST 14.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(III and VIII ).

**POL SCI 44B. Global Political Ideologies. 4 Units.**

An overview of the major political ideologies shaping the current world order and global conflict. Topics include liberalism, democracy, nationalism, capitalism, communism, socialism, fascism, neoliberalism, clash of civilizations, sectarian violence, populist nationalism, and de-globalization.

Same as INTL ST 12, SOC SCI 12.

Restriction: International Studies Majors have first consideration for enrollment.

(III and VIII ).

**POL SCI 45A. Human Rights and Global Governance. 4 Units.**

Historical development of civil, political rights and the rise of human rights in international law. Explores role, and limitations, of the UN, ICJ, and ICC in global governance. Reconceptualizing democracy and political representation in a postnational 21st century.

Same as INTL ST 16, SOC SCI 16.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

(III and VIII ).

**POL SCI 49. Lower-Division Special Topics in International Relations. 4 Units.**

Studies in selected areas of international relations. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**POL SCI 51A. Introduction to Politics Around the World. 4 Units.**

Introduces comparative politics. Compares political systems in a variety of countries. Includes elections, parties, parliaments, presidents, protest movements, and other aspects of national politics. Addresses how to make meaningful comparisons across countries.

(III, VIII)

**POL SCI 61A. Introduction to Race and Ethnicity in Political Science. 4 Units.**

Examines major theories that attempt to explain the roles of race and ethnicity in U.S. politics.

Same as CHC/LAT 64.

(III and VII).

**POL SCI 71A. Introduction to Law. 4 Units.**

An introduction to the study of judicial politics. Questions include: what is law?; what is a court?; who are the judges? Analysis of a wide range of judicial decisions illustrates the political importance of courts in the U.S. and elsewhere.

(III)

**POL SCI 79. Lower-Division Special Topics in Law. 4 Units.**

Studies in selected areas of law. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**POL SCI H80. Globalization and Human Security. 4 Units.**

Emerging issues of human security in the globalized world, including personal human security, physical integrity, human trafficking, global climate change, food. Challenges of these complex human security problems for a multi-scalar system (international, national, local).

Restriction: Campuswide Honors Collegium students only.

(III, VIII)

**POL SCI 120. Public Opinion. 4 Units.**

Theories concerning sources of public opinion, processes by which it is altered, organization of citizens' belief systems, and role of public opinion in government policy. Students analyze survey data as a research project.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 121A. The American Presidency. 4 Units.**

Presents a comprehensive survey of the American presidency and considers the question of political power.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 121C. U.S. Elections and Voting Behavior. 4 Units.**

Examines how voters evaluate political parties, candidates, and issues in electoral campaigns to reach their decisions. Numerous controversies concerning the degree of issue voting, sophistication of candidate evaluations, and the decline of political parties are discussed.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 121F. Presidents Since World War II. 4 Units.**

Reviews the actions and character of presidents from Harry Truman through Bill Clinton. Each week a different president is examined from a variety of perspectives. Students are expected to write a substantial original research paper.

Prerequisite: POL SCI 21A

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 121G. American Public Policy. 4 Units.**

Focuses on the development and implementation of public policy in the United States. Lectures cover theoretical models of the policy process as well as significant problems facing contemporary American decision-makers.

Same as PUBHLTH 132, SOC SCI 152C, UPPP 129.

**POL SCI 121HW. Writing for the President of the United States. 4 Units.**

Imagines how White House staffers can help presidents with clear, focused, and effective writing. Through a variety of formats, students study, hone, and practice writing skills that will prove useful- in and out of the White House.

Prerequisite: POL SCI 21A

(Ib)

**POL SCI 122A. American Metropolitan Politics. 4 Units.**

Explores the politics of urban and suburban America, including the policy making process; the exercise of political power; local politics, federalism and the problems of metropolitanism; and major policy problems facing urban areas.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 122B. California Politics. 4 Units.**

Examines the structure and function of California government, traces historical development of political power, with constantly changing casts of power-brokers and seekers. Explores California exceptionalism and the roles played by the electorate, legislature, executive, and organized interests in policy making.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 122BW. California Politics. 4 Units.**

Examines the structure and function of California government, traces historical development of political power, with constantly changing casts of power-brokers and seekers. Explores California exceptionalism and the roles played by the electorate, legislature, executive, and organized interests in policy making.

Prerequisite: Satisfactory completion of the Lower-Division writing requirement.

Restriction: Political Science Majors have first consideration for enrollment.

(Ib)

**POL SCI 123B. Representation. 4 Units.**

Deals with classical theories of representation: issues of racial and political representation in U.S. legislatures and city councils; proportional representation models; and comparative election systems.

Prerequisite: SOC SCI 3A or SOC SCI 10A or SOC SCI 10B

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 124A. The Politics of Protest. 4 Units.**

Examines the Civil Rights, Black Power, and women's movements in relationship to the Asian American movement. Uses social movement theories to illuminate the cases, and the cases to critique and revise the theories.

Same as ASIANAM 144.

(VII)

**POL SCI 124B. Latinos in U.S. Politics. 4 Units.**

Comparing the political issues facing Latino groups by examining their migration histories, voting behavior, nonelectoral participation, and policy issues. Latino issues are examined on the national, state, and local levels, including formal representation, immigration, affirmative action, and language policy.

Same as CHC/LAT 151.

(VII)

**POL SCI 124C. Comparative Minority Politics. 4 Units.**

Examines the political experiences of Blacks, Latinos, and Asian Americans in the United States from roughly 1950 to the present. Focuses on how each group has pursued political empowerment via both conventional political channels and social movements.

Same as AFAM 151, CHC/LAT 147, ASIANAM 132.

**POL SCI 124E. African American Politics. 4 Units.**

Examines politics of African Americans in order to gain a broader perspective of the American political process. Major developments in African American politics (including the civil rights movement, Black presidential bids), continuing problem of racism, responsiveness of key governing institutions.

Same as AFAM 152.

**POL SCI 125A. The United States Congress. 4 Units.**

Does the Congress do a good job of representing the American citizenry? Is it the most appropriate mechanism for the creation, resolution, and implementation of public policy.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 125CW. Constitutional Convention. 4 Units.**

Analyzes the Constitution, its amendments, and periods of Constitutional reform as a foundation for a critical evaluation of the Constitution with an eye both to necessary reforms and to elements of the Constitution that should be maintained.

Prerequisite: POL SCI 21A. Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**POL SCI 126C. U.S. Immigration Policy. 4 Units.**

Examines selected immigration policy debates since the nineteenth century, rationale and consequences of immigration law since 1965, problems of administration, implementation and enforcement, impact of immigration policy on foreign relations, and contemporary debate regarding the future of U.S. policy.

Same as CHC/LAT 163.

(VII)

**POL SCI 126D. Urban Politics and Policy. 4 Units.**

Examines economic limits of cities and welfare policy. Addresses such issues as why are the poor concentrated in the central cities? Which anti-poverty programs will work best in cities? Which level of government can best combat poverty in the U.S.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 126F. Politics of Animal Rights. 4 Units.**

Examines animal rights/welfare movement's efforts to transform moral, practical, and legal standing of nonhuman animals in contemporary U.S. Explores intersection of racism, sexism, and speciesism informed by theories of race and ethnicity, including Asian American Studies.

Same as ASIANAM 168.

Restriction: Political Science Majors have first consideration for enrollment. Asian American Studies Majors have first consideration for enrollment.

**POL SCI 128BW. Political Ideologies: The Way We View Our World. 4 Units.**

Politics has become divisive and ideological. But ideologies are poorly understood and have become mere labels for identifying friends and enemies. Course analyzes the nature of ideology, focusing on liberalism, conservatism, fascism, socialism, and contemporary 'liberation' ideologies.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**POL SCI 128C. Political Psychology. 4 Units.**

Examination of how psychological theory and research may be used to better understand political thought and behavior. Drawing on theories of learning, cognition, and personality, discusses such topics as the formation of political attitudes, and the process of political decision-making.

Same as PSYCH 176A.

Restriction: Majors only. POL SCI 128C may not be taken for credit if taken after POL SCI 137C.

**POL SCI 129. Special Topics in American Politics and Society. 4 Units.**

Studies in selected areas of American politics and society. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 130A. Game Theory and Politics I. 4 Units.**

Introduction to game theory and a survey of its political applications. Examples of topics covered include voting in small committees, legislatures, and mass elections; interest group activities and environmental issues; institutional design, and the evolution of cooperative behavior.

Same as SOCIOL 134, SOC SCI 103A.

Restriction: Social Policy/Public Service Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**POL SCI 130B. Game Theory and Politics II. 4 Units.**

More advanced game theory and its political applications, beginning where Game Theory and Politics I ends. Examples of topics covered include revolutions; arms race; spatial models of party competition; political manipulation; political coalitions and their power.

Prerequisite: POL SCI 130A or ECON 116A

Same as SOC SCI 103B.

Restriction: Social Policy/Public Service Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 131C. Modern Political Theory. 4 Units.**

Examines major thinkers and intellectual movements in the political thought of the 17th and 18th centuries.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 131F. Twentieth Century Political Theory. 4 Units.**

Examines major thinkers and intellectual movements in the political thought of the 20th Century.

Prerequisite: POL SCI 31A

**POL SCI 134F. Social and Political Theory. 4 Units.**

Focus is on recent major work in social and political theory. An in-depth analysis of a relatively small body of writing. Authors discussed include Jurgen Habermas, Anthony Giddens, and Richard Rorty.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 135A. Origins of Liberalism. 4 Units.**

Examines the ideals, social forces, and historical events that gave rise to liberal political theory. Topics include patriarchal authority, the divine right of kings, religious toleration, slavery, colonialism, political economy, the evolution of law, and tensions between liberty and equality.

Prerequisite: POL SCI 31A

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 135B. Just War Revisited. 4 Units.**

Examines the evolution of the doctrine of the just war across the history of Western political thought, the importance of changes in the doctrine and whether it applies today; examines international relations case studies to determine today's relevancy.

Same as INTL ST 131A.

**POL SCI 136B. Cannibals and Conquistadores: The Philosophy of the Other. 4 Units.**

Examines critically the notion of the 'other' by looking at the philosophical challenges difference poses in the context of the European discovery of the New World. Seeks to understand the naissance of the concept of human rights and tolerance.

**POL SCI 136BW. Cannibals and Conquistadores: The Philosophy of the Other. 4 Units.**

Examines critically the notion of the 'other' by looking at the philosophical challenges difference poses in the context of the European discovery of the New World. Seeks to understand the naissance of the concept of human rights and tolerance.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Overlaps with POL SCI 136B.

(Ib)

**POL SCI 137BW. Types of Political Representation. 4 Units.**

Political representation plays an important role in democratic systems, but is elusive once examined closely. Students delve into the concept and relate different views to political life. Half of the course is spent on writing instruction.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Recommended: Upper-Division students. Political Science majors have first consideration for enrollment.

(Ib)

**POL SCI 138A. The Moral of the Story: Introductory Seminar in Ethics. 4 Units.**

Introduces major theories and classic texts in ethics, from Plato and Aristotelian virtue ethics to utilitarianism and Kant and contemporary moral psychology.



**POL SCI 138AW. Moral of the Story: Introduction to Ethics. 4 Units.**

Focuses on how we learn about ethics from stories, in the form of fables, bedtime stories, religious stories, soap operas, television, and movies as adults. Students bring in stories that informed their own ethical development.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**POL SCI 138CW. Ethics of Difference. 4 Units.**

Examines differences traditionally judged politically salient—race, ethnicity, religion, gender. Personal interviews with an elderly person encourage students to understand the social construction of difference and to reexamine their own attitudes by putting themselves in the place of another.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Political Science Majors have first consideration for enrollment.

(Ib)

**POL SCI 138DW. The Moral Life During War. 4 Units.**

Can people keep their humanity during war? What does the term humanity signify when simply surviving requires faith, courage, and desperation? When facing wartime brutality, must we abrogate morality? What does it mean to compose a moral life during war?.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Political Science Majors have first consideration for enrollment.

Concurrent with POL SCI 238D.

(Ib)

**POL SCI 139. Special Topics in Political Theory and Methods. 4 Units.**

Studies in selected areas of political theory and methods. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 141B. International Political Economy. 4 Units.**

Examination of problems in global political-economic relations through competing conceptual lenses or grand theories: mercantilism, liberalism, and Marxism. Surveys North-North and North-South issues relating power and wealth.

Same as INTL ST 114A.

(VIII)

**POL SCI 141C. International Political Economy of East Asia. 4 Units.**

Integration of theoretical perspectives in international political economy with the study of economic development in East Asia, with special emphasis on regional integration.

(VIII)

**POL SCI 141E. U.S. Foreign Policy Toward Asia. 4 Units.**

U.S. policy toward the countries of East Asia: bilateral and regional security relationships, U.S. economic relations with the major Asian countries, the development of regional institutions, and human rights.

Same as INTL ST 142G.

**POL SCI 142B. The International Relations of East Asia. 4 Units.**

Surveys various aspects of relations between the nations of East Asia. Topics include the historical development of the region; current political and security relations, including the impact of the American military presence.

Same as INTL ST 142D.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 142D. U.S. Foreign Policy I: Globalism and Cold War. 4 Units.**

Looks at changing international perspectives, policy responses, and military strategies of presidential administrations from Truman to Reagan. In assessing the motives and objectives of U.S. foreign policy leaders during the "Cold War" era, the concept of "national interest" is examined.

Same as INTL ST 142A.

Restriction: International Studies Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment.

**POL SCI 142G. U.S. Coercive Diplomacy. 4 Units.**

Examines the theory of compellence and the U.S. practice of coercive diplomacy--the power to change behavior of other governments. Specific case examples: the Cuban missile crisis, bombing of North Vietnam, the Nicaraguan Contras, Desert Shield/Desert Storm, and Libya.

Same as INTL ST 142E.

Restriction: Upper-division students only. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 142J. U.S. Intervention in Latin America. 4 Units.**

Explores political, economic, social, and cultural ties that bind Latin America to the United States. Focuses on U.S. intervention and Latin American response from early nineteenth century to present day. Case studies include Mexico, Guatemala, Cuba, Chile, and Central America.

Same as HISTORY 166, INTL ST 177D, CHC/LAT 150.

**POL SCI 143G. Homeland Security . 4.0 Units.**

Examines the 9/11 origins of the concept of homeland security; assess the evolution, structure, and operations of the Department of Homeland Security; critically examines the evolution of threat assessment to the U.S. and the utilization of risk management methodologies.

Same as INTL ST 141B.

**POL SCI 144A. Approaches to International Relations. 4 Units.**

Reviews theoretical and methodological approaches to the study of international relations using contending perspectives to analyze power and influence, capabilities, interdependence, reciprocity, international regimes, anarchy, cooperation, imperialism, and hegemony.

Same as INTL ST 140A.

Restriction: Upper-division students only. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 145A. Ethics in an Age of Terror and Genocide. 4 Units.**

Original sources document personal impact of wars on genocides, from World War II to the Bosnian and Rwandan genocides and current wars in Iraq and Afghanistan. Students train for and conduct personal interviews with someone who lived through a war.

Same as INTL ST 154C.

**POL SCI 146B. Religion and World Politics. 4 Units.**

Examines the relationship between religion and world politics historically and today, focusing on connections with peace/war, democracy, human rights, secularism(s), and globalization. Covers major debates, scholarship, concepts, and theories through class exercises, exams, and essays.

Prerequisite: POL SCI 41A or INTL ST 11 or INTL ST 12 or REL STD 5A or REL STD 5B or REL STD 5C

Same as REL STD 115, INTL ST 151B.

**POL SCI 147CW. International Humanitarianism. 4 Units.**

Examines, analyzes, and evaluates the humanitarian phenomenon, the actors involved in it (including states, international organizations (IOs), and nongovernmental organizations (NGOs)), the rise of a body of international humanitarian law, and the problems and debates associated with international humanitarianism today.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as INTL ST 147CW.

(Ib)

**POL SCI 147D. International Organizations. 4 Units.**

Active learning course that examines origins, decision-making processes, activities, and evolution of leading international organizations (e.g. U.N., NATO, EU, AU, WTO, World Bank, IMF). Activities include drafting reforms, applying theory, assessing dysfunctions, and participating in U.N. negotiation simulations.

Same as INTL ST 147D.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 147E. Critical Investigations into Humanitarianism in Africa. 4 Units.**

Explores the complex phenomenon of aid to Africa (emergency and development aid), and the representational, cultural, historical, and other reasons why some participants and many observers critique it. Students occasionally engage with peers and faculty in African institutions.

**(VIII)****POL SCI 149. Special Topics in International Relations. 4 Units.**

Studies in selected areas of international relations. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 151B. Introduction to Chinese Politics. 4 Units.**

Background to the Chinese revolution, rise of the communist party; and institutions, ideology, and structure of Communist party rule from 1949-present.

Same as INTL ST 176C.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 151C. Chinese Politics: Policy, Leadership, and Change. 4 Units.**

Examines major policies from 1949 to the present, and considers the changing role of the Communist Party and its shifting treatment of various social groups; the era of Mao Zedong, reforms under Deng, and post-Deng politics.

Same as INTL ST 176D.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 151H. Voting and Political Manipulation. 4 Units.**

Introduction to social choice and cooperative games. Topics include majority rule, types of voting methods, apportionment and proportional representation, agenda manipulation, coalition formation, voting power, political consequences of electoral laws.

Same as INTL ST 156A, SOC SCI 121T, ECON 154.

Restriction: International Studies Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**POL SCI 152F. West European Politics. 4 Units.**

Explores four main themes: (1) thinking scientifically about politics; (2) understanding the linkages between different political structures and spheres of activity; (3) evaluating some theories about politics; (4) learning about three countries: Britain, France, and Germany.

Same as INTL ST 176I.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 152K. Immigration Politics in Western Europe. 4 Units.**

Examines immigration politics in Western Europe, analyzing trends and policy from the postwar period through to today. Topics include citizenship, immigrant integration, asylum, the far-right, and a rotating focus on contemporary issues, e.g., terrorism, Islamophobia.

Same as INTL ST 178A.

Overlaps with POL SCI 141D.

**POL SCI 153B. Canadian Politics. 4 Units.**

Addresses the basic structures and processes of contemporary Canadian government and politics. Additional topics may include regionalism, federalism, western alienation and oil, Canadian solutions to social welfare policy questions, developments in Quebec, and other issues associated with French-English relations.

Same as INTL ST 176L.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 153E. Human Rights. 4 Units.**

Examines the causes and consequences of human rights violations with a focus on Latin America. What are human rights? When and where are they violated? What political mechanisms are available to deal with human rights problems? How effective are they.

Same as INTL ST 154B.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 153G. Cuban Society and Revolution. 4 Units.**

Explores the causes, development, and legacy of the 1959 Revolution. Themes include economic dependency, democracy, race, gender, culture, and the always volatile relations between Cuba and the United States.

Same as INTL ST 177E, HISTORY 166C, CHC/LAT 157.

**POL SCI 154C. Comparative Politics: Four Nations, Three Continents. 4 Units.**

Studies four countries in a comparative fashion: their respective political histories and cultural traditions; actual differences among their superficially similar party, parliamentary, and executive institutions; contemporary economic policy. The countries represent three continents and varying levels of economic development.

Same as INTL ST 144A.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 154F. Peoples and Cultures of Post-Soviet Eurasia. 4 Units.**

Examines the cultures and political conflicts of the more than 130 indigenous ethnic groups in the European and Asian territories of the former U.S.S.R. Emphasis is on the theoretical issues of ethnicity, nationalism, and conflict management.

Same as INTL ST 162B, ANTHRO 164P.

**(VIII)****POL SCI 154G. Conflict Resolution in Cross-Cultural Perspective. 4 Units.**

Examines theories of conflict management. Analyzes how conflict is mitigated in diverse cultures: at the interpersonal level, between groups, and on the international scale. Students discuss readings, hear from conflict management practitioners, and simulate negotiations.

Same as ANTHRO 136D, SOC SCI 183E, INTL ST 183E.

**(VIII)****POL SCI 154J. Jews and Power. 4 Units.**

Examines the relationship between the Jewish people and political power over a 3500 year period. How have Jews preserved their communal interests and personal safety? How have they defined the proper relationship of the people to political authority.

Same as HISTORY 130F, REL STD 130F.

**POL SCI 154KW. US Government in Comparative Perspective. 4 Units.**

Introduction to the United States in comparative perspective, covering general features of the United States and other countries, such as institutional design and policy choices. Addresses the debates about American exceptionalism and American decline.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Political Science Majors have first consideration for enrollment.

**(Ib)**

**POL SCI 155C. Organizations. 4 Units.**

How bureaucracies, formal organizations, and voluntary associations work, how/why they grow, and where they are going. History and structure of organizational rationality; dynamics of organized groups; behavior in organizations; limits of bureaucratization and attempts to overcome these limits through decentralization.

Same as SOCIOL 141.

Restriction: Sociology Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment.

**POL SCI 156A. Political Participation. 4 Units.**

The ways in which people in various political systems take part in politics, especially in activities directed toward affecting outcomes. Who is active, what they do, why they do it, and what difference it makes.

**POL SCI 156D. Protests, Movements, and Revolutions. 4 Units.**

A survey of models of collective action drawn from sociology, economics, psychology, and political science. Focus on areas such as social movements, strikes, crowd psychology, cults, fads, fashions, public opinion, and symbolic and mythical elements in collective culture.

Prerequisite: SOCIOL 1 or POL SCI 11A or ECON 1

Same as SOCIOL 174.

Restriction: Political Science Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**POL SCI 157B. International Divided Cities. 4 Units.**

Investigates urban divisions in international cities where deep-seated nationalistic ethnic differences create pressures for intergroup conflicts, autonomy, or territorial separation, and can incite violence. Urban political polarization as it is manifest in the urban setting.

Same as UPPP 178, SOCIOL 176.

**POL SCI 158D. Introduction to Contemporary Middle East Politics. 4 Units.**

An overview of basic issues that shape the politics of the Middle East and North Africa. Themes include implication of the colonization era, nation-state formation, inter-Arab relations, nationalism, Arab-Israel conflict, Islamic resurgence, and more.

Same as SOC SCI 188A, INTL ST 165.

**POL SCI 159. Special Topics in Comparative Politics. 4 Units.**

Studies in selected areas of comparative politics. Topics addressed vary each quarter.

Repeatability: May be repeated for credit unlimited times.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 169. Special Topics in Race and Ethnicity Politics. 4 Units.**

Studies in selected areas of race and ethnicity. Topics vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 171AW. Law and Society. 4 Units.**

Law and its various roles in society. The nature and meaning of law; legality and power in the American system; law as a mechanism for social change; the role of law in dispute processing, social control, compliance with judicial decisions.

Prerequisite: POL SCI 71A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Political Science Majors have first consideration for enrollment.

(Ib)

**POL SCI 171CW. Comparative Constitutional Politics. 4 Units.**

Examines the impact of constitutional courts on politics and policy-making in Canada, France, Germany, and the United States. Cases may focus on the constitutional politics of free speech, abortion, rights to property, and the conduct of foreign relations.

Prerequisite: POL SCI 71A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Political Science Majors have first consideration for enrollment.

(Ib)

**POL SCI 171D. American Constitutional Law. 4 Units.**

American constitutional interpretation of cases involving separation of powers, federal-state relations, rights of property, free expression, privacy, criminal due process, political participation, and equality. Includes legal research methods, development of judicial review, legal reasoning, and impact of Supreme Court decisions.

Prerequisite: POL SCI 71A

Overlaps with CRM/LAW C122.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 171F. Law in the Twenty-First Century. 4 Units.**

Examines the complex relationship between law, the social sciences, and modern society. Lectures explore such issues as the interplay between technology and constitutional rights, the impact of science on law, and the evolving roles of attorneys and judges.

Same as SOC SCI 172D.

Restriction: Political Science Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

**POL SCI 171G. Legal Implications of the Drug Trade. 4 Units.**

Examines United States policy to combat domestic and international narcotics trafficking. Analyzes the national drug policy and program implementation by federal and state agencies. Considers the effects of these policies on our individual constitutional rights and the criminal justice system.

**POL SCI 172A. International Law. 4 Units.**

Examination of the origin, changing structure, application of international law, and the role of legal norms in regulating the behavior of states and maintaining international order.

Prerequisite: POL SCI 71A

Same as INTL ST 145A.

**(VIII)**

**POL SCI 174A. Civil Liberties. 4 Units.**

Political analysis of selected Supreme Court cases involving claims under the Bill of Rights and the Fourteenth Amendment. Topics include: race, sex, and other forms of discrimination; criminal justice; privacy; freedom of speech and related claims.

Prerequisite: POL SCI 71A

Overlaps with CRM/LAW C122.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 174C. U.S. Supreme Court. 4 Units.**

Overview and analysis of the role played by the U.S. Supreme Court in the American political system. Judicial review, appointment of justices, judicial activism and judicial restraint, process of case selection, court deliberation, and decision-making, impact of Supreme Court decisions.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 174CW. U.S. Supreme Court. 4 Units.**

Overview and analysis of the role played by the U.S. Supreme Court in the American political system. Judicial review, appointment of justices, judicial activism and judicial restraint, process of case selection, court deliberation, and decision-making, impact of Supreme Court decisions.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Political Science Majors have first consideration for enrollment.

**(Ib)**

**POL SCI 175. The Bill of Rights in Film. 4 Units.**

Focuses on ways American cinema has portrayed, represented, and analyzed U.S. Bills of Rights. Juxtaposes cinematic presentations on specific Bill of Rights clauses, treating films as cultural texts, with pertinent judicial decisions and more scholarly appraisals of those same provisions.

**POL SCI 179. Special Topics in Public Law. 4 Units.**

Studies in selected areas of public law. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI H180D. Honors Seminar in Political Science. 2-4 Units.**

Course for students enrolled in the Honors Program in Political Science.

Prerequisite: Only open to students in the Political Science Honors Program.

Repeatability: May be repeated for credit unlimited times.

**POL SCI H182A. Honors Thesis Workshop. 4 Units.**

A weekly seminar/workshop to facilitate the exchange of ideas and research strategies among students and to review their progress in writing the thesis.

Restriction: Open only to students in the Political Science Senior Thesis program.

**POL SCI 190W. Senior Thesis. 4 Units.**

Thesis research with Political Science faculty.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 3 times.

**(Ib)****POL SCI 197. Field Study. 1-4 Units.**

Field study with Political Science faculty.

Repeatability: Unlimited as topics vary.

**POL SCI 198. Directed Group Study. 1-4 Units.**

Directed group study with Political Science faculty.

Repeatability: Unlimited as topics vary.

**POL SCI 199. Independent Study. 1-4 Units.**

Independent study or research with a Political Science faculty member.

Repeatability: May be repeated for credit unlimited times.

**POL SCI 209A. Study of Democracy Colloquium. 1.33 Unit.**

Skills critical to professional success. Students learn and practice professional presentation skills, develop substantive knowledge in the field by attending talks and panels, and interact with scholars and professionals in the field.

Restriction: Graduate students only. POL SCI 209A may not be taken for credit if taken after SOCIOL 229.

**POL SCI 209B. Study of Democracy Colloquium. 1.33 Unit.**

This colloquium teaches students skills critical to professional success. Students learn and practice professional presentation skills and develop substantive knowledge in the field by attending talks and panels and interacting with scholars and professionals in the field.

Restriction: Graduate students only. POL SCI 209B may not be taken for credit if taken after SOCIOL 229 Democracy.

**POL SCI 209C. Study of Democracy Colloquium . 1.34 Unit.**

This colloquium teaches students skills critical to professional success. Students learn and practice professional presentation skills and develop substantive knowledge in the field by attending talks and panels and interacting with scholars and professionals in the field.

Restriction: Graduate students only. POL SCI 209C may not be taken for credit if taken after SOCIOL 229 Democracy.

**POL SCI 210A. Colloquium. 1.3 Unit.**

Doctoral training requires more than learning substantive debates and research methods; it also requires students learn professional practices, routines, and expectations. This year-long workshop offers students a mix of professional development, outside speakers, and casual conversations with departmental faculty.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**POL SCI 210B. Colloquium. 1.3 Unit.**

Doctoral training requires more than learning substantive debates and research methods; it also requires students learn professional practices, routines, and expectations. This year-long workshop offers students a mix of professional development, outside speakers, and casual conversations with departmental faculty.

Prerequisite: POL SCI 210A

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**POL SCI 210C. Colloquium. 1.4 Unit.**

Doctoral training requires more than learning substantive debates and research methods; it also requires students learn professional practices, routines, and expectations. This year-long workshop offers students a mix of professional development, outside speakers, and casual conversations with departmental faculty.

Prerequisite: POL SCI 210B

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**POL SCI 212A. Public Opinion. 4 Units.**

Introduction to the study of U.S. public opinion. Provides an overview of the theories regarding opinion formation, the methodologies employed, and the role of public opinion in democratic governments.

Restriction: Graduate students only.

**POL SCI 212B. Ethics Workshop. 4 Units.**

Students find an important question in ethics, search literature to assess topic's importance, pose question to be researched, propose method of analysis and type of data, analyze data, and note how their works contribute to knowledge in the field.

**POL SCI 219. Special Topics in Politics and Society. 4 Units.**

Current research in politics and society.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**POL SCI 221A. Public Policy. 4 Units.**

Explores different approaches to public policy analysis, the diverse conceptions of the goals and objectives that should be served by policy, and the appropriate role of the policy analyst. Policy consequences are traced to indirect and subtle incentives and disincentives.

Same as CRM/LAW C255, UPPP 221.

Restriction: Graduate students only.

**POL SCI 223A. Theories of Power and Empowerment. 4 Units.**

Studies different ways of thinking about power and its uses. Explores theories of power that inform various notions of empowerment, including resistance, participatory democracy, and workplace empowerment.

Same as MGMTPHD 297R, UPPP 279.

Restriction: Graduate students only.

**POL SCI 229. Special Topics in American Politics. 4 Units.**

Current research in American Politics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.



**POL SCI 231A. Political Epistemology. 4 Units.**

Focuses on fundamental issues of knowledge in the study of politics, especially interconnections and tensions between politics and knowledge. Counts as the Field Seminar in Political Theory.

Restriction: Graduate students only.

**POL SCI 231B. Theories of Textual Interpretation. 4 Units.**

Examination of different theories of textual interpretation, including Straussian, hermeneutical, poststructuralist, feminist, postcolonial, and critical race theories. Key questions include: How does one go about the task of interpreting texts? What makes one interpretation better or more insightful than another.

Restriction: Graduate students only.

**POL SCI 232A. Introduction to Voting Theory. 4 Units.**

Introduction to voting modules. Substantive topics include majority rule, voting methods and their properties, apportionment and proportional representation, agenda manipulation, coalition formation, voting power, political consequences of electoral laws.

Restriction: Graduate students only.

**POL SCI 238D. The Moral Life During War. 4 Units.**

Can people keep their humanity during war? What does the term humanity signify when simply surviving requires faith, courage, and desperation? When facing wartime brutality must we abrogate morality? What does it mean to compose a moral life during war?.

Restriction: Graduate students only. Political Science Majors have first consideration for enrollment.

Concurrent with POL SCI 138DW.

**POL SCI 239. Special Topics in Political Theory. 4 Units.**

Current research in political theory. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**POL SCI 241B. Seminar in International Relations Theory. 4 Units.**

Overview of the major theories guiding research and scholarship in international relations. Focus on major conceptual approaches (realism, neoliberalism, marxism) and levels of analysis (systemic, state, and subnational), as well as on methodological/epistemological debates engulfing the field.

Restriction: Graduate students only.

**POL SCI 241E. Research Design in International Relations. 4 Units.**

Surveys research design primarily through substantive readings in international relations. The purpose is to familiarize students with choices/dilemmas relevant to IR-specific research. Students at various stages in the graduate program and with different methodological orientations are welcome.

**POL SCI 249. Special Topics in International Relations. 4 Units.**

Current research in international relations. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**POL SCI 252G. Theories and Practice of Migration and Citizenship. 4 Units.**

Examines theories of migration and citizenship. In examining these themes, the course includes discussion of theory development, multi-method testing, and case study comparison with a focus on Western Europe and other advanced democratic receiving states.

**POL SCI 254A. Introduction to Game Theory. 4 Units.**

Introduction to non-cooperative games. The prisoner's dilemma, Nash equilibrium, sequential games, subgame perfection. Applications include collective action, agenda-setter models, spatial competition of political parties, models of revolution and arms race.

Restriction: Graduate students only.

**POL SCI 259. Special Topics in Comparative Politics. 4 Units.**

Current research in comparative politics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**POL SCI 260B. Political Participation. 4 Units.**

Examines theoretical approaches to the explanation of the pattern of participation and consideration of the results of empirical studies of such activity by mass publics (mainly in Europe and North America). Addresses issues in both comparative politics and political behavior.

Restriction: Graduate students only.

**POL SCI 273A. Advanced Qualitative Methods: Analyzing Qualitative Data. 4 Units.**

Introduction to the theory and practice of analyzing qualitative data. Students must have already learned about data collection and research design for qualitative research and must have qualitative data they can analyze.

Same as MGMPHD 297K, UPPP 213.

Restriction: Graduate students only.

**POL SCI 276. Predictive Models in Social Sciences. 4 Units.**

Basic numeracy (logarithms, fixed-exponent and exponential formats, graphing). Models based on ignorance and logical constraints. Logical quantitative models (how things should be) to complement and guide statistical analysis (how things are).

**POL SCI 285A. Introduction to Political Psychology I. 4 Units.**

Reviews theoretical questions regarding the relationship between the analytical and normative and the polity. Considers relationships between the analytical and normative concerns of psychology and political science, addressing empirical literatures on political socialization, ideology and public opinion, identity and nationality.

**POL SCI 290. Dissertation Research. 1-12 Units.**

Dissertation research with Political Science faculty.

Repeatability: Unlimited as topics vary.

**POL SCI 299. Independent Study. 1-12 Units.**

Independent research with Political Science faculty.

Repeatability: Unlimited as topics vary.

## Portuguese (PORTUG)

### Courses

**PORTUG 121. Topics in Luso-Brazilian Literature. 4 Units.**

In English. Contextualized study of a major author, current, or genre in Brazilian, Portuguese, and/or Lusophone African literature. Examples: Gender, Race, and Sexualities in Postcolonial Lusophone Literatures; Women and Writing in Brazil and Portugal; The Short Story.

Repeatability: Unlimited as topics vary.

**PORTUG 243. Studies in Luso-Brazilian Literature and Culture. 4 Units.**

Critical analysis of selected literary works from Portugal and/or Brazil. Contextualizes the works within their historical and literary specificity, and discusses pertinent theoretical issues raised by them. Taught in Portuguese.

Prerequisite: Reading knowledge of Portuguese.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

# Psychological Science (PSCI)

## Courses

### **PSCI 9. Introduction to Psychology. 4 Units.**

Introduction to field of psychology, addressing the application of scientific methods to the study of human development, learning, memory, problem solving, perception, biological mechanisms, emotions and motivation, personality, psychopathology, and effects of diverse social and cultural contexts on human behavior.

Same as PSYC 7A.

Overlaps with PSYC 9A, PSYC 9B, PSYC 9C, PSCI 11A, PSCI 11B.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment. PSCI 9 and PSYCH 7A may not be taken for credit if taken concurrently with or after PSCI 11A, PSCI 11B, PSCI 11C, PSYCH 9A, PSYCH 9B, or PSYCH 9C.

(III)

### **PSCI 11A. Psychology Fundamentals. 4 Units.**

Designed to provide freshman with an in-depth survey of general psychology. Topics include biological bases of behavior, sensation, perception, cognition, development, personality, psychopathology, and social psychology.

Same as PSYC 9A.

Restriction: Lower-division students only. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. PSCI 9 and PSYCH 7A may not be taken for credit if taken after PSCI 11A, PSCI 11B, PSCI 11C, PSYCH 9A, PSYCH 9B, or PSYCH 9C.

(III)

### **PSCI 11B. Psychology Fundamentals. 4 Units.**

Designed to provide freshmen with an in-depth survey of general psychology. Topics include biological bases of behavior, sensation, perception, cognition, development, personality, psychopathology, and social psychology.

Same as PSYC 9B.

Restriction: Lower-division students only. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

(III)

### **PSCI 11C. Psychology Fundamentals. 4 Units.**

Designed to provide freshman with an in-depth survey of general psychology. Topics include biological bases of behavior, sensation, perception, cognition, development, personality, psychopathology, and social psychology.

Same as PSYC 9C.

Restriction: Lower-division students only. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

(III)

**PSCI 100. Special Topics in Social Behavior. 4 Units.**

Course content varies with interest of instructor.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Repeatability: Unlimited as topics vary.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 101D. Life Span Developmental Psychology. 4 Units.**

Addresses the major issues, concepts, and methods of life span developmental psychology. The fundamental theories, distinctive methods, and the physical, perceptual, cognitive, social, motivational, and emotional development for each developmental phase of the life course are considered.

Prerequisite: PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment.

**PSCI 102C. Abnormal Psychology. 4 Units.**

Survey of disorders organized by the diagnostic categories of the American Psychiatric Association. Interdisciplinary orientation combines environmental, psychological, and organic perspectives on etiology and treatment.

Prerequisite: (PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C) and SE 10

Overlaps with PSYC 120A.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment.

**PSCI 103H. Health Psychology. 4 Units.**

Theory and research are considered as they contribute to an understanding of the role of psychological processes in health and illness. The distinction between prevention and treatment of illness is established, and a variety of psychosocial interventions are elaborated.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment.

**PSCI 104S. Social Animal: An Introduction to Social Psychology. 4 Units.**

Theories and research exploring social behavior and social influences on behavior. Topics include methods of social research, attitude formation and change, social perception, the social self, stereotypes and prejudice, conformity, obedience, altruism, aggression, interpersonal relationships and love, and group behavior.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment.

**PSCI 110D. Infant Development. 4 Units.**

Study of human development from conception through the first two years of life, covering processes and events in the domains of physical, social, and cognitive development.

Prerequisite: PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 111D. Child Development. 4 Units.**

Examines social, emotional, and intellectual growth and development between the ages of 2 and 12 years.

Prerequisite: PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B

Overlaps with PSYC 120D.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 111W. Advanced Research Methods. 4 Units.**

For students planning to conduct senior research projects or apply to graduate school in social research fields. Topics include reviewing literature, preparing a research proposal, protecting human subjects, citing scholarly work, building measures, estimating sample size, interview and presentation skills.

Prerequisite: SE 10 and SE 13. Satisfactory completion of the Lower-Division Writing requirement.

Same as CLS C169W, SE 111W, UPPP 114W.

(Ib)

**PSCI 112D. Adolescent Development. 4 Units.**

Examines current research on the biological, social, and cultural contexts of adolescent development. Topics include the impacts of puberty, adolescents' decision-making competencies, changes in family and peer relationships, identity development, and psychosocial problems such as depression and problem behavior.

Prerequisite: PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B

Overlaps with PSYC 21A.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 113D. Adult Development. 4 Units.**

Examines why and how we change (with attention to gains as well as losses) from ages 18-65 and the nature and sources of continuity over time. Topics include physical and intellectual functioning, personality, coping strategies, and social roles and relationships.

Prerequisite: PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 115D. Cognitive Development. 4 Units.**

Examines theories on nature of cognitive development. Discusses behaviorist theories on role of the environment including those of Vygotsky and Piaget, and recent evidence from cognitive psychologists stressing the importance of knowledge and skills within specific domains.

Prerequisite: PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 116D. Human Development and Cross-Cultural Perspectives. 4 Units.**

Human development in diverse cultures (e.g., Asian, American, and African). Special emphasis on East-West contrasts and when East meets West (i.e., Asian-American experiences). Topics include parenting, family relations, language and cognition, schooling and academic achievement, and morality.

Prerequisite: (PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B) and SE 10

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 117D. The Psychology of Gender. 4 Units.**

Discussion of gender identity development and examination of gender differences and similarities across the life span. Consideration of the biology and psychology of gender in relation to physical, behavioral, personality, and intellectual capabilities.

Prerequisite: PSCI 9 or PSYC 9B or PSCI 11B or PSYC 7A

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 118D. Human Sexuality. 4 Units.**

A broad survey of human sexuality encompassing genetic factors, physiological and anatomical development, customary and atypical forms of behavior, reproductive processes, and cultural determinants.

Prerequisite: PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 121D. Work and Family. 4 Units.**

Effects of employment and unemployment on mental health and marital quality; effects of work on parenting and child development; corporate and social policies for 'families that work'; young adults' decision-making about work and family.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Upper-division students only. Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 126D. Development of Motivation Across the Lifespan. 4 Units.**

Introduces major concepts in life-span development of motivation and self-regulation, and discusses exemplar empirical findings pertaining to these concepts during the various phases of life. Students participate in discussion, present findings from research articles, and write a paper.

Restriction: Psychological Science Majors only. Psychology and Social Behavior Majors only. Social Ecology Majors only.

**PSCI 127D. Attachment Relationships. 4 Units.**

Students learn about the development of attachment-related needs throughout development, as well as the links between attachment and emotion, psychopathology and treatment. Lectures emphasize classic as well as cutting-edge research and are supplemented by primary source readings.

Prerequisite: PSCI 9 or PSYC 7A or PSCI 11A or PSYC 9A or PSCI 11B or PSYC 9B

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 134H. The Science and Practice of Wellness and Resilience . 4 Units.**

Wellness is a common, but elusive goal. Covers the history, theory, psychology, and behavioral science behind skills for wellness and resilience. Provides opportunities to practice the strategies to help further understanding of the behavioral nature of each of the areas.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors only. Psychology and Social Behavior Majors only. Social Ecology Majors only.

**PSCI 136H. Behavioral Medicine. 4 Units.**

Examines biobehavioral aspects of health and illness, focusing on how stress contributes to or exacerbates disease processes. Background information on psychosomatic medicine and stress models and detailed examination of specific organ systems emphasizing the reactivity of these systems to stress.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 137H. Human Stress. 4 Units.**

Stress as a multidisciplinary topic. Biological, psychological, and sociological approaches to adaptation-related disorders. Effects of acute and chronic stress on emotions, physiology, and behavior. Methods of stress assessment, stress reduction, and intervention.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 138H. Child Health Psychology. 4 Units.**

Exploration of psychological antecedents, concomitants, and consequences of medical illnesses in children. Children's beliefs about health, illness, and medication; the role of stress; coronary-prone behavior; therapeutic adherence and physician-patient interaction; coping with chronic illness; effects of child's illness on family.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 9C or PSYC 7A. Recommended: SE 10.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 139H. Clinical Sport Psychology. 4 Units.**

An interdisciplinary introduction to clinical sport psychology, that includes, among other things, an introduction to psychopathology in sport; plus the use of psychological skills training, including anxiety reduction techniques, visualization, self-efficacy, coping skills, concentration, and goal-setting in sports.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Overlaps with PSYC 124S.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 140H. The Hardiness Approach to Stress Management. 4 Units.**

New development within psychology involving a combination of motivations and skills that extensive research has shown enhances performance, conduct, morale, stamina, and health. Combines study of hardiness research with strategies for improvement of personal hardiness through a series of exercises.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 141H. Clinical Health Psychology. 4 Units.**

Behavioral role in etiology, treatment, and prevention of certain diseases. Behavioral intervention including biofeedback, stress-, pain-management, health habit counseling, and other skills to assist patients make cognitive, emotional, and behavioral changes needed to cope with disease or achieve better health.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Same as PUBH 141.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 142H. Introduction to Interdisciplinary Salivary Bioscience . 4 Units.**

Introduction to the integration of salivary analytes into developmental, social, behavioral, and health sciences. Lectures cover theoretical perspectives; oral fluid as a biological specimen; saliva collection and study design; basics of salivary assay methods; and research findings across multiple fields.

Restriction: Psychological Science Majors only. Psychology and Social Behavior Majors only. Social Ecology Majors only.

**PSCI 150C. Clinical Psychology. 4 Units.**

Overview of theories, assessment techniques, research methodologies, and intervention approaches in clinical psychology. Psychodynamic, behavioral, humanistic, and cognitive perspectives are examined along with ethical and professional issues.

Prerequisite: (PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C) and PSCI 102C

Overlaps with PSYC 122C.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 152C. Clinical Child Psychology. 4 Units.**

Examines research and theory concerning childhood psychopathology behavior disorders. Diagnosis and assessment, early identification of high-risk children, fears and phobias, antisocial behavior, childhood psychoses, autism, depression, attention deficit/hyperactivity disorders, and ethical and policy implications of identifying children who are different.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.



**PSCI 153C. Developmental Psychopathology. 4 Units.**

Research and theory of origins, course, and outcomes of disordered behavior. Continuity and change in patterns of behavior; environmental challenges and buffers; stress/competence in children; vulnerable/invincible children; children of mentally ill parents; families at risk; childhood antecedents of adult disorders.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C. Recommended: SE 10.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 154C. Cognitive Behavior Therapy. 4 Units.**

Presentation of principles and procedures of therapeutic interventions based on cognitive-behavior methods. Cognitive factors in learning, emotional arousal, psychological disorder, and psychotherapy reviewed. Introduces the application of cognitive behavioral methods to problems of depression, anxiety, anger, pain, and impulsivity.

Prerequisite: PSCI 9 or (PSCI 11A and PSCI 11C) or PSYC 7A or (PSYC 9A and PSYC 9C)

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 155C. Child Therapies. 4 Units.**

Examines research methodologies, empirical data, and implications of diverse intervention strategies. Primary topics include psychotherapy process and outcome, family therapies, behavioral intervention, cognitive behavior modification, pediatric psychopharmacology, and ethical and social policy implications of intervening in other people's lives.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 156C. Forensic Psychology: Advanced Seminar. 4 Units.**

Focuses on the psychology of criminal offending, particularly violent behavior. Examines violence, sexual offending, and mental disorder related to crime with regard to clinical assessment and treatment; mental health services within forensic institutions.

Prerequisite: (PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C) and PSCI 102C and (PSCI 178S or CLS C149)

Same as CLS C136, PSYC 177F.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 160C. Clinical Neuroscience. 4 Units.**

An introduction to the neuroclinical bases of human behavior, including neuropsychological approaches to mental disorders. Also includes case formulations, research articles, therapeutic approaches, and other discussions related to select psychopathology and other neurobehavioral topics.

Prerequisite: PSCI 9 or PSYC 7A or PSCI 11A or PSYC 9A or BIOL 99

Same as BIOL N170.

Restriction: Psychological Science Majors have first consideration for enrollment. Biological Sciences Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 161C. Forensic Psychology . 4 Units.**

Forensic psychology is the interface between clinical psychology and the law. Emphasizes clinically relevant legal topics (insanity defense; competency to stand trial) and includes critical thinking about issues that arise when psychologists are involved in legal proceedings.

Prerequisite: PSCI 9 or PSCI 11B or PSCI 11C

Same as CLS C160.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.



**PSCI 162C. Psychodynamic Studies. 4 Units.**

Introduction to contemporary psychodynamic studies. Emphasis on clinical concepts associated with psychodynamic psychotherapy, including unconscious determinants of behavior, typical defenses, life experiences, and techniques. Exploration of links between psychodynamic-oriented psychotherapy and other disciplines (e.g., psychology, music, medicine, neuroscience, film).

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 163C. Human Neuropsychology. 4 Units.**

A survey of human brain disorders using a clinical case study approach to illustrate fundamental issues in studying brain and behavior. Topics include sensory deficits, attentional neglect, amnesia, cortical organization, clinical psychopathology, and more.

Prerequisite: BIOL N110 or BIOL N115A or PSYC 9A or PSCI 11A

Same as BIOL N173, PSYC 162N.

Restriction: School of Biological Sciences students have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSCI 164C. Addiction. 4 Units.**

Designed for those with an interest in the nature and treatment of addiction. Focuses on the etiology and treatment of addiction, but does not prepare students to treat substance abuse disorders.

Prerequisite: PSCI 11A and PSCI 11B and PSCI 11C and PSCI 102C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 165C. Adult Psychopathology. 4 Units.**

Advanced course in abnormal psychology, focusing on adult psychopathology. Covers historical and fundamental issues about psychiatric disorders, clinical research on disorders of anxiety, PTSD, mood, psychoses, personality, and dementia, and their biopsychosocial features, and attends to assessment and treatment.

Prerequisite: PSCI 102C. Equivalent to PSCI 102C is also accepted.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 166S. Chicano/Latino Families. 4 Units.**

Introduction to the research, literature, and issues surrounding the topic of Chicano/Latino families including cultural history, contemporary issues, organization of family, traditions, lifestyles, values, beliefs, generational differences, gender issues, ethnic identity, evolution of demographic patterns, current economic and political standings.

Same as CHLT 170, SSCI 165, PSYC 174H.

**PSCI 170S. Personality. 4 Units.**

Comparison of the major theories of personality. Provides a frame of reference for understanding lifestyles, development, maturity, and psychopathology. Emerging research themes are used to identify promising lines of personality theorizing.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Overlaps with PSYC 120P.

Restriction: Upper-division students only. Sophomores only. Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 171S. Environmental Psychology. 4 Units.**

Impact of the physical environment on individual and group behavior. Three basic concerns examined: (a) environmental determinants of behavior at the individual and interpersonal level; (b) social planning and urban design; (c) methodological approaches to the study of environmental issues.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 173S. Social Relationships. 4 Units.**

Examines major issues, concepts, and methods in the scientific study of social relationships. Topics include relationship formation and dissolution, friendships and love relationships, loneliness, bereavement, societal influences on close relationships, significance of close relationships for health and well-being.

Prerequisite: (PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C) and SE 10

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 174S. Error and Bias in Social Judgement. 4 Units.**

Examines how people encode, reason about, and remember social information and explores how biases and shortcomings in social perception, judgment, and memory are central to understanding both effective social functioning and many forms of maladaptive behavior and social conflict.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 176S. Motivation. 4 Units.**

History, major theories, methods, and applications of motivational psychology, with emphasis on European approaches. Origins of the field in personality, learning, cognition, and activation research. Recent innovations in motivational and volitional self-recognition. Current approaches, major debates, empirical research programs.

Prerequisite: (PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C) and PSCI 101D and (PSCI 104S or UPPP 151)

Overlaps with PSYC 121M.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 178S. Violence in Society. 4 Units.**

Current theory and research on aggression; anger and violence as problems in individual and social functioning. Process and functions of anger examined with regard to normal behavior and psychopathology. The determinants, prevalence, and implications of violence in society are analyzed.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Same as CLS C149.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment.

**PSCI 179S. Cultural Psychology. 4 Units.**

An examination of culture's influence on human minds. Topics include culture's impact on perception, cognition, motivation, emotion, moral reasoning, communication, and health. Addresses cultural psychology's methods, history, and place within psychology and related fields.

Prerequisite: PSCI 9 or PSCI 11B or PSCI 11C or PSYC 7A or PSYC 9B or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 183S. Social Epidemiology. 4 Units.**

Overviews evidence linking environmental factors to mental and physical disorders including such variables as socioeconomic status, income inequality, work stress, job loss, social capital, location, and other demographic characteristics. Measurement and research design issues of both individual and aggregate levels.

Prerequisite: (PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C) and SE 10 and SE 13

Same as PUBH 102.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 184S. Positive Psychology . 4 Units.**

The field of positive psychology focuses on what is right and positive about people and institutions. Introduces findings associated with human strengths and positive emotions, and provides clinical and personal applications and implications.

Prerequisite: PSCI 9 or PSCI 11C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 185S. Industrial-Organizational Psychology. 4 Units.**

Examines the application of social psychology to organizational settings. Topics include motivation of workers, group decision-making, leadership styles, career management, and organizational development.

Prerequisite: PSCI 9 or PSCI 11A or PSCI 11B or PSCI 11C or PSYC 7A or PSYC 9A or PSYC 9B or PSYC 9C

Overlaps with PSYC 122I.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 187S. Psychology of Inequality. 4 Units.**

Focuses on the psychological dimensions of poverty, wealth, and economic inequality.

Prerequisite: PSCI 104S and PSCI 11C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 188S. Evolutionary Psychology. 4 Units.**

Understanding our evolutionary origins is critical to truly understanding the complexities of human psychology. Explores how Darwinian principles, applied to both genes and culture, can help us understand not just how the mind works, but why.

Prerequisite: PSCI 11C or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 190. Applied Statistics in Social and Behavioral Research. 4 Units.**

Covers statistical techniques used to describe and make generalizations about phenomena represented by data. Hands-on experience in data analysis and interpretation using statistical software (SPSS, STATA) is emphasized. Topics include data visualization, ANOVA, multiple regression, and categorical data analyses.

Prerequisite: SE 13

Same as CLS C190, SE 190, UPPP 190.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**PSCI 192B. The Science and Practice of Compassion. 4 Units.**

Explores the latest scientific research on compassion and its correlates, and considers practical strategies for increasing compassion in everyday life. Students discover how cutting-edge research is yielding insights into kindness, empathy, altruism, and compassion.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 192Q. Chicano/Latino Social Psychology. 4 Units.**

Examines theories, research, and major issues of relevance to understanding social psychological processes in Chicano/Latino populations. Topics include social development, cultural orientations, gender and sexuality, close relationships, happiness and well-being, stereotyping, prejudice and discrimination, and mental and physical health.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as CHLT 168.

Restriction: Psychological Science Majors have first consideration for enrollment. Chicano/Latino Studies Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**(VII)****PSCI 192T. Cognition and Learning in Educational Settings. 4 Units.**

Foundational concepts in cognition and development as applied to student learning. Primary topics include historical behaviorism, basic cognitive structure and processes, complex cognition, cognitive development, and motivation.

Same as EDUC 173.

Restriction: Psychological Science Majors have first consideration for enrollment. Education Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 192U. Psychology of Learning, Abilities, and Intelligence. 4 Units.**

Overview of classic positions on the mind, human abilities, and intelligence, especially as related to academic achievement. Contrasting views: psychometric versus information processing; experimental versus correlational research.

Prerequisite: PSYC 7A or PSCI 9 or PSCI 11A or PSCI 11B or PSCI 11C

Same as EDUC 176.

Restriction: Psychological Science Majors have first consideration for enrollment. Education Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 192V. Language and Literacy. 4 Units.**

Addresses the linguistic principles and processes that underlie oral and written language proficiency. Emphasis is on how to use phonology, morphology, orthography, semantics, syntax, and pragmatics to support literacy and oral language development for K-12 students.

Same as EDUC 151, LSCI 182V.

Restriction: Language Science Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Education Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 193B. Juvenile Delinquency. 4 Units.**

Patterns of delinquent behavior, theories that explain behavior, current research aimed at enhancing exploratory power. Attempts to prevent and control delinquency are put in historical perspective. Development of the current juvenile justice system and evolution of modern juvenile law.

Same as CLS C109.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment.

**PSCI 193C. Social Control of Delinquency. 4 Units.**

Assumes familiarity with theories of delinquency, the juvenile justice system, and elements of juvenile law. Explores socio-historical origins and evolution of juvenile justice, current research and policy on delinquency prevention and treatment, and future directions of law, policy, and practice.

Prerequisite: Recommended: CLS C109.

Same as CLS C164.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 193E. Psychology and the Law. 4 Units.**

Psychological assumptions of the American legal system and mental health aspects of provision of criminal justice services. Civil commitment, insanity defense, competence to stand trial, jury selection, eyewitness identification. Use of police, courts, correctional institutions in prevention of behavior disorder.

Same as CLS C105.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment.

**PSCI 193F. Family Law. 4 Units.**

Examines legal issues surrounding marriage, cohabitation, divorce, child custody and support, adoption, and the rights of parents and children in the family context. The findings of social science research are used to illuminate the legal issues.

Same as CLS C123.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 193G. Eyewitness Testimony. 4 Units.**

Faulty eyewitness testimony is a major cause of wrongful convictions. Covers the fast-growing topic of eyewitness testimony and memory for real-world events, both how psychologists study eyewitness capacity, and how the legal system has dealt with eyewitness issues.

Prerequisite: SE 10

Same as CLS C177.

Restriction: Seniors only. Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

Concurrent with CLS C263.

**PSCI 196. Research Seminar in Psychological Science . 4 Units.**

Special topics research seminar. Content varies with interest of instructor. Capstone seminar for students who have conducted research with, or have a background in, the research topics of the PSCI faculty member offering this seminar in a given quarter.

Prerequisite: PSCI 11C

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**PSCI P200. Introduction to Legal and Forensic Psychology . 4 Units.**

Familiarizes students with the interrelated fields of psychology, law, and forensic studies. Emphasizes clinically relevant legal topics (insanity defense; competency to stand trial) and includes critical thinking about issues that arise when psychologists are involved in legal proceedings.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P201. Research Methods in Psychology. 4 Units.**

In-depth examination of the conceptualization of research problems and linkages between theory and the design of appropriate strategies for empirical research in psychological science. Topics include experimental and quasi-experimental designs, reliability and validity of measurement and non-experimental procedures.

Restriction: Graduate students only. Psychological Science Majors only. Psychology and Social Behavior Majors only.

**PSCI P202. Data Analysis and Statistics . 4 Units.**

Statistical techniques to facilitate inferences in psychological research, including fundamentals of statistical inference and methods for analyzing data.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P204. Adolescence. 4 Units.**

Considers pubertal and cognitive changes and their social consequences; the family, peer group, school, and cultural contexts in which adolescence is embedded; and selected psychosocial issues including autonomy, identity, health, and well-being.

Restriction: Graduate students only.

**PSCI P208. Research Methods. 4 Units.**

In-depth examination of issues relevant to designing and evaluating research in psychological science. Topics address casual inference, ethical issues surrounding the responsible conduct of research, experimental and quasi-experimental designs, reliability and validity of measurement, and non-experimental procedures.

Overlaps with PSCI P201.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P209A. Applied Psychological Research. 4 Units.**

Focuses on scientific and professional issues in the field of psychology. Topics include communication skills; intervention approaches; collaboration, consultation, and referral; and ethical issues associated with at-risk populations research.

Restriction: Graduate students only.

**PSCI P214. Seminar in Social Psychology. 4 Units.**

Presents an overview of selected theoretical and empirical topics in social psychology including social influence and conformity, altruism and aggression, persuasion and attitude change, self and social perception, and social cognition.

Restriction: Graduate students only.

**PSCI P215. Psychology and Law . 4 Units.**

An interdisciplinary approach to research in psychology, law, and/or criminology. Examines how psychology is applied to the civil and criminal justice systems, how case law shapes this application, and how legal decisions affect the direction of psychological research.

Overlaps with PSCI P266.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P217. Life-Span Development. 4 Units.**

Introduces the major concepts of life-span development and discusses those with regard to some key topics of developmental psychology. For example, change and continuity, evolutionary and inherited nature, culture, society, and family-based nurture, and their dynamic interaction.

Restriction: Graduate students only.

**PSCI P220. Developmental Psychology: Theories and History. 4 Units.**

Examines key concepts, theories, and the historical and philosophical roots of research in human life span development. Focuses on biological and environmental causation, universalism and cultural relativism, continuity and change.

Restriction: Graduate students only.

**PSCI P222. Forensic Assessment . 4 Units.**

Explores the various ways in which clinical psychology is relevant to the law, and how forensic psychologists can meaningfully contribute to the adjudicatory process. Examines legal, scientific, and ethical issues that arise when psychologists are involved in legal proceedings.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P223. Cross-Cultural Developmental Psychology. 4 Units.**

Examines human development in diverse cultures (e.g., Asian, American, and African). Cultural diversity within the U.S. and acculturation of various ethnic groups is also discussed. Topics include parenting, family relations, language, and cognition, schooling and academic achievement, and morality.

Restriction: Graduate students only.

**PSCI P224. Children and the Law. 4 Units.**

Examines how psychology research and practice can inform several areas of law and social policy affecting children, adolescents, and families. Topics include education, mental health, reproductive rights, and delinquency.

Overlaps with PSCI 120D.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P226. Emotion in Psychology. 4 Units.**

Covers original and recent theories of emotions and how they guide current research. Specific topics include neuroanatomical structure of emotion, life-span emotional development, and health and emotion.

Restriction: Graduate students only.

**PSCI P231. Professional Issues in Psychology. 4 Units.**

Examines a variety of issues related to the professional socialization and development of graduate students in psychology. Topics include the publication process, sources of research funding, alternative employment options, competitiveness on the job market, and the academic career route.

Restriction: Graduate students only.

**PSCI P232. Trauma and Resilience. 4 Units.**

Psychological impact of trauma; biopsychosocial factors affecting development of traumatic stress, treatment, and preventive interventions for traumatic stress; define and measure resilience; moral injury and post traumatic growth; ethics of studying trauma.

Restriction: Graduate students only.

**PSCI P234. Childhood. 4 Units.**

Provides graduate students with an overview of traditional and emerging theories, models, and research designed to understand children's development in the domains of cognitive, social, and emotional functioning.

Restriction: Graduate students only.

**PSCI P238. Child Psychopathology. 4 Units.**

Examination of etiology, classification, and developmental pathways of disorders, as well as risk and resilience factors, during the childhood/adolescent years. Discussion of genetic influences and contextual risk factors as well as internalizing and externalizing disorders.

Restriction: Graduate students only.

**PSCI P242. Legal Reasoning and Jurisprudence. 4 Units.**

Overview of the law and legal process as well as the history and assumptions underlying modern legal reasoning. Issues related to procedure and evidence as well as key jurisprudential perspectives are discussed.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P246. Affective Neuroscience. 4 Units.**

Provides an overview of the emerging field of affective neuroscience. Emphasis is placed on mapping affective experience and behavior to brain function, including cross-level integration of anatomical, chemical, fMRI, and electrical data.

Restriction: Graduate students only.

**PSCI P247. EEG Methods . 4 Units.**

Provides an in-depth training of the electroencephalogram (EEG) methodology with a specific focus on the event-related potential technique. Emphasis is on learning how to use this methodology and how to analyze data, with a focus on emotional stimuli.

Restriction: Graduate students only.

**PSCI P249. Advanced Social Psychology . 4 Units.**

Conveys an appreciation of the flavors of contemporary social psychology, an understanding of empirical approaches to problems in this area, and a sense of the array of theoretical orientations in the field.

Restriction: Graduate students only.

**PSCI P250. Emotion, Reasoning, and Memory. 4 Units.**

Examines research and theory on emotion from the perspective of cognitive psychology. Topics include the effects of emotions on attention, memory, and problem solving; the relations between emotional and cognitive development; flash-bulb memories of intense emotional experiences; eyewitness testimony.

Restriction: Graduate students only.

**PSCI P251. Clinical Interviewing and Treatment in a Forensic Setting. 4 Units.**

Students receive an introduction to clinical interviewing, learn details of strategic, solution-focused therapy, and think critically about issues that come at the interaction of psychology and the law. Students are not 'license-eligible' at end of this course.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P252. Law and Behavior: Compliance and Enforcement. 4 Units.**

Provides sophisticated insight into the different ways through which law shapes behavior. Addresses both the economic amoral rational choice theories, as well as ideas from social psychology, criminology, and sociology about the moral, social, and and unconscious dimensions of compliance.

Restriction: Graduate students only. Psychological Science Majors only. Psychology and Social Behavior Majors only.



**PSCI P253. Master of Legal and Forensic Psychology Capstone. 4 Units.**

Focuses on macro-level writing topics such as developing a meaningful research question, conducting a thorough review of relevant literature, and presenting a clear and convincing research-based argument.

Restriction: Graduate students only.

**PSCI P254. Mental Health and the Law . 4 Units.**

Explores the history of criminalization of persons with mental illness. Topics include challenges and needs of persons with mental illness; civil and outpatient commitment; law enforcement responses to persons with mental illness; and mentally ill offenders in jails and prisons.

Restriction: Master of Legal & Forensic Psy Degree students only. Graduate students only.

**PSCI P255. Violence, Anger, and Psychopathology. 4 Units.**

Overviews the prevalence of violence as a criminal and public health problem. Topics include violence within families and intimate partner relationships, traumatic origins of violence, the development of a violence-prone personality, the association of anger and violence with psychopathology.

Restriction: Master of Legal & Forensic Psy Degree students only. Graduate students only.

**PSCI P256. Family and the Law . 4 Units.**

Examines sociological and legal perspectives on the relationship between family life and law, with a focus on three distinct but sometimes interconnected domains: the child welfare system, the criminal justice system, and the immigration system.

Restriction: Master of Legal & Forensic Psy Degree students only. Graduate students only.

**PSCI P258. Health Psychology. 4 Units.**

Interdisciplinary exploration of emerging fields of health psychology and behavioral medicine. Topics: role of stress in development/treatment of medical problems; sociocognitive determinants of health and illness; interpersonal health transactions; behavioral approaches to medical problems such as diabetes, obesity, hypertension.

Restriction: Graduate students only.

**PSCI P260. Technology and Health. 4 Units.**

Explores the growing intersection of health and technology, including electronic Health ("eHealth"), mobile health ("mHealth"), and digital health and medicine. Specifically, it focuses on the implications and uses of technologies for behavioral and emotional health, and behavioral change.

Restriction: Graduate students only.

**PSCI P261. Intensive Longitudinal Data Analysis. 4 Units.**

Fundamentals of Intensive Longitudinal Study designs, gain first-hand experience collecting ILD using web and/or mobile-based platforms, and learn.

Prerequisite: SE 264A and SE 264B

Restriction: Graduate students only.

**PSCI P262. Interpersonal Processes and Health. 4 Units.**

Examines traditions of research linking interpersonal processes to emotional or physical health. Topics include: role of social support in ameliorating stress, effects of social control on health-compromising behaviors, adverse effects of social relationships on health, causes of deficient social relationships.

Restriction: Graduate students only.

**PSCI P263. Eyewitness Testimony. 4 Units.**

Examines the evidence that shows that faulty eyewitness memory is the major cause of wrongful convictions. Explores what the legal system thinks of eyewitness testimony and how the legal system has dealt with eyewitness issues.

Same as CLS C263.

Restriction: Graduate students only.

**PSCI P265. Memory and the Law. 4 Units.**

Examines the controversial topic of repressed memory, or perception and memory of real-world events.

Same as CLS C265.

Restriction: Graduate students only.



**PSCI P266. Psychology and the Law. 4 Units.**

Overview of how psychology is applied to the civil and criminal justice systems, how case law shapes this application, and how legal decisions affect the direction of psychological research. Interdisciplinary approach to research in psychology, law, and/or criminology.

Same as CLS C266.

Restriction: Graduate students only.

**PSCI P271. Human Evolution and Behavior. 4 Units.**

Covers theories and empirical research concerning the evolutionary origins of human behaviors and their variations. An interdisciplinary course emphasizing both evolutionary psychology (e.g., mating strategies, kinship, and parenting) and molecular evolution (i.e., evolution of genes for various behaviors).

Same as BIOC 217.

Restriction: Graduate students only.

**PSCI P273. Biobehavioral Aspects of Health and Illness. 4 Units.**

Examines the behavior-physiology interactions of some major bodily systems: the nervous, cardiovascular, gastrointestinal, and endocrine systems. Analysis of normal and abnormal states of these systems as they relate to tissue injury, disease, and rehabilitation.

Restriction: Graduate students only.

**PSCI P275. Special Topics in Psychological Science . 4 Units.**

Topics covered vary with interests of instructor.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PSCI P276. Meta Analysis. 4 Units.**

The process of synthesizing results from a number of studies that address a common research question is often referred to as meta-analysis. Explores the meta-analysis process from the coding of retrieved studies to the final research synthesis.

Restriction: Graduate students only.

**PSCI P280A. Interdisciplinary Salivary Bioscience. 4 Units.**

Theory and research on the integration of salivary analytes into developmental, social, behavioral, and health sciences. Topics include oral fluid as biological specimens; practical aspects of sample handling, collection, and study design; basics of laboratory methods used for assaying saliva.

Restriction: Graduate students only.

**PSCI P280B. Interdisciplinary Salivary Bioscience Lab. 4 Units.**

Laboratory sequel to the P280A seminar. Provides laboratory-based hands-on experience integrating salivary analytes into developmental, social, behavioral, and health sciences that also includes supervised training on sample processing.

Prerequisite or corequisite: PCSI P280A. PCSI P280A with a grade of B or better

Restriction: Graduate students only.

**PSCI P281. Race and the Law. 4 Units.**

Explores how race and other markers of social identity shape outcomes within the criminal justice system. Students examine how race, ethnicity, and national origin intersect with rules governing the policing, trials, and punishment.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P282. Salivary Bioscience Data Analysis . 4 Units.**

A salivary bioscience statistical research working group. Students conduct guided data analyses with salivary biomarker data. Special topics related to salivary bioscience analytic strategies and the interpretation and dissemination of research findings are discussed.

Restriction: Graduate students only.

**PSCI P283H. Psychoneuroimmunology. 4 Units.**

Introduces students to the field of psychoneuroimmunology and helps them develop the conceptual and methodological skills necessary for designing and interpreting research on the bidirectional relationship between the immune system and psychological processes.

Restriction: Graduate students only.

**PSCI P284. Health and Emotion. 4 Units.**

Overview of research focused on understanding how emotional processes influence physical health. Provides students with a deeper understanding of how emotions play into the health of others as well.

Restriction: Graduate students only.

**PSCI P285. Anger: A Turbulent Emotion. 4 Units.**

Provides an enriched perspective on anger beginning with its understanding in classical antiquity. Topics include developmental processes and trauma, anger physiology and neuroscience, anger-related physical health impairments, and the involvement of anger in psychopathology and violence.

Restriction: Graduate students only.

**PSCI P286. Motivation. 4 Units.**

Introduces major concepts of motivational psychology, theory, and history. Application of motivational concepts to phenomena from social psychology and affective science. Development of own research proposal in a motivational framework and/or conceptualizing or expanding an ongoing or planned research project.

Restriction: Graduate students only.

**PSCI P288. Human Neuropsychology . 4 Units.**

Focuses on clinical, neuroanatomical, and neuropathological studies that have contributed to our understanding of brain-behavior relationships in the context of normal brain function and disease-associated neuropsychiatric syndromes.

Restriction: Graduate students only.

**PSCI P289. The Teaching of Psychology. 4 Units.**

Provides students with the theory and skills needed to teach undergraduate psychology courses. Covers research on theories and methods of teaching, curriculum design, and evaluation. Students also gain practical experience preparing and presenting material.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Psychological Science Majors only. Psychology and Social Behavior Majors only.

**PSCI P290. Research in Developmental Psychology. 4 Units.**

Introduces graduate students to research conducted by individual faculty members in the area of developmental psychology. This is accomplished by having students involve themselves in the conceptualization, strategy, and implementation of the faculty member's research.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PSCI P291. Research in Health Psychology. 4 Units.**

Introduces graduate students to research conducted by individual faculty members in the area of health psychology. This is accomplished by having students involve themselves in the conceptualization, strategy, and implementation of the faculty member's research.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PSCI P292. Research in Psychopathology and Behavior Disorder. 4 Units.**

Introduces graduate students to research conducted by individual faculty members in the area of psychopathology and behavior disorder. This is accomplished by having students involve themselves in the conceptualization, strategy, and implementation of the faculty member's research.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PSCI P293. Research in Social and Personality Psychology. 4 Units.**

Introduces graduate students to research conducted by individual faculty members in the area of social and personality psychology. This is accomplished by having students involve themselves in the conceptualization, strategy, and implementation of the faculty member's research.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PSCI P294A. Research Directions in Psychological Science I. 2 Units.**

Introduces students to the current research of faculty, graduate students, and visitors to the Department of Psychological Science. Includes examination of contemporary research issues and controversies, as well as issues related to students' development as professionals.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PSCI P294B. Research Directions in Psychological Science II. 2 Units.**

Introduces students to the current research of faculty, graduate students, and visitors to the Department of Psychological Science. Includes examination of contemporary research issues and controversies, as well as issues related to students' development as professionals.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PSCI P294C. Research Directions in Psychological Science III. 2 Units.**

Introduces students to the current research of faculty, graduate students, and visitors to the Department of Psychological Science. Includes examination of contemporary research issues and controversies, as well as issues related to students' development as professionals.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PSCI P295. Research in Psychology and Law. 4 Units.**

Introduces graduate students to research conducted by individual faculty members in the area of psychology and law. This is accomplished by having students involve themselves in the conceptualization, strategy, and implementation of the faculty member's research.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PSCI P296. Doctoral Dissertation Research and Writing. 4-12 Units.**

Dissertation research with Psychological Science faculty.

Prerequisite: Advancement to candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PSCI P298. Directed Studies in Psychological Science. 2-4 Units.**

Directed study with Psychological Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PSCI P299. Independent Studies in Psychological Science. 2-8 Units.**

Independent research with Psychological Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

# Psychology (PSYCH)

## Courses

### **PSYCH 7A. Introduction to Psychology. 4 Units.**

Introduction to field of psychology, addressing the application of scientific methods to the study of human development, learning, memory, problem solving, perception, biological mechanisms, emotions and motivation, personality, psychopathology, and effects of diverse social and cultural contexts on human behavior.

Same as PSCI 9.

Overlaps with PSYCH 9A, PSYCH 9B, PSYCH 9C, PSCI 11A, PSCI 11B.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment. PSCI 9 and PSYCH 7A may not be taken for credit if taken concurrently with or after PSCI 11A, PSCI 11B, PSCI 11C, PSYCH 9A, PSYCH 9B, or PSYCH 9C.

(III)

### **PSYCH 9A. Psychology Fundamentals. 4 Units.**

Designed to provide freshman with an in-depth survey of general psychology. Topics include biological bases of behavior, sensation, perception, cognition, development, personality, psychopathology, and social psychology.

Same as PSCI 11A.

Restriction: Lower-division students only. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. PSCI 9 and PSYCH 7A may not be taken for credit if taken after PSCI 11A, PSCI 11B, PSCI 11C, PSYCH 9A, PSYCH 9B, or PSYCH 9C.

(III)

### **PSYCH 9B. Psychology Fundamentals. 4 Units.**

Designed to provide freshmen with an in-depth survey of general psychology. Topics include biological bases of behavior, sensation, perception, cognition, development, personality, psychopathology, and social psychology.

Same as PSCI 11B.

Restriction: Lower-division students only. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

(III)

### **PSYCH 9C. Psychology Fundamentals. 4 Units.**

Designed to provide freshman with an in-depth survey of general psychology. Topics include biological bases of behavior, sensation, perception, cognition, development, personality, psychopathology, and social psychology.

Same as PSCI 11C.

Restriction: Lower-division students only. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

(III)

**PSYCH 10A. Probability and Statistics in Psychology I. 4 Units.**

An introduction to probability and statistics. Emphasis on thorough understanding of the probabilistic basis of statistical inference. Examples drawn primarily from psychology.

Restriction: Psychology Majors have first consideration for enrollment.

(Va)

**PSYCH 10B. Probability and Statistics in Psychology II. 4 Units.**

An introduction to probability and statistics. Emphasis on thorough understanding of the probabilistic basis of statistical inference. Examples drawn primarily from psychology.

Prerequisite: PSYCH 10A

Restriction: Psychology Majors have first consideration for enrollment.

(Va)

**PSYCH 10C. Probability and Statistics in Psychology III. 4 Units.**

An introduction to probability and statistics. Emphasis on thorough understanding of the probabilistic basis of statistical inference. Examples drawn primarily from psychology.

Prerequisite: PSYCH 10B

Restriction: Psychology Majors have first consideration for enrollment.

(Vb)

**PSYCH 21A. Adolescent Psychology. 4 Units.**

Focuses on psychosocial dynamics of today's adolescents in America emphasizing the quest for identity, independence, values, and sexual orientation. The influence of society, family, school, and peers is analyzed. Strategies for helping troubled adolescents are discussed.

Overlaps with PSCI 112D.

(III)

**PSYCH 46A. Introduction to Human Memory. 4 Units.**

Covers the core concepts of modern research and theorizing about human memory, including structural subdivisions (e.g., perceptual memory, short-term memory, long-term memory), different measures of memory (e.g., recall, reorganization), and some practical applications of memory research (e.g., mnemonics).

(III)

**PSYCH 56L. Acquisition of Language. 4 Units.**

What children say, what they mean, and what they understand. Theories about the learning of language by one-, two-, and three-year-olds. Comparison of kinds of data on which these theories are based.

Same as LSCI 51.

(III)

**PSYCH 78A. Self-Identity and Society. 4 Units.**

Studies sociological contributions to theory and research in social psychology, with focus on the social influences on personality, attitudes, beliefs, and behavior; socialization, human groups, and social interaction.

Same as SOCIOL 31.

(III)

**PSYCH 89. Special Topics in Lower-Division Psychology. 4 Units.**

Studies in selected areas of psychology at the lower-division level. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**PSYCH H101A. Honors Seminar in Psychology I. 4 Units.**

Focuses on the research activities and honors thesis research projects of each student and the research of various Cognitive Sciences faculty. Students discuss their research interests in the early and later stages of their projects. Research projects and write-ups required.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

Restriction: Psychology Majors only. Cognitive Sciences Majors only. Social Science Honors students only.

**PSYCH H101B. Honors Seminar in Psychology II. 4 Units.**

Focuses on the research activities and honors thesis research projects of each student and the research of various Cognitive Sciences faculty. Students discuss their research interests in the early and later stages of their projects. Research projects and write-ups required.

Prerequisite: PSYCH H101A

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

Restriction: Psychology Majors only. Cognitive Sciences Majors only. Social Science Honors students only.

**PSYCH H101C. Honors Seminar in Psychology III. 4 Units.**

Focuses on the research activities and honors thesis research projects of each student and the research of various Cognitive Sciences faculty. Students discuss their research interests in the early and later stages of their projects. Research projects and write-ups required.

Prerequisite: PSYCH H101B

Repeatability: May be taken for credit 2 times.

Restriction: Psychology Majors only. Cognitive Sciences Majors only. Social Science Honors students only.

**PSYCH 111BW. Honors Advanced Experimental Psychology. 4 Units.**

Design and analysis of multivalent, factorial, and correlational studies. Students prepare proposals for independent research.

Corequisite: PSYCH H111B

Prerequisite: PSYCH H111A and (PSYC H11A or PSYCH 112A). Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Psychology Majors only. Social Science Honors students only.

**(Ib)****PSYCH H111A. Honors Experimental Psychology. 4 Units.**

Emphasis on design of experiments and analysis of results. Experiments are conducted in laboratory sections.

Prerequisite: ((PSYCH 9A and PSYCH 9B and PSYCH 9C) or (PSY BEH 11A and PSY BEH 11B and PSY BEH 11C)) and ((PSYCH 10A and 10B and 10C) or (MATH 2A and MATH 2B and (MATH 7 or STATS 7))).

Overlaps with PSYCH 112A.

Restriction: Psychology and Cognitive Sciences Honors Program students only.

**PSYCH H111B. Honors Advanced Experimental Psychology Laboratory. 2 Units.**

Design and analysis of multivalent, factorial, and correlational studies. Students prepare proposals for independent research.

Corequisite: PSYCH 111BW

**PSYCH H111C. Honors Research in Experimental Psychology. 4 Units.**

Each student conducts a research project in experimental psychology. The projects are discussed in a seminar format. Written reports on each project are submitted at the end of the quarter.

Prerequisite: PSYCH 111BW or PSYCH 112B

Restriction: Psychology Majors only. Social Science Honors students only.

**PSYCH 112A. Experimental Psychology. 4 Units.**

Emphasis on design of experiments and analysis of results. Experiments are conducted in laboratory sections.

Corequisite: PSYCH 112LA

Prerequisite: ((PSYCH 9A and PSYCH 9B and PSYCH 9C) or (PSY BEH 11A and PSY BEH 11B and PSY BEH 11C)) and ((PSYCH 10A and PSYCH 10B and PSYCH 10C) or (MATH 2A and MATH 2B and (MATH 7 or STATS 7)))

Overlaps with PSYCH H111A, PSYCH 112F, PSYCH 112G.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 112BW. Advanced Experimental Psychology. 4 Units.**

Design and analysis of multivalent, factorial, and correlational studies. Students prepare proposals for independent research.

Prerequisite: PSYCH 112A and PSYCH 112LA. Satisfactory completion of the Lower-Division Writing requirement.

Overlaps with PSYCH 112F, PSYCH 112FW, PSYCH 112G, PSYCH 112GW.

Restriction: Psychology Majors have first consideration for enrollment.

**(Ib)****PSYCH 112C. Research in Experimental Psychology. 4 Units.**

Each student conducts a research project in experimental psychology. The projects are discussed in a seminar format. Written reports on each project are submitted at the end of the quarter.

Corequisite: PSYCH 112LC

Prerequisite: PSYCH 112B and PSYCH 112LB

Overlaps with PSYCH 112F, PSYCH 112FW, PSYCH 112G, PSYCH 112GW.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 112D. Effective Graphical Presentation of Data. 4 Units.**

Learn to use MATLAB to produce graphical displays of data based on psychological principles for effective design. Approach is problem-oriented, with emphasis on case-studies using data from psychological experiments and real-world corpora. Assessment via independent individual projects.

Corequisite: PSYCH 112LD

Prerequisite: (PSYCH 9A and PSYCH 9B and PSYCH 9C) or (PSY BEH 11A and PSY BEH 11B and PSY BEH 11C) and (PSYCH 10C or SOC SCI 10C or ANTHRO 10C or POL SCI 10C or SOCIOL 10C) or (MATH 2B and STATS 7)

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 112LA. Experimental Psychology Laboratory. 2 Units.**

Required laboratory section and co-requisite for Psych 112A.

Corequisite: PSYCH 112A

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 112LB. Advanced Experimental Psychology Laboratory. 2 Units.**

Required laboratory section for PSYCH 112B and PSYCH 112BW.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 112LC. Research in Experimental Psychology.**

Required laboratory section and co-requisite for PSYCH 112C.

Corequisite: PSYCH 112C

**PSYCH 112LD. Effective Graphical Presentation of Data Lab . 2 Units.**

Lab to learn to use MATLAB to produce graphical displays of data based on psychological principles for effective design. Approach is problem-oriented, with emphasis on case-studies using data from psychological experiments and real-world corpora. Assessment via independent individual projects.

Corequisite: PSYCH 112D

Restriction: Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment.

**PSYCH 112LM. Research Methods in Psychology Laboratory. 2 Units.**

Required laboratory section and co-requisite for PSYCH 112M.

Corequisite: PSYCH 112M

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 112LR. Cognitive Robotics Laboratory. 2 Units.**

Required laboratory section and corequisite for PSYCH 112R.

Corequisite: PSYCH 112R

Restriction: Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment.

**PSYCH 112M. Research Methods in Psychology. 4 Units.**

Research methods in psychology for majors who wish to fulfill this requirement separately from upper-division writing. Covers both experimental and descriptive research methods, analysis of results, and reading the psychological literature. Research experience is provided in laboratory sections.

Corequisite: PSYCH 112LM

Prerequisite: (PSYCH 9A and PSYCH 9B and PSYCH 9C) or (PSY BEH 11A and PSY BEH 11B and PSY BEH 11C) and (PSYCH 10C or SOC SCI 10C or ANTHRO 10C or POL SCI 10C or SOCIOL 10C) or (MATH 2B and STATS 7)

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 112R. Cognitive Robotics. 4 Units.**

Introduces concepts on experimental design, embodiment, robot construction, and computer programming. Concepts of embodied intelligence and case studies of cognitive robotics are covered in lecture. Simple robots are constructed and programmed to carry out different behavioral experiments in lab.

Corequisite: PSYCH 112LR

Prerequisite: (PSYCH 9A and PSYCH 9B and PSYCH 9C) or (PSY BEH 11A and PSY BEH 11B and PSY BEH 11C) and (PSYCH 10C or SOC SCI 10C or ANTHRO 10C or POL SCI 10C or SOCIOL 10C) or (MATH 2B and STATS 7)

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 114M. MATLAB Programming. 4 Units.**

MATLAB is a mathematical software package for solving quantitative problems often encountered in experimental psychology. Topics include rudiments of programming, statistical analysis of data, matrix algebra, signal processing, graphic visualization, and simulated models of cognitive and perceptual processes.

Restriction: Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment.

**PSYCH 119. Special Topics in Research Methodologies. 1-4 Units.**

Studies in selected areas of research methodologies. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 120A. Abnormal Psychology. 4 Units.**

Introduction to psychopathology and behavioral deviations, and the concepts of theories regarding these conditions.

Prerequisite: PSYCH 7A or PSCI 9 or PSYCH 9C or PSCI 11C

Overlaps with PSCI 102C.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 120D. Developmental Psychology. 4 Units.**

A general introduction to the study of the physical, intellectual, social, and emotional development of the child from birth to adulthood.

Prerequisite: PSYCH 7A or PSCI 9 or PSYCH 9A or PSCI 11A

Overlaps with PSCI 111D.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Nursing Science Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.



**PSYCH 120H. History of Psychology. 4 Units.**

A history of the development of various schools and systems of psychological thought.

Prerequisite: (PSYCH 7A or PSCI 9) or (PSYCH 9A or PSCI 11A) and (PSYCH 9B or PSCI 11B) and (PSYCH 9C or PSCI 11C)

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 120P. Personality Theories. 4 Units.**

A survey of the evolution of personality theory during this century. An overview of major perspectives in the field, with special attention to Freud, Jung, and Adler.

Prerequisite: PSYCH 7A or PSCI 9 or PSYCH 9C or PSCI 11C

Overlaps with PSCI 170S.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 121M. Theories of Motivation. 4 Units.**

Factors affecting the behavioral performance of organisms. A survey of theoretical and empirical approaches to the physiological, psychological, and social factors which generate behavior.

Prerequisite: (PSYCH 7A or PSCI 9) or (PSYCH 9A or PSCI 11A) and (PSYCH 9B or PSCI 11B) and (PSYCH 9C or PSCI 11C)

Overlaps with PSCI 176S.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 121P. Positive Psychology. 4 Units.**

Positive psychology, at the subjective level, is about valued subjective experiences; at the individual level, it is about positive individual traits; and at the group level, it is about the civic virtues and institutions that move individuals toward better citizenship.

Prerequisite: (PSYCH 9A or PSCI 11A) and (PSYCH 9B or PSCI 11B) and (PSYCH 9C or PSCI 11C)

Overlaps with PSY BEH 184S.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 121S. Psychology of Sleep and Consciousness. 4 Units.**

Covers the physiology, neurochemistry, and neuroanatomy associated with sleep, contemporary sleep theory, REM and NREM, phenomenology, sleep disorders, examination of differences between conscious and unconscious cognitive function, the history of sleep and dream theories from ancient time to present day.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 122C. Clinical Psychology. 4 Units.**

Provides overview of the clinical psychology field including theories and techniques used in counseling and testing.

Overlaps with PSY BEH 150C.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 122I. Organizational/Industrial Psychology. 4 Units.**

Introduction to applied psychology in organizations, including personnel testing, selection, training and evaluation, job and classification analysis, job satisfaction and motivation, organizational development, leadership, market research, and consumer psychology. Potential ethical problems are discussed.

Prerequisite: (PSYCH 7A or PSY BEH 9) or (PSYCH 9A or PSY BEH 11A) or (PSYCH 9B or PSY BEH 11B) or (PSYCH 9C or PSY BEH 11C)

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 122P. Clinical Psychophysiology. 4 Units.**

Psychophysiology investigates the relationships between physiological processes and psychological phenomena. Technologies examined include reaction times, heart rate variability, EEGs, ERPs, magnetoencephalography, and eye tracking. Applications include diagnosis, the longitudinal assessment, and the identification of individuals at risk of disease onset.

Prerequisite: BIO SCI N110 or BIO SCI N115A or PSYCH 9A or PSCI 11A

Same as BIO SCI N118.

(II ).

**PSYCH 123P. Topics in Philosophy of Psychology. 4 Units.**

Selected topics in the philosophy of psychology, e.g., the nature of psychological explanation, reductionism, issues in cognitive, behavioral, and neuroscience.

Repeatability: Unlimited as topics vary.

Same as LPS 143, PHILOS 143.

Restriction: Psychology Majors have first consideration for enrollment. Philosophy Majors have first consideration for enrollment.

**PSYCH 124S. Sports Psychology. 4 Units.**

Discusses the field of sports psychology with an emphasis on clinical practice including motivation, goal setting, performance skills, and mental skills. Discusses and utilizes a wide range of techniques designed to enhance performance and manage problems among athletes.

Prerequisite: (PSYCH 7A or PSY BEH 9) or (PSYCH 9C or PSY BEH 11C)

Overlaps with PSY BEH 139H.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 124V. Psychology of Violence. 4 Units.**

Discusses the psychology of violence and aggression with an emphasis on understanding the psychological, social, and physiological roots of violent and aggressive behavior. Psychological treatment techniques and strategies for prevention of aggressive and violent behavior are also discussed.

Prerequisite: (PSYCH 7A or PSY BEH 9) or (PSYCH 9C or PSY BEH 11C)

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 129. Special Topics in General Psychology. 4 Units.**

Studies in selected areas of general psychology. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 130A. Perception and Sensory Processes. 4 Units.**

A general introduction to the scientific study of sensory processes and perceptual phenomena, with special emphasis in the visual systems.

Prerequisite: (PSYCH 7A or PSY BEH 9) or (PSYCH 9A or PSY BEH 11A)

Overlaps with PSYCH 131A, PSYCH 131B.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 131A. Vision. 4 Units.**

Visual perception and the anatomy and physiology of the visual system. Topics include the retina and the visual pathway; visual sensitivity; color vision; spatial vision; motion perception; and the development of the visual system.

Same as BIO SCI N182.

Overlaps with PSYCH 130A.

Restriction: Upper-division students only. Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment.

**PSYCH 131B. Hearing. 4 Units.**

Auditory perception, the anatomy and physiology of the auditory system, and the physics of sound. Topics include neural transduction of sound, sensitivity, sound localization, complex sound perception, and hearing loss.

Prerequisite: (PSYCH 9A or PSY BEH 11A) and (PSYCH 9B or PSY BEH 11B)

Overlaps with PSYCH 130A.

Restriction: Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment.

**PSYCH 135M. The Mind/Body Problem. 4 Units.**

What is consciousness and what is matter and how are the two related? How can brains have minds? This multidisciplinary course draws on information from the fields of computer vision, artificial intelligence, cognition, neurophysiology, philosophy, and psychophysics.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 139. Special Topics in Perception and Sensory Processes. 4 Units.**

Studies in selected areas of perception and sensory processes. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 140C. Cognitive Science. 4 Units.**

Introduction to the investigations of the structure and function of the mind, from viewpoints of computation, neuroscience, philosophy, and cognitive psychology. Topics include perception, attention, knowledge representations, learning and memory, action, reasoning, and language.

Prerequisite: (PSYCH 7A or PSY BEH 9) and (PSYCH 9A or PSY BEH 11A) and (PSYCH 9B or PSY BEH 11B)

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 140L. Principles of Learning Theory. 4 Units.**

Investigation of the learning and memory processes of human and animals. Basic experimental approaches to learning and memory, empirical results, and theoretical interpretations of the evidence are discussed.

Prerequisite: (PSYCH 7A or PSY BEH 9) or (PSYCH 9A or PSY BEH 11A)

Restriction: Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment.

**PSYCH 140M. Human Memory. 4 Units.**

Developments in the area of memory; history of memory research; theories of the nature of memory. Visual memory, recognition memory, high-speed scanning, free recall, short-term memory, mnemonics, retrieval, relationship of memory to thinking. Selected theoretical formulations for memory.

Prerequisite: (PSYCH 7A or PSY BEH 9) or (PSYCH 9B or PSY BEH 11B)

Restriction: Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment.

**PSYCH 143P. Human Problem Solving. 4 Units.**

Modern developments in the psychology of human problem solving. Topics include concept identification, arithmetic, sets, logic puzzles, story problems, group problem solving, and theorem proving.

Prerequisite: (PSYCH 7A or PSY BEH 9) or (PSYCH 9B or PSY BEH 11B)

Restriction: Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment.

**PSYCH 146MW. Writing about Memory. 4 Units.**

Covers a broad range of texts, literary, philosophical, and scientific, each probing the nature of memory and its meaning in human life. Readings are drawn from across many disciplines and many perspectives.

Prerequisite: PSYCH 7A or PSYCH 9B or PSY BEH 9 or PSY BEH 11B. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Psychology Majors have first consideration for enrollment.

(Ib)

**PSYCH 149. Special Topics in Cognition and Learning. 4 Units.**

Studies in selected areas of cognition and learning. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 150. Psychology of Language. 4 Units.**

Examines language using the tools of experimental psychology. From sounds to words to spoken and written sentences, explores how language is used in real time, and how its use reveals how it is represented in the mind.

Prerequisite: PSYCH 7A or PSCI 9 or PSYCH 9B or PSCI 11B or LSCI 3

Same as LSCI 155.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Language Science Majors have first consideration for enrollment.

Psychology Majors have first consideration for enrollment.

**PSYCH 156A. Acquisition of Language II. 4 Units.**

Focuses on native language learning, exploring the way in which infants and very young children unconsciously uncover the rich systematic knowledge of their native language. Examines both experimental and computational studies that quantitatively investigate the 'how' of language acquisition.

Prerequisite: PSYCH 56L or LINGUIS 51

Same as LINGUIS 150.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 157M. Computational Methods for Language Research. 4 Units.**

Focuses on computational methods useful for language research. Students become familiar with software and programming languages used for extracting information from electronic datasets and for creating basic simulations of linguistic cognition. No prior programming experience assumed.

Prerequisite: PSYCH 150 or LSCI 155 or PSYCH 156A or LSCI 151

Same as PSYCH 157M.

**PSYCH 159. Special Topics in Language. 4 Units.**

Studies in selected areas of language sciences. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 160A. Introduction to Cognitive Neuroscience. 4 Units.**

Introduction to the neural basis of human perceptual, motor, and cognitive abilities. Topics include sensory perception, motor control, memory, language, attention, emotion, frontal lobe function, functional brain imaging, and neuropsychological disorders.

Prerequisite: (PSYCH 7A or PSY BEH 9) and (PSYCH 9A or PSY BEH 11A) and (PSYCH 9B or PSY BEH 11B)

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 160D. Brain Disorders and Behavior. 4 Units.**

Examines the localization of human brain functions and the effects of neurological disorders on psychological functions such as perception, motor control, language, memory, and decision-making.

Prerequisite: (PSYCH 7A or PSY BEH 9) and (PSYCH 9A or PSY BEH 11A) and (PSYCH 9B or PSY BEH 11B) or BIO SCI 35 or BIO SCI N110

Same as BIO SCI N165.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Biological Sciences Majors have first consideration for enrollment.

Psychology Majors have first consideration for enrollment.

**PSYCH 160H. History of Cognitive Neuroscience. 4 Units.**

Studies of the human mind from ancient cultures to the innovation of modern methods of brain imaging. Logic of valid and invalid brain hypothesis are examined. Recurring theme is the competition between holistic and localized views of brain function.

Prerequisite: PSYCH 9A or PSY BEH 11A or PSYCH 7A or PSY BEH 9

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 161. Language and the Brain . 4 Units.**

Research analysis on biological bases of human linguistic capacity. Development, focusing on hemispheric specialization, plasticity; localization of specific linguistic functions in adults, with emphasis on study of aphasia; relation of linguistic capacity to general cognitive capacity, considering research on retardation.

Prerequisite: (PSYCH 7A or PSY BEH 9 or PSYCH 9A or PSY BEH 11A) and (PSYCH 9B or PSY BEH 11B or BIO SCI 35 or BIO SCI N110 or BIO SCI N115A)

Same as BIO SCI N160, LSCI 158.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Biological Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 161H. Hearing and the Brain. 4 Units.**

An overview of brain mechanisms of hearing, including perception of simple sounds, speech, and music. Begins with sound itself, and looks at processing by the ear, auditory pathways, auditory cortex, and beyond. Also auditory development, learning, and clinical issues.

Prerequisite: PSYCH 160A or BIO SCI 93 or BIO SCI H93

Same as BIO SCI N147.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Biological Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 162N. Human Neuropsychology. 4 Units.**

A survey of human brain disorders using a clinical case study approach to illustrate fundamental issues in studying brain and behavior. Topics include sensory deficits, attentional neglect, amnesia, cortical organization, clinical psychopathology, and more.

Prerequisite: BIO SCI N110 or BIO SCI N115A or PSYCH 9A or PSCI 11A

Same as BIO SCI N173, PSCI 163C.

Restriction: School of Biological Sciences students have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 169. Special Topics in Cognitive Neuroscience . 4 Units.**

Studies in selected areas of cognitive neuroscience. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 173A. Psychological Anthropology. 4 Units.**

Cultural differences and similarities in personality and behavior. Child-rearing practices and consequent adult personality characteristics, biocultural aspects of child development and attachment, culture and behavior evolutionary models, politically linked personality, cognitive anthropology, psychology of narrative forms, comparative national character studies.

Prerequisite: ANTHRO 2A or PSYCH 7A or (PSYCH 9A and PSYCH 9B and PSYCH 9C) or (PSY BEH 11A and PSY BEH 11B and PSY BEH 11C)

Same as ANTHRO 132A.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 174E. African American Psychology. 4 Units.**

Historical overview of the development of black psychology and the African American frame of reference. Topics include personality development, psychological assessment, issues in education, black mental health, and the role of the African American psychologist in the community.

Same as AFAM 153.

**PSYCH 174H. Chicano/Latino Families. 4 Units.**

Introduction to the research, literature, and issues surrounding the topic of Chicano/Latino families including cultural history, contemporary issues, organization of family, traditions, lifestyles, values, beliefs, generational differences, gender issues, ethnic identity, evolution of demographic patterns, current economic and political standings.

Same as CHC/LAT 170, PSCI 166S, SOC SCI 165.

**PSYCH 176A. Political Psychology. 4 Units.**

Examination of how psychological theory and research may be used to better understand political thought and behavior. Drawing on theories of learning, cognition, and personality, discusses such topics as the formation of political attitudes, and the process of political decision-making.

Same as POL SCI 128C.

Restriction: Majors only. POL SCI 128C may not be taken for credit if taken after POL SCI 137C.

**PSYCH 177D. Deviance. 4 Units.**

Perspectives on deviance and criminality in behavior, institution, community, and myth. The suitability of contemporary theories of deviant behavior.

Same as SOCIOL 156, CRM/LAW C107.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 177F. Forensic Psychology: Advanced Seminar. 4 Units.**

Focuses on the psychology of criminal offending, particularly violent behavior. Examines violence, sexual offending, and mental disorder related to crime with regard to clinical assessment and treatment; mental health services within forensic institutions.

Prerequisite: (PSCI 9 or PSCI 11C or PSYCH 7A or PSYCH 9C) and PSCI 102C and (PSCI 178S or CRM/LAW C149)

Same as CRM/LAW C136, PSCI 156C.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSYCH 178N. Social Psychology of Networks. 4 Units.**

Review of network methods used in small group and organizational research. Discussion of social psychological literature relevant to the network of study of cognitive social structure, exchange/communication, identity negotiation, and social control. Case study of network datasets exemplifies research issues.

Same as SOCIOL 135.

Restriction: Sociology Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 179. Special Topics in Interdisciplinary Studies. 1-4 Units.**

Studies in selected areas of interdisciplinary studies. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 198. Directed Group Study. 1-4 Units.**

Directed study with Cognitive Sciences faculty.

Repeatability: May be repeated for credit unlimited times.

**PSYCH 199. Independent Study. 1-4 Units.**

Independent research with Cognitive Sciences faculty.

**PSYCH 201A. Cognitive Sciences Research Seminar. 1.3 Unit.**

Weekly reports and colloquia by faculty, students, and visitors.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Psychology Majors only.

**PSYCH 201B. Cognitive Sciences Research Seminar. 1.3 Unit.**

Weekly reports and colloquia by faculty, students, and visitors.

Prerequisite: PSYCH 201A

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Psychology Majors only.

**PSYCH 201C. Cognitive Sciences Research Seminar. 1.4 Unit.**

Weekly reports and colloquia by faculty, students, and visitors.

Prerequisite: PSYCH 201B

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Psychology Majors only.

**PSYCH 202A. Proseminar in the Cognitive Sciences. 1 Unit.**

Introduction to the conceptual foundations and basic research results in the cognitive sciences for first-year graduate students.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**PSYCH 203A. Discrete Mathematics and Probability. 4 Units.**

Logic and set theory are covered during the first three weeks, using an interactive computer system. The remaining seven weeks are devoted to probability theory and cover elementary concepts from samples spaces to Chebychev's Inequality and the moment generating function.

Restriction: Graduate students only.

**PSYCH 203C. Algorithmic Statistics. 4 Units.**

Discussion of the fundamentals of statistical inference and computational implementations of common statistical models.

Restriction: Graduate students only.

**PSYCH 203D. Applied Mathematics for Cognitive Sciences Research. 4 Units.**

Covers the basics of linear systems analysis, focusing on linear algebra, Fourier analysis, differential equations, and elementary signal processing. Applications in Cognitive Science and Cognitive Neuroscience research will be developed.

Prerequisite: PSYCH 205A

Restriction: Graduate students only. Psychology Majors only.

**PSYCH 205A. Computational and Research Methods with MATLAB. 4 Units.**

Introduces rudiments of programming, statistical analysis and probability theory, graphic visualization, GUI design, spectral analysis, and simulation models using MATLAB, a software package for solving quantitative problems often encountered in experimental psychology.

Restriction: Graduate students only.

**PSYCH 205B. Running Experiments Using MATLAB. 4 Units.**

Provides an in-depth introduction to writing MATLAB programs to run auditory and visual experiments. Topics covered include program structure, stimulus generation, presentation, and data collection.

Prerequisite: PSYCH 205A

**PSYCH 205C. Computational Statistics. 4 Units.**

Introduction to a number of computational statistics approaches including exploratory data analysis and modeling using a probabilistic framework with Bayesian graphical models. Emphasis will be on in-class programming using MATLAB.

Restriction: Graduate students only.

**PSYCH 210A. Introduction to Cognitive and Brain Sciences I: Perception. 4 Units.**

Discusses models of cognition and evidence linking cognition and the brain. Focus is on visual, auditory, and somatic perception and bottom-up mechanisms of attention.

Restriction: Graduate students only.

**PSYCH 210B. Introduction to Cognitive and Brain Sciences II: Cognition. 4 Units.**

Discusses models of cognition and evidence linking cognition and the brain. Focus is on emotion, top-down attention, goal-directed behavior, categorization, judgment, and decision-making.

Restriction: Graduate students only.

**PSYCH 210C. Introduction to Cognitive and Brain Sciences III: Learning and Development. 4 Units.**

Discusses experimental data, formal models of learning, and evidence linking learning and development to its neural substrates. Topics include Pavlovian and instrumental conditioning, language acquisition, causal reasoning, perceptual learning, category formation, and structure learning.

Restriction: Graduate students only.

**PSYCH 213. The Mind/Body Problem. 4 Units.**

Course is multidisciplinary, drawing on information from the fields of quantum physics, computer vision, artificial intelligence, cognition, neurophysiology, philosophy, and psychophysics.

Restriction: Graduate students only.

**PSYCH 214. Bayesian Cognitive Modeling. 4 Units.**

Considers a range of statistical methods of data analysis and simple cognitive models using the Bayesian graphical modeling framework.

Restriction: Graduate students only.

**PSYCH 218. Hearing. 4 Units.**

Examines auditory sensation and perception using psychophysical and neuroscientific perspectives. Covers physical aspects of sound; subcortical auditory processing; aspects of sensation and perception such as sensitivity, sound localization, and complex-sound recognition; neuroscientific studies of cortical function; and abnormal auditory processing.

Restriction: Graduate students only.

**PSYCH 229. Special Topics in Human Cognition. 1.3-4 Units.**

Current research in brain/ behavior relationships, human memory, and learning theory is presented.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PSYCH 231P. Topics in Philosophy of Psychology. 4 Units.**

Selected topics in the philosophy of psychology, e.g., the nature of psychological explanation, reductionism, issues in cognitive, behavioral, and neuroscience.

Repeatability: Unlimited as topics vary.

Same as LPS 243, PHILOS 243.

**PSYCH 234A. Mathematical Models of Cognitive Processes I . 4 Units.**

Mathematical models of various cognitive processes developed since 1960, including learning, memory, perception, psycholinguistics, and problem solving. Models are formulated in different mathematical languages: calculus, algebra, logic, probability, and computer. Difficulties in testing and validating models discussed.

Restriction: Graduate students only.

**PSYCH 237. Advanced Bayesian Cognitive Modeling. 4 Units.**

Considers a range of advanced cognitive process models including models of signal detection, memory retention, category learning, stimulus representation, and reasoning using the Bayesian graphical modeling framework.

Prerequisite: PSYCH 214

Restriction: Graduate students only.



**PSYCH 239. Special Topics in Methodology and Models. 1.3-4 Units.**

Current research in cognitive sciences methodologies, concepts, and models is presented.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PSYCH 245A. Computational Models of Language Learning. 4 Units.**

Focuses on computational models of native language learning, exploring how probabilistic learning and inference fare on difficult case studies within language acquisition. In all cases, grounds the learning models in available empirical data and considers their psychological plausibility.

Prerequisite: PSYCH 215L

Restriction: Graduate students only.

**PSYCH 245M. Computational Models of Language Learning. 4 Units.**

Focuses on computational models of native language learning, exploring how probabilistic learning and inference fare on difficult case studies within language acquisition. In all cases, grounds the learning models in available empirical data and considers their psychological plausibility.

Prerequisite: LSCI 251. LSCI 251 with a grade of B- or better

Same as LSCI 206C.

Restriction: Graduate students only.

Concurrent with LSCI 106M.

**PSYCH 249. Special Topics in Language Science. 1.3-4 Units.**

Foundations and current research in theoretical, experimental, and computational linguistics.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PSYCH 259. Special Topics in Human Performance. 1.3-4 Units.**

Current research in the human issues involved with sensation, perception, and cognition.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PSYCH 261N. Cortical Neuroscience. 4 Units.**

Physiology of the cerebral cortex, theoretical neuroscience, and the neural basis of perception.

Prerequisite: PSYCH 216

**PSYCH 262. Functional Neuroanatomy. 4 Units.**

It is impossible to truly understand human behavior without some understanding of the physical structure that enables behavior. Examines recent findings in functional neuroanatomy through lectures and papers discussing links between particular behaviors and specific brain structures.

Restriction: Graduate students only.

**PSYCH 265. Introduction to Functional MRI. 4 Units.**

Describes the fundamentals of imaging the human brain function using functional Magnetic Resonance Imaging (fMRI). Topics include basic fMRI physics, experimental design, and data acquisition and analysis.

Restriction: Graduate students only.

**PSYCH 268A. Computational Neuroscience. 4 Units.**

Introduction to computational neuroscience. Mathematical models of single neurons, neural circuits, thalamocortical systems, and cortical mass action can stimulate single-unit, local field potential, and EEG dynamics. These models are used to investigate mechanisms of sensation, motor control, attention, and consciousness.

Prerequisite: PSYCH 205A and (PSYCH 210A or PSYCH 210B or PSYCH 210C)

**PSYCH 268R. Cognitive Robotics. 4 Units.**

Introduces concepts for studying cognitive function by embedding brain models on robotic platforms. Topics include robot construction, computer programming, and the notion of embodiment. Students construct simple robots and program these robots to perform different behaviors.

**PSYCH 269. Special Topics in Cognitive Neuroscience. 1.3-4 Units.**

Current research in cognitive neuroscience.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PSYCH 289. Special Topics in Sensation and Perception. 1.3-4 Units.**

Current research in the reception and processing of visual and auditory stimuli presented.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PSYCH 290. Dissertation Research. 1-12 Units.**

Dissertation research with Cognitive Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Psychology Majors only.

**PSYCH 299. Individual Study. 4-12 Units.**

Individual research with Cognitive Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Public Health (PUBHLTH)

### Courses

**PUBHLTH 1. Principles of Public Health. 4 Units.**

Introduces the major concepts and principles of public health and the determinants of health status in communities. Emphasizes the ecological model that focuses on the linkages and relationships among multiple natural and social determinants affecting health.

Restriction: Nursing Science Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

(III)

**PUBHLTH 2. Case Studies in Public Health Practice. 4 Units.**

Presents case studies in various themes of public health practice to demonstrate how the principles of public health were established and continue to evolve.

Prerequisite: PUBHLTH 1

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

(II)

**PUBHLTH 7A. Public Health Statistics I. 4 Units.**

Introduces the development and application of statistical reasoning and methods in addressing, analyzing, and solving problems in public health, health care, and biomedical, clinical, and population-based research and practice.

Overlaps with SOCECOL 13, STATS 7, STATS 8, MGMT 7.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

(Va)

**PUBHLTH 7B. Public Health Statistics II. 4 Units.**

Introduces the development and application of statistical reasoning and methods in addressing, analyzing, and solving problems in public health, health care, and biomedical, clinical, and population-based research and practice.

Prerequisite: PUBHLTH 7A

Restriction: Public Health Majors only. Public Health Sciences Majors only. Public Health Policy Majors only.

(Va)

**PUBHLTH 10. Special Topics in Public Health . 2-4 Units.**

Introduction to emerging topics in public health. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PUBHLTH 30. Introduction to Urban Environmental Health. 4 Units.**

Study of natural and physical components of earth's environmental problems due to human activities. Topics include global air, water, soil, biodiversity, rainforests, energy, demographics, agriculture, and urbanization. Theme is sustainability. Integrated into the science are social, legal, and economic considerations.

(II)

**PUBHLTH 60. Environmental Quality and Health. 4 Units.**

Overviews how pollution in the environment affects human health. Topics are toxicology, epidemiology, risk assessment, water, food, air, radiation, pesticides, solid and hazardous waste. Included are interdisciplinary elements of environmental regulations, education, and consumer protection.

(II)

**PUBHLTH 80. AIDS Fundamentals. 4 Units.**

Considers the biological and sociological bases of the AIDS epidemic. Topics include the history of AIDS, current medical knowledge, transmission, risk reduction, and how the community can respond.

Same as BIO SCI 45.

(II)

**PUBHLTH 90. Natural Disasters. 4 Units.**

Natural disasters are natural Earth processes that adversely affect humans. Topics include tectonics, earthquakes, tsunami, volcanoes, landslides, severe weather, flooding, coastal processes, wildfire, related topics, and use of GIS for hazard and risk assessment.

Overlaps with EARTHSS 17.

(II)

**PUBHLTH 91. Disparities in Health Care. 2-8 Units.**

Student participatory course practicing initiation, planning, and coordination of various speakers on the subject of Disparities in Health Care.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 8 units.

**PUBHLTH 100. Special Topics in Public Health. 4 Units.**

Studies in selected areas of public health. Topics addressed vary each quarter. Course may be offered online when topic is Public Health in the Corporate World.

Prerequisite: PUBHLTH 1

Repeatability: Unlimited as topics vary.

**PUBHLTH 101. Introduction to Epidemiology. 4 Units.**

The distribution of disease and injury across time, space, and populations. Covers basic concepts and methods of descriptive epidemiology including the natural history of disease, data, and indices of health.

Prerequisite: STATS 7 or STATS 8 or PUBHLTH 7 or PUBHLTH 7A

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 102. Social Epidemiology. 4 Units.**

Overviews evidence linking environmental factors to mental and physical disorders including such variables as socioeconomic status, income inequality, work stress, job loss, social capital, location, and other demographic characteristics. Measurement and research design issues of both individual and aggregate levels.

Prerequisite: (PSCI 9 or PSCI 11C or PSYCH 7A or PSYCH 9C) and SOCECOL 10 and SOCECOL 13

Same as PSCI 183S.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PUBHLTH 105. Introduction to Medical Informatics. 4 Units.**

Broad overview of medical informatics for students with varied backgrounds. Electronic medical records, online resources, mobile technologies, patient safety, and computational design. Legal, ethical, and public policy issues. Health systems management. Evaluation and fieldwork for health systems.

Prerequisite: WRITING 39C or WRITING 30 or WRITING 31 or HUMAN 1C or HUMAN H1C. WRITING 39C with a grade of C or better. WRITING 30 with a grade of C or better. WRITING 31 with a grade of C or better. HUMAN 1C with a grade of C or better. HUMAN H1C with a grade of C or better

Same as IN4MATX 171.

Restriction: Upper-division students only. Satisfactory completion of the Lower-Division Writing requirement.

**PUBHLTH 106. Project in Health Informatics. 4 Units.**

Students undertake significant quarter-long projects related to health informatics. Topics may include field evaluations of health care technologies, prototypes, iterative design, and system implementations.

Prerequisite: PUBHLTH 105 or IN4MATX 171

Same as IN4MATX 172.

**PUBHLTH 107. Epidemiology of Drug Use and Misuse. 4 Units.**

Applies epidemiologic concepts to the use and misuse of licit/illicit substances. Emphasizes descriptive aspects of drug use and determinants of progressing from experimental use to misuse. Assesses subgroups of abusers, risk factors, trends, and surveillance techniques for estimating drug prevalence.

Prerequisite: PUBHLTH 101

Restriction: Upper-division students only. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 115. Community, Social Justice, and Health Equity Research for Action. 4 Units.**

Focuses on community as a unit of identity, community, well-being, and social justice perspectives and initiatives to promote community health. Addresses community change and improvements in community well-being, with a focus on health equity research for action.

Prerequisite: PUBHLTH 1 or PUBHLTH 2 or CHC/LAT 61 or CHC/LAT 62 or CHC/LAT 63

Same as CHC/LAT 152B.

**PUBHLTH 119. Special Topics in Epidemiology and Genetics. 4 Units.**

Studies in selected areas of epidemiology and genetics. Topics addressed vary each quarter.

Prerequisite: PUBHLTH 1

Repeatability: Unlimited as topics vary.

**PUBHLTH 120. Nutrition and Global Health. 4 Units.**

Global issues related to nutrition and public health. Evaluation of nutritional risk factors associated with the development of chronic diseases and the role of nutritional medicine in prevention. Topics include food safety, communicable diseases, supplements, and regulatory issues.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 121. Introduction to Complementary and Alternative Medicine. 4 Units.**

Examines health and disease in contemporary American culture/society with definitions, models, and practices of what has come to be known as 'orthodox' or 'conventional' medicine. Selected 'alternative' or 'complementary' modes of promoting health and well-being including homeopathy, herbology, and chiropractic.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 122. Health Policy. 4 Units.**

Considers social and economic aspects of health and disease in the United States. What are the proper roles of the individual, community, and government in improving health and health care? International comparisons will be made wherever possible.

Same as UPPP 170.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**PUBHLTH 125. Foundations of Community Health. 4 Units.**

A social ecological framework for understanding community health is presented. Measures of individual and community health are compared, and the influence of personal and environmental factors on individual, group, and population health is examined. Community health promotion strategies are discussed.

Same as UPPP 112.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**PUBHLTH 126. Public Health Law: Fundamentals in Action. 4 Units.**

Addresses the relationship of U.S. public health law to health systems at the individual and population levels. Examines legislative and judicial concepts and how they are applied to disease prevention strategies, health services, management, and policy.

**PUBHLTH 127. Public Health Programs for the Corporate World. 4 Units.**

International perspective on workplace health promotion. Strategies for developing programs to improve employee health and to decrease risks of chronic degenerative diseases. Case studies include assessment of employee health, program design, implementation, and evaluation. Emphasis on disease prevention.

**PUBHLTH 129. Public Health Administration. 4 Units.**

Examines historical aspects of public health administration including policies, procedures, trends, and development of organizations. Addresses information and skills necessary to succeed in public health leadership roles. Discusses strategic planning, collaborations, and ethical considerations for successful management in public health.

Prerequisite: PUBHLTH 1

Restriction: Upper-division students only. Public Health Policy Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment.

**PUBHLTH 132. American Public Policy. 4 Units.**

Focuses on the development and implementation of public policy in the United States. Lectures cover theoretical models of the policy process as well as significant problems facing contemporary American decision-makers.

Same as POL SCI 121G, SOC SCI 152C, UPPP 129.

**PUBHLTH 135. Medical Sociology. 4 Units.**

Current problems in U.S. health-care system and proposals for reform. Examines financial barriers to access; problem of patient dumping; underinsurance; prenatal and perinatal care; child services; preventative care and needs of the elderly; minorities; low-income people; undocumented.

Same as SOCIOL 154.

Restriction: Upper-division students only. Sociology Majors have first consideration for enrollment.

**PUBHLTH 138. Tobacco Control Policy. 4 Units.**

Examines the challenges that governments encounter in regulating the marketing, sales and acquisition, and use of tobacco products. Students assess the supply and demand for tobacco from the perspectives of the industry and consumer.

Restriction: Public Health Majors only. Public Health Sciences Majors only. Public Health Policy Majors only.

**PUBHLTH 139. Special Topics in Health Policy and Administration. 4 Units.**

Studies in selected areas of health policy and administration. Topics addressed vary each quarter.

Prerequisite: PUBHLTH 1

Repeatability: Unlimited as topics vary.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 141. Clinical Health Psychology. 4 Units.**

Behavioral role in etiology, treatment, and prevention of certain diseases. Behavioral intervention including biofeedback, stress-, pain-management, health habit counseling, and other skills to assist patients make cognitive, emotional, and behavioral changes needed to cope with disease or achieve better health.

Prerequisite: PSCI 9 or PSCI 11C or PSYCH 7A or PSYCH 9C

Same as PSCI 141H.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PUBHLTH 144. Health Behavior Theory. 4 Units.**

Introduces theoretical perspectives from the social sciences to understand health behavior from the vantage point of individuals, their interpersonal contacts, communities, and ecological contexts. Application of theory to public health problems is a central focus.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 146. Health Promotion Programs. 4 Units.**

Examines ecological perspectives of health promotion programs and risk factors related to mortality/morbidity. Analyzes effectiveness of health promotion strategies and issues in the existing healthcare systems in light of sociocultural beliefs and economical/political conditions.

Prerequisite: PUBHLTH 1

Restriction: Upper-division students only. Public Health Policy Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment.

**PUBHLTH 147. Drug Abuse and Its Prevention. 4 Units.**

Theoretical and practical underpinnings of drug abuse and its prevention at the individual and population levels. Students practice developing drug abuse prevention schemes for specific populations. Recent developments in pharmacological and biobehavioral theories of drug dependence are explored.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 148. Public Health Communication. 4 Units.**

Theoretical underpinnings and practical applications of communication sciences in public health practice. Techniques of effective communication, including fear appeal and deterrence; social marketing; public-private partnerships; health service delivery; and outreach in rural and urban settings, and for international health strategies.

Prerequisite: PUBHLTH 1 and PUBHLTH 2

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 150. Public Health and Wellness. 4 Units.**

Presents information about wellness from both science and policy perspectives in order to demonstrate the role of wellness in public health. Emphasizes the conditions that create wellness in the individual, the community, the nation, and the world.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 151. Environmental Psychology. 4 Units.**

Impact of the physical environment on individual and group behaviour. Three basic concerns examined: (a) environmental determinants of behaviour at the individual and interpersonal level; (b) social planning and urban design; (c) methodological approaches to the study of environmental issues.

Prerequisite: ENVIRON E8 and (SOCECOL 10 or PP&D 4)

**PUBHLTH 159. Special Topics in Social and Behavioral Health Science. 4 Units.**

Studies in selected areas of social and behavioral health sciences. Topics addressed vary each quarter.

Prerequisite: PUBHLTH 1

Repeatability: Unlimited as topics vary.

**PUBHLTH 161. Environmental Geology. 4 Units.**

Introduction to geologic principles and applications to environmental problems. Topics include: tectonic processes, earth materials, soils, river processes, groundwater, the coastal environment, slope failures, seismic hazards, mineral resources, and land-use evaluation based on geologic conditions. Examples from case studies.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 163. Introduction to Environmental Health Science. 4 Units.**

Focuses on processes of exposure to environmental toxins/agents and their impact to human health and the environment. Media transport, exposure assessment, susceptibility, behavior, and health effect of several toxins are discussed.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 167. Air Pollution, Climate, and Health. 4 Units.**

Introduction to how air pollutants are emitted into the atmosphere, how people are most exposed to air pollutants in developed and developing areas, physical and meteorological processes that affect transport, and the influence of air pollutants on global warming.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 168. Nuclear Environments. 4 Units.**

Understanding the impact of the nuclear age on the environment and human health through interrelated developments of nuclear power and nuclear weapons. The early years of weapon development, catastrophic environmental pollution, perils of nuclear power in the U.S. and Russia.

Same as INTL ST 122, SOCECOL E127.

**(VIII)****PUBHLTH 170. Introduction to Global Health. 4 Units.**

Provides a foundational interdisciplinary understanding of global health issues and their importance to various societal goals, including poverty reduction, economic productivity, and peace promotion. Covers major communicable and non-communicable diseases and demographic patterns of disease burden.

Prerequisite: PUBHLTH 1

**(VIII)****PUBHLTH 171. Human Exposure to Environmental Contaminants. 4 Units.**

Introduces origins of human's realization that chemicals in the environment may adversely affect health. Introduces the theory and principles of exposure assessment. Covers estimation of exposure, variability of measures, the way exposure assessment is incorporated into the risk-assessment paradigm.

**PUBHLTH 172. Climate Change and Disaster Management. 4 Units.**

Examines the social, economic, environmental, and health impacts of anthropogenic climate change through engaged learning that integrates practice and theory.

**PUBHLTH 173. Health and Global Environmental Change . 4 Units.**

Overview of scientific underpinnings of global environmental change and human health consequences. Provides an understanding of the fundamental dependency of human health on global environmental integrity. Encourages disciplinary cross-fertilization through interaction of students in environmental, health, and policy sciences.

Prerequisite: One upper-division course in environmental science, public health, environmental policy, and/or environmental management.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 174. Global Health Ethics. 4 Units.**

Provides a foundation for understanding and application of key issues.

**(VIII)**

**PUBHLTH 176. War and Public Health. 4 Units.**

Explores how war impacts public health both globally and domestically in the United States. Focus on the link between war and the burden that it ultimately places on physical, mental, environmental, and societal health as well as on health systems.

**PUBHLTH 179. Special Topics in Environmental and Global Health Science. 4 Units.**

Studies in selected areas of environmental and global health sciences. Topics addressed vary each quarter.

Prerequisite: PUBHLTH 1

Repeatability: Unlimited as topics vary.

**PUBHLTH 180. Epidemiology of Infectious Disease. 4 Units.**

Examines the distribution of infectious disease and the health and disease risk among human populations. Introduces basic methods for infectious disease epidemiology. Case studies of important diseases, including HIV and malaria, are conducted.

Prerequisite: PUBHLTH 1

**PUBHLTH 181. Infectious Disease Dynamics. 4 Units.**

Learn how the immune system interacts with infectious diseases, in particular with viral infections. An introduction to basic virology and immunology, it concentrates on the way in which the immune system is critical to the prevention of infections.

Same as BIO SCI E124.

**PUBHLTH 182. Evolutionary and Ecological Principles in Medicine. 4 Units.**

Explore the dynamics of populations on an ecological, epidemiological, and medical level. Considers the dynamics of competition, predation, and parasitism; the spread and control of infectious diseases; and the in vivo dynamics of viral infections and the immune system.

Prerequisite: BIO SCI 93

Same as BIO SCI E151.

Concurrent with ECO EVO 251.

**PUBHLTH 189. Special Topics in Infectious Diseases. 4 Units.**

Studies in selected areas of infectious diseases. Topics addressed vary each quarter.

Prerequisite: PUBHLTH 1

Repeatability: Unlimited as topics vary.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 190. Geographic Information Systems for Public Health. 4 Units.**

Provides a broad introduction to the use of Geographic Information Systems software to carry out projects for visualizing and analyzing spatial data to address significant issues of health care and policy-planning.

Concurrent with PUBHLTH 283.

**PUBHLTH 191A. Seminar: Advances and Challenges in Public Health. 2 Units.**

Forum for exploring recent advances and challenges in all disciplines of public health research and practice. Features case studies exemplifying the integration of core competencies with cross-cutting interdisciplinary themes of public health.

Grading Option: Pass/no pass only.

Concurrent with PUBHLTH 291A.

**PUBHLTH 191B. Seminar: Advances and Challenges in Public Health. 2 Units.**

Forum for exploring recent advances and challenges in all disciplines of public health research and practice. Features case studies exemplifying the integration of core competencies with cross-cutting interdisciplinary themes of public health.

Grading Option: Pass/no pass only.

Concurrent with PUBHLTH 291B.



**PUBHLTH 191C. Seminar: Advances and Challenges in Public Health. 2 Units.**

Forum for exploring recent advances and challenges in all disciplines of public health research and practice. Features case studies exemplifying the integration of core competencies with cross-cutting interdisciplinary themes of public health.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

Concurrent with PUBHLTH 291C.

**PUBHLTH H192A. Public Health Honors Seminar and Thesis I. 4 Units.**

Provides an opportunity for selected students to pursue advanced work in research and earn Public Health Honors. Students will conduct their honors research project with faculty through lectures, guest speakers, creating timelines and assignments.

Corequisite: PUBHLTH 199

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Public Health Policy Majors only. Public Health Sciences Majors only.

**PUBHLTH H192B. Public Health Honors Seminar and Thesis II. 4 Units.**

Students initiate and complete data collection for the honors thesis. In addition, students begin data analysis and summarize results at a class symposium at the end of the quarter. A faculty mentor provides supervision and feedback on thesis chapters.

Corequisite: PUBHLTH 199

Prerequisite: PUBHLTH H192A

Grading Option: Pass/no pass only.

Restriction: Public Health Policy Majors only. Public Health Sciences Majors only.

**PUBHLTH H192C. Public Health Honors Seminar and Thesis III. 4 Units.**

Students write their honors research project (PUBHLTH H192A-PUBHLTH H192B) and prepare an oral report to be presented at a class symposium at the end of the quarter. A faculty mentor provides supervision and feedback on thesis chapters.

Corequisite: PUBHLTH 199

Prerequisite: PUBHLTH H192B

Restriction: Public Health Policy Majors only. Public Health Sciences Majors only.

**PUBHLTH 193. Ethics and Responsible Conduct of Research in Public Health. 4 Units.**

Issues of scientific integrity and satisfies the requirements for training in public health ethics. Includes guidelines for responsible conduct of research, federal and international codes, administrative review and approval, conflict of interest, and privacy and safety of research participants. Course may be offered online.

Restriction: Upper-division students only. Public Health Sciences Majors only. Public Health Policy Majors only.

**PUBHLTH 194A. Clinical and Translational Research Preparatory I. 4 Units.**

Provides training for students with an interest in clinical and translational research in the health care setting. Cultivates skills for study design, research literature review, ethics, responsible conduct of research, and cultural competence while emphasizing professionalism and personal responsibility.

Prerequisite: BIO SCI 99 and BIO SCI 194S and CHEM 1C and CHEM 1LC and CHEM 1LD. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only.

**PUBHLTH 194B. Clinical and Translational Research Preparatory II. 1-4 Units.**

Provides opportunities for students to participate in clinical and translational research through rotations in at least two health care settings. Builds on preparation through the first course (194A) in the sequence to support exploration of various research topics.

Prerequisite: PUBHLTH 194A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only.

**PUBHLTH 194C. Clinical and Translational Research Preparatory III. 4 Units.**

Provides opportunities for students to work closely in a particular clinical and translational research setting. Builds on preparation through the didactic instruction presented in first course of the sequence (194A) to support deeper engagement on a particular research topic.

Prerequisite: PUBHLTH 194B. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**PUBHLTH 194D. Clinical and Translational Research Preparatory IV. 4 Units.**

Provides opportunities for students to participate in clinical and translational research through placement in a research laboratory. This course is a continuation of 194C in which students have the opportunity to participate in a permanent research rotation.

Prerequisite: PUBHLTH 194C

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**PUBHLTH 195W. Public Health Practicum and Culminating Experience. 8 Units.**

Provides direct opportunities for Public Health majors to observe and participate in public health activities and/or research; and to cultivate skills for verbal and written communication of contemporary public health topics for an integrative culminating experience.

Prerequisite: PUBHLTH 1 and PUBHLTH 2. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Public Health Sciences Majors only. Public Health Policy Majors only.

**(Ib)****PUBHLTH 196A. Clinical and Translational Research Preparatory I - Community-Based Research and Evaluation. 4 Units.**

Provides training for students with an interest in clinical and translational research in a community-based setting. Cultivates skills for study design, research literature review, ethics, responsible conduct of research, and cultural competence while emphasizing professionalism and personal responsibility.

Overlaps with PUBHLTH 194A.

**PUBHLTH 196B. Clinical and Translational Research Preparatory II - Community-Based Research and Evaluation. 4 Units.**

Provides the unique opportunity for students to participate in research in two or more community-based settings. Builds on preparation through PUBHLTH 196A to support exploration of various research topics.

Prerequisite: PUBHLTH 196A

**PUBHLTH 196C. Clinical and Translational Research Preparatory III - Community-Based Research and Evaluation III. 4 Units.**

Final course in the 196 series where students have the unique opportunity to participate in permanent research rotation. Instructs students how to design, perform, interpret, and discuss independent research in a collaborative atmosphere.

Prerequisite: PUBHLTH 196B

**PUBHLTH 197. Field Studies in Public Health. 2-12 Units.**

For students who may either accompany faculty members on field trips or engage in post-practicum work at a field agency.

Prerequisite: PUBHLTH 1 and PUBHLTH 2

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 12 units.

**PUBHLTH 198. Directed Studies. 1-4 Units.**

Student participation in a series of research-related activities performed in an individual or small-group setting under the guidance of a faculty advisor.

Prerequisite: PUBHLTH 1

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**PUBHLTH 199. Undergraduate Research. 1-4 Units.**

Original research with Public Health faculty. Attendance at regular research group meetings is also generally expected, and a quarterly written report is required. Strongly recommended for students considering research careers and/or graduate degree programs.

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**PUBHLTH 200. Foundations of Public Health. 4 Units.**

Presents the overarching framework, principles, and core responsibilities of public health research and practice from a multidisciplinary perspective. Provides necessary foundation for further studies toward advanced cross-cutting approaches essential for public health practice.

Restriction: College of Health Sciences students only. Program in Public Health students only. Master of Public Health Degree students only. Graduate students only. Public Health Majors only.

**PUBHLTH 204. Biostatistics I: Introduction to Statistical Methods. 4 Units.**

Designed to help students develop an appreciation for statistician's view of the research process, emphasizing biomedical research. Instills an understanding of how statistical models are used to yield insights about data that form evidence-based understanding of the world around us.

Same as EPIDEM 204A.

Restriction: Graduate students only.

**PUBHLTH 204B. Biostatistics II: Intermediate Statistical Methods. 4 Units.**

Intended for graduate students in epidemiology, public health, and clinical research fields. Covers common regression-modeling techniques frequently used in biologic and medical applications.

Prerequisite: EPIDEM 204. EPIDEM 204 with a grade of B or better

Repeatability: May be taken for credit 2 times.

Same as EPIDEM 204B.

Restriction: Graduate students only.

**PUBHLTH 204C. Biostatistics III: Advanced Statistical Methods. 4 Units.**

Intended for graduate students in epidemiology, public health, and related fields. Introduces statistical methods for analyzing survival and longitudinal/clustered data, and techniques to resolve missing data.

Prerequisite: EPIDEM 204B. EPIDEM 204B with a grade of B or better

Repeatability: May be taken for credit 2 times.

Same as EPIDEM 204C.

Restriction: Graduate students only.

**PUBHLTH 206A. Principles of Epidemiology. 4 Units.**

Fundamental principles of epidemiology, biostatistics, and epidemiological research. Topics include research methods of measuring health problems in populations, disease control and prevention in populations, how epidemiology contributes to knowledge of disease etiology, and biostatistical analysis and interpretation of epidemiologic data.

Same as EPIDEM 200A.

Restriction: Graduate students only.

**PUBHLTH 206B. Intermediate Epidemiology. 4 Units.**

Learn to design and conduct epidemiologic studies using common designs. Determine why bias and measurement error arise in observational studies, and how they influence effect estimates. Perform and interpret epidemiologic data analyses using statistical software.

Prerequisite: PUBHLTH 206A. PUBHLTH 206A with a grade of B or better

Same as EPIDEM 200B.

Restriction: College of Health Sciences students only. Program in Public Health students only. Master of Public Health Degree students only. Graduate students only. Epidemiology Majors only.

**PUBHLTH 206C. Advanced Epidemiologic Methods. 4 Units.**

Advanced topics in the design and statistical analysis of epidemiologic studies. Topics include simulation methods, counter-matching and multiphase study designs, missing data, and Bayesian analysis. Published simulation studies are discussed and replicated using the R software package.

Prerequisite: EPIDEM 200A and EPIDEM 200B. EPIDEM 200A with a grade of B or better. EPIDEM 200B with a grade of B or better

Same as EPIDEM 200C.

**PUBHLTH 207A. Probability and Statistics in Public Health. 4 Units.**

An introduction to probability and statistical methods, using examples in public health. Topics include descriptive statistics, laws of probability, discrete and continuous probability distributions, estimation, confidence intervals, hypothesis testing, and power calculations for one- and two-sample comparisons.

Prerequisite: PUBHLTH 206A. PUBHLTH 206A with a grade of B or better

Restriction: Program in Public Health students only. Master of Public Health Degree students only. Graduate students only. Public Health Majors only.

**PUBHLTH 207B. Analysis of Public Health Data Using Statistical Software. 4 Units.**

Overview of common statistical methods in public health and how to implement them in R. Topics include linear regression, ANOVA, the Kruskal-Wallis test, logistic regression, missing data and censoring, Kaplan-Meier survival curves, log-rank tests, and Cox regression.

Prerequisite: PUBHLTH 207A. PUBHLTH 207A with a grade of B or better

Restriction: Program in Public Health students only. Master of Public Health Degree students only. Graduate students only. Public Health Majors only.

**PUBHLTH 208. Advances in Social Epidemiology. 4 Units.**

Advances understanding of social distribution and social determinants of disease through multiple risk factor models and mechanisms that emphasize developmental and socio-environmental risk factors on mental and physical health across the life span.

Restriction: Graduate students only.

**PUBHLTH 209. Methods of Demographic Analysis. 4 Units.**

Introduces basic demographic methods used in social science and public health research. Topics include sources and limitations of demographic data; components of population growth; measures of nuptiality, fertility, mortality, and population mobility projection methods; and demographic models.

Same as SOCIOL 226A.

Restriction: Graduate students only.

**PUBHLTH 210. Theory-Driven Secondary Data Analysis. 4 Units.**

Learn how to develop and test theoretically-driven research questions in secondary data sources. Logic of theory building and testing, how to conduct statistical analyses on testable research questions, and interpret results. There is also a lab component.

Restriction: Graduate students only. Environmental Health Sciences Majors only. Epidemiology Majors only. Public Health Majors only.

**PUBHLTH 211A. Latinos/Latinas and Medical Care: Contemporary Issues. 2 Units.**

Introduction to medical anthropological and social science perspectives on Latinos/Latinas in relation to a number of health and medically-related issues, i.e., immigration, gender, reproduction, culture, social structure, political economy, sexuality, utilization of medical services, and health beliefs.

Same as CHC/LAT 211A.

**PUBHLTH 211B. Latinos/Latinas and Medical Care: Contemporary Issues. 2 Units.**

Introduction to medical anthropological and social science perspectives on Latinos/Latinas in relation to a number of health and medically-related issues, i.e., immigration, gender, reproduction, culture, social structure, political economy, sexuality, utilization of medical services, and health beliefs.

Prerequisite: CHC/LAT 211A

Same as CHC/LAT 211B.

**PUBHLTH 213. Epidemiology in Global Health. 4 Units.**

Examines major topics in epidemiology and global health. Research topics within these two disciplines are focused on resource-poor communities, with an application to the global world.

Restriction: Graduate students only. Environmental Health Sciences Majors only. Epidemiology Majors only. Public Health Majors only.

**PUBHLTH 214. Surveillance Systems. 4 Units.**

Surveillance as a fundamental element of the practice of public health is examined in terms of the application and evaluation of monitoring systems. Topics include surveillance of infectious and chronic diseases, environmental constituents, and other indicators of population health.

Prerequisite: PUBH 206

Restriction: Graduate students only.

**PUBHLTH 219. Special Topics in Biostatistics, Epidemiology, and Health Informatics. 4 Units.**

Current research in biostatistics, epidemiology, and health informatics. Topics vary from quarter to quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PUBHLTH 222. Health Policy and Management. 4 Units.**

Multidisciplinary inquiry into theory and practice concerned with delivery, quantity, costs of health care for individuals and populations. Explores managerial and policy concerns regarding structure, process, outcomes of health services including the costs, financing, organization, outcomes, and accessibility of care.

Same as UPPP 243.

Restriction: Master of Public Health Degree students have first consideration for enrollment. Master of Public Policy Degree students have first consideration for enrollment. Graduate students only. Public Health Majors have first consideration for enrollment. Urban and Regional Planning Majors have first consideration for enrollment.

**PUBHLTH 223. Risk Communication. 4 Units.**

Examines theory and research related to the communication of scientific information in risk communication contexts, risk perceptions, and behavior as related to decision-making under risk.

Restriction: Graduate students only.

**PUBHLTH 239. Special Topics in Health Policy and Management. 4 Units.**

Current research in health policy and management. Topics vary from quarter to quarter.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PUBHLTH 241. Environmental Policy and Global Sustainability. 4 Units.**

Organized around four transcendent questions: does the world value sustainability, what challenges must be met to move toward it, what are the roots of inequality, and is capitalism compatible with sustainability.

Restriction: Graduate students only.

**PUBHLTH 242. Theories of Health Communication. 4 Units.**

Explores the concepts, constructs, and theories of communication in health and risk contexts. Examines interpersonal, family, organizational, and mediated communicative processes about health care and conditions from a global perspective.

Restriction: Graduate students only.

**PUBHLTH 244. Health Behavior Theory. 4 Units.**

Introduces the field of Health Behavior and segues into major theoretical perspectives. Focus on health behavior change from the vantage point of individual health behavior and theoretical abstraction. Explores how to relate theory to behavior-change intervention programs.

Restriction: Master of Public Health Degree students only. Graduate students only. Public Health Majors only.

**PUBHLTH 245. Health Promotion Planning. 4 Units.**

Introduces strategic planning integral to intervention planning in public health practice and research, emphasizing the fundamental domains of social and behavioral health science and practices. Students develop an intervention plan for a specific health problem, health behavior, and target population.

Restriction: Graduate students only.

**PUBHLTH 246. Social Research Methods. 4 Units.**

An interactive graduate seminar covering topics related to the research process and study design. Begins with conceptualizing research questions, hypotheses, and then turns to topics in measurement and concludes with experimental, quasi-experimental, and observational study designs.

Restriction: Graduate students only.

**PUBHLTH 247. Program Evaluation. 4 Units.**

Introduces methods, tools, and procedures for systematic investigation of the effectiveness of programs in health and social services for disease intervention, prevention, and health promotion. Includes development of program evaluation plans, logic models, contextual frameworks, study designs, and data analyses.

Restriction: Graduate students only.

**PUBHLTH 248. Fundamentals of Maternal and Child Health - Programs, Problems, and Policy. 4 Units.**

Overview of issues facing women, children, and families from a public health perspective. Discusses role of socio-economic, political, biological, environmental factors on population health. Studies historical foundations and current factors impacting Maternal Child Health programs and legislation in the US.

Restriction: Graduate students only.

**PUBHLTH 250. Health Status and Care Disparities. 4 Units.**

Expert health care providers present viewpoints and interdisciplinary strategies for addressing sociocultural, economic, gender, age, and other disparities in population health status and care provision.

Restriction: Graduate students only.

**PUBHLTH 251. Models of Practice and Intervention at the Community Level. 4 Units.**

Examines and critiques current models, frameworks, theories for.

Prerequisite: CHC/LAT 200A or PUBHLTH 246

Same as CHC/LAT 251.

Restriction: Graduate students only.

**PUBHLTH 259. Special Topics in Social and Behavioral Health Sciences. 4 Units.**

Current research in Social and Behavioral Health Sciences. Topics vary from quarter to quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PUBHLTH 260. Human Exposure Modeling. 4 Units.**

Explores the basic principles and methods in estimating human exposure to environmental pollutants. Topics include source emissions, spatial/temporal aspects of human exposures, air pollution exposure modeling, time-activity patterns, micro-environmental exposure assessment, the uncertainty/variability analysis.

Restriction: Graduate students only.

**PUBHLTH 264. Introduction to Environmental Health Science. 4 Units.**

Convergence of agents (chemical, physical, biological, or psychosocial) in environment can emerge as diseases influenced by social, political, and economic factors, allowing them to become rooted in society. How these agents from various spheres come together and impact human health.

Same as EPIDEM 264, EHS 264.

Restriction: Graduate students only. Environmental Health Sciences Majors only. Epidemiology Majors only. Public Health Majors only. Environ Health Sci and Policy Majors only.

**PUBHLTH 265. Advanced Environmental Health Science. 4 Units.**

Explores the complex relationships among exposure processes and adverse health effects of environmental toxins focusing on specific chemicals, sources, transport media, exposure pathways, and human behaviors. Techniques of environmental sampling for exposure assessment are discussed.

Same as EPIDEM 265.

Restriction: Graduate students only.

**PUBHLTH 269. Air Pollution, Climate, and Health. 4 Units.**

Emission of air pollutants into the atmosphere, physical and meteorological processes that affect transport, and influence on global warming. Concepts of how and where people are most exposed, and how exposures and health effects differ in developed and developing regions.

Same as EPIDEM 269, EHS 269.

**PUBHLTH 270. Human Exposure to Environmental Contaminants. 4 Units.**

Introduces founders of conceptual thought that environmental contaminants can impact health. Theory and principles of exposure assessment, the continuum from emissions of a contaminant into the environment to evidence of health effects in a population.

Same as EPIDEM 270, EHS 270.

**PUBHLTH 272. Occupational Health Psychology. 4 Units.**

Introduction to psychological and social factors in the workplace that affect health and productivity. Goal is to support redesign of the workplace and social situations that can reduce stress-related illness risks, and increase humane forms of productivity and competence development.

Same as EHS 294.

Restriction: Graduate students only.

**PUBHLTH 275. Environmental Modeling and Risk Management. 4 Units.**

Surveys the general principles, basic mathematical methods, and practices of environmental modeling and human health risk assessment. Topics include advection-dispersion models, risk management, and risk perception. Students conduct an original risk assessment as a final group project.

Prerequisite: MATH 2A and STATS 7

Same as EHS 275.

Restriction: Graduate students only.

Concurrent with PUBHLTH 175.

**PUBHLTH 277A. Target Organ Toxicology I. 4 Units.**

Mechanistic analysis of responses occurring in various organ systems of experimental animals and humans exposed to environmental and occupational chemicals and radiation. Review distinctive cellular and tissue structure and physiological function of the various organ systems.

Same as EHS 206A.

Restriction: Graduate students only.

**PUBHLTH 277B. Target Organ Toxicology II. 4 Units.**

Mechanistic analysis of responses occurring in various organ systems of experimental animals and humans exposed to environmental and occupational chemicals and radiation. Review of distinctive cellular and tissue structure and physiological function of the various organ systems.

Prerequisite: PUBHLTH 277A or EHS 206A

Same as EHS 206B.

Restriction: Graduate students only.

**PUBHLTH 278. Industrial Toxicology. 4 Units.**

Analysis of responsibilities toxicologists have in industry, including product safety, generating material safety, data sheets, animal testing, ecotoxicological testing, risk/hazard communication, and assisting industrial hygienists and occupational physicians; emphasis on interdisciplinary nature of industrial toxicology and communication skills.

Prerequisite: PUBHLTH 277B or EHS 206B

Same as EHS 220.

**PUBHLTH 279. Special Topics in Environmental & Occupational Health. 4 Units.**

Current research in environmental and occupational health. Topics vary from quarter to quarter.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PUBHLTH 280. Global Burden of Disease. 4 Units.**

Introduces composite measures of disease burden, including Disability Adjusted Life Years and their use in prioritizing disease burden at local, regional, and global levels. Focuses on WHO's landmark assessments and introduces DISMOD software for specific analyses.

Restriction: Graduate students only.

**PUBHLTH 281. Infectious Disease Epidemiology. 4 Units.**

Geographical distribution of infectious diseases and the health and disease risk in diverse human populations. Introduces basic methods for infectious disease epidemiology and case studies of important diseases. Includes surveillance, outbreak investigation, emerging pathogens, traditional and molecular epidemiology.

Restriction: Graduate students only.

**PUBHLTH 282. Climate Change and Global Health. 4 Units.**

Designed for students to examine major topics in climate change and global health. Draws heavily on the literature in order to develop an understanding of micro- and macro-level impacts and drivers with regard to climate change and health.

Restriction: Graduate students only. Environmental Health Sciences Majors only. Epidemiology Majors only. Public Health Majors only.

**PUBHLTH 283. Geographic Information Systems for Public Health. 4 Units.**

Provides a broad introduction to the use of Geographic Information Systems software to carry out projects for visualizing and analyzing spatial data to address significant issues of health care and policy-planning.

Prerequisite: PUBH 206

Restriction: Graduate students only.

Concurrent with PUBHLTH 190.

**PUBHLTH 286. Advanced Geographic Information Systems and Spatial Epidemiology. 4 Units.**

Students expand their current knowledge of the ArcGIS software to develop advanced geographic-related research questions, learn how to apply spatial epidemiologic methods to public health data, and integrate their skills in a GIS project of their design.

Prerequisite: PUBHLTH 283

Restriction: Graduate students only.

**PUBHLTH 287. Qualitative Research Methods in Public Health. 4 Units.**

General introduction to qualitative research methods for investigating public health questions at various scales from community level to global populations. Emphasizes systematic approaches to the collection, analysis, interpretation of qualitative data.

Restriction: Graduate students only.

**PUBHLTH 288. Research Proposal Writing in Global Health. 4 Units.**

Overview of financial support for research in global health and disease prevention. Collaborative agreements, guidelines for proposal writing, team building, budgeting, peer-review process, and transitioning from proposal to research project implementation.

Restriction: Graduate students only.

**PUBHLTH 289. Special Topics in Global Health and Disease Prevention. 4 Units.**

Current research in global health and disease prevention. Topics vary from quarter to quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PUBHLTH 290. Special Topics in Public Health. 4 Units.**

Studies in selected areas of public health. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.



**PUBHLTH 291A. Seminar: Advances and Challenges in Public Health. 2 Units.**

Forum for exploring recent advances and challenges in all disciplines of public health research and practice. Features case studies exemplifying the integration of core competencies with cross-cutting interdisciplinary themes of public health.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

Concurrent with PUBHLTH 191A.

**PUBHLTH 291B. Seminar: Advances and Challenges in Public Health. 2 Units.**

Forum for exploring recent advances and challenges in all disciplines of public health research and practice. Features case studies exemplifying the integration of core competencies with cross-cutting interdisciplinary themes of public health.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

Concurrent with PUBHLTH 191B.

**PUBHLTH 291C. Seminar: Advances and Challenges in Public Health. 2 Units.**

Forum for exploring recent advances and challenges in all disciplines of public health research and practice. Features case studies exemplifying the integration of core competencies with cross-cutting interdisciplinary themes of public health.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

Concurrent with PUBHLTH 191C.

**PUBHLTH 292. Ethics and Responsible Conduct of Research in Public Health. 4 Units.**

Issues of scientific integrity and satisfies the requirements for training in public health ethics. Includes guidelines for responsible conduct of research, federal and international codes, administrative review and approval, conflict of interest, and privacy and safety of research participants.

Restriction: Graduate students only.

Concurrent with PUBHLTH 193.

**PUBHLTH 293. Foundations of Clinical and Translational Science. 4 Units.**

Introduces rationale and imperative for clinical translational science and various approaches being developed to speed-up discoveries and their transformation into health care practices. Compares and contrasts current impediments to clinical research with the potential and transformative power of translational science.

Restriction: Graduate students only.

**PUBHLTH 294. Research Communication in Public Health. 4 Units.**

Strategies for effective writing and oral presentation of research characteristics and results to various audiences. Includes exercises in writing for the public, for scholarly journals, and at conferences.

Restriction: Graduate students only.

**PUBHLTH 295. Graduate Practicum and Culminating Experience in Public Health. 8 Units.**

Provides opportunities for hands-on experience for graduate students at agencies or organizations engaged in public health practice. Students are matched with placement sites based on academic preparation and students' career goals. The practicum report is integrated into the culminating experience.

Prerequisite: PUBHLTH 200 and PUBHLTH 244 and PUBHLTH 222 and PUBHLTH 264 and PUBHLTH 207A. PUBHLTH 200 with a grade of B or better. PUBHLTH 244 with a grade of B or better. PUBHLTH 222 with a grade of B or better. PUBHLTH 264 with a grade of B or better. PUBHLTH 207A with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Public Health Majors only.

**PUBHLTH 296. Doctoral Dissertation Research and Writing. 1-12 Units.**

Dissertation research with Public Health faculty.

Prerequisite: Advancement to candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit for 12 units.

Restriction: Graduate students only. Public Health Majors only.

**PUBHLTH 297. Research Design and Proposal Writing. 4 Units.**

Evaluate strengths of research findings based on methods used by researchers to develop research proposals. Components such as collaborative agreements, guidelines for proposal writing, budgeting, peer-review process, and transitioning from proposal to research project implementation are addressed.

Restriction: College of Health Sciences students only. Program in Public Health students only. Master of Public Health Degree students only. Graduate students only. Public Health Majors only.

**PUBHLTH 298. Directed Studies in Public Health. 2-8 Units.**

Directed study with Public Health faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PUBHLTH 299. Independent Study in Public Health . 2-8 Units.**

Independent research with Public Health faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PUBHLTH 399. University Teaching. 2-4 Units.**

Limited to teaching assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Public Policy (PUB POL)

### Courses

**PUB POL 215. Statistics and Methods for Public Policy. 4 Units.**

Introductory course with focus on gaining a sound understanding of what constitutes credible evidence in support of policy arguments and management decisions.

Restriction: Graduate students only.

**PUB POL 219. Information and Public Policy. 4 Units.**

Evaluates strengths and weaknesses of qualitative and quantitative methods and the data used in making public policy claims. Looks at the bases of certain widely accepted measures of poverty, growth, environmental quality, and the like.

Repeatability: May be taken for credit 2 times.

Restriction: Public Policy Majors have first consideration for enrollment.

**PUB POL 221. Public Policy . 4 Units.**

Explores different approaches to public policy analysis, the diverse conceptions of the goals and objectives that should be served by policy, and the appropriate role of the policy analyst. Policy consequences are traced to indirect and subtle incentives and disincentives.

Repeatability: May be taken for credit 2 times.

Same as PP&D 221.

Restriction: Public Policy Majors have first consideration for enrollment.

**PUB POL 225. Qualitative Methods . 4 Units.**

Fieldwork, data collections techniques, and related issues for anti-positivistic research. Data collection techniques include observation, physical traces, participation, in-depth interview. Data checks include veracity, detail, completeness, rigor.

Repeatability: May be taken for credit 2 times.

Restriction: Public Policy Majors only.

**PUB POL 227. Economics of Government. 4 Units.**

Prepares students to analyze public policy questions with tools from economics. By the end, students should be able to identify important economic issues in public policy debates and consume and critique economic research on these topics.

Same as ECON 275.

**PUB POL 240. Microeconomics and Public Policy. 4 Units.**

Introduces the fundamental principles of microeconomics that are required for applied policy analysis. Provides students with an intuitive understanding of the microeconomic approach, and familiarizes them with concepts used in applied public policy analysis.

Repeatability: May be taken for credit 2 times.

Same as ECON 255.

Restriction: Graduate students only.

**PUB POL 260. Policy and Ethics . 4 Units.**

Examines the challenge of identifying ethical principles that can guide us in formulating and assessing public policy, the public policy process from an ethical perspective, and the ethics of the individual engaged in the public policy arena.

Restriction: Public Policy Majors only.

**PUB POL 283. Collaborative Governance and Public Management. 4 Units.**

Introduction to inclusive management. To make effective use of public resources, public managers are inventing ways of managing that alter relationships within organizations, between organizations, between sectors, and with the public. Requires rethinking fundamentals such as leadership and motivation.

Same as UPPP 283.

Restriction: Public Policy Majors have first consideration for enrollment.

## Radiological Sciences (RAD SCI)

## Radiology (RADIO)

# Religious Studies (REL STD)

## Courses

### REL STD 5A. World Religions I. 4 Units.

An introduction to the history, doctrine, culture, and writing of Judaism, Christianity, and Islam.

Same as HISTORY 16A.

(IV and VIII ).

### REL STD 5B. World Religions II. 4 Units.

An introduction to various religious traditions in selected areas of the world—including India and South Asia, East Asia, Africa, and the Americas.

Same as HISTORY 16B.

(IV and VIII ).

### REL STD 5C. Religious Dialogue. 4 Units.

Lectures and discussion on controversial topics in religion: sexual morality; religious violence; science; treatment of women and girls; religious truth, American Constitutional matters; secularization; the future of religion, and other topics.

Same as HISTORY 16C.

(IV, VIII)

### REL STD 17. An Economic Approach to Religion. 4 Units.

Introduction to how basic economic concepts such as demand, supply, consumption, production, competition, free-riding, innovation, regulation, and rent-seeking can be applied to understand observed religious behavior.

Same as ECON 17.

(III)

### REL STD 21. Philosophy and Religion. 4 Units.

Examines the intersection of religion and philosophy from a standpoint that does not presuppose previous academic study of either. Both Western and Eastern traditions and perspectives may be explored.

Repeatability: Unlimited as topics vary.

Same as PHILOS 21.

(IV)

### REL STD 61. Gender and Religion. 4 Units.

Introduces the topic of religion in a feminist context by performing cross-cultural exploration of gender, authority, and faith in various traditions. Study includes (but is not limited to) writings of contemporary Jewish, Christian, and Muslim feminists.

Same as GEN&SEX 60C.

(III and VIII ).

### REL STD 90. Aspects of Religion. 4 Units.

A presentation of selected issues in the study of religion.

Repeatability: May be taken for credit 3 times as topics vary.

### REL STD 91. Topics in Aspects of Asian Religions. 4 Units.

A survey course of a specific Asian religious tradition such as Hinduism, Buddhism, Jainism, Sikhism, Daoism, Confucianism, or Shinto in its manifestation in Asia or in its transmission to the Americas.

Repeatability: May be taken for credit 3 times as topics vary.

### REL STD 100. Topics in the Study of Religion. 4 Units.

The intersection of religious belief and practices with selected subjects of continuing interest.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 103. Topics in the Philosophy of Religion. 4 Units.**

Critical examination of philosophical concepts in religious scripture and theology, e.g., the nature and existence of God, miracles, the problem of evil, and divine command theories in ethics. May include any religious tradition.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 106. Topics in Gender and Religion. 4 Units.**

Critical examination of how religious beliefs and practices have shaped (and been shaped by) attitudes toward gender and sexuality in modern and/or premodern society.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 110. Thinking about Religion: Theories and Methodologies. 4 Units.**

A survey and investigation of the major thinkers, theories, and methodologies in the study of religions. Designed to develop the student's ability to analyze and articulate theoretical arguments; includes a paper on relevant Religious Studies topics.

Prerequisite: (REL STD 5A or HISTORY 16A) and (REL STD 5B or HISTORY 16B) and (REL STD 5C or HISTORY 16C)

Overlaps with REL STD 110W.

Restriction: Religious Studies Majors have first consideration for enrollment.

**REL STD 110W. Thinking about Religion: Theories and Methodologies. 4 Units.**

A survey and investigation of the major thinkers, theories, and methodologies in the study of religions. Designed to develop the student's ability to analyze and articulate theoretical arguments in writing; includes a paper on relevant Religious Studies topics.

Prerequisite: (REL STD 5A or HISTORY 16A) and (REL STD 5B or HISTORY 16B) and (REL STD 5C or HISTORY 16C). Satisfactory completion of the Lower-Division Writing requirement.

Overlaps with REL STD 110.

Restriction: Religious Studies Majors have first consideration for enrollment.

**(Ib)****REL STD 115. Religion and World Politics. 4 Units.**

Examines the relationship between religion and world politics historically and today, focusing on connections with peace/war, democracy, human rights, secularism(s), and globalization. Covers major debates, scholarship, concepts, and theories through class exercises, exams, and essays.

Prerequisite: POL SCI 41A or INTL ST 11 or INTL ST 12 or REL STD 5A or REL STD 5B or REL STD 5C

Same as POL SCI 146B, INTL ST 151B.

**REL STD 120. Topics in Asian Religious Traditions. 4 Units.**

Studies involving (but not limited to) Hinduism, Buddhism, Confucianism, Jainism, Sikhism, Daoism, Shinto or Shamanism, including both elite and doctrinal aspects and forms of more popular religiosity.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 122. Ancient India. 4 Units.**

Examines the visual and religious history of the region defined as 'India' today, but necessarily encompassing modern Bangladesh and Pakistan. Culminates with the supposed Golden Age of the Gupta empire and its far-reaching legacies.

Same as HISTORY 170A, ART HIS 155A.

Concurrent with ART HIS 255A.

**REL STD 123. Medieval India. 4 Units.**

Begins with the Gupta period's aesthetic legacies in South Asia's architecture, sculpture, and painting. Explores the dispersal of Islam throughout South Asia, including the Muslim communities of southern India.

Same as HISTORY 170B, ART HIS 155B.

Concurrent with ART HIS 255B.

**REL STD 124. Topics in Modern Indian Religion. 4 Units.**

Topics in religions of the Indian subcontinent including, but not confined to, Hinduism, Jainism, Sikhism, Islam, and Buddhism from the founding of the Mughal Empire in 1526 to the creation of the several modern states of the Indian subcontinent.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 130. Jewish, Islamic, and Middle Eastern Religious Traditions. 4 Units.**

Character and evolution of Egyptian, Jewish, Zoroastrian, Muslim, and other religious communities of the region from their formative periods to the present era.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 130F. Jews and Power. 4 Units.**

Examines the relationship between the Jewish people and political power over a 3500 year period. How have Jews preserved their communal interests and personal safety? How have they defined the proper relationship of the people to political authority.

Same as HISTORY 130F, POL SCI 154J.

**REL STD 131A. History of Zoroastrianism. 4 Units.**

Reviews major trends in the history of Zoroastrianism.

Same as HISTORY 131A.

**REL STD 140. Early Western Religious Traditions. 4 Units.**

Religious perspectives of the Mediterranean and European regions from the earliest times to approximately 1500 C.E.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 141. Recent Western Religious Traditions. 4 Units.**

Studies related to Catholic, Protestant, and Orthodox Christianity as well as alternative belief systems in Europe of the early modern and modern eras.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 150. Religion in the Americas. 4 Units.**

Religious belief and social context in North and South America from the earliest human societies to the present.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 160. Diaspora Religions. 4 Units.**

Examination of what happens to belief and practice as religious communities are scattered geographically.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 170. Topics in Comparative Studies in Religion. 4 Units.**

Literary, historical, or philosophical comparison of selected religious and quasi-religious traditions, their beliefs and practices.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 199. Independent Study. 1-4 Units.**

Directed reading and research in consultation with a faculty member. Substantial written work required.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only.

**REL STD 399. University Teaching . 4 Units.**

Limited to teaching assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

# Reserve Officers' Training Corps (ROTC)

## Courses

### **ROTC 10L. Military Science-Basic Leadership Laboratory. 1 Workload Unit.**

Provides hands-on and practical military science material covered in the corresponding military science courses.

Grading Option: Workload Credit P/NP Only.

Repeatability: May be repeated for credit unlimited times.

### **ROTC 11. Military Science-Personal Development. 1 Workload Unit.**

Focuses on life skills such as physical fitness, nutrition, and time management while providing an introduction to military knowledge, customs, and skills.

Grading Option: Workload Credit Letter Grade with P/NP.

### **ROTC 12. Military Science-Leadership I. 1 Workload Unit.**

Focuses on the fundamentals of leadership, Army leadership values, ethics, and counseling techniques.

Grading Option: Workload Credit Letter Grade with P/NP.

### **ROTC 13. Military Science-Tactical Leadership I. 1 Workload Unit.**

Focuses on leadership at the tactical level and includes instruction in fundamental military skills such as map reading, land navigation, squad and platoon operations, and resource planning techniques.

Grading Option: Workload Credit Letter Grade with P/NP.

### **ROTC 21. Military Science-Team Leadership I. 2 Workload Units.**

Explores the dimensions of creative and innovative tactical leadership strategies and styles by examining team dynamics and two historical leadership theories that form the basis of the Army leadership requirements model.

Grading Option: Workload Credit Letter Grade with P/NP.

### **ROTC 22. Military Science-Team Leadership II. 2 Workload Units.**

Explores team dynamics and two historical leadership theories that form the basis of the Army leadership requirements model.

Grading Option: Workload Credit Letter Grade with P/NP.

### **ROTC 23. Military Science-Tactical Leadership II. 2 Workload Units.**

Examines the challenges of leading tactical teams in the OE. Highlights dimensions of terrain analysis, patrolling, and operation orders.

Grading Option: Workload Credit Letter Grade with P/NP.

### **ROTC 100L. Military Science-Advanced Leadership Laboratory. 1 Workload Unit.**

Provides hands-on and practical exercises for the military science material covered in the corresponding military science courses as well as leader training through practical application of the Leadership Development Program.

Corequisite: ROTC 131 or ROTC 132 or ROTC 133 or ROTC 141 or ROTC 142 or ROTC 143 or ROTC 197.

Grading Option: Workload Credit P/NP Only.

Repeatability: May be repeated for credit unlimited times.

### **ROTC 131. Military Science-Leadership II. 3 Workload Units.**

Challenges cadets to study, practice, and evaluate adaptive leadership skills as they are presented with challenging scenarios related to squad tactical operations. Cadets receive systematic and specified feedback on their leadership attributes and core leader competencies.

Corequisite: ROTC 100L

Prerequisite: ROTC 11 and ROTC 12 and ROTC 13 and ROTC 21 and ROTC 22 and ROTC 23

Grading Option: Workload Credit Letter Grade with P/NP.

**ROTC 132. Military Science-Team Leadership III. 3 Workload Units.**

Provides cadets systematic and specific feedback on their leadership attributes and core leader competencies. Based on such feedback, as well as their own self-evaluations, cadets continue to develop their leadership and critical thinking abilities.

Corequisite: ROTC 100L

Prerequisite: ROTC 11 and ROTC 12 and ROTC 13 and ROTC 21 and ROTC 22 and ROTC 23

Grading Option: Workload Credit Letter Grade with P/NP.

**ROTC 133. Military Science-Tactical Leadership III. 3 Workload Units.**

Uses increasingly intense situational leadership challenges to build cadet awareness and skills in leading small units. Skills in decision-making, persuading, and motivating team members when 'under fire' are explored, evaluated, and developed.

Corequisite: ROTC 100L

Prerequisite: ROTC 11 and ROTC 12 and ROTC 13 and ROTC 21 and ROTC 22 and ROTC 23

Grading Option: Workload Credit Letter Grade with P/NP.

**ROTC 141. Military Science-Leadership III . 3 Workload Units.**

Transitions the focus of student learning from being trained, mentored, and evaluated as a cadet to learning how to train, mentor, and evaluate cadets. Cadets begin to learn the duties and responsibilities of an Army staff officer.

Corequisite: ROTC 100L

Prerequisite: ROTC 131 and ROTC 132 and ROTC 133

Grading Option: Workload Credit Letter Grade with P/NP.

**ROTC 142. Military Science-Leadership IV. 3 Workload Units.**

Requires students to continue to train, mentor, and evaluate underclass cadets. Cadets learn to safely conduct training by understanding and employing the Composite Risk Management Process and the Comprehensive Soldier Fitness (CSF) program.

Corequisite: ROTC 100L

Prerequisite: ROTC 131 and ROTC 132 and ROTC 133 and ROTC 141

Grading Option: Workload Credit Letter Grade with P/NP.

**ROTC 143. Military Science-Officership. 3 Workload Units.**

Explores the dynamics of leading in the complex situations of current military operations in the OE. Cadets examine differences in customs and courtesies, military law, principles of war, and rules of engagement in the face of international terrorism.

Corequisite: ROTC 100L

Prerequisite: ROTC 131 and ROTC 132 and ROTC 133 and ROTC 141 and ROTC 142

**ROTC 151. United States Military History-1607 to 1865. 3 Workload Units.**

Examines the creation of the American military establishment and traces its evolution in the context of the changing nature of warfare, the progression of military professionalism, and social, political, economic, and technological developments through the Civil War.

Grading Option: Workload Credit Letter Grade with P/NP.

**ROTC 152. United States Military History-1865 to 1945. 3 Workload Units.**

Examines the evolution of the American military establishment and the progression of military professionalism in terms of social, political, economic, military, and technological developments from the end of the Civil War through World War II.

Grading Option: Workload Credit Letter Grade with P/NP.

**ROTC 153. United States Military History-1945 to 2001. 3 Workload Units.**

Examines the evolution of the American military establishment and the progression of military professionalism in terms of social, political, economic, military, and technological developments from the Cold War to the War on Terrorism.

Grading Option: Workload Credit Letter Grade with P/NP.



**ROTC 197. Military Science Independent Studies. 2-4 Workload Units.**

Provides intensive, individual study with scheduled meetings to be arranged between Cadre and student. Assigned reading and tangible evidence of mastery of subject matter required.

Grading Option: Workload Credit Letter Grade with P/NP.

Repeatability: May be taken for credit for 12 units.

## Russian (RUSSIAN)

### Courses

**RUSSIAN 1A. Fundamentals of Russian. 5 Units.**

Focuses on reading, comprehension, basic composition, and conversation skills, and gives the student an initial exposure to the Russian cultural scene.

Prerequisite: Placement into RUSSIAN 1A.

**RUSSIAN 1B. Fundamentals of Russian. 5 Units.**

Focuses on reading, comprehension, basic composition, and conversation skills, and gives the student an initial exposure to the Russian cultural scene.

Prerequisite: RUSSIAN 1A. RUSSIAN 1A with a grade of C or better. Placement into RUSSIAN 1B is also accepted.

**RUSSIAN 1C. Fundamentals of Russian. 5 Units.**

Focuses on reading, comprehension, basic composition, and conversation skills, and gives the student an initial exposure to the Russian cultural scene.

Prerequisite: RUSSIAN 1AB or RUSSIAN 1B. RUSSIAN 1AB with a grade of C or better. RUSSIAN 1B with a grade of C or better. Placement into RUSSIAN 1C is also accepted.

### (VI)

**RUSSIAN 2A. Intermediate Russian. 4 Units.**

Students read simple passages from contemporary Russian literary texts and newspapers. Development of oral skills and exposure to Russian culture continue.

Prerequisite: RUSSIAN 1BC or RUSSIAN 1C. RUSSIAN 1BC with a grade of C or better. RUSSIAN 1C with a grade of C or better. Placement into RUSSIAN 2A is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

### (VIII)

**RUSSIAN 2B. Intermediate Russian. 4 Units.**

Students read simple passages from contemporary Russian literary texts and newspapers. Development of oral skills and exposure to Russian culture continue.

Prerequisite: RUSSIAN 2A. RUSSIAN 2A with a grade of C or better. Placement into RUSSIAN 2B is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

### (VIII)

**RUSSIAN 2C. Intermediate Russian. 4 Units.**

Students read simple passages from contemporary Russian literary texts and newspapers. Development of oral skills and exposure to Russian culture continue.

Prerequisite: RUSSIAN 2B. RUSSIAN 2B with a grade of C or better. Placement into RUSSIAN 2C is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

### (VIII)

**RUSSIAN 50. Russian Culture . 4 Units.**

Study of varied topics in Russian culture, area studies, and society, both in the present and in historical perspective.

Repeatability: May be taken for credit 4 times as topics vary.

### (IV, VIII)

**RUSSIAN 99. Special Studies Russian. 1-5 Units.**

Special studies under faculty supervision.

Repeatability: May be taken for credit 2 times.

**RUSSIAN 150. Topics in Russian Literature. 4 Units.**

Examines major themes in Russian literature, film, and other media from the eighteenth to twenty-first centuries. Taught in English.

Repeatability: Unlimited as topics vary.

**RUSSIAN 190. Topics in Russian Language Through Film. 4 Units.**

Uses Russian films of the late 20th century to enhance students' language skills and deepen their cultural knowledge. Work involves intensive conversation, reading and listening comprehension, and the acquisition of written skills and grammatical accuracy. Conducted primarily in Russian.

Prerequisite or corequisite: RUSSIAN 2C

Repeatability: Unlimited as topics vary.

**RUSSIAN 199. Independent Study. 1-4 Units.**

Independent study under direct faculty supervision.

Repeatability: May be taken for credit 2 times.

## Social Ecology (SOCECOL)

### Courses

**SOCECOL 10. Research Design. 4 Units.**

An introduction to the logic behind and methods of designing and conducting research studies in Social Ecology. Topics include how to measure variables of interest, identifying causal relationships, sampling, survey research methods, experiments, quasi-experimental designs, and ethics in research.

Overlaps with EDUC 10.

Restriction: School of Social Ecology students only. Environmental Science and Policy Majors only.

**SOCECOL 13. Statistical Analysis in Social Ecology. 4 Units.**

Introduction to the techniques of statistical analysis in Social Ecology. Topics include probability, statistical inference, significance testing, univariate descriptive statistics, and multivariate analysis from an interdisciplinary perspective.

Overlaps with PSYCH 10A, SOCIOL 10A, SOC SCI 10A, POL SCI 10A, STATS 7, STATS 8.

Restriction: School of Social Ecology students have first consideration for enrollment. Environmental Science and Policy Majors have first consideration for enrollment. No credit for SOCECOL 13 if taken concurrently with or after PSYCH 10A, SOCIOL 10A, POL SCI 10A, SOC SCI 10A, STATS 7, STATS 8, STATS 67, EDUC 15

**(Va)****SOCECOL H20A. Honors: Critical Issues on the Social Sciences. 6 Units.**

Major themes, methods, and works in the social sciences from an interdisciplinary perspective. Each quarter focuses on a different topic. Weekly seminars emphasizing development of critical thinking skills and quantitative analysis through written work are integral to the course.

Same as SOC SCI H1E.

Restriction: Campuswide Honors Collegium students only.

**(III)**

**SOCECOL H20B. Honors: Critical Issues on the Social Sciences. 6 Units.**

Major themes, methods, and works in the social sciences from an interdisciplinary perspective. Each quarter focuses on a different topic. Weekly seminars emphasizing development of critical thinking skills and quantitative analysis through written work are integral to the course.

Prerequisite: SOC SCI H1E or SOCECOL H20A

Same as SOC SCI H1F.

Restriction: Campuswide Honors Collegium students only.

**(III)****SOCECOL H20C. Honors: Critical Issues on the Social Sciences. 6 Units.**

Major themes, methods, and works in the social sciences from an interdisciplinary perspective. Each quarter focuses on a different topic. Weekly seminars emphasizing development of critical thinking skills and quantitative analysis through written work are integral to the course.

Prerequisite: SOC SCI H1F or SOCECOL H20B

Same as SOC SCI H1G.

Restriction: Campuswide Honors Collegium students only.

**(III)****SOCECOL 74A. Moral Development and Just Communities. 4 Units.**

A three-quarter sequence exploring interpersonal, personal, and social issues based on principles of fairness and justice. Both the living environment of a University residence hall and selected institutions of society are analyzed in terms of moral development theory.

Grading Option: Pass/no pass only.

**SOCECOL 74B. Moral Development and Just Communities. 4 Units.**

A three-quarter sequence exploring interpersonal, personal, and social issues based on principles of fairness and justice. Both the living environment of a University residence hall and selected institutions of society are analyzed in terms of moral development theory.

Prerequisite: SOCECOL 74A

Grading Option: Pass/no pass only.

**SOCECOL 74C. Moral Development and Just Communities. 4 Units.**

A three-quarter sequence exploring interpersonal, personal, and social issues based on principles of fairness and justice. Both the living environment of a University residence hall and selected institutions of society are analyzed in terms of moral development theory.

Prerequisite: SOCECOL 74B

Grading Option: Pass/no pass only.

**SOCECOL 100. Special Topics in Social Ecology. 4 Units.**

Special topics courses are offered from time to time. In general they will focus on a topic from interdisciplinary perspectives. Course content varies with the interest of the instructor.

Repeatability: Unlimited as topics vary.

Restriction: School of Social Ecology students only.

**SOCECOL 111W. Advanced Research Methods. 4 Units.**

For students planning to conduct senior research projects or apply to graduate school in social research fields. Topics include reviewing literature, preparing a research proposal, protecting human subjects, citing scholarly work, building measures, estimating sample size, interview and presentation skills.

Prerequisite: SOCECOL 10 and SOCECOL 13. Satisfactory completion of the Lower-Division Writing requirement.

Same as CRM/LAW C169W, PSCI 111W, UPPP 114W.

**(Ib)**

**SOCECOL 118. Domestic Violence. 4 Units.**

General perspectives about domestic violence and theoretical accounts about what causes such behavior.

Same as CRM/LAW C118.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**SOCECOL 119. Violence in Intimate Relationships. 4 Units.**

Responses to various forms of domestic violence, such as intimate partner violence and child abuse. Covers barriers to reporting to the police, and prosecutors and courts. Human services, such as safety planning for victims, treatment programs, and restorative justice approaches.

Corequisite:

Same as CRM/LAW C119.

**SOCECOL E127. Nuclear Environments. 4 Units.**

Understanding the impact of the nuclear age on the environment and human health through interrelated developments of nuclear power and nuclear weapons. The early years of weapon development, catastrophic environmental pollution, perils of nuclear power in the U.S. and Russia.

Same as INTL ST 122, PUBHLTH 168.

**(VIII)****SOCECOL 183A. Global and International Studies Forum. 4 Units.**

A faculty-student forum featuring lectures from a variety of institutions with discussion issues related to Global and International Studies.

Repeatability: May be taken for credit 4 times.

Same as INTL ST 183A, SOC SCI 183A.

**SOCECOL 183B. Seminar in Mediation. 4 Units.**

Students develop mediation skills and refine knowledge in the practice and theory of conflict resolution. Students who complete this course may serve as mediators in the Campus Mediation Program. Course is a prerequisite to completing Indep Study as an intern.

Same as INTL ST 183B, SOC SCI 183B.

Restriction: International Studies Majors have first consideration for enrollment. School of Humanities students have first consideration for enrollment. School of Social Ecology students have first consideration for enrollment. School of Social Sciences students have first consideration for enrollment.

**SOCECOL 183CW. Seminar Conflict Resolution. 4 Units.**

Designed for seniors who are pursuing the minor in Conflict Resolution and/or International Studies major. Provides a forum in which students will refine skills and theory in the study of cooperation and conflict, from local to global arenas.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as SOC SCI 183CW, INTL ST 183CW.

**(Ib)****SOCECOL 186A. Senior Seminar on Global Sustainability I. 2 Units.**

Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum is also required. Seminar utilized to analyze forum presentations. Prepare bibliography.

Same as BIO SCI 191A, EARTHSS 190A.

Restriction: Seniors only. Global Sustainability Minors have first consideration for enrollment.

**SOCECOL 186B. Senior Seminar on Global Sustainability II. 2 Units.**

Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum is also required. Seminar utilized to analyze forum presentations. Prepare research proposal.

Prerequisite: BIO SCI 191A or SOCECOL 186A or EARTHSS 190A

Same as BIO SCI 191B, EARTHSS 190B.

Restriction: Seniors only.

**SOCECOL 186CW. Writing/Senior Seminar on Global Sustainability III. 4 Units.**

Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum also is required. Seminar utilized to analyze Forum presentations and to prepare senior research paper. Prepare/write research paper under direction of faculty member.

Prerequisite: BIO SCI 191B or EARTHSS 190B or SOCECOL 186B. BIO SCI 191B or EARTHSS 190B or SOCECOL 186B. Satisfactory completion of the Lower-Division Writing requirement.

Same as BIO SCI 191CW, EARTHSS 190CW.

Restriction: Seniors only.

**(Ib)**

**SOCECOL 189. Global Service Scholars Advanced Seminar. 4 Units.**

For students who are accepted into the Global Service Scholars Program. Provides advanced training in empathy and compassion, and prepares students for their summer international field experience.

Prerequisite: PSCI 192B

**SOCECOL 190. Applied Statistics in Social and Behavioral Research. 4 Units.**

Covers statistical techniques used to describe and make generalizations about phenomena represented by data. Hands-on experience in data analysis and interpretation using statistical software (SPSS, STATA) is emphasized. Topics include data visualization, ANOVA, multiple regression, and categorical data analyses.

Prerequisite: SOCECOL 13

Same as CRM/LAW C190, PSCI 190, UPPP 190.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**SOCECOL H190A. Honors Research. 4 Units.**

Independent work on an individual research project in addition to participation in a mini proseminar in which faculty discuss their ongoing research. Students prepare a written proposal for a research project.

Restriction: Seniors only.

**SOCECOL H190B. Honors Research. 4 Units.**

Independent work on an individual research project in addition to participation in a mini proseminar in which faculty discuss their ongoing research. Students prepare a written proposal for a research project.

Prerequisite: SOCECOL H190A

Grading Option: Pass/no pass only.

Restriction: Seniors only.

**SOCECOL H190W. Honors Research. 4 Units.**

Students write up their honors research project (H190A-B) and prepare an oral report which is presented at the honors seminar.

Prerequisite: SOCECOL H190B

Restriction: Seniors only.

**(Ib)**

**SOCECOL 194W. Naturalistic Field Research. 4 Units.**

Introduction to alternative models of experiential learning and to various methods of observation, assessment, and evaluation. Introduction to the nature of organizations and ethical issues that emerge from research and intervention in natural settings.

Prerequisite: SOCECOL 10. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: School of Social Ecology students only.

**(Ib)**

**SOCECOL 195. Field Study. 2-8 Units.**

Community engagement to facilitate civic education through field research experience, social intervention, and professionalization. Small group instruction, discussion, writing, and presentations synthesizing students' experiences in the field with theory, paradigms, and ideas learned about in their course work.

Prerequisite: SOCECOL 10

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 12 units.

Restriction: Upper-division students only. School of Social Ecology students only.

**SOCECOL 195A. Advanced Field Study. 4 Units.**

While completing 10 hours of field work per week, students become acquainted with the goals and activities of their placement and will work closely with the placement supervisor and AFS instructor to identify the scope of a research project.

Prerequisite: SOCECOL 10 and SOCECOL 13. Acceptance to Advanced Field Study required.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

Restriction: Upper-division students only. School of Social Ecology students only.

**SOCECOL 195B. Advanced Field Study. 4 Units.**

While completing 10 hours of field work per week, students implement their research project through data collection and observations which allow them to reflect on, apply, and synthesize their academic training through observations and experiences at the placement.

Prerequisite: SOCECOL 195A. Acceptance to Advanced Field Study required.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

Restriction: Upper-division students only. School of Social Ecology students only.

**SOCECOL 195CW. Advanced Field Study. 4 Units.**

While completing 10 hours per week of field work, students write and finalize their AFS Client Project in consultation with the placement and the FS instructor, and make a final written and oral presentation to the placement and invited guests.

Prerequisite: SOCECOL 195B. Acceptance to Advanced Field Study required. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times.

Restriction: Upper-division students only. School of Social Ecology students only.

**(Ib)****SOCECOL 195W. Field Study Writing Seminar. 4-8 Units.**

Community engagement to promote civic education through field research experience, and the opportunity to study social issues and the environments where they occur. Develop discipline-specific writing and communication skills, methodology, and integrate information from multiple sources. Course may be offered online.

Prerequisite: SOCECOL 10. Cumulative UC GPA of 2.0. Authorization is required. Successful completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit for 8 units.

Restriction: Upper-division students only. Criminology, Law and Society Majors only. Psychology and Social Behavior Majors only. Social Ecology Majors only. Urban Studies Majors only.

**(Ib)**

**SOCECOL 198. Directed Studies. 2-4 Units.**

Directed study with Social Ecology faculty.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**SOCECOL 199. Special Studies. 1-4 Units.**

Special Studies with Social Ecology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**SOCECOL 200. Seminar in Social Ecology. 4 Units.**

Students are introduced to the classic and contemporary literature of human and social ecology and are expected to use the ecological paradigm to analyze social phenomena of interest to the differing subprograms.

Restriction: Graduate students only.

**SOCECOL 261. Strategies of Theory Development. 4 Units.**

Examines key issues and controversies facing the development of social ecological theory, and encourages students to develop their own abilities as theorists. Strategies for enhancing creative hypothesis formation are emphasized.

Restriction: Graduate students only.

**SOCECOL 264A. Data Analysis. 4 Units.**

Provides an appreciation and understanding of statistics necessary to conduct applied research. Topics include approaches to and presentation of data, robust statistics, standardization techniques, multivariate regression, and analysis of variance.

Restriction: Graduate students only.

**SOCECOL 264B. Data Analysis. 4 Units.**

Provides an appreciation and understanding of statistics necessary to conduct applied research. Topics include approaches to and presentation of data, robust statistics, standardization techniques, multivariate regression, and analysis of variance.

Prerequisite: SOCECOL 264A

Restriction: Graduate students only.

**SOCECOL 266D. Analysis of Survival Data. 4 Units.**

Provides an introduction to survival analysis methods for the analysis of change in discrete dependent variables. Focuses on data collection strategies for obtaining longitudinal data and continuous-time hazards models. Communicates the variety and power of multivariate hazard models.

**SOCECOL 272A. Structural Equation Modeling I. 4 Units.**

The general structural equation model is developed including path models, recursive and nonrecursive structural models, multiple indicator models, and confirmatory factor models. Use of LISREL and other software for estimating model parameters is covered.

Prerequisite: SOCECOL 264A and SOCECOL 264B

**SOCECOL 272B. Structural Equation Modeling II: Longitudinal and Advanced Topics. 4 Units.**

Provides hands-on experience with longitudinal and advanced structural equation models and is of interest to students from a range of disciplines. Topics covered include confirmatory factor, latent growth curve, general growth mixture, and multi-level modeling.

Prerequisite: SOCECOL 272A

Restriction: Graduate students only.

**SOCECOL 275. Special Topics in Social Ecology. 2-4 Units.**

Topics covered vary with interests of the instructor.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCECOL 291. Program Evaluation. 4 Units.**

Students are introduced to the use of research techniques and statistical methods in assessing the effectiveness of social programs. Different evaluative models are discussed using examples of actual program evaluations.

Restriction: Graduate students only.

**SOCECOL 295. Masters Thesis Research & Writing. 1-8 Units.**

Independent research with Social Ecology faculty.

Prerequisite: Advancement to candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**SOCECOL 296. Doctoral Dissertation Research & Writing. 1-12 Units.**

Dissertation research with Social Ecology faculty.

Prerequisite: Advancement to Candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**SOCECOL 297. Field Study. 2-4 Units.**

Field studies in Social Ecology.

Restriction: Graduate students only.

**SOCECOL 298. Directed Studies. 2-4 Units.**

Directed study with Social Ecology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**SOCECOL 299. Independent Study. 1-8 Units.**

Independent study with Social Ecology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**SOCECOL 399. University Supervised Teaching. 2-4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Social Policy and Public Service (SPPS)

### Courses

**SPPS 40. Social Policy and Public Service. 4 Units.**

An introduction to the basic theories and principles of public policy. Students examine various influences on the development of public policy and the principle actors in the process, and learn to identify tools and techniques employed in policy making.

Same as SSCI 40.

(III)



**SPPS 70A. Race and Ethnicity. 4 Units.**

Focuses on racial and ethnic relations in the United States and compares them with those found in other societies. Analyzes the conditions that favor either cooperation and integration or rivalry, tension, and conflict. Appraises strategies for reducing and resolving conflicts.

Same as SOCL 63.

**(VII)****SPPS 101A. Immigration, Nation, and Media. 4 Units.**

Examines media shapes and reflects public opinion on immigration and its representation of immigrants, citizens, and ideas about the nation, and who belongs and who is a potential threat; as well as the relationship between scholars and journalists.

Same as CHLT 123, ANTH 125U.

**SPPS H190A. Honors Research Workshop. 4 Units.**

Student develops a 10–15-page prospectus of research for the honors thesis which includes: the research question, literature review, methods of investigation, and bibliography. Student selects a faculty mentor who will supervise thesis research and writing in winter and spring.

Same as SSCI H190A.

Restriction: Social Science Majors only. Social Policy/Public Service Majors only. Social Science Honors students only.

**SPPS H190B. Honors Thesis Research. 4 Units.**

The student initiates and completes data collection for the honors thesis. A faculty mentor provides supervision and feedback on thesis chapters.

Prerequisite: SSCI H190A or SPPS H190A

Same as SSCI H190B.

**SPPS H190C. Honors Thesis. 4 Units.**

The student completes, with the approval of the faculty mentor, an honors thesis containing: statement of the problem, literature review, research hypotheses, methods of investigation, results, discussion, and bibliography.

Prerequisite: SSCI H190B or SPPS H190B. Satisfactory completion of the Lower-Division Writing requirement.

Same as SSCI H190C.

**(Ib)****SPPS 193A. Field Studies in Social Policy and Public Service. 4 Units.**

Advanced training in qualitative and ethnographic research centered on community service. Students pursue field studies at nonprofit agencies (200 hours) to understand current social problems in underrepresented and underserved communities. Through field placement, students apply theory to practice.

Prerequisite: SSCI 70C or SOCL 63. Satisfactory completion of the Lower-Division Writing requirement.

Same as SSCI 193A.

Restriction: Social Policy/Public Service Majors only.

**SPPS 193B. Field Studies in Social Policy and Public Service. 4 Units.**

Advanced training in qualitative and ethnographic research centered on community service. Students pursue field studies at nonprofit agencies (200 hours) to understand current social problems in underrepresented and underserved communities. Through field placement, students apply theory to practice.

Prerequisite: SSCI 193A

Same as SSCI 193B.

**SPPS 193C. Field Studies in Social Policy and Public Service. 4 Units.**

Advanced training in qualitative and ethnographic research centered on community service. Students pursue field studies at nonprofit agencies (200 hours) to understand current social problems in underrepresented and underserved communities. Through field placement, students apply theory to practice.

Prerequisite: SSCI 193B

Same as SSCI 193C.

**SPPS 193CW. Field Studies in Social Policy and Public Service. 4 Units.**

Advanced training in qualitative and ethnographic research centered on community service. Students pursue field studies at nonprofit agencies (200 hours) to understand current social problems in underrepresented and under-served communities. Through field placement, students apply theory to practice.

Prerequisite: SSCI 193B

Same as SSCI 193CW.

Overlaps with SPPS 193C.

Restriction: Social Science Majors only.

(Ib)

## Social Science (SOC SCI)

### Courses

**SOC SCI 1A. Principles in the Social Sciences. 4 Units.**

Introduction to various disciplines within the social sciences. Provides an interdisciplinary perspective on understanding human behavior and social institutions, including interpersonal, economic, and cultural activities.

(III)

**SOC SCI H1E. Honors: Critical Issues on the Social Sciences. 6 Units.**

Major themes, methods, and works in the social sciences from an interdisciplinary perspective. Each quarter focuses on a different topic. Weekly seminars emphasizing development of critical thinking skills and quantitative analysis through written work are integral to the course.

Same as SOCECOL H20A.

Restriction: Campuswide Honors Collegium students only.

(III)

**SOC SCI H1F. Honors: Critical Issues on the Social Sciences. 6 Units.**

Major themes, methods, and works in the social sciences from an interdisciplinary perspective. Each quarter focuses on a different topic. Weekly seminars emphasizing development of critical thinking skills and quantitative analysis through written work are integral to the course.

Prerequisite: SOC SCI H1E or SOCECOL H20A

Same as SOCECOL H20B.

Restriction: Campuswide Honors Collegium students only.

(III)

**SOC SCI H1G. Honors: Critical Issues on the Social Sciences. 6 Units.**

Major themes, methods, and works in the social sciences from an interdisciplinary perspective. Each quarter focuses on a different topic. Weekly seminars emphasizing development of critical thinking skills and quantitative analysis through written work are integral to the course.

Prerequisite: SOC SCI H1F or SOCECOL H20B

Same as SOCECOL H20C.

Restriction: Campuswide Honors Collegium students only.

(III)

**SOC SCI 2A. Introduction to Social Science Analysis. 4 Units.**

Introduction to social science research and analytical models. Theory construction and use of research methods in an interdisciplinary context. Discussion of the application of social science research to public policy. Computer laboratories develop creative thinking, graphing, and data presentation skills.

Restriction: School of Social Sciences students have first consideration for enrollment.

(III)

**SOC SCI 3A. Computer-Based Research in the Social Sciences. 4 Units.**

Focuses on the data manipulation, data visualization, and information searching techniques. Hands-on experience in hypothesis testing, mapping, graphics, and data arrays.

Restriction: School of Social Sciences students have first consideration for enrollment.

**SOC SCI 4A. Introduction to Global Studies. 4 Units.**

Ongoing historical processes that increase global integration, the social, economic, and political interdependence of different regions, cultures, and peoples. Topics include ancient empires, colonialism, nationalism, industrialization, modern imperialism and warfare, decolonization, global social movements, conflict, inequality, and global governance.

Same as INTL ST 1.

Restriction: International Studies Majors have first consideration for enrollment.

(III and VIII ).

**SOC SCI 5A. Introduction to Human Geography. 4 Units.**

Human behavior in a geographical context. Spatial patterns and organization of the cultural, social, and economic activities of man as imposed on and influenced by the earth's physical setting.

(III)

**SOC SCI 5B. Introduction to Physical Geography. 4 Units.**

An introduction to the physical world we live in. Distribution and dynamics of the earth's air, water, and solid crust. Concepts and principles from climatology and geology. Selected examples from North America and beyond.

**SOC SCI 5D. US & World Geography. 4 Units.**

Survey of general geographical principles and facts on a world scale, as well as introduction to the broad regional and resource geography of the U.S., emphasizing in particular the interactions of physical and cultural factors.

(III, VIII)

**SOC SCI 10A. Probability and Statistics in Social Sciences I. 4 Units.**

Introduction to the variety of statistical applications in the social sciences. Descriptive statistics. Measures of central tendency and dispersion. Percentile ranks. Standardization and normal approximation. Basic probability theory focuses on application to statistical inference and binomial distribution. Laboratory required.

Corequisite: SOC SCI 3A

Prerequisite: SOC SCI 3A

Overlaps with PSYCH 10A, SOCECOL 13, POL SCI 10A, SOCIOL 10A, ECON 15A.

Restriction: Lower-division students only. Social Science Majors have first consideration for enrollment. SOC SCI 10A may not be taken for credit if taken after or concurrently with ECON 15A.

(Va)

**SOC SCI 10B. Probability and Statistics in Social Sciences II. 4 Units.**

Introduction to statistical inference, sampling distribution, standard error. Hypothesis tests for proportions and means. Inferential techniques for nominal variables including chi-square, study measures of strengths, significance of relationships between variables, assumptions, data requirements, and types of error in significance tests.

Prerequisite: SOC SCI 10A

Overlaps with ANTHRO 10B, POL SCI 10B, SOCECOL 13, SOCIOL 10B, PSYCH 10B.

Restriction: School of Social Sciences students have first consideration for enrollment.

(Va)

**SOC SCI 10C. Probability and Statistics in Social Sciences III. 4 Units.**

Focus on correlation, regression, and control for effects of variables. One-way and two-way factorial analysis of variance. A priori and a posteriori comparisons. Introduction to repeated measures design and non-parametric statistics. Discuss use of statistics in newspapers and popular magazines.

Prerequisite: SOC SCI 10B

Overlaps with ANTHRO 10C, POL SCI 10C, PSYCH 10C, SOCECOL 13, SOCIOL 10C.

Restriction: School of Social Sciences students have first consideration for enrollment.

**(Vb)**

**SOC SCI 11A. Barter to Bitcoin: Society, Technology and the Future of Money. 4 Units.**

Digital money has captured the broad imagination of speculators, coders, regulators, criminals and the mass media. Course puts this change in context: how do we understand money as a social, political and technological phenomenon?

Same as IN4MATX 12.

**(II and III ).**

**SOC SCI 12. Global Political Ideologies. 4 Units.**

An overview of the major political ideologies shaping the current world order and global conflict. Topics include liberalism, democracy, nationalism, capitalism, communism, socialism, fascism, neoliberalism, clash of civilizations, sectarian violence, populist nationalism, and de-globalization.

Same as POL SCI 44B, INTL ST 12.

Restriction: International Studies Majors have first consideration for enrollment.

**(III and VIII ).**

**SOC SCI 15. Global Political Economy. 4 Units.**

The global economy as an integrated system. The rise of world trade, capitalism, national economies, market cycles, competing economic ideologies, development, globalization, transnational labor, multinational corporations, and the role of UN, World Bank, WTO, and the IMF in global governance.

Same as INTL ST 15.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

**(III and VIII ).**

**SOC SCI 16. Human Rights and Global Governance. 4 Units.**

Historical development of civil, political rights and the rise of human rights in international law. Explores role, and limitations, of the UN, ICJ, and ICC in global governance. Reconceptualizing democracy and political representation in a postnational 21st century.

Same as POL SCI 45A, INTL ST 16.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

**(III and VIII ).**

**SOC SCI 17. Global Environmental Issues. 4 Units.**

Examines problems such as global climate change, growing human populations, fisheries depletion, ocean acidification, biodiversity loss, deforestation, and food security. Introduces political, social, and economic factors contributing to environmental issues and their disproportional impacts on the world's poor and minorities.

Same as INTL ST 17.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

**(III and VIII ).**

**SOC SCI 20. Model United Nations. 2 Units.**

Focuses on simulations of the foreign policy pursuits of selected countries in the international community. Emphasis placed on understanding the rules of debate, as well as the policy positions of the student's selected country in the United Nations.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 6 times.

**SOC SCI H30D. Social Science Perspectives on the Sustainability of Societies. 4 Units.**

Introduces the perspectives of social science using examples from different countries to explore how social issues regarding sustainability are influenced by a society's changing economic and political institutions, and how economic, political, and other social choices affect their sustainability.

Prerequisite: EARTHSS H30C. EARTHSS H30C with a grade of C or better

Restriction: Campuswide Honors Collegium students only.

(III)

**SOC SCI 40. Social Policy and Public Service. 4 Units.**

An introduction to the basic theories and principles of public policy. Students examine various influences on the development of public policy and the principle actors in the process, and learn to identify tools and techniques employed in policy making.

Same as SPPS 40.

(III)

**SOC SCI 66. Introduction to Gangs . 4 Units.**

Introduces students to street gang subculture and explores risk factors associated with gang membership. Students develop a working definition for street gang and understand the difference between social and legal definitions. Also explores the connection between prison and street gangs.

**SOC SCI 70C. Comparing Cultures. 4 Units.**

Introduces students to the scope of cross-cultural comparisons by analyzing the theories, methodologies, and facts utilized by anthropologists, sociologists, social psychologists, political scientists, and historians in comparing cultures.

(III, VII)

**SOC SCI 78A. Asian American Histories. 4 Units.**

Examines and compares diverse experiences of major Asian American groups since the mid-nineteenth century. Topics include origins of emigration; the formation and transformation of community; gender and family life; changing roles of Asian Americans in American society. Formerly ASIANAM 60A.

Same as ASIANAM 50, HISTORY 15C.

((III or IV) and VII ).

**SOC SCI 78B. Asian American Communities. 4 Units.**

Examines the renewal of Asian immigration following World War II. Explores contemporary Asian American populations and communities in the U.S., and the impact of contemporary Asian immigration on the U.S. political economy and social order.

Same as ASIANAM 52.

(III, VII)

**SOC SCI 78C. Asian Americans and Race . 4 Units.**

Analyzes the Asian American experience in comparative perspective, which includes comparisons of different ethnic and racial groups, and across gender and class. Possible topics include labor, economy, politics, migration, nation, popular culture, gender, family, sexuality, and multiraciality.

Same as ASIANAM 53.

(III, VII)

**SOC SCI 89. Special Topics in Social Sciences. 2-4 Units.**

Studies in selected areas of Social Sciences. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**SOC SCI 102A. Introduction to Geographic Information Systems in Social Sciences. 4 Units.**

Hands-on laboratory course introduces students to the fundamentals of Geographic Information Systems (GIS) technology using social science applications. Students learn to organize, manipulate, and display spatial data leading to the design of their own GIS research project.

Restriction: School of Social Sciences students have first consideration for enrollment.

**SOC SCI 102B. Intermediate Geographic Information Systems in Social Sciences. 4 Units.**

Expands Geographic Information Systems (GIS) skills to more advanced theories and concepts in the spatial analysis of social science issues and particularly to analyzing and interpreting spatial data. Students develop and complete a GIS research project of their own choosing.

Prerequisite: SOC SCI 102A

Restriction: School of Social Sciences students have first consideration for enrollment.

**SOC SCI 103A. Game Theory and Politics I. 4 Units.**

Introduction to game theory and a survey of its political applications. Examples of topics covered include voting in small committees, legislatures, and mass elections; interest group activities and environmental issues; institutional design, and the evolution of cooperative behavior.

Same as SOCIOL 134, POL SCI 130A.

Restriction: Social Policy/Public Service Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**SOC SCI 103B. Game Theory and Politics II. 4 Units.**

More advanced game theory and its political applications, beginning where Game Theory and Politics I ends. Examples of topics covered include revolutions; arms race; spatial models of party competition; political manipulation; political coalitions and their power.

Prerequisite: POL SCI 130A or ECON 116A

Same as POL SCI 130B.

Restriction: Social Policy/Public Service Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**SOC SCI 115D. International Business. 4 Units.**

Introduction to conducting business in the international arena, decision making in the organization, and globalization of markets and production. Topics covered range from tax and finance to ethics, marketing, and more. Continuing corporate regulatory scandals discussed.

Same as INTL ST 112A.

**SOC SCI 119. Special Topics in Geography. 4 Units.**

Studies in selected areas of geography. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**SOC SCI 120. Transnational Gangs. 4 Units.**

Examines the internationalization of U.S. domestic street gangs. The relationship between California gangs Mara Salvatrucha and 18th Street and Mexico/Central American gangs is assessed. Specified topics include: mobilization, migration, territorialism, culture, organization, and use of technology.

Same as INTL ST 130.

Overlaps with SOC SCI XI120, INTL ST XI130.

**SOC SCI 121T. Voting and Political Manipulation. 4 Units.**

Introduction to social choice and cooperative games. Topics include majority rule, types of voting methods, apportionment and proportional representation, agenda manipulation, coalition formation, voting power, political consequences of electoral laws.

Same as INTL ST 156A, POL SCI 151H, ECON 154.

Restriction: International Studies Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**SOC SCI 132. Veterans in History and Society. 4 Units.**

Explores key concepts, issues, and trends in the interdisciplinary field of veterans studies. Students gain a deep understanding of the ways that social scientists and historians have analyzed the identities, experiences, and worldviews of U.S. military veterans.

Same as HISTORY 149.

**SOC SCI 133. Veterans' Transitions. 4 Units.**

Provides veteran and non-veteran students with a comprehensive and academically rigorous overview of the ways and means through which diverse communities of veterans have made and continue to make the complex and multi-faceted transition from active military.

**SOC SCI 134W. Veterans' Voices. 4 Units.**

Uses the medium of academic writing to develop a broad understanding and appreciation for the wide range of worldviews, priorities, and values embodied in the creative production and activism of diverse U.S. military veterans.

(Ib)

**SOC SCI 152A. Non-Government Organization (NGO) Fundamentals. 4 Units.**

Introduction to non-governmental organizations, including their role in U.S. society and the international community. Explores varying definitions of NGOs and the characteristics held in common by all NGOs.

Same as INTL ST 152A.

**SOC SCI 152C. American Public Policy. 4 Units.**

Focuses on the development and implementation of public policy in the United States. Lectures cover theoretical models of the policy process as well as significant problems facing contemporary American decision-makers.

Same as PUBHLTH 132, POL SCI 121G, UPPP 129.

**SOC SCI 163A. Urban America . 4 Units.**

Students examine the historical, social, political, and economic factors that contributed to the construction of the American urban context, one that is poverty concentrated and racially/ethnically segregated. Students also critically assess the consequence of growing up in America's urban neighborhoods.

Same as CHC/LAT 162A, UPPP 104.

**SOC SCI 164B. Domestic Gangs. 4 Units.**

Examines the history and development of California street gangs and the role of historical events in that development. Students will be able to contrast and compare gang cohort behaviors between some of the major gangs in California.

Restriction: School of Social Sciences students have first consideration for enrollment.

**SOC SCI 164C. Prison Gangs. 4 Units.**

Examines the growth and spread of prison gangs throughout the country. Relationships between prison and street gangs, and possible relationships with foreign drug trafficking organizations studied. Violence examined as the standard to establish dominance in and out of prison.

Restriction: School of Social Sciences students have first consideration for enrollment.

**SOC SCI 164D. Juvenile Gangs. 4 Units.**

Examines risk factors that can be used to predict gang membership. Compares generational with non-generational gangs and develops a working sociological definition that can be used to identify street gangs. Myths about juveniles, street gangs.

Restriction: School of Social Sciences students have first consideration for enrollment.

**SOC SCI 165. Chicano/Latino Families. 4 Units.**

Introduction to the research, literature, and issues surrounding the topic of Chicano/Latino families including cultural history, contemporary issues, organization of family, traditions, lifestyles, values, beliefs, generational differences, gender issues, ethnic identity, evolution of demographic patterns, current economic and political standings.

Same as CHC/LAT 170, PSCI 166S, PSYCH 174H.

**SOC SCI 168B. Immigration and Inequality. 4 Units.**

Explores immigration, ethnicity, and inequality as interconnected social forces. International migration, propelled by global inequalities, plays a central role in the formation of multinational societies, shapes inter-group relations and patterns of ethnic inequality, and transforms the immigrants themselves.

Same as SOCIOL 166.

**SOC SCI 170A. Research Methods in the Social Sciences. 4 Units.**

Examines how interdisciplinary social science research questions are formulated and studies several research methods including: experimental method, quasi-experimental methods, survey research, field research, evaluation research, and meta-analysis. Parametric and non-parametric statistical methods are illustrated using the SPSS program.

Prerequisite: SOC SCI 1A and SOC SCI 2A and SOC SCI 3A and (SOC SCI 10A or STATS 7)

Restriction: Upper-division students only. School of Social Sciences students have first consideration for enrollment.

**SOC SCI 172AW. American Culture. 4 Units.**

A survey of the historical development of dominant American culture and society; emphasis on a close reading of key cultural texts, with weekly text as a model of writing, examining its use of language and rhetoric.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: School of Social Sciences students have first consideration for enrollment.

**(Ib)****SOC SCI 172D. Law in the Twenty-First Century. 4 Units.**

Examines the complex relationship between law, the social sciences, and modern society. Lectures explore such issues as the interplay between technology and constitutional rights, the impact of science on law, and the evolving roles of attorneys and judges.

Same as POL SCI 171F.

Restriction: Political Science Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

**SOC SCI 173L. Latinos in a Global Society. 4 Units.**

Examines interconnections between diverse Latino groups in the U.S. and the effects of globalization on their social, cultural, and political realities. Topics include immigration, demographics, socioeconomic differentiation, familial relations, political protest/resistance, law and policy, and links to 'homeland' issues.

Same as CHC/LAT 167.

**(VII)****SOC SCI 173N. Revolution in Latin America. 4 Units.**

Presents a comparative analysis of the causes, development, and consequences of selected revolutionary movements, focusing on outbreaks in Mexico, Bolivia, Cuba, Chile, Nicaragua, and Grenada. Explores topics of state formation, economic nationalism, social justice, ethnicity, and role of international affairs.

Same as CHC/LAT 151B, HISTORY 166D, INTL ST 177C.

**SOC SCI 177B. Asian American Women. 4 Units.**

Examines the representations and experiences of Asian American women from diverse perspectives. Explores the commonalities and differences among various groups of Asian American women, with particular focus on history, culture, values, and family roles.

Same as ASIANAM 162.

**SOC SCI 178C. Korean American Studies. 4 Units.**

Explores the factors that have distinctly shaped the Korean American experience, including patterns of racial domination, the profile of immigrant flow, immigrant roles in the urban political economy, politics in Korea, and the role of the church.

Same as ASIANAM 151C.

**SOC SCI 178D. Vietnamese American Studies. 4 Units.**

Studies the resettlement of Vietnamese in the United States following their exodus from Southeast Asia. Topics include the Vietnam War, the 1975 evacuation, boat and land refugees, the shaping of Vietnamese communities, and Vietnamese American literature.

Same as ASIANAM 151D.

**SOC SCI 178E. Japanese American Studies. 4 Units.**

Studies the settlement of Japanese in Hawaii and the continental United States since the late 19th century. Topics include sugar plantations, development of rural Japanese America, World War II internment, post-War community development, and persistence of Japanese American identity.

Same as ASIANAM 151E.

**SOC SCI 178F. South Asian American Studies. 4 Units.**

Examines and compares the experiences of South Asian immigrants in the U.S. over time. Looks at the economic, political, and social positions of the immigrants, with special emphasis on religious changes and the changes in the second and later generations.

Same as ASIANAM 151F.

Restriction: Asian American Studies Majors have first consideration for enrollment. Social Policy/Public Service Majors have first consideration for enrollment.



**SOC SCI 178H. Southeast Asian American Studies. 4 Units.**

Analyzes experiences of refugees and immigrants from Southeast Asia, which may include those from Cambodia, Laos, Vietnam, and the Philippines. Examines political and economic factors for their exodus and how they reconstruct their identities, histories, and communities.

Same as ASIANAM 151H.

**SOC SCI 178J. Chinese American Studies. 4 Units.**

Analyzes the experiences of Chinese in the United States. Immigration, Chinese exclusion, racial and gender identity. Historical overview and contemporary issues covered.

Same as ASIANAM 151J.

**SOC SCI 178K. Filipina/Filipino American Studies. 4 Units.**

Explores the experience of Filipina/Filipino Americans from the era of Spanish colonization of the Philippines to present-day community formations in the United States, with special emphasis on the 20th century. Topics include colonialism, nation, migration, gender, and culture.

Same as ASIANAM 151K.

**SOC SCI 179. Special Topics in Asian American Studies. 4 Units.**

Studies in selected areas of Asian American Studies. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**SOC SCI 181A. Ethical Leadership. 4 Units.**

Explores historical and contemporary theories of ethical and unethical leadership. Examines models of 'good leadership' such as cardinal and monastic virtues; and models of 'bad leadership,' such as Machiavelli's Prince. Explores the philosophies, styles, and accomplishments of leaders.

Restriction: School of Social Sciences students have first consideration for enrollment.

**SOC SCI 183A. Global and International Studies Forum. 4 Units.**

A faculty-student forum featuring lectures from a variety of institutions with discussion issues related to Global and International Studies.

Repeatability: May be taken for credit 4 times.

Same as SOCECOL 183A, INTL ST 183A.

**SOC SCI 183B. Seminar in Mediation. 4 Units.**

Student develop mediation skills and refine knowledge in the practice and theory of conflict resolution. Students who complete this course may serve as mediators in the Campus Mediation Program. Course is a prerequisite to completing Indep Study as an intern.

Same as INTL ST 183B, SOCECOL 183B.

Restriction: International Studies Majors have first consideration for enrollment. School of Humanities students have first consideration for enrollment. School of Social Ecology students have first consideration for enrollment. School of Social Sciences students have first consideration for enrollment.

**SOC SCI 183CW. Seminar Conflict Resolution. 4 Units.**

Designed for seniors who are pursuing the minor in Conflict Resolution and/or International Studies major. Provides a forum in which students will refine skills and theory in the study of cooperation and conflict, from local to global arenas.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as SOCECOL 183CW, INTL ST 183CW.

(Ib)

**SOC SCI 183E. Conflict Resolution in Cross-Cultural Perspective. 4 Units.**

Examines theories of conflict management. Analyzes how conflict is mitigated in diverse cultures: at the interpersonal level, between groups, and on the international scale. Students discuss readings, hear from conflict management practitioners, and simulate negotiations.

Same as ANTHRO 136D, POL SCI 154G, INTL ST 183E.

(VIII)

**SOC SCI 184A. Sage Leader Research I. 2 Units.**

Participants in the SAGE Scholars Program learn to define leadership concepts, discover various leadership styles, and develop strong leadership and communication skills resulting in strengthened ability to contribute to and interact with UCI and the Orange County community.

Grading Option: Pass/no pass only.

Restriction: SAGE Scholars Program students only.

**SOC SCI 184B. Sage Leader Research II. 4 Units.**

Provides a survey of contemporary topics and challenges in the fields of management and leadership. Case studies and text by leading authors are used to analyze key leadership issues in twenty-first century, with particular emphasis on current events.

Restriction: SAGE Scholars Program students only.

**SOC SCI 184GW. Media Writing. 4 Units.**

Designed to teach reporting and news writing basics. Students learn how to gather and organize information, ask effective questions, develop story ideas, research facts, and write stories on deadline.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Overlaps with INTL ST XI155B, SOC SCI XI184G.

Restriction: International Studies Majors have first consideration for enrollment.

**(Ib)**

**SOC SCI 185W. People in Society. 4 Units.**

Through readings about people in distinctly different societies throughout history, students learn concepts that cross the boundaries of the social science disciplines. Such themes as democracy, elitism, power, social class, and gender are the basis for discussion and writing.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: School of Social Sciences students only.

**(Ib)**

**SOC SCI 187. Twenty-First-Century Graduate Education. 2 Units.**

Graduate and professional education in twenty-first century United States. Examines strategies for admission to postbaccalaureate programs and success in graduate study culture. Introduction to processes including planning and preparation, school selection, entrance examination preparation, submission of applications, writing personal statements.

Grading Option: Pass/no pass only.

Restriction: Upper-division students only.

**SOC SCI 188A. Introduction to Contemporary Middle East Politics. 4 Units.**

An overview of basic issues that shape the politics of the Middle East and North Africa. Themes include implication of the colonization era, nation-state formation, inter-Arab relations, nationalism, Arab-Israel conflict, Islamic resurgence, and more.

Same as INTL ST 165, POL SCI 158D.

**SOC SCI 188K. Political Islam. 4 Units.**

Political Islam is a diverse phenomenon. While noticeable barriers exist to 'Islamist democracy,' it is the Islamists who will define the political future of much of the Muslim world. Reviews the experience of Saudi Arabia, Egypt, Pakistan, Turkey, and Indonesia.

Same as INTL ST 161A.

**SOC SCI 189. Special Topics in Social Sciences. 2-4 Units.**

Studies in selected areas of social sciences. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: School of Social Sciences students have first consideration for enrollment.

**SOC SCI H190A. Honors Research Workshop. 4 Units.**

Student develops a 10–15-page prospectus of research for the honors thesis which includes: the research question, literature review, methods of investigation, and bibliography. Student selects a faculty mentor who will supervise thesis research and writing in winter and spring.

Same as SPPS H190A.

Restriction: Social Science Majors only. Social Policy/Public Service Majors only. Social Science Honors students only.

**SOC SCI H190B. Honors Thesis Research. 4 Units.**

The student initiates and completes data collection for the honors thesis. A faculty mentor provides supervision and feedback on thesis chapters.

Prerequisite: SOC SCI H190A or SPPS H190A

Same as SPPS H190B.

**SOC SCI H190C. Honors Thesis. 4 Units.**

The student completes, with the approval of the faculty mentor, an honors thesis containing: statement of the problem, literature review, research hypotheses, methods of investigation, results, discussion, and bibliography.

Prerequisite: SOC SCI H190B or SPPS H190B. Satisfactory completion of the Lower-Division Writing requirement.

Same as SPPS H190C.

**(Ib)****SOC SCI 191. Graduate-Mentored Study in the Social Sciences. 4 Units.**

Offers a hands-on research experience while increasing awareness of the various disciplines in the social sciences and of the requirements of graduate school. Features graduate-mentored study under the supervision of the Associate Dean.

Prerequisite: Identification of a graduate student (who is in good standing) as a mentor.

Grading Option: Pass/no pass only.

**SOC SCI 193A. Field Studies in Social Policy and Public Service. 4 Units.**

Advanced training in qualitative and ethnographic research centered on community service. Students pursue field studies at nonprofit agencies (200 hours) to understand current social problems in underrepresented and underserved communities. Through field placement, students apply theory to practice.

Prerequisite: SOC SCI 70C or SOCIOL 63. Satisfactory completion of the Lower-Division Writing requirement.

Same as SPPS 193A.

Restriction: Social Policy/Public Service Majors only.

**SOC SCI 193B. Field Studies in Social Policy and Public Service. 4 Units.**

Advanced training in qualitative and ethnographic research centered on community service. Students pursue field studies at nonprofit agencies (200 hours) to understand current social problems in underrepresented and underserved communities. Through field placement, students apply theory to practice.

Prerequisite: SOC SCI 193A

Same as SPPS 193B.

**SOC SCI 193C. Field Studies in Social Policy and Public Service. 4 Units.**

Advanced training in qualitative and ethnographic research centered on community service. Students pursue field studies at nonprofit agencies (200 hours) to understand current social problems in underrepresented and underserved communities. Through field placement, students apply theory to practice.

Prerequisite: SOC SCI 193B

Same as SPPS 193C.

**SOC SCI 193CW. Field Studies in Social Policy and Public Service. 4 Units.**

Advanced training in qualitative and ethnographic research centered on community service. Students pursue field studies at nonprofit agencies (200 hours) to understand current social problems in underrepresented and under-served communities. Through field placement, students apply theory to practice.

Prerequisite: SOC SCI 193B

Same as SPPS 193CW.

Overlaps with SPPS 193C.

Restriction: Social Science Majors only.

**(Ib)**

**SOC SCI 194A. Public Service Internship. 2-4 Units.**

Introduces the role of etiquette and leadership in the professional environment. With a two-unit (50 hours) or four-unit (100 hours) credit option, students intern at a nonprofit agency exploring their roles as community leaders and improving their professional skills.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 8 units.

Restriction: Social Policy/Public Service Majors only.

**SOC SCI 194C. Management and Leadership Practicum-Social Science . 2-4 Units.**

Social Sciences Academic Resource Center (SSARC) Resource Managers (RMs) report directly to the Director and Associate Director, serving as frontline resource consultants, assisting visitors with resume development, graduate and professional school planning, internship placement, and professional development.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 12 units.

**SOC SCI 195A. Educational Policy Field Studies. 4 Units.**

Integrates academic course work with experiential learning; examines the effects of educational policy on urban and suburban schools; explores the relationship between community service and personal academic interests; and develops awareness about the challenges of public education.

Repeatability: May be taken for credit 3 times.

**SOC SCI 195B. Educational Policy Field Studies. 4 Units.**

Integrates academic course work with experiential learning; examines the effects of educational policy on urban and suburban schools; explores the relationship between community service and personal academic interests; and develops awareness about the challenges of public education.

Prerequisite: SOC SCI 195A

Repeatability: May be taken for credit 3 times.

**SOC SCI 195C. Educational Policy Field Studies . 4 Units.**

Integrates academic course work with experiential learning; examines the effects of educational policy on urban and suburban schools; explores the relationship between community service and personal academic interests; and develops awareness about the challenges of public education.

Prerequisite: SOC SCI 195B

Repeatability: May be taken for credit 3 times.

**SOC SCI 196. Global Connect. 2-4 Units.**

Identifies factors of change that influence the twenty-first century. Students serve as mentors at high schools to introduce globalization issues through workshops and lectures. Students must submit an application and have a 3.0 or higher overall GPA.

Repeatability: May be taken for credit 3 times.

**SOC SCI 197. Professional Internship. 2-4 Units.**

Students apply classroom knowledge through research projects in nonprofit agencies (local, state, and government) and the private sector. They pose solutions to agency-posed questions. Students gain field experience through 50 hours (for 2 units) or 100 (for 4 units).

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 8 units.

Restriction: School of Social Sciences students only.

**SOC SCI 198. Directed Group Study. 2-4 Units.**

Directed study with Social Science faculty.

Repeatability: May be taken for credit for 12 units.

**SOC SCI 199. Individual Study. 2-4 Units.**

Opportunities to do research and learn new skills outside the normal classroom environment. Students participate in planned research and study activities under a written contract with a supervising UCI instructor. Students may enroll for only one 199 each quarter.

Repeatability: May be taken for credit for 16 units.

Restriction: Upper-division students only.

**SOC SCI 211A. Mathematical Behavioral Sciences Colloquium. 2 Units.**

Weekly reports and colloquia by faculty, students, and visitors.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**SOC SCI 211B. Mathematical Behavioral Sciences Colloquium. 2 Units.**

Weekly reports and colloquia by faculty, students, and visitors.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**SOC SCI 211C. Mathematical Behavioral Sciences Colloquium. 2 Units.**

Weekly reports and colloquia by faculty, students, and visitors.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**SOC SCI 253K. Race and Justice Studies Writing Seminar . 4 Units.**

A required writing-intensive seminar conducted by an instructor affiliated with the Race and Justice Studies emphasis. Students with manuscripts on relevant topics will read and critique peer manuscripts, and revise manuscripts toward completion of articles, dissertation chapters, and other publications.

Prerequisite: CRM/LAW C260C

Same as HUMAN 261, CRM/LAW C261.

Restriction: Graduate students only.

**SOC SCI 254A. Transnational Migration. 4 Units.**

Examines borders and boundaries as material and semiotic constructs. Drawing upon an array of literatures, but loosely situated in U.S. geo/biopolitics, explores transformative troubleings of places, spaces, borders, and bodies of all sorts.

Same as ANTHRO 235A, CHC/LAT 215.

Restriction: Graduate students only.

**SOC SCI 272A. Origin and Evolution of Marxist Social Thought. 4 Units.**

Focuses on the genesis and evolution of Marxist social thought. The 'systemic' method of Marx and Engels to questions of economic production and reproduction is compared and contrasted with modern world-system grand visions, feminist-theoretic approaches, and postmodern critiques.

Prerequisite: Undergraduate course in political theory or equivalent.

Restriction: Graduate students only.

**SOC SCI 289. Special Topics in Social Science. 4 Units.**

Current research in Social Science.

Repeatability: Unlimited as topics vary.

**SOC SCI 290. Dissertation Research. 4-12 Units.**

Dissertation research with Social Science faculty.

Repeatability: May be repeated for credit unlimited times.

**SOC SCI 299. Independent Study. 1-12 Units.**

Independent research with Social Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**SOC SCI 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Letter Grade only.

Repeatability: May be repeated for credit unlimited times.

## Sociology (SOCIOL)

### Courses

**SOCIOL 1. Introduction to Sociology. 4 Units.**

Considers major sociological concepts, theories, and research findings illuminating processes of interpersonal interaction, social differentiation and stratification, integration and conflict, and change, with attention to variation in class, race/ethnic, gender, multicultural, and cross-national perspectives and experiences.

(III, VII)

**SOCIOL 2. Globalization and Transnational Sociology. 4 Units.**

Examines globalization and international issues from the perspective of sociology and related fields. Issues include economic globalization and global inequality, international environmental problems, international politics, trends in global culture, and global conflict.

(III, VIII)

**SOCIOL 3. Social Problems. 4 Units.**

Focuses on how institutional and organizational features of societies generate problems for people. Particular attention directed at a set of problems related to political and economic inequality: poverty, racism, sexism, urban and population problems, the environment, the criminal justice system.

(III, VII)

**SOCIOL 10A. Probability and Statistics. 4 Units.**

An introduction to probability and statistics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Emphasizes examples from sociology, anthropology, and related social science disciplines.

Same as ANTHRO 10A.

Overlaps with PSYCH 10A, SOCECOL 13, SOC SCI 10A, POL SCI 10A.

Restriction: Anthropology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

(Va)

**SOCIOL 10B. Probability and Statistics. 4 Units.**

An introduction to probability and statistics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Emphasizes examples from sociology, anthropology, and related social science disciplines.

Prerequisite: SOCIOL 10A or ANTHRO 10A

Same as ANTHRO 10B.

Overlaps with PSYCH 10B, SOCECOL 13, SOC SCI 10B, POL SCI 10B.

Restriction: Anthropology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**(Va)****SOCIOL 10C. Probability and Statistics. 4 Units.**

An introduction to probability and statistics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Emphasizes examples from sociology, anthropology, and related social science disciplines.

Prerequisite: SOCIOL 10B or ANTHRO 10B

Same as ANTHRO 10C.

Overlaps with PSYCH 10C, SOCECOL 13, SOC SCI 10C, POL SCI 10C.

Restriction: Anthropology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**(Vb)****SOCIOL 19. Special Topics: Methods. 4 Units.**

Studies in selected areas of methods. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**SOCIOL 29. Special Topics: Theory. 4 Units.**

Studies in selected areas of theory. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: May be repeated for credit unlimited times.

**SOCIOL 31. Self-Identity and Society. 4 Units.**

Studies sociological contributions to theory and research in social psychology, with focus on the social influences on personality, attitudes, beliefs, and behavior; socialization, human groups, and social interaction.

Same as PSYCH 78A.

**(III)****SOCIOL 39. Special Topics: Social Psychology. 4 Units.**

Studies in selected areas of social psychology. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**SOCIOL 41. Small Group Dynamics. 4 Units.**

Deals with models for understanding behavior in small groups, including coalition formation, socialization, group norms and decision rules, leadership, conformity, group structure, and communication processes.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 43. City and Community. 4 Units.**

Examines nature, causes, and consequences of urbanization along with changing scale and complexity, demographic/ecological city growth patterns, quality of life in urban areas, processes of decision-making, and bearing of sociological investigation on public policy concerns in contemporary urban society.

Overlaps with UPPP 40.

**SOCIOL 44. Births, Deaths, and Migration. 4 Units.**

Introduction to the analysis of human population including fertility, mortality dispersion, sex distribution. Attention is focused on the effects of these variables on, e.g., over-population, social disorganization, and the stability of social institutions.

(VIII)

**SOCIOL 49. Special Topics: Structures. 4 Units.**

Studies in selected areas of structures. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**SOCIOL 51. Asian American Family & Community. 4 Units.**

Briefly examines the history of different Asian American groups and provides an in-depth analysis of issues related to family composition, mate selection, changing gender roles, and intergenerational conflict.

(VII)

**SOCIOL 56. Religion and Society. 4 Units.**

A critical and personal examination of the varieties of religious and spiritual experiences human beings are undergoing in contemporary society. The role of conscious understanding and unconscious conditioning regarding religion and spirituality.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 59. Special Topics: Social Institutions and Culture. 4 Units.**

Studies in selected areas of social institutions and culture. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**SOCIOL 62. Families and Intimate Relations. 4 Units.**

Sociological theories/research on marriage, kinship, intimacy, and divorce. Emphasis on comparing family patterns in different social classes, ethnic groups, and societies, and on relating family life to the economy and other social institutions. Topics include gender roles, child-rearing, historical change. Materials fee.

(III)

**SOCIOL 63. Race and Ethnicity. 4 Units.**

Focuses on racial and ethnic relations in the United States and compares them with those found in other societies. Analyzes the conditions that favor either cooperation and integration or rivalry, tension, and conflict. Appraises strategies for reducing and resolving conflicts.

Same as SPPS 70A.

(VII)

**SOCIOL 64. Sociology of Sexuality. 4 Units.**

Provides an introduction to and overview of the sociology of sex and sexuality. Considers the social meanings of sex and sexuality, the social contexts of sex and sexuality, and the social regulations of sex and sexuality.

(VII)

**SOCIOL 68. Gender and Race Inequality in the Workplace. 4 Units.**

Analysis of current state and trends in major inequality measures including the wage gap, occupational segregation, and access to managerial positions. Theories that purport to explain such differences, and the related empirical evidence, are also covered.

**SOCIOL 68A. Ethnic and Immigrant America. 4 Units.**

Focusing on Asian, Latino, and Black immigrant groups, examines the second generation's experience of straddling two cultures and growing up American. Covers topics such as assimilation, bilingualism, race relations, education, bicultural conflicts, interracial marriage, and multiracial identities.

Same as CHC/LAT 65.

(VII)



**SOCIOL 69. Special Topics: Age, Gender, Race, and Ethnicity. 4 Units.**

Studies in selected areas of age, gender, race, and ethnicity. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**SOCIOL 79. Special Topics: Societies and Social Inequality. 4 Units.**

Studies in selected areas of societies and social inequality. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**SOCIOL 110. Research Methods. 4 Units.**

Methods of data collection and analysis used by sociologists. Experimental methods, surveys, and interviews, field research and participant observation, demographic methods, historical and comparative approaches.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 119. Special Topics: Methods. 4 Units.**

Studies in selected areas of methods. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 120. Sociological Theory. 4 Units.**

What a theory of society is and is not. Historical and contemporary models, perspectives, and schools.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 120W. Sociological Theory. 4 Units.**

What a theory of society is and is not. Historical and contemporary models, perspectives, and schools.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Sociology Majors have first consideration for enrollment.

**(Ib)****SOCIOL 129. Special Topics: Theory. 4 Units.**

Studies in selected areas of theory. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 134. Game Theory and Politics I. 4 Units.**

Introduction to game theory and a survey of its political applications. Examples of topics covered include voting in small committees, legislatures, and mass elections; interest group activities and environmental issues; institutional design, and the evolution of cooperative behavior.

Same as POL SCI 130A, SOC SCI 103A.

Restriction: Social Policy/Public Service Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**SOCIOL 135. Social Psychology of Networks. 4 Units.**

Review of network methods used in small group and organizational research. Discussion of social psychological literature relevant to the network of study of cognitive social structure, exchange/communication, identity negotiation, and social control. Case study of network datasets exemplifies research issues.

Same as PSYCH 178N.

Restriction: Sociology Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**SOCIOL 136. Religious Traditions of Asian Americans. 4 Units.**

Studies the religious traditions of Asian Americans, focusing on the transplantation of religious institutions, establishment of sacred spaces, celebration of religious holidays, socialization of children, as well as birth, marriage, gender relations, death, family.

Same as ASIANAM 143.

**SOCIOL 138. Business Decisions. 4 Units.**

Surveys normative and descriptive models of decision-making behavior, with an emphasis on organizational and policy contexts. Topics include rational choice theory, biases and heuristics, framing effects, and overconfidence. Management fads, panics, and herd behavior are also discussed.

Prerequisite: (ANTHRO 10A and ANTHRO 10B and ANTHRO 10C) or (SOCIOL 10A and SOCIOL 10B and SOCIOL 10C) or (SOC SCI 10A and SOC SCI 10B and SOC SCI 10C) or (MATH 2A and MATH 2B and (STATS 7 or MGMT 7)) or (STATS 120A and STATS 120B and STATS 120C) or (ECON 15A and ECON 15B)

Same as ECON 148.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 139. Special Topics: Social Psychology. 4 Units.**

Studies in selected areas of social psychology. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 141. Organizations. 4 Units.**

How bureaucracies, formal organizations, and voluntary associations work, how/why they grow, and where they are going. History and structure of organizational rationality; dynamics of organized groups; behavior in organizations; limits of bureaucratization and attempts to overcome these limits through decentralization.

Same as POL SCI 155C.

Restriction: Sociology Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment.

**SOCIOL 142. White-Collar Crime. 4 Units.**

Examines criminal activity in business and corporate enterprise, organizations, and the professions. Theories regarding the causes and control of white-collar and corporate crime are covered as well as the numerous definitions of these terms.

Same as CRM/LAW C142.

Restriction: Sociology Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**SOCIOL 143. Social Networks and Social Support. 4 Units.**

Examines the manner in which behaviors/attitudes of individuals are affected by their network ties to others. How are peoples' opportunities and well-being increased/decreased by their social networks? May include studies in mental/physical health, job seeking, separation and loss, and aging.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 144. Politics, Power, and Society. 4 Units.**

Includes an examination of the major theoretical approaches to political sociology, and the application of these ideas to the politics of advanced capitalist societies. Also considers stability and change in power structures.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 145. Occupations and Professions. 4 Units.**

What makes some jobs satisfying and others boring? How does technology influence the workplace? What changes are coming in the U.S. job market? Sociology and psychology of occupations. Students interview workers and study aspects of their occupations.

Restriction: Upper-division students only. Sociology Majors have first consideration for enrollment.

**SOCIOL 145W. Occupations and Professions. 4 Units.**

What makes some jobs satisfying and others boring? How does technology influence the workplace? What changes are coming in the U.S. job market? Sociology and psychology of occupations. Students interview workers and study aspects of their occupations.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Sociology Majors have first consideration for enrollment.

(Ib)

**SOCIOL 149. Special Topics: Structures. 4 Units.**

Studies in selected areas of structures. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 150. Sociological Lens on Religion. 4 Units.**

Examines the effects of religious beliefs, belonging, and institutions on social dynamics, including class, gender, and racial stratification, politics, and social movements. Additional topics: the sociological significance of conversion, commitment, and secularization/sacralization.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 151. Social Inequalities and Health. 4 Units.**

Introduces ways in which social inequalities produce health disparities. Begins with general perspectives on social causation of health, and then considers how particular individual attributes (e.g., gender, SES, race/ethnicity, nativity) and social contexts (e.g., neighborhoods) can get "under the skin."

**SOCIOL 154. Medical Sociology. 4 Units.**

Current problems in U.S. health-care system and proposals for reform. Examines financial barriers to access; problem of patient dumping; underinsurance; prenatal and perinatal care; child services; preventative care and needs of the elderly; minorities; low-income people; undocumented.

Same as PUBHLTH 135.

Restriction: Upper-division students only. Sociology Majors have first consideration for enrollment.

**SOCIOL 154W. Medical Sociology. 4 Units.**

Current problems in U.S. health-care system and proposals for reform. Examines financial barriers to access; problem of patient dumping; underinsurance; prenatal and perinatal care; child services; preventative care and needs of the elderly; minorities; low-income people; undocumented.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Sociology Majors have first consideration for enrollment.

(Ib)

**SOCIOL 155B. Baseball and Society. 4 Units.**

An examination of baseball's role in American social life over the last 150 years. Issues of fraternal organizations, national development, capitalism, rationalization, race and ethnicity, gender, economic organization, labor relations, and politics are discussed.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 155BW. Baseball and Society. 4 Units.**

An examination of baseball's role in American social life over the last 150 years. Issues of fraternal organizations, national development, capitalism, rationalization, race and ethnicity, gender, economic organization, labor relations, and politics are discussed.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Sociology Majors have first consideration for enrollment.

**(Ib)**

**SOCIOL 156. Deviance. 4 Units.**

Perspectives on deviance and criminality in behavior, institution, community, and myth. The suitability of contemporary theories of deviant behavior.

Same as CRM/LAW C107, PSYCH 177D.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

Sociology Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**SOCIOL 157A. Sociology of Education. 4 Units.**

Focuses on education's role in creating and redressing inequality, and in shaping how we understand our place in society. Education from cross-national and historical perspectives, and education as a vehicle for examining and solving social problems. Course may be offered online.

**SOCIOL 157AW. Sociology of Education. 4 Units.**

Focuses on education's role in creating and redressing inequality, and in shaping how we understand our place in society. Education from cross-national and historical perspectives, and education as a vehicle for examining and solving social problems.

Overlaps with SOCIOL 157A.

**(Ib)**

**SOCIOL 157C. Comparing European and US Societies. 4 Units.**

Society, culture, institutions of U.S. and European countries. Fertility to football, guns to government, work to welfare, health to housework. Cross-national approaches for understanding the world and thinking critically about taken-for-granted practices. Policies the U.S. might borrow for social issues.

Same as INTL ST 157C.

**SOCIOL 158C. Money, Work, and Social Life . 4 Units.**

Sociological perspective on issues related to money and work. Consumption practices and lifestyles, jobs and organizations, issues of money in intimate relations, marriage, and households, illegal work, discrimination, economic globalization are discussed.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 158CW. Money, Work, and Social Life. 4 Units.**

Sociological perspective on issues related to money and work. Consumption practices and lifestyles, jobs and organizations, issues of money in intimate relations, marriage, and households, illegal work, discrimination, economic globalization are discussed.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Sociology Majors have first consideration for enrollment.

**(Ib)**

**SOCIOL 159. Special Topics: Social Institutions and Culture. 4 Units.**

Studies in selected areas of social institutions and culture. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 161. Sociology of Sex and Gender. 4 Units.**

Explores complex processes contributing to social construction of gender and sexuality in the U.S. with focus on intersection of gender, race, ethnicity, sexuality, and class; evaluates how men and women are differentially constituted in family, education, work, politics, media, language.

**SOCIOL 161W. Sociology of Sex and Gender. 4 Units.**

Explores complex processes contributing to social construction of gender and sexuality in the U.S. with focus on intersection of gender, race, ethnicity, sexuality, and class; evaluates how men and women are differentially constituted in family, education, work, politics, media, language.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**SOCIOL 164. Sociology of Aging . 4 Units.**

Introduction to sociology of age, aging, and the aged. Problems posed by aging population. Life course transitions and how social organizations influence the life course. Addresses work, health, and family in later life.

Overlaps with SOCIOL 164W.

Restriction: Upper-division students only. Sociology Majors have first consideration for enrollment.

**SOCIOL 164W. Sociology of Aging . 4 Units.**

Introduction to sociology of age, aging, and the aged. Problems posed by aging population. Life course transitions. How social organizations influence the life course. Work, health, family in later life.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Sociology Majors have first consideration for enrollment.

(Ib)

**SOCIOL 166. Immigration and Inequality. 4 Units.**

Explores immigration, ethnicity, and inequality as interconnected social forces. International migration, propelled by global inequalities, plays a central role in the formation of multinational societies, shapes inter-group relations and patterns of ethnic inequality, and transforms the immigrants themselves.

Same as SOC SCI 168B.

**SOCIOL 167A. Racial and Ethnic Relations in the United States. 4 Units.**

Examines central questions and issues in the field of race and ethnicity; the emergence, maintenance, and consequences of the ethnic and racial stratification system in the United States; the future of racial and ethnic relations; and relevant public policy issues.

Same as CHC/LAT 148.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**SOCIOL 167AW. Racial and Ethnic Relations in the United States. 4 Units.**

Examines central questions and issues in the field of race and ethnicity; the emergence, maintenance, and consequences of the ethnic and racial stratification system in the United States; the future of racial and ethnic relations; and relevant public policy issues.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as CHC/LAT 148W.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

(Ib)

**SOCIOL 169. Special Topics in Age, Gender, Race, and Ethnicity. 4 Units.**

Studies in selected areas of age, gender, race, and ethnicity. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 170A. Vietnam War. 4 Units.**

Examines social structures and social changes in Vietnamese and U.S. societies through the study of the Vietnam War.

Same as INTL ST 143A.

**SOCIOL 170B. U.S. War on Terrorism. 4.0 Units.**

Analyzes the United States war on terrorism by focusing on terrorism, the U.S. wars in Afghanistan and Iraq, and changes in police powers through the Patriot Act, as well as the political leadership which directs the war.

Same as INTL ST 175A.

**SOCIOL 171. Environment and Society. 4 Units.**

Examines society's changing relationship to the natural world. Delineates different models of 'nature' and then explores their institutional roots, the social responses they have generated, and their implications for social inequality.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 172. Revolution and Social Transformation in China. 4 Units.**

Introduces the major political events in Mao's communist revolution and the social transformations afterward. Helps students understand the historic and political landscape from which China is now departing.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 173. Social Inequality. 4 Units.**

Sources, functions, and dynamics of the unequal distribution of wealth, prestige, knowledge, and power in American and other societies.

Overlaps with SOCIOL 173W.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 173W. Social Inequality. 4 Units.**

Sources, functions, and dynamics of the unequal distribution of wealth, prestige, knowledge, and power in American and other societies.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Overlaps with SOCIOL 173.

Restriction: Upper-division students only.

**(Ib)****SOCIOL 174. Protests, Movements, and Revolutions. 4 Units.**

A survey of models of collective action drawn from sociology, economics, psychology, and political science. Focus on areas such as social movements, strikes, crowd psychology, cults, fads, fashions, public opinion, and symbolic and mythical elements in collective culture.

Prerequisite: SOCIOL 1 or POL SCI 11A or ECON 1

Same as POL SCI 156D.

Restriction: Political Science Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**SOCIOL 175B. China in the Global Age. 4 Units.**

Chinese society from 1949 to present. Social change in the context of political control and ideological considerations. Focus on the power structure, political decision processes, and ideological legitimation, and interplay with the Chinese community and its culture.

Same as INTL ST 158D.

**SOCIOL 176. International Divided Cities. 4 Units.**

Investigates urban divisions in international cities where deep-seated nationalistic ethnic differences create pressures for intergroup conflicts, autonomy, or territorial separation, and can incite violence. Urban political polarization as it is manifest in the urban setting.

Same as POL SCI 157B, UPPP 178.

**SOCIOL 177. Immigration and Social Policy. 4 Units.**

Explains how people decide to migrate and how they are incorporated into a host society (both historically and currently), examines the effects of immigration on the U.S., analyzes how the framing of immigration shapes the discourse about the issue.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 177C. Undocumented Immigrant Experiences. 4 Units.**

Examines the experiences of undocumented immigrants and the policies that structure their educational, economic, social, and political participation.

Same as ASIANAM 130, CRM/LAW C187, CHC/LAT 164A.

(III and VII ).

**SOCIOL 177W. Immigration and Social Policy. 4 Units.**

Explains how people decide to migrate and how they are incorporated into a host society (both historically and currently), examines the effects of immigration on the U.S., analyzes how the framing of immigration shapes the discourse about the issue.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Sociology Majors have first consideration for enrollment.

(Ib)

**SOCIOL 179. Special Topics: Societies and Social Inequality. 4 Units.**

Studies in selected areas of societies and social inequality. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 180A. Sociology Majors Seminar. 4 Units.**

Students learn sociology by doing it. A modest-sized research project is planned and implemented by each student.

Prerequisite: SOCIOL 110

Restriction: Sociology Majors only.

**SOCIOL 180AW. Sociology Majors Seminar. 4 Units.**

Students learn sociology by doing it. A modest-sized research project is planned and implemented by each student.

Prerequisite: SOCIOL 110. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Sociology Majors only.

(Ib)

**SOCIOL 188BW. Honors Research and Thesis. 4 Units.**

Focuses on the design and implementation of individual research projects undertaken by senior Sociology majors. Writing projects consist of a proposal and paper on some empirical research.

Prerequisite: SOCIOL H188A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Sociology Honors students only.

(Ib)

**SOCIOL H188A. Honors Research and Thesis. 4 Units.**

Focuses on the design and implementation of individual research projects undertaken by senior Sociology majors. Writing projects consist of a proposal and paper on some empirical research.

Restriction: Sociology Honors students only.

**SOCIOL 189. Special Topics: Honors Sequence. 4 Units.**

Independent honors research with Social Sciences faculty.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 197. Field Study. 4 Units.**

Field study with Sociology faculty.

Repeatability: May be repeated for credit unlimited times.

**SOCIOL 198. Directed Group Study . 4 Units.**

Directed study with Sociology faculty.

Repeatability: May be repeated for credit unlimited times.

**SOCIOL 199. Independent Study. 1-4 Units.**

Independent research with Sociology faculty.

Repeatability: May be repeated for credit unlimited times.

**SOCIOL 202A. Proseminar I in Sociology. 1 Unit.**

Introduces first-year graduate students in Sociology to the current research interests of Sociology faculty, as well as to other aspects of graduate life at UCI and to the profession of sociology more generally.

Restriction: Graduate students only.

**SOCIOL 202B. Proseminar II in Sociology. 4 Units.**

Focus is on second-year research projects, design, development, data gathering, analysis, and preparing oral and written presentations of the results. Students learn analytic and writing skills, gain experience with research processes, and become socialized about professional standards, customs, and institutions.

Restriction: Graduate students only.

**SOCIOL 210A. Classical Social Theory. 4 Units.**

Examines the development of classical sociological theory through the writings of Karl Marx, Emile Durkheim, Max Weber, Georg Simmel, and George Herbert Mead.

Restriction: Graduate students only.

**SOCIOL 210B. Contemporary Social Theory. 4 Units.**

Familiarizes students with 20th-century developments in social thought that have influenced sociological research, suggesting 'what is living and what is dead' in the 'classics' and offering an overview of the main outlines of recent sociological theorizing.

Restriction: Graduate students only.

**SOCIOL 211A. Sociology of Gender. 4 Units.**

An introduction to the sociology of gender in the U.S. and globally. The social construction of gender and sexuality; theoretical perspectives and feminist frameworks. Theories of economy, patriarchy, and race, and the social positions of women and men.

Restriction: Graduate students only.

**SOCIOL 212. Network Theory. 4 Units.**

An introduction to theoretical work in the field of social networks. Topics include baseline models, homophily, and propinquity, exchange and power, balance theory, diffusion and social influence, equivalence, and cohesion. Deductive use of theory to make novel predictions is emphasized.

Restriction: Graduate students only.

**SOCIOL 219. Special Topics: Theory. 2-4 Units.**

Studies in selected areas of theory. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 220A. Research Design. 4 Units.**

Data collection, organization, and analysis in ethnographic or quasi-experimental settings, including interviewing, participant observations, behavior observations, and questionnaires. Research design issues include sampling, longitudinal research, and comparative research. Emphasis on the integration of qualitative and quantitative data.

Overlaps with SOCIOL 265.

Restriction: Graduate students only.



**SOCIOL 221A. Graduate Statistics I. 4 Units.**

Statistics with emphasis on applications in sociology and anthropology. Examines exploratory uses of statistical tools in these fields as well as univariate, bivariate, and multivariate applications in the context of the general linear model.

Restriction: Graduate students only.

**SOCIOL 221B. Graduate Statistics II. 4 Units.**

Statistics with emphasis on applications in sociology and anthropology. Examines exploratory uses of statistical tools in these fields as well as univariate, bivariate, and multivariate applications in the context of the general linear model.

Prerequisite: SOCIOL 221A

Restriction: Graduate students only.

**SOCIOL 221C. Graduate Statistics III. 4 Units.**

Statistics with emphasis on applications in sociology and anthropology. Examines exploratory uses of statistical tools in these fields as well as univariate, bivariate, and multivariate applications in the context of the general linear model.

Prerequisite: SOCIOL 221A and SOCIOL 221B

Restriction: Graduate students only.

**SOCIOL 222A. Comparative and Historical Sociological Methods. 4 Units.**

Topics include the logic of comparative and historical analysis techniques and the examination of exemplar works in representative problem areas.

Restriction: Graduate students only.

**SOCIOL 224. Interview Methods . 4 Units.**

Hands-on introduction to the use of interviews in social scientific research. Topics include when to use interviews and/or focus groups; how to design an interview-based study, how to conduct interviews, analyze interview data, and write up and publish interview-based results.

Restriction: Graduate students only.

**SOCIOL 226A. Methods of Demographic Analysis. 4 Units.**

Introduces basic demographic methods used in social science and public health research. Topics include sources and limitations of demographic data; components of population growth; measures of nuptiality, fertility, mortality, and population mobility projection methods; and demographic models.

Same as PUBHLTH 209.

Restriction: Graduate students only.

**SOCIOL 227A. Seminar Ethnographic & Qualitative Field Methods. 4 Units.**

Comprehensive and critical discussion of the traditions of qualitative fieldwork; detailed examination of the collection, coding, analysis, and presentation of ethnographic/qualitative field data; and close mentoring of student projects culminating in an original research paper.

Grading Option: In Progress (Letter Grade with S/U).

Restriction: Graduate students only.

**SOCIOL 227B. Seminar Ethnographic & Qualitative Field Methods. 4 Units.**

Comprehensive and critical discussion of the traditions of qualitative fieldwork; detailed examination of the collection, coding, analysis, and presentation of ethnographic/qualitative field data; and close mentoring of student projects culminating in an original research paper.

Prerequisite: SOCIOL 227A

Restriction: Graduate students only.

**SOCIOL 229. Special Topics: Methods . 1-4 Units.**

Studies in selected areas of methods. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 230A. Race and Ethnicity. 4 Units.**

An examination of central questions and issues in the field of race and ethnicity through a critical analysis and discussion of the principal theoretical perspectives and paradigms that have framed much of the scholarship in the area.

Restriction: Graduate students only.

**SOCIOL 232. Inequality. 4 Units.**

Theoretical and empirical approaches to the study of social and economic inequality, with special attention to race/ethnicity, class, and gender.

Restriction: Graduate students only.

**SOCIOL 234. Ethnic America. 4 Units.**

Examines critically the meaning and measurement of ethnicity, race, and nation in sociological theory and research. Theories of ethnicity are explored, along with empirical studies of the construction of ethnic and pan-ethnic identities in historical and contemporary contexts.

Same as CHC/LAT 223.

Restriction: Graduate students only.

**SOCIOL 235. Poverty and Development . 4 Units.**

Examines competing conceptualizations, methods of measurement, and poverty alleviation strategies widely used in developing countries. Focuses on poverty conceptualized as economic deprivation, well-being, vulnerability, and social exclusion.

Same as UPPP 251.

Restriction: Graduate students only.

**SOCIOL 237. Educational Inequality. 4 Units.**

Focuses on macro-level explanations of inequality of schooling, particularly in the U.S. context. Explores traditional models, such as conflict, functionalism, status-attainment, cultural reproduction, and newer synthetic accounts. Emphasis on higher education access and the intersection of education and work.

Restriction: Graduate students only.

**SOCIOL 239. Special Topics: Social Inequality. 2-4 Units.**

Studies in selected areas of social inequality. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 240A. Social Movements. 4 Units.**

A survey of the field of Social Movements, oriented around critical themes in the major theoretical traditions and contemporary exemplars.

Restriction: Graduate students only.

**SOCIOL 241A. Political Sociology. 4 Units.**

Begins with an examination of the three major orientations to the State (Pluralist, Elitist, and Class). Next considers current topics in political sociology including the Welfare State, the New Deal, political behavior, social movements, participation, and democracy.

Restriction: Graduate students only.

**SOCIOL 242. Sociology of Culture. 4 Units.**

Major perspectives in the sociology of culture. Topics include the role of cultural dynamics in the reproduction of inequality, collective action, political and organizational decision making, emotional experience, and the social impacts of new technologies.

**SOCIOL 249. Special Topics: Political Sociology and Social Movements. 2-4 Units.**

Studies in selected areas of political sociology and social movements. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 252A. Global Urbanization. 4 Units.**

Examines the spread of cities worldwide in the 20th century. What are the political and economic causes of this process? What are the social-cultural, political, and economic effects? How is contemporary urbanization linked to global restructuring of other kinds.

Same as UPPP 273.

Restriction: Graduate students only.

**SOCIOL 259. Special Topics: Global Studies and Comparative Development. 2-4 Units.**

Studies in selected areas of global studies and comparative development. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 262A. Population. 4 Units.**

Introduces the interrelationships between population and social organization. Considers measurement and explanation of historical and contemporary trends in birth rates, death rates, migration, and marriage and divorce. Case material is drawn primarily from the U.S. and other industrialized nations.

Restriction: Graduate students only.

**SOCIOL 264. Immigrant America. 4 Units.**

The study of the causes and consequences of international migration has become one of the most vital fields of sociological theory and research. Examines principal theoretical perspectives and empirical research on contemporary immigration flows and the processes of incorporation.

Same as CHC/LAT 224.

Restriction: Graduate students only.

**SOCIOL 265. DASA Research Design. 4 Units.**

Data collection, organization, and analysis in population studies and demography. Research design issues include sampling, longitudinal research, and comparative research.

Prerequisite: Enrollment in DASA program.

Overlaps with SOCIOL 220A.

Restriction: Graduate students only.

**SOCIOL 268. Crimmigration. 4 Units.**

Examines the criminalization of immigration, with an emphasis on U.S. enforcement procedures and outcomes. Analyzes the devolution of federal immigration law to local authorities, the rise in immigrant detention and deportation, and the militarization of the U.S.-Mexico border.

Same as CHC/LAT 225, CRM/LAW C258.

Restriction: Graduate students only.

**SOCIOL 269. Special Topics: Social Demography. 4 Units.**

Studies in selected areas of social demography. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 279. Special Topics: Social Organizations and Institutions. 2-4 Units.**

Studies in selected areas of social organizations and institutions. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 280. Analysis of Social Network Data. 4 Units.**

Overview and application of methods for analyzing social network data. Topics include: data structures, visualization, graph theory, centrality, subgroups, positions, blockmodels, local properties, and statistical models. Social network analysis software is used to analyze a range of examples.

Restriction: Graduate students only.

**SOCIOL 281. Introduction to Social Networks. 4 Units.**

Provides a broad overview of the history, concepts, and applications of social networks. Students have the opportunity to delve deeply into applications of the network approach in their individual areas of interest.

Restriction: Graduate students only.

**SOCIOL 282. Theorizing Illegality and the Experiences of Undocumented Immigrants. 4 Units.**

Examines theories of illegality and citizenship, historical and contemporary undocumented immigrant experiences, and methodological concerns in this area of study.

Same as CHC/LAT 222.

Restriction: Graduate students only.

**SOCIOL 289. Special Topics . 2-4 Units.**

Studies in selected areas of Social Sciences. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 290. Dissertation Research. 1-12 Units.**

Dissertation research with Sociology faculty.

Repeatability: May be taken for credit 10 times.

Restriction: Graduate students only.

**SOCIOL 299. Independent Study. 1-12 Units.**

Independent research with Sociology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Software Engineering (SWE)

### Courses

**SWE 211. Software Engineering. 4 Units.**

Study of the concepts, methods, and tools for the analysis, design, construction, and measurement of complex software-intensive systems. Underlying principles emphasized. State-of-the-art software engineering and promising research areas covered, including project management.

**SWE 212. Analysis of Programming Languages. 4 Units.**

Concepts in modern programming languages, their interaction, and the relationship between programming languages and methods for large-scale, extensible software development. Empirical analysis of programming language usage.

Same as CS 253.

**SWE 213. Requirements Engineering and Specification. 4 Units.**

Rigorous techniques in requirements engineering - the requirements definition phase of software development - with a focus on modeling and specification. Topics include notations and models for requirements specification; and methods, tools, and processes for software requirements elicitation, representation, analysis.

Restriction: Graduate students only.

**SWE 214. Program Analysis. 4 Units.**

Covers principles and concepts of automated program analysis. Topics include program representations; intra-procedural data-flow analysis; call-graph construction; pointer analysis; alias analysis; inter-procedural analysis; inter-procedural finite distributive subset problems; inter-procedural distributive environment problems; symbolic execution; and program-analysis applications.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Graduate students only.

**SWE 215. Software Analysis and Testing. 4 Units.**

Studies techniques for developing confidence in software from traditional testing schemes to integrated, multitechnique analytic approaches. Considers strengths and weaknesses and explores opportunities for synergistic technique application. Emphasis is on approaches integrated into the software process.

Restriction: Graduate students only.

**SWE 221. Software Architecture. 4 Units.**

Study of the concepts, representation techniques, development methods, and tools for architecture-centric software engineering. Topics include domain-specific software architectures, architectural styles, architecture description languages, software connectors, and dynamism in architectures.

Restriction: Graduate students only.

**SWE 225. Information Retrieval, Filtering, and Classification. 4 Units.**

Algorithms for the storage, retrieval, filtering, and classification of textual and multimedia data. The vector space model, Boolean and probabilistic queries, and relevance feedback. Latent semantic indexing; collaborative filtering; and relationship to machine learning methods.

Prerequisite: CS 161 and CS 171 and (ICS 6N or MATH 3A or MATH 6G)

Same as CS 221.

Restriction: Graduate students only.

**SWE 233. Intelligent User Interfaces. 4 Units.**

Explores example software systems and their underlying concepts that leverage computing to empower and augment human individuals in their activities. Topics span the fields of user interface design, human-computer interaction, software engineering, and cognitive computing.

Prerequisite: CS 171

Restriction: Graduate students only.

**SWE 234. Human Aspects of Software Engineering. 4 Units.**

Selected topics about the cooperative and human aspects of software engineering from the perspective that software engineering is inherently an endeavor involving human stakeholders. Topics may include but are not limited to collaboration, trust, emotion, language, gender, and software tools.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Graduate students only.

**SWE 241P. Applied Data Structures and Algorithms. 2 Units.**

Exploration of strategies to tackle computational problems whose solutions include well-known algorithms and data structures. Topics include sorting, searching, indexing, among others.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only.

**SWE 242P. Network Programming. 2 Units.**

Exploration of networking principles and concepts for the development of distributed software. Topics include programming against well-known network protocols, ports and sockets, and network APIs.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only.

**SWE 243P. Database Programming . 2 Units.**

Exploration of software development with substantial reliance on a database for storage and retrieval of data. Topics include relational databases, structured query language, relational database management systems, APIs and libraries for database programming, among others.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only.

**SWE 244P. Concurrent Programming. 2 Units.**

Exploration of concepts and mechanisms for the development of concurrent software. Topics include threads, locks, race conditions, and deadlocks, among others.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 245P. GUI Programming . 2 Units.**

Exploration of interactive software with substantial graphical user interface elements. Topics include libraries and frameworks for GUI programming, layout design and alternatives, event-driven programming, among others.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 246P. Mobile Programming. 2 Units.**

Exploration of contemporary libraries and frameworks for construction of mobile applications. Topics include emulators, mobile development standards and patterns, energy consumption issues, screen layout, among others.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 247P. Applied Information Retrieval. 2 Units.**

Exploration of principles and concepts for textual information retrieval. Topics include tokenization, inverted indexes, scored retrieval, and precision and recall.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 248P. Neural Network Programming . 2 Units.**

Exploration of the concepts, terminology, and processes for training and using deep neural networks for classification problems. Topics include tensors and tensor operations, gradient-based optimization, feature engineering and learning, and workflow of learning systems.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 249P. Applied Data Analytics. 2 Units.**

Exploration of the concepts, terminology, and processes used in supervised and unsupervised learning for classification and clustering, from a software engineering perspective. Topics include K-Nearest Neighbors, Logistic Regression, Random Forests, Support Vector Machines, K-Means, and model assessment.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only.

**SWE 250P. Web Programming. 2 Units.**

Exploration of the concepts, terminology, and popular frameworks for developing full-stack web applications. Students develop simple applications using multiple development stacks, and deploy them on the cloud.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only.

**SWE 261P. Software Testing and Debugging. 4 Units.**

Designed to teach students how to ensure high-quality software by means of testing, debugging, and other quality assurance activities. Students learn a combination of both theoretical and practical skills, including hands-on experience with modern tools and approaches.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 262P. Programming Styles. 4 Units.**

Designed to teach students the various ways software can be decomposed and put back together. Students are exposed to a variety of different programming styles and composition mechanisms.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 263P. User Experience and Interaction. 4 Units.**

Provides an introduction to the basic principles of human-computer interaction (HCI) and the pragmatic aspects of usability engineering. Topics include the fundamentals of interaction, user experience, design for usability, and evaluation of products for their usability.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 264P. Distributed Software Architecture. 4 Units.**

Study of software system architectures and architectural styles for large-scale distributed applications, and contemporary technologies and standards for their construction. Topics include client-server, peer-to-peer, publish-subscribe, REST, cloud computing, content distribution networks, scalability, latency, caching, and security, among others.

Restriction: Master of Software Engineering Degree students only.

**SWE 265P. Reverse Engineering and Modeling. 4 Units.**

Introduces theories, concepts, representations, techniques, and case studies in understanding large-scale, complex software systems. Topics include static and dynamic modeling notations, manual and (semi-)automated reverse engineering techniques, APIs, patterns, and styles. A significant, hands-on project is included.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 266P. Software Security and Dependability . 4 Units.**

Principles and concepts for the design and construction of secure software. Topics include common types of software security vulnerabilities, methods for detecting vulnerabilities, design and process methodologies to improve security of software, and techniques for assessing security properties of software.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 271P. Career and Entrepreneurship. 4 Units.**

Teaches practical skills for spoken, written, and electronic communication in a range of business and technical contexts, including promoting project ideas and portfolio development. Students practice their skills in classroom presentations and written exercises.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 272P. Project Management. 4 Units.**

Provides an introduction to project management in software engineering from several perspectives. Topics include team behavior; globally distributed work; resource estimation, scheduling, and budgeting. Students apply their knowledge in an ongoing class project.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 275P. Curricular Practical Training. 1 Unit.**

Mandatory internship in which students individually work at an outside organization to gain experience with the challenges involved in the practice of software engineering.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 276P. Capstone Project in Software Engineering. 4 Units.**

Quarter-long software-intensive project focusing on the design and implementation of a novel software system. Students are expected to bring to bear the concepts acquired during the program.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 290. Research Seminar. 2 Units.**

Forum for presentation and criticism by students of research work in progress. Presentation of problem areas and related work. Specific goals and progress of research.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**SWE 290P. Advisement. 0.3 Units.**

Mandatory weekly meetings with a faculty advisor.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 295. Special Topics in Software Engineering. 4 Units.**

Studies in selected areas of software engineering. Topics addressed vary each quarter.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**SWE 298. Thesis Supervision. 2-12 Units.**

Individual research or investigation conducted in preparation for the M.S. thesis option or the dissertation requirements for the Ph.D. program.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**SWE 299. Individual Study. 1-12 Units.**

Individual research or investigation under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Spanish (SPANISH)

### Courses

**SPANISH 1A. Fundamentals of Spanish. 5 Units.**

Communicative approach with emphasis on conversational skills: the students and their environment, their experiences, and their opinions about issues. Reading and writing skills also introduced.

Prerequisite: Placement into SPANISH 1A.

Overlaps with SPANISH 1AB, SPANISH S1AB.

Restriction: SPANISH 1A and SPANISH 1AB and SPANISH S1AB may not be taken for full credit.

**SPANISH 1AB. Fundamentals Intensive Spanish. 10 Units.**

An intensive, proficiency-oriented, and task-based approach, designed to develop basic oral communicative abilities in Spanish. Reading and writing skills, along with an introduction to Hispanic cultures.

Prerequisite: Placement into SPANISH 1A.

Overlaps with SPANISH 1A, SPANISH 1B, SPANISH S1AB.

Restriction: SPANISH 1AB and SPANISH 1A and SPANISH 1B and SPANISH S1AB may not be taken for full credit.

**SPANISH 1B. Fundamentals of Spanish. 5 Units.**

Communicative approach with emphasis on conversational skills: the students and their environment, their experiences, and their opinions about issues. Reading and writing skills also introduced.

Prerequisite: SPANISH 1A. SPANISH 1A with a grade of C or better. Placement into SPANISH 1B is also accepted.

Overlaps with SPANISH 1AB, SPANISH S1AB.

Restriction: SPANISH 1B and SPANISH 1AB and SPANISH S1AB may not be taken for full credit.

**SPANISH 1C. Fundamentals of Spanish. 5 Units.**

Communicative approach with emphasis on conversational skills: the students and their environment, their experiences, and their opinions about issues. Reading and writing skills also introduced.

Prerequisite: SPANISH 1AB or SPANISH 1B or SPANISH S1AB. SPANISH 1AB with a grade of C or better. SPANISH 1B with a grade of C or better. SPANISH S1AB with a grade of B or better. Placement into SPANISH 1C is also accepted.

Overlaps with SPANISH S1BC.

Restriction: SPANISH 1C and SPANISH S1BC may not be taken for full credit.

(VI)



**SPANISH S1AB. Fundamentals of Spanish. 7.5 Units.**

First half of first-year Spanish in an intensified form. Communicative approach with emphasis on conversational skills.

Prerequisite: Placement into SPANISH 1A.

Overlaps with SPANISH 1A, SPANISH 1B, SPANISH 1AB.

Restriction: SPANISH S1AB and SPANISH 1A and SPANISH 1B and SPANISH 1AB may not be taken for full credit.

**SPANISH S1BC. Fundamentals of Spanish. 7.5 Units.**

Second half of first-year Spanish in an intensified form. Communicative approach with emphasis on conversational skills.

Prerequisite: SPANISH S1AB or SPANISH 1A or SPANISH 1B. SPANISH S1AB with a grade of C or better. SPANISH 1A with a grade of C or better. SPANISH 1B with a grade of C or better. Placement into SPANISH 1B or SPANISH 1C is also accepted.

Overlaps with SPANISH 1B, SPANISH 1C, SPANISH 1AB.

Restriction: SPANISH S1BC and SPANISH 1B and SPANISH 1C and SPANISH 1AB may not be taken for full credit.

**(VI)****SPANISH 2A. Intermediate Spanish. 4 Units.**

Conversation, reading, and composition skills are developed using texts of literary and social interest. Emphasis on grammar review.

Prerequisite: SPANISH 1C or SPANISH S1BC. SPANISH 1C with a grade of C or better. SPANISH S1BC with a grade of C or better. Placement into SPANISH 2A is also accepted.

Overlaps with SPANISH 2AB, SPANISH S2AB.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)****SPANISH 2AB. Intermediate Intensive Spanish. 8 Units.**

Intensive intermediate course designed to improve student's abilities in reading, writing, speaking, and comprehension, including a thorough introduction to Hispanic cultures. Grammatical component of the language is gradually reviewed and tested.

Prerequisite: SPANISH 1C or SPANISH S1BC. SPANISH 1C with a grade of C or better. SPANISH S1BC with a grade of C or better. Placement into SPANISH 2A is also accepted.

Overlaps with SPANISH 2A, SPANISH 2B, SPANISH S2AB.

**(VIII)****SPANISH 2B. Intermediate Spanish. 4 Units.**

Conversation, reading, and composition skills are developed using texts of literary and social interest. Emphasis on grammar review.

Prerequisite: SPANISH 2A. SPANISH 2A with a grade of C or better. Placement into SPANISH 2B is also accepted.

Overlaps with SPANISH 2AB, SPANISH S2AB.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)****SPANISH 2C. Intermediate Spanish. 4 Units.**

Conversation, reading, and composition skills are developed using texts of literary and social interest. Emphasis on grammar review.

Prerequisite: SPANISH 2AB or SPANISH 2B or SPANISH S2AB. SPANISH 2AB with a grade of C or better. SPANISH 2B with a grade of C or better. SPANISH S2AB with a grade of B or better. Placement into SPANISH 2C is also accepted.

Overlaps with SPANISH S2BC.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)**

**SPANISH S2AB. Intermediate Spanish. 6 Units.**

First half of second-year Spanish in an intensified form. Conversation, reading, and composition skills are developed using texts of literary and social interest. Emphasis on grammar review.

Prerequisite: SPANISH 1C or SPANISH S1BC. SPANISH 1C with a grade of C or better. SPANISH S1BC with a grade of C or better. Placement into SPANISH 2A is also accepted.

Overlaps with SPANISH 2A, SPANISH 2B, SPANISH 2AB.

**(VIII)****SPANISH S2BC. Intermediate Spanish. 6 Units.**

Second half of second-year Spanish in an intensified form. Conversation, reading, and composition skills are developed using texts of literary and social interest. Emphasis on grammar review.

Prerequisite: SPANISH 2B or SPANISH S2AB or SPANISH 2A. SPANISH 2B with a grade of C or better. SPANISH S2AB with a grade of C or better. SPANISH 2A with a grade of B or better. Placement into SPANISH 2B or SPANISH 2C is also accepted.

Overlaps with SPANISH 2B, SPANISH 2C, SPANISH 2AB, SPANISH 2.

Restriction: SPANISH S2BC and SPANISH 2B and SPANISH 2C and SPANISH 2AB and SPANISH 2 may not be taken for full credit.

**(VIII)****SPANISH 3. US Latino Communities. 4 Units.**

Focuses on intermediate to advanced grammar and composition. Emphasis is placed on key elements of grammar, which constitutes about 70 percent of the curriculum, and composition writing, which constitutes the remaining 30 percent.

Prerequisite: SPANISH 2C or SPANISH S2BC. SPANISH 2C with a grade of C or better. SPANISH S2BC with a grade of C or better. Placement into SPANISH 3 is also accepted.

Overlaps with SPANISH 3H.

**(VIII)****SPANISH 3H. Heritage Spanish: Latinidad. 4 Units.**

Designed for students who grew up speaking Spanish in their homes/communities, whose schooling has been primarily in English, and need additional practice writing in Spanish.

Prerequisite: Placement into SPANISH 3H.

Overlaps with SPANISH 3.

**(VII)****SPANISH 44. Hispanic Literatures for Nonmajors. 4 Units.**

Focuses on major Spanish and Latin American literary texts within a historical and theoretical perspective. Taught in English with literary texts read in the original language.

Prerequisite: SPANISH 2 or SPANISH 2C or SPANISH S2BC

Restriction: No Spanish Majors.

**(VIII)****SPANISH 50. Latin America, U.S. Latino, and Iberian Cultures. 4 Units.**

Introduction (for non-majors) to the culture of the Spanish- and Portuguese-speaking worlds (Europe, Latin America, U.S., Africa). May focus on any time period. Taught in English.

Repeatability: May be taken for credit 3 times as topics vary.

**(IV and VIII ).**

**SPANISH 60E. Mexico and Central America: A Survey . 4 Units.**

Panoramic view of Mexico and Central America examining key texts throughout history. Shows the richness of the culture, and an appraisal of various forms of representation, including images, chronicles, novels, essays, poems, and a film. Taught in English.

Overlaps with SPANISH 60S.

(IV and VIII ).

**SPANISH 60S. Mexico and Central America: A Survey . 4 Units.**

Panoramic view of Mexico and Central America examining key texts throughout history. Shows the richness of the culture, and an appraisal of various forms of representation, including images, chronicles, novels, essays, poems, and a film. Taught in Spanish.

Prerequisite: Placement into SPANISH 2A or higher via Spanish Placement Test B is required.

Overlaps with SPANISH 60E.

(IV and VIII ).

**SPANISH 61. The Culture of the Visual Image in Latin America . 4 Units.**

A survey of visual forms of expression which have endured through more than five centuries of pre-colonial, colonial, and independent Latin America. Forms to be treated in the class include painting, monuments, sculpture, urban planning, graffiti, comics, and photography.

(IV and VIII ).

**SPANISH 62. Latinx, Multilingualism, and Social Justice . 4 Units.**

Explores the role of multilingualism (Spanish, indigenous languages, Latino English) in Latinx social justice movements in the United States with an emphasis on California. Course is taught in English.

(VII)

**SPANISH 97. Fundamentals of Spanish (with Emphasis on Reading). 4 Units.**

Designed for students interested in acquiring a solid reading knowledge of Spanish, and to facilitate the understanding and translating of Spanish texts covering a variety of disciplines. Does not fulfill any undergraduate foreign language requirement. Taught in English.

Prerequisite: Does not serve as prerequisite for any higher-level Spanish courses.

Restriction: No Spanish Majors.

**SPANISH 101A. Introduction to Iberian Literature and Culture. 4 Units.**

Introduction to the major authors and movements of Iberian literature and culture from the Middle Ages to the present.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 101B. Introductory Studies to Latin American Literature and Culture. 4 Units.**

A historical overview of Latin American literature and culture mainly focused on canonical texts. Topics include colonialism and postcolonialism, the nation, indigenismo, gender, and literary movements. Also introduces literary analysis, research methods, and cultural critique.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 104. Writing in Spanish. 4 Units.**

Focuses on the use of writing as a medium to encourage critical thinking and the practical analysis of literary texts, as well as the study of historical and social issues in the Spanish-speaking world.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 105. Spanish Communication. 4 Units.**

Designed to help students develop Spanish oral skills by exposing them to different verbal Spanish language registers. Special emphasis placed on abilities essential to professional or academic careers. Intended for Spanish majors as an important component of their overall education.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 107. Advanced Spanish Grammar. 4 Units.**

Designed for students who have demonstrated a substantial level of proficiency in their studies of the Spanish language. Takes thorough approach to advanced grammatical problems, in order to assist students in their mastery of the elements of the Spanish language.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 110A. Topics in Peninsular Literature and Cultures. 4 Units.**

Topics in Peninsular literature and cultures.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 110B. Topics in Latin American Literature and Cultures. 4 Units.**

Topics in Latin American literature and cultures.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 110C. U.S. Latino Literature and Cultures. 4 Units.**

Focuses on aspects of literature, art, cultural production, and history of the multifaceted Latino cultures that have developed within the United States. Focuses on one group, such as Caribbean Americans, Chicanos, Central Americans, or a comparative perspective of several groups.

Same as CHC/LAT 134.

**SPANISH 113A. Spanish Phonetics. 4 Units.**

Introduction to fundamental notions of Spanish phonetics. Particular attention paid to problems of pronunciation that arise in native and non-native speakers of Spanish due to interference between Spanish and English. Phonology (the system that underlies phonetics) and Spanish dialectology included.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 113B. Introduction to Spanish Linguistics. 4 Units.**

Application of basic notions of linguistics to Spanish, Spanish phonology, morphology, syntax, and semantics. Special attention to the application of linguistics to the teaching of Spanish.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 119. Textual Analysis and Interpretation. 4 Units.**

Focus on analysis and interpretation of literary texts. Emphasis on narrative, poetry, theater/performance, and visual media. Introduces students to major currents in theoretical thought, such as cultural studies, postmodernism, and others. Oral presentations and short essays required. Taught in Spanish.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 121. Topics in Golden Age Literature and Culture. 4 Units.**

Golden Age Literature in Spain, including the Renaissance and Baroque periods. Works of poetry, narrative, and theater. Historical and cultural background.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: May be taken for credit 3 times as topics vary.

**SPANISH 122. Topics in 18th and 19th Century Spanish Literature and Culture. 4 Units.**

The main literary and ideological trends in 18th and 19th century Spain, including the enlightenment, romanticism, realism, and naturalism.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: May be taken for credit 3 times as topics vary.

**SPANISH 123. Topics in 20th and 21st Century Spanish Literature and Culture. 4 Units.**

20th century Spanish authors. Works of poetry, narrative, or theater. Historical context of the period and principles of literary theory.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: May be taken for credit 3 times as topics vary.

**SPANISH 130A. Topics in Latin American Colonial Literature and Culture. 4 Units.**

Topics in Latin American colonial literature and culture.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 130B. Topics in Latin American Literature and Culture of the 19th Century. 4 Units.**

Topics in Latin American literature and culture of the 19th century.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 130C. Topics in Latin American Literature and Culture of the 20th Century. 4 Units.**

Topics in Latin American literature and culture of the 20th century.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 140. Topics in Chicano Literature and Culture. 4 Units.**

Studies in selected areas of Chicano/Latino Studies. Topics addressed vary each quarter. Taught in English.

Repeatability: May be taken for credit 4 times as topics vary.

Same as CHC/LAT 110.

**SPANISH 150. Topics in Literature in Translation. 4 Units.**

Study of texts by modern and contemporary Peninsular, Latin American, and/or U.S. Latino writers in translation. Taught in English. Not applicable toward Spanish major or minor requirements.

Repeatability: Unlimited as topics vary.

**SPANISH 160. Topics in Luso-Hispanic Film Studies. 4 Units.**

Study of Peninsular, Latin-American, and/or U.S. Latino film. Taught in English or Spanish.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 185. Selected Topics in Peninsular Literature and Culture. 4 Units.**

Selection of representative topics in Spanish and/or Portuguese literature and culture.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 186. Selected Topics in Latin American Literature and Culture. 4 Units.**

Selection of representative topics in the history of Latin American literature and culture.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 187. Selected Topics in Spanish Linguistics. 4 Units.**

Major topics in Spanish linguistics.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 190. Colloquium. 4 Units.**

Specialized, discussion-based course dealing primarily with a research topic that reflects the instructor's current intellectual interests. Required oral presentation(s) and final research paper. Limited to 15 students.

Prerequisite: SPANISH 107 or SPANISH 113A

Restriction: Upper-division students only. Spanish Majors only.

**SPANISH 199. Independent Study. 1-4 Units.**

Research paper required.

Repeatability: May be repeated for credit unlimited times.

**SPANISH 201. History of the Spanish Language. 4 Units.**

Diachronic survey of phonological changes from Latin to Old Spanish to Modern Spanish. Focuses in Castilian including Romance languages and other peninsula dialects for comparative purposes. Morphological changes.

**SPANISH 204. Spanish in Contact. 4 Units.**

Sociohistorical and linguistic overview of Spanish in contact with Basque, Catalan, English, German, American Indian, and African languages in Spain, Latin America, and the United States. Examines theories about language contact, and linguistic changes in Spanish phonology and grammar.

**SPANISH 205. Spanish Dialectology. 4 Units.**

Phonological, morphological, and syntactic variations in Spanish as spoken in the Hispanic world, from synchronic and diachronic points of view. The study of Spanish as spoken in the United States.

Restriction: Graduate students only.

**SPANISH 214. Topics in Golden Age Literature and Culture. 4 Units.**

Topics in Golden Age literature and culture.

Repeatability: Unlimited as topics vary.

**SPANISH 218. Topics in Enlightenment and Romanticism. 4 Units.**

Topics in Enlightenment and Romanticism.

Repeatability: Unlimited as topics vary.

**SPANISH 219. Topics in Nineteenth Century. 4 Units.**

Topics in nineteenth-century Spanish literature and culture.

Repeatability: Unlimited as topics vary.

**SPANISH 220. Topics in Twentieth Century. 4 Units.**

Topics in twentieth-century Spanish literature and culture.

Repeatability: Unlimited as topics vary.

**SPANISH 221. Topics in Iberian Studies. 4 Units.**

Cross-cultural connections and interactions between different ethnicities in the Iberian Peninsula.

Repeatability: Unlimited as topics vary.

**SPANISH 231. Topics in Colonial Latin America. 4 Units.**

Topics in Colonial Latin America.

Repeatability: Unlimited as topics vary.

**SPANISH 232. Topics in Nineteenth-Century Latin America. 4 Units.**

Topics in nineteenth-century Latin America.

Repeatability: Unlimited as topics vary.

**SPANISH 233. Topics in Twentieth-Century Latin America. 4 Units.**

Topics in twentieth-century Latin America.

Repeatability: Unlimited as topics vary.

**SPANISH 234. Topics in Latin America. 4 Units.**

Topics in Latin America.

Repeatability: Unlimited as topics vary.

**SPANISH 235. Topics in Trans-Oceanic Studies. 4 Units.**

Focuses on meaningful connections between different geographical and cultural areas.

Repeatability: Unlimited as topics vary.

**SPANISH 239A. Topics in Literary Theory I. 4 Units.**

Traces the development of Western literary critical principles from Aristotle to the twentieth century through selected readings of key figures in intellectual history (Aristotle, St. Augustine, Descartes, Kant, Hegel, Marx, Nietzsche, William James, Freud).

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SPANISH 239B. Topics in Literary Theory II. 4 Units.**

Study of major critical movements of the twentieth century, from Modernism's varied trends to those of the Postmodern/Postcolonial period. Emphasis on the development of prior critical discourses as well as revisionary theories.

Prerequisite: SPANISH 239A

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SPANISH 239C. Special Topics in Theory. 4 Units.**

Focus on issues related to critical theory, theory of literature, cultural criticism and visual arts as they pertain specifically to Latin America, Spain, Portugal, and Brazil. Topics vary. Examples: Latin American cultural studies; theory, film, and media in post-war Spain.

Repeatability: Unlimited as topics vary.

**SPANISH 245. Topics in Luso-Hispanic Film. 4 Units.**

Topics in Luso-Hispanic Film.

Repeatability: Unlimited as topics vary.

**SPANISH 251. Topics in Chicano Literature and Culture. 4 Units.**

Topics in Chicano Literature and Culture.

Repeatability: Unlimited as topics vary.

**SPANISH 252. Topics in U.S. Latino Literature and Culture. 4 Units.**

Topics in U.S. Latino Literature and Culture.

Repeatability: Unlimited as topics vary.

**SPANISH 260. Seminar in Spanish . 4 Units.**

Topics in Spanish.

Repeatability: Unlimited as topics vary.

**SPANISH 270. Creative Writing Workshop in Spanish/English. 4 Units.**

Discussion of theory and practice of creative writing. Focus on critical analysis of participant's work in progress. Texts may be written in Spanish and/or English and may be written in poetry or prose format.

Repeatability: Unlimited as topics vary.

**SPANISH 290. Individual Study. 4 Units.**

Individual Study.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SPANISH 291. Directed Reading. 4 Units.**

Directed Reading in Spanish.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SPANISH 292. Teaching Practicum. 4 Units.**

Teaching Practicum.

Grading Option: Satisfactory/unsatisfactory only.

**SPANISH 299. Dissertation Research. 4-12 Units.**

Dissertation Research.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Humanities students only.

**SPANISH 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Statistics (STATS)

### Courses

**STATS 5. Seminar in Data Science. 1 Unit.**

An introduction to the field of Data Science; intended for entering freshman and transfers.

Grading Option: Pass/no pass only.

Restriction: Information Computer Science Majors only.

**STATS 7. Basic Statistics. 4 Units.**

Introduces basic inferential statistics including confidence intervals and hypothesis testing on means and proportions, t-distribution, Chi Square, regression and correlation. F-distribution and nonparametric statistics included if time permits.

Overlaps with STATS 8, MGMT 7, SOCECOL 13.

Restriction: STATS 7 may not be taken for credit concurrently with or after STATS 110, STATS 111, STATS 112.

(Va)

**STATS 8. Introduction to Biological Statistics . 4 Units.**

Introductory statistical techniques used to collect and analyze experimental and observational data from health sciences and biology. Includes exploration of data, probability and sampling distributions, basic statistical inference for means and proportions, linear regression, and analysis of variance.

Overlaps with SOCECOL 13, MGMT 7, STATS 7.

Restriction: STATS 8 may not be taken for credit concurrently with or after STATS 110, STATS 111, STATS 112.

(Va)

**STATS 67. Introduction to Probability and Statistics for Computer Science. 4 Units.**

Introduction to the basic concepts of probability and statistics with discussion of applications to computer science.

Prerequisite: MATH 2B

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment. STATS 67 may not be taken for credit concurrently with or after STATS 120B.

(Va)

**STATS 68. Statistical Computing and Exploratory Data Analysis. 4 Units.**

Introduces key concepts in statistical computing. Techniques such as exploratory data analysis, data visualization, simulation, and optimization methods, will be presented in the context of data analysis within a statistical computing environment.

Prerequisite: STATS 7 and I&C SCI 31



**STATS 110. Statistical Methods for Data Analysis I. 4 Units.**

Introduction to statistical methods for analyzing data from experiments and surveys. Methods covered include two-sample procedures, analysis of variance, simple and multiple linear regression.

Prerequisite: STATS 7 or STATS 8 or AP90 or (STATS 120A and STATS 120B and STATS 120C). AP90 with a minimum score of 3

Restriction: School of Info & Computer Sci students only.

**STATS 111. Statistical Methods for Data Analysis II. 4 Units.**

Introduction to statistical methods for analyzing data from surveys or experiments. Emphasizes application and understanding of methods for categorical data including contingency tables, logistic and Poisson regression, loglinear models.

Prerequisite: STATS 110

Concurrent with STATS 202.

**STATS 112. Statistical Methods for Data Analysis III. 4 Units.**

Introduction to statistical methods for analyzing longitudinal data from experiments and cohort studies. Topics covered include survival methods for censored time-to-event data, linear mixed models, non-linear mixed effects models, and generalized estimating equations.

Prerequisite: STATS 111

Concurrent with STATS 203.

**STATS 115. Introduction to Bayesian Data Analysis. 4 Units.**

Basic Bayesian concepts and methods with emphasis on data analysis. Special emphasis on specification of prior distributions. Development for one-two samples and on to binary, Poisson, and linear regression. Analyses performed using free OpenBugs software.

Prerequisite: STATS 120C. Recommended: STATS 110.

**STATS 120A. Introduction to Probability and Statistics I. 4 Units.**

Introduction to basic principles of probability and statistical inference. Axiomatic definition of probability, random variables, probability distributions, expectation.

Prerequisite: MATH 2A and MATH 2B and (MATH 2D or MATH 4)

Restriction: Data Science Majors have first consideration for enrollment. Quantitative Economics majors have second consideration.

Concurrent with STATS 281A.

**STATS 120B. Introduction to Probability and Statistics II. 4 Units.**

Introduction to basic principles of probability and statistical inference. Point estimation, interval estimating, and testing hypotheses, Bayesian approaches to inference.

Prerequisite: STATS 120A

Restriction: Data Science Majors have first consideration for enrollment. Quantitative Economics majors have second consideration.

Concurrent with STATS 281B.

**STATS 120C. Introduction to Probability and Statistics III. 4 Units.**

Introduction to basic principles of probability and statistical inference. Linear regression, analysis of variance, model checking.

Prerequisite: STATS 120B and (MATH 3A or MATH 6G or I&C SCI 6N)

Restriction: Data Science Majors have first consideration for enrollment. Quantitative Economics majors have second consideration.

Concurrent with STATS 281C.

**STATS 140. Multivariate Statistical Methods. 4 Units.**

Theory and application of multivariate statistical methods. Topics include statistical inference for the multivariate normal model and its extensions to multiple samples and regression, use of statistical packages for data visualization and reduction, discriminant analysis, cluster analysis, and factor analysis.

Prerequisite: STATS 120C and (MATH 3A or I&C SCI 6N)

Concurrent with STATS 240.

**STATS 170A. Project in Data Science I. 4 Units.**

Problem definition and analysis, data representation, algorithm selection, solution validation, and results presentation. Students do team projects and lectures cover analysis alternatives, project planning, and data analysis issues. First quarter emphasizes approach selection, project planning, and experimental design.

Prerequisite: STATS 68 and STATS 112 and IN4MATX 43 and COMPSCI 122A and COMPSCI 161 and COMPSCI 178

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Seniors only. Data Science Majors have first consideration for enrollment.

**STATS 170B. Project in Data Science II. 4 Units.**

Problem definition and analysis, data representation, algorithm selection, solution validation, and results presentation. Students do team projects and lectures cover analysis alternatives, project planning, and data analysis issues. Second quarter emphasizes project execution and analysis, and presentation of results.

Prerequisite: STATS 170A. In Progress (IP) grade for STATS 170A is also accepted.

Restriction: Seniors only. Data Science Majors have first consideration for enrollment.

**STATS 199. Individual Study. 2-5 Units.**

Individual research or investigations under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

**STATS 200A. Intermediate Probability and Statistical Theory. 4 Units.**

Basics of probability theory, random variables and basic transformations, univariate distributions—discrete and continuous, multivariate distributions.

Prerequisite: STATS 120C

**STATS 200B. Intermediate Probability and Statistical Theory. 4 Units.**

Random samples, transformations, limit laws, normal distribution theory, introduction to stochastic processes, data reduction, point estimation (maximum likelihood).

Prerequisite: STATS 200A

**STATS 200C. Intermediate Probability and Statistical Theory. 4 Units.**

Interval estimation, hypothesis testing, decision theory and Bayesian inference, basic linear model theory.

Prerequisite: STATS 200B

**STATS 201. Statistical Methods for Data Analysis I. 4 Units.**

Introduction to statistical methods for analyzing data from experiments and surveys. Methods covered include two-sample procedures, analysis of variance, simple and multiple linear regression.

Prerequisite: STATS 7 or STATS 8

Restriction: STATS 201 cannot be taken for credit after taking STATS 210.

**STATS 202. Statistical Methods for Data Analysis II. 4 Units.**

Introduction to statistical methods for analyzing data from surveys or experiments. Emphasizes application and understanding of methods for categorical data including contingency tables, logistic and Poisson regression, loglinear models.

Prerequisite: STATS 201 or STATS 210

Concurrent with STATS 111.

**STATS 203. Statistical Methods for Data Analysis III. 4 Units.**

Introduction to statistical methods for analyzing longitudinal data from experiments and cohort studies. Topics covered include survival methods for censored time-to-event data, linear mixed models, non-linear mixed effects models, and generalized estimating equations.

Prerequisite: STATS 202

Concurrent with STATS 112.

**STATS 205. Introduction to Bayesian Data Analysis. 4 Units.**

Basic Bayesian concepts and methods with emphasis on data analysis. Special emphasis on specification of prior distributions. Development for one-two samples and on to binary, Poisson and linear regression. Analyses performed using free OpenBugs software.

Prerequisite: STATS 120C. Recommended: STATS 201 or STATS 210.

**STATS 210. Statistical Methods I: Linear Models. 4 Units.**

Statistical methods for analyzing data from surveys and experiments. Topics include randomization and model-based inference, two-sample methods, analysis of variance, linear regression and model diagnostics.

Prerequisite: Knowledge of basic statistics, calculus, linear algebra.

**STATS 210A. Statistical Methods I: Linear Models. 4 Units.**

Statistical methods for analyzing data from surveys and experiments. Topics include randomization and model-based inference, two-sample methods, analysis of variance, linear regression, and model diagnostics.

Prerequisite: Knowledge of basic statistics (at the level of STATS 7), calculus, and linear algebra.

Restriction: Graduate students only.

**STATS 210B. Statistical Methods II: Categorical Data. 4 Units.**

Introduction to statistical methods for analyzing discrete and non-normal outcomes. Emphasizes the development and application of methods for categorical data, including contingency tables, logistic and Poisson regression, loglinear models.

Prerequisite: STATS 210. May not be taken for graduate credit by Ph.D. students in Statistics.

Restriction: Graduate students only.

**STATS 210C. Statistical Methods III: Longitudinal Data. 4 Units.**

Introduction to statistical methods for analyzing longitudinal outcomes. Emphasizes the development and application of regression methods for correlated and censored outcomes. Methods for continuous and discrete correlated outcomes, as well as censored outcomes, are covered.

Prerequisite: STATS 210B. May not be taken for graduate credit by Ph.D. students in Statistics.

Restriction: Graduate students only.

**STATS 211. Statistical Methods II: Generalized Linear Models. 4 Units.**

Development of the theory and application of generalized linear models. Topics include likelihood estimation and asymptotic distributional theory for exponential families, quasi-likelihood and mixed model development. Emphasizes methodological development and application to real scientific problems.

Prerequisite or corequisite: STATS 210

**STATS 212. Statistical Methods III: Methods for Correlated Data. 4 Units.**

Development and application of statistical methods for analyzing correlated data. Topics covered include repeated measures ANOVA, linear mixed models, non-linear mixed effects models, and generalized estimating equations. Emphasizes both theoretical development and application of the presented methodology.

Prerequisite: STATS 211

**STATS 220A. Advanced Probability and Statistics Topics. 4 Units.**

Advanced topics in probability and statistical inference including measure theoretic probability, large sample theory, decision theory, resampling and Monte Carlo methods, nonparametric methods.

Prerequisite: STATS 200C

**STATS 220B. Advanced Probability and Statistics Topics. 4 Units.**

Advanced topics in probability and statistical inference, including measure theoretic probability, large sample theory, decision theory, resampling and Monte Carlo methods, nonparametric methods.

Prerequisite: STATS 220A and MATH 140B

**STATS 225. Bayesian Statistical Analysis. 4 Units.**

Introduction to the Bayesian approach to statistical inference. Topics include univariate and multivariate models, choice of prior distributions, hierarchical models, computation including Markov chain Monte Carlo, model checking, and model selection.

Prerequisite: STATS 205 and STATS 230

**STATS 226. Advanced Topics in Modern Bayesian Statistical Inference. 4 Units.**

Modern Bayesian Statistics: selected topics from theory of Markov chains, application of theory to modern methods of Markov chain Monte Carlo sampling; Bayesian non-parametric and semiparametric modeling, including Dirichlet Process Mixtures; Mixtures of Polya Trees.

Prerequisite: STATS 200C and STATS 225

**STATS 230. Statistical Computing Methods. 4 Units.**

Numerical computations and algorithms with applications in statistics. Topics include optimization methods including the EM algorithm, random number generation and simulation, Markov chain simulation tools, and numerical integration.

Prerequisite: Two quarters of upper-division or graduate training in probability and statistics.

Overlaps with COMPSCI 206.

**STATS 235. Modern Data Analysis Methods . 4 Units.**

Introduces selected modern tools for data analysis. Emphasizes use of computational and resampling techniques for data analyses when the data do not conform to standard toolbox of regression models and/or complexity of modeling problem threatens validity of standard methods.

Prerequisite: STATS 120C and STATS 205 and (STATS 201 or STATS 210)

Restriction: Graduate students only.

**STATS 240. Multivariate Statistical Methods. 4 Units.**

Theory and application of multivariate statistical methods. Topics include statistical inference for the multivariate normal model and its extensions to multiple samples and regression, use of statistical packages for data visualization and reduction, discriminant analysis, cluster analysis, and factor analysis.

Prerequisite: STATS 120C and (MATH 3A or I&C SCI 6N)

Concurrent with STATS 140.

**STATS 245. Time Series Analysis. 4 Units.**

Statistical models for analysis of time series from time and frequency domain perspectives. Emphasizes theory and application of time series data analysis methods. Topics include ARMA/ARIMA models, model identification/estimation, linear operators, Fourier analysis, spectral estimation, state space models, Kalman filter.

Corequisite: STATS 200C

Prerequisite or corequisite: STATS 201 or STATS 210

**STATS 250. Biostatistics. 4 Units.**

Statistical methods commonly used to analyze data arising from clinical studies. Topics include analysis of observational studies and randomized clinical trials, techniques in the analysis of survival and longitudinal data, approaches to handling missing data, meta-analysis, nonparametric methods.

Prerequisite: STATS 210

**STATS 255. Statistical Methods for Survival Data. 4 Units.**

Statistical methods for analyzing survival data from cohort studies. Topics include parametric and nonparametric methods, the Kaplan-Meier estimator, log-rank tests, regression models, the Cox proportional hazards model and accelerated failure time models, efficient sampling designs, discrete survival models.

Corequisite: STATS 202 or STATS 211.

Prerequisite: STATS 210

Restriction: Graduate students only.

**STATS 257. Introduction to Statistical Genetics. 4 Units.**

Provides students with knowledge of the basic principles, concepts, and methods used in statistical genetic research. Topics include principles of population genetics, and statistical methods for family- and population-based studies.

Prerequisite: Two quarters of upper-division or graduate training in statistical methods.

Same as EPIDEM 215.

**STATS 260. Inference with Missing Data. 4 Units.**

Statistical methods and theory useful for analysis of multivariate data with partially observed variables. Bayesian and likelihood-based methods developed. Topics include EM-type algorithms, MCMC samplers, multiple imputation, and general location model. Applications from economics, education, and medicine are discussed.

Prerequisite or corequisite: STATS 210 or STATS 200C. STATS 230.

**STATS 262. Theory and Practice of Sample Surveys. 4 Units.**

Basic techniques and statistical methods used in designing surveys and analyzing collected survey data. Topics include simple random sampling, ratio and regression estimates, stratified sampling, cluster sampling, sampling with unequal probabilities, multistage sampling, and methods to handle nonresponse.

Prerequisite: STATS 120C

**STATS 265. Causal Inference. 4 Units.**

Various approaches to causal inference focusing on the Rubin causal model and propensity-score methods. Topics include randomized experiments, observational studies, non-compliance, ignorable and non-ignorable treatment assignment, instrumental variables, and sensitivity analysis. Applications from economics, politics, education, and medicine.

Prerequisite: STATS 200C and STATS 210

**STATS 270. Stochastic Processes. 4 Units.**

Introduction to the theory and application of stochastic processes. Topics include Markov chains, continuous-time Markov processes, Poisson processes, and Brownian motion. Applications include Markov chain Monte Carlo methods and financial modeling (for example, option pricing).

Prerequisite: STATS 120C

Overlaps with MATH 271A, MATH 271B, MATH 271C.

**STATS 275. Statistical Consulting. 4 Units.**

Training in collaborative research and practical application of statistics. Emphasis on effective communication as it relates to identifying scientific objectives, formulating a statistical analysis plan, choice of statistical methods, and interpretation of results and their limitations to non-statisticians.

Prerequisite: STATS 203 or STATS 212 or STATS 210C. STATS 203 with a grade of B or better. STATS 212 with a grade of B or better. STATS 210C with a grade of B or better

Restriction: Graduate students only.

**STATS 280. Seminar in Statistics. 0.5 Units.**

Periodic seminar series covering topics of current research in statistics and its application.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**STATS 281A. Introduction to Probability and Statistics I. 4 Units.**

Introduction to basic principles of probability and statistical inference. Axiomatic definition of probability, random variables, probability distributions, expectation.

Restriction: Graduate students only.

Concurrent with STATS 120A.

**STATS 281B. Introduction to Probability and Statistics II. 4 Units.**

Introduction to basic principles of probability and statistical inference. Point estimation, interval estimating, and testing hypotheses, Bayesian approaches to inference.

Restriction: Graduate students only.

Concurrent with STATS 120B.

**STATS 281C. Introduction to Probability and Statistics III. 4 Units.**

Introduction to basic principles of probability and statistical inference. Contingency table analysis, linear regression, analysis of variance, model checking.

Restriction: Graduate students only.

Concurrent with STATS 120C.

**STATS 295. Special Topics in Statistics. 4 Units.**

Studies in selected areas of statistics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**STATS 298. Thesis Supervision. 2-12 Units.**

Individual research or investigation conducted in preparation for the M.S. thesis option or the dissertation requirements for the Ph.D. program.

Repeatability: May be repeated for credit unlimited times.

**STATS 299. Individual Study. 2-12 Units.**

Individual research or investigation under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

## Studio Art (ART STU)

## Surgery (SURGERY)

## Tagalog (TAGALOG)

## Toxicology (TOX)

## UC Washington DC (UCDC)

### Courses

**UCDC 170. Washington DC Internship. 4-8 Units.**

Supervised internship (20-40 hours per week) in Washington DC government, nonprofit, or private institution consistent with student's interest.

Corequisite: UCDC 180

Prerequisite: Selected for Washington DC Center Program.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**UCDC 180. Washington-Themed Seminar. 4 Units.**

UCDC core course (multiple topics offered each quarter). Enhances students' experiential learning and imparts knowledge and skills to help them transition into public service/private sector positions. One core course per quarter mandatory for all participants in Washington DC Center Program.

Prerequisite: Selected for Washington DC Center Program.

Repeatability: May be taken for credit 3 times as topics vary.

**UCDC 190. Washington DC Elective. 4 Units.**

Studies in selected areas related to the UC Washington, DC Center Program (UCDC).

Prerequisite: Selected for Washington DC Center Program.

Repeatability: May be taken for credit 3 times as topics vary.

## University Affairs (UNI AFF)

### Courses

**UNI AFF 1A. Student Participation. 1.3 Unit.**

Campus projects with a University department to enrich academic growth and development as well as academic growth and development of UCI. Includes 30 hours per quarter working on proposed project under faculty/staff supervision. Paper required.

Prerequisite: Project must be approved by a Student Affairs Department head and the instructor.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**UNI AFF 1B. Student Participation. 1.3 Unit.**

Campus projects with a University department to enrich academic growth and development as well as academic growth and development of UCI. Includes 30 hours per quarter working on proposed project under faculty/staff supervision. Paper required.

Prerequisite: UNI AFF 1A

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**UNI AFF 1C. Student Participation. 1.3 Unit.**

Campus projects with a University department to enrich academic growth and development as well as academic growth and development of UCI. Includes 30 hours per quarter working on proposed project under faculty/staff supervision. Paper required.

Prerequisite: UNI AFF 1B

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

## University Studies (UNI STU)

### Courses

**UNI STU 1. Freshman Experience. 2 Units.**

An introduction to the freshman experience provides an overview of the University's aims and resources and exploration of developmental theories and skills necessary for academic success. Attention is also paid to questions of personal development and major choice. Materials fee.

Grading Option: Pass/no pass only.

**UNI STU 3. Mini-Seminars . 1 Unit.**

Designed primarily for freshmen as introduction to scholarly inquiry. Each section is taught by a faculty member from one of the academic disciplines and presents interesting and challenging topics representing the instructor's interest. Students participate in discussions, presentations, and projects.

Repeatability: May be taken for credit 3 times as topics vary.

**UNI STU 4. Transfer Student Seminars. 1 Unit.**

Designed primarily for transfer students during their first year at UCI. Each section is taught by a faculty member from one of the academic disciplines as introduction to scholarly inquiry in their discipline. Students participate in discussions, presentations, and projects.

Repeatability: May be taken for credit 2 times.

Restriction: New students only. Upper-division only until first week of classes.

**UNI STU 6. University Studies International Village Seminar. 1 Unit.**

Seminars held in International Village that are specifically designed to either (a) introduce visiting international students to the U.S. and/or local area and institutions or (b) engage both international and U.S. students in discussion of topics of international interest.

Grading Option: Pass/no pass only.

Repeatability: Unlimited as topics vary.

**UNI STU 7. UTeach: Student-Taught Seminar. 1 Unit.**

Student-taught seminar courses on selected topics. Topics vary each year according to the interest of the students teaching the classes.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**UNI STU 10. Introduction to Civic and Community Engagement and Community Research. 4 Units.**

Provides a foundation for understanding the role of public scholarship, civic engagement, and social action, and the relationship between service learning and engaged citizenship. Introduces key theoretical and research methodologies on the traditions and innovations of civic and community engagement.

**UNI STU 13A. Introduction to Global Sustainability I. 4 Units.**

Introduces Earth as a system and living planet. Examines physical and biological resources as well as energy, water, climate, and ecosystems. Introduces and applies analytic lens of environmental, social, and economic sustainability to examine human impacts and resource use.

Restriction: Lower-division students only.

(II)

**UNI STU 13B. Introduction to Global Sustainability II. 4 Units.**

Introduces Earth as a system and living planet. Examines physical and biological resources as well as energy, water, climate, and ecosystems. Introduces and applies analytic lens of environmental, social, and economic sustainability to examine human impacts and resource use.

Prerequisite: UNI STU 13A

(II)

**UNI STU 13C. Introduction to Global Sustainability III. 4 Units.**

Introduces Earth as a system and living planet. Examines physical and biological resources as well as energy, water, climate, and ecosystems. Introduces and applies analytic lens of environmental, social, and economic sustainability to examine human impacts and resource use.

Prerequisite: UNI STU 13B

(III)

**UNI STU 43. Topics in Illuminations . 1 Unit.**

This course connects students to Illuminations, the Chancellor's Arts and Culture Initiative. Students will attend five Illuminations-sponsored events and engage in brief preparatory and reflective activities in response to these events.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times as topics vary.

**UNI STU 45. Graduate School Opportunities and Preparation. 1 Unit.**

Explores the opportunities associated with graduate school by considering a wide range of disciplines and career paths. Reviews professional and academic paths in graduate school and the ways to prepare for a chosen path.

**UNI STU H80. Neurodivergent. 4 Units.**

Examines the evolution of the diagnosis of autism through history. Deep inquiry of the neuroscience, etiology, and genetics of neurodivergent individuals as well as a review of the validity of the varied treatments will inform critical thinking.

Restriction: Campuswide Honors Collegium students only.

(III)

**UNI STU 83. Pathways to University Success. 2 Units.**

Helps first-year students transition to UC Irvine and promotes a successful University experience. Students learn about academic resources and programs that support acclimation to the campus and enhance academic development through lectures, discussions, and a range of co-curricular activities.

Overlaps with UNI STU 84.



**UNI STU 84. Bridges to University Success. 4 Units.**

Helps first-year students transition to UC Irvine and promotes a successful University experience. Students learn about academic resources/programs that support acclimation to the campus and enhance academic development through lectures, writing laboratories, discussions, and a range of co-curricular activities.

Overlaps with UNI STU 83.

**UNI STU 85A. Leading from Within. 4 Units.**

Students examine characteristics and behaviors of effective leaders. Study the history and theoretical framework for understanding effective leadership. In addition, examine their own leadership strengths and weakness and become familiar with the theory behind and use of comprehensive self-assessment tools.

(III)

**UNI STU 85B. Leading Others. 4 Units.**

Students examine best practices within a team environment. They learn goal setting, diagnosing performance problems, designing solutions, and recognizing relevant differences in culture, priorities, and values within a team through lectures, writing, discussions, and practical activities.

(III)

**UNI STU 85C. Leading Change. 4 Units.**

Focused on a global viewpoint, students learn the theoretical framework behind innovation and change management. Develop innovative solutions to real-world challenges, design strategies to bring an expansive vision into fruition, and learn to communicate a vision and strategies.

(III)

**UNI STU 93. Strategies for Success. 2 Workload Units.**

Designed to develop good study skills in technical fields and the participation of students as active learners in their education. Topics include time management, analytical thinking, text analysis, academic survival strategies, and goal setting.

Grading Option: Workload Credit P/NP Only.

**UNI STU 100. Doing Research in the Community. 4 Units.**

Critically reimagines the research endeavor and its participants/outcomes. Grapples with methods, values, and relationships involved in research. Explores alternative conceptions of research; focus is community-based. Students work in teams on real-world community research projects with faculty mentors and community partners.

Prerequisite: UNI STU 10

**UNI STU 110. Philanthropy in the Community. 4 Units.**

Introduces the role of community engagement, social action and philanthropy. Examines theories and practices of philanthropy, and strategies for social change. Involves hand-on engagement with philanthropy in the form of students making decisions about the distribution of a real fund.

**UNI STU 170. Advanced Internship in Undergraduate Education. 1-2 Workload Units.**

Advanced interns have a year's internship experience and return to contribute to Undergraduate Education programs in a leadership position. Students work three-five hours per week in a DUE office to coordinate or lead less-experienced interns and/or events.

Prerequisite: UNI AFF 1A and UNI AFF 1B and UNI AFF 1C

Grading Option: Workload Credit P/NP Only.

Repeatability: May be taken for credit for 6 units.

**UNI STU 175. Methods and Application in Small Group Instruction. 2 Workload Units.**

Explores various theories and methods of learning and development and their practical application in small group settings. Peer tutors receive instruction in the design, implementation, and evaluation of an effective learning environment for undergraduate students.

Grading Option: Workload Credit P/NP Only.

Restriction: Learning and Academic Resource Center employed tutors only.

**UNI STU 176. Pedagogy of Small Group Facilitation - LAs. 2 Units.**

Overview and readings in evidence-based instruction for undergraduate learning assistants. LAs receive instruction, training, and feedback on effective small group facilitation and active learning. To be taken while serving as a learning assistant in a course.

**UNI STU H176A. Campuswide Honors Thesis Seminar. 2 Units.**

Supports the honors thesis research activities of Campuswide Honors Program students. Students set research goals, discuss, and develop their research interests.

Corequisite: Students must sign up separately for 8 units of independent study with faculty mentors.

Grading Option: Pass/no pass only.

Restriction: Campuswide Honors Collegium students only.

**UNI STU H176C. Campuswide Honors Thesis Seminar. 2 Units.**

Supports the honors thesis research activities of Campuswide Honors Program students. Students work with each other to improve both written and spoken presentations of their results.

Corequisite: Students must sign up separately for 8 units of independent study with faculty mentors.

Prerequisite: UNI STU H176A

Grading Option: Pass/no pass only.

Restriction: Campuswide Honors Collegium students only.

**UNI STU 181. Internship in Civic and Community Engagement. 2-4 Workload Units.**

Provides an opportunity to extend learning into a community-based setting addressing important social, environmental, and public issues. The internship project has a creative and scholarly component where students initiate their own action or inquiry experience.

Prerequisite: UNI STU 10

Grading Option: Workload Credit P/NP Only.

Repeatability: May be taken for credit for 8 units.

**UNI STU 190. Teaching Seminar: Theory and Practice. 2 Units.**

For students selected to be discussion leaders for University Studies 2. Models of teaching, developmental theory applied to college freshmen, curriculum development. Practice of teaching techniques and group management skills.

Repeatability: May be taken for credit 2 times.

**UNI STU 192. Group Project for Discussion Leaders. 4 Units.**

For discussion leaders for University Studies 2. Weekly discussion group training for leading effective groups in addition to evaluations of weekly discussion sections and completion of a special project on issues of freshman development. Materials fee.

Repeatability: May be taken for credit 4 times.

Restriction: Discussion leaders only.

**UNI STU 193. Internship. 2-4 Units.**

Enables students from all majors to receive credit for an approved internship on or off-campus. Internship sites may be public or private, for profit or non-profit agencies, organizations, companies, or corporations offering paid or unpaid learning experiences.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**UNI STU 196. Directed Studies in Undergraduate Education. 1-4 Units.**

Students do directed study (research, readings, etc.) on a topic related to Undergraduate Education under the supervision of one of the faculty who serve as Deans or Faculty Directors in the Division of Undergraduate Education.

Repeatability: May be taken for credit for 12 units.

**UNI STU 197A. UTeach Special Study. 2 Units.**

Students accepted to teach a UTeach course in spring quarter enroll in Special or Independent Study with their faculty mentor during the preceding fall quarter to develop their detailed course syllabus.

Repeatability: Unlimited as topics vary.

Restriction: UTeach Program students only.

**UNI STU 197B. UTeach: Teaching Theory and Practice. 2 Units.**

Students accepted to teach a UTeach course in spring quarter enroll during the winter to develop their teaching skills in preparation for teaching the following quarter.

Prerequisite: UNI STU 197A

Grading Option: Pass/no pass only.

Restriction: UTeach Program students only.

**UNI STU 197C. UTeach: Teaching Practicum. 2 Units.**

Students selected to teach in the UTeach Program teach their courses and meet weekly in a seminar to continue to develop and enhance their teaching skills.

Prerequisite: UNI STU 197B

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

Restriction: UTeach Program students only.

**UNI STU 197D. Study Abroad Experiential Learning. 1 Unit.**

Study abroad on an approved program. Complete critical reflection (written paper, blog, etc.) submitted no later than the end of the quarter following the completion of the study abroad program. Enroll while studying abroad or the quarter immediately following return.

Grading Option: Pass/no pass only.

**UNI STU 197E. Reflections While Abroad. 1 Unit.**

For students while they are studying abroad; maximizing learning outcomes by critically reflecting on learning experiences while abroad. Topics include cultural observations, professional issues, cultural competence, etc. Participants are located in different countries around the world.

Grading Option: Pass/no pass only.

**UNI STU 197F. Internship Plus. 1 Unit.**

Provides training and development of career readiness competencies in parallel with a student's internship experience. Internship sites may be public or private, for profit or non-profit agencies, organizations, companies, or corporations offering paid or unpaid learning experiences.

Grading Option: Pass/no pass only.

**UNI STU 198. Mentored Learning Assistant Field Work. 1-3 Units.**

Oversight of trained learning assistants by the course instructor, including training in the discipline and responsibilities associated with supporting active group work. Instructor mentors LAs in how assisting small groups supports their career goals.

Corequisite: UNI STU 176

Repeatability: May be taken for credit for 9 units.

**UNI STU 296. Graduate Legal Studies . 0.3 Units.**

Monthly faculty/student colloquium to present and discuss socio-legal related research/issues. Course convened by Law School faculty with other faculty participation. Required for PLGS students enrolled in Law portion of degree.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Law students only.

**UNI STU 297. California Community College Internship. 2-8 Units.**

The California Community College Internship offers graduate students the opportunity to learn about faculty life, governance, and teaching at local community colleges. Structures fieldwork for students to participate in and reflect on the educational mission of community colleges.

Prerequisite: Teaching experience.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit for 10 units.

Restriction: MFA or Doctoral students who have advanced to candidacy.

**UNI STU 390A. Advanced Pedagogy and Academic Job Preparation. 2-4 Units.**

Focuses on advanced pedagogical research and practices. Students design and implement an integrated curriculum in the context of the TA Professional Development Program. Prepare for the academic job market by developing application materials and reviewing Pedagogical Fellow applicants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Must be a pedagogical fellow.

**UNI STU 390B. Advanced Pedagogy and Academic Job Preparation. 2-4 Units.**

Focuses on advanced pedagogical research and practices. Students design and implement an integrated curriculum in the context of the TA Professional Development Program. Prepare for the academic job market by developing application materials and reviewing Pedagogical Fellow applicants.

Prerequisite: UNI STU 390A

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Must be a pedagogical fellow.

**UNI STU 390C. Advanced Pedagogy and Academic Job Preparation. 2-4 Units.**

Focuses on advanced pedagogical research and practices. Students design and implement an integrated curriculum in the context of the TA Professional Development Program. Prepare for the academic job market by developing application materials and reviewing Pedagogical Fellow applicants.

Prerequisite: UNI STU 390B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Must be a pedagogical fellow.

**UNI STU 390X. Developing Teaching Excellence. 2-4 Units.**

An introduction to evidence-based instructional design and methods, specifically for higher education courses. Students practice, observe, and design instruction based on pedagogical literature. Meets most of the requirements for the Certificate in Teaching Excellence Program.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit for 8 units.

**UNI STU 390Z. Advanced Course Design for Instructors of Record. 2-4 Units.**

Confirmed instructors of record who have earned the Certificate in Teaching Excellence design their course (syllabus, lesson plans, activities, assessments, assignments) using best practices in pedagogy. By the end of the course, participants have their full course mapped.

Prerequisite: Certificate of Teaching Excellence required, proof of instructor of record appointment required.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit for 12 units.

Restriction: Graduate students only.

**UNI STU 395. Seminar for Teaching as Research. 1 Unit.**

Preparation and implementation of a teaching as research project in higher education. Participants learn research, experimental design, human subjects, and statistical analysis.

Prerequisite: UNI STU 390B

Repeatability: May be taken for credit 2 times.

## Urban Policy and Public Planning (UPPP)

### Courses

**UPPP 4. Introduction to Urban Studies. 4 Units.**

Introduces the substantive areas, concepts, and tools in the field of urban studies. Acquaints students with physical, environmental, social, economic, and political dimensions of cities. Examines the challenges facing cities, including poverty, sustainability, development, globalization, and others.

Restriction: School of Social Ecology students have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

(III)

**UPPP 5. Introduction to Urban Planning and Policy. 4 Units.**

Introduces students to the basic issues in urban planning and public policy.

(III)

**UPPP 8. Introduction to Environmental Analysis and Design. 4 Units.**

Overview of general concepts, theoretical principles, and analytical techniques for investigating environmental systems. Integrates tools from natural and social sciences to analyze contemporary environmental challenges such as pollution, resource acquisition, facility and ecosystem design, impact assessments, formulation of environmental policy.

(III)

**UPPP H30E. Cities: Focal Point for Sustainability Problems and Solutions I. 4 Units.**

Explores the nature of cities, focusing on the challenges facing cities today, their possible solutions, and the technical and social constraints on those solutions.

Prerequisite: SSCI H30D

Restriction: Campuswide Honors Collegium students only.

(III)

**UPPP H30F. Cities: Focal Point for Sustainability Problems and Solutions II. 4 Units.**

Explores the nature of cities, focusing on the challenges facing cities today, their possible solutions, and the technical and social constraints on those solutions.

Prerequisite: UPPP H30E

Restriction: Campuswide Honors Collegium students only.

(II)

**UPPP 40. Urban Sociology. 4 Units.**

Overview of theoretical, substantive, and policy issues in urban sociology. History of urbanization, the school of human ecology, and recent trends regarding urbanism. Time is devoted to understanding the causes and possible solutions to urban problems.

Overlaps with SOCL 43.

**UPPP 100. Special Topics in Urban Studies. 4 Units.**

Course content varies with interest of the instructor.

Repeatability: Unlimited as topics vary.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 101. History of Cities. 4 Units.**

Surveys the global and historical co-evolution of cities and social institutions, including religion, the economy, governance, the arts, technology, and family life.

**UPPP 102. Urban Inequality. 4 Units.**

Examines structural inequality and the influence that urbanization has in affecting race, ethnic, and class relations. Explores how race/ethnicity, class, urban space, housing, economic development, public education, and land policy intersect in cities, both historically and today.

Restriction: Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 103. Comparative Approaches to Urban Regions. 4 Units.**

An introduction to comparative urbanization in developing countries. Introduces students to the geography, history, and theories of urbanization, and then reviews urban planning, public policy, and governance.

Restriction: Public Health Policy Majors only. Social Ecology Majors only. Urban Studies Majors only.

**UPPP 104. Urban America . 4 Units.**

Students examine the historical, social, political, and economic factors that contributed to the construction of the American urban context, one that is poverty concentrated and racially/ethnically segregated. Students also critically assess the consequence of growing up in America's urban neighborhoods.

Same as CHLT 162A, SSCI 163A.

**UPPP 107. Urban and Regional Planning. 4 Units.**

Important substantive areas, concepts, tools in the field of urban and regional planning. Topics include: forces that have historically guided and are currently guiding U.S. urbanization; land use, economic development, housing and community development, environmental planning; legal, environmental, governmental contexts.

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 108. Cities and Transportation. 4 Units.**

The relationship between urban areas and transportation systems. Economic analysis of cities, transportation and urban form, highway congestion, environmental impacts of transportation, public transit, land use and transportation, and political influences on transportation planning.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 109. Housing and Urban Development Policy. 4 Units.**

Surveys public policy issues and develops analytic techniques in the areas of housing and urban development. Examines a range of policy topics including housing assistance to low- and moderate-income families, housing finance system, incentives for economic development, and neighborhood preservation.

Prerequisite: Recommended: Previous course work in economics.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 110. Urban Economic Development Policy. 4 Units.**

Theoretical and practical perspectives on local economic development policy. Integrates economic, planning, and political perspectives. Overview of economic role of cities and metropolitan areas. Specific development issues include: link between taxes, regulation, job growth; redevelopment planning; evaluation economic development policy.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 111. Climate Solutions. 4 Units.**

Focuses on carbon neutrality and climate stability, addressing.

Same as ESS 179, MAE 119.

Restriction: Upper-division students only.

**UPPP 112. Foundations of Community Health. 4 Units.**

A social ecological framework for understanding community health is presented. Measures of individual and community health are compared, and the influence of personal and environmental factors on individual, group, and population health is examined. Community health promotion strategies are discussed.

Same as PUBH 125.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 113. Poverty and Change in Developing Countries. 4 Units.**

Focuses on poverty in developing countries. Analyzes the magnitude and changing nature of poverty in the global south. Critically examines poverty conceptualized in terms of economic deprivation, well-being, and social exclusion.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 114W. Advanced Research Methods. 4 Units.**

For students planning to conduct senior research projects or apply to graduate school in social research fields. Topics include reviewing literature, preparing a research proposal, protecting human subjects, citing scholarly work, building measures, estimating sample size, interview and presentation skills.

Prerequisite: SE 10 and SE 13. Satisfactory completion of the Lower-Division Writing requirement.

Same as CLS C169W, PSCI 111W, SE 111W.

(Ib)

**UPPP 115. Global Poverty and Inequality in the 21st Century. 4 Units.**

Explores a multidisciplinary understanding of poverty and inequality in the 21st century and assesses impact of education, health, technology, and other interventions. Course offered online only.

Same as IS 115.

**UPPP 117. Environmental Justice. 4 Units.**

Engages students to critically analyze and evaluate environmental problems, environmental responses, and planning and policy debates regarding 'environmental justice' - essentially the race, class, and equity implications of environmental problems and policies.

**UPPP 118. Gentrification. 4 Units.**

Gentrification is a complex process that changes the makeup of neighborhoods and fuels political and policy conflicts. Students are provided with tools to understand the process and conceive of policies to ensure more inclusive and equitable cities.

**UPPP 120. Introduction to GIS for Planning and Policy. 4 Units.**

Provides hands-on experience creating, visualizing, and interpreting spatial data, with a focus on Geographic Information Systems (GIS) applications for urban planning and public policy.

**UPPP 129. American Public Policy. 4 Units.**

Focuses on the development and implementation of public policy in the United States. Lectures cover theoretical models of the policy process as well as significant problems facing contemporary American decision-makers.

Same as PUBH 132, SSCI 152C, PLSC 121G.

**UPPP 130. Cities and Food . 4 Units.**

Explores the role of cities in transforming global diets: how urbanization has shaped what and how we eat, and what the co-evolution of diets and city life portend for the future.

**UPPP 131. Environmental Sustainability I. 4 Units.**

Provides an introduction to sustainability from different points of view; historical, scientific, political, ethical, and economic.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 132. Environmental Sustainability II. 4 Units.**

Investigates how sustainability can be implemented in a variety of contexts including water, energy, non-renewable resources, biodiversity, and urban policy, and also how it could be measured.

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 133. Environmental Law and Policy . 4 Units.**

Environmental law as a combination of traditional legal principles and newly created statutes, rules, and decisions applied to environmental protection. Investigates roles of courts, legislature, executive branch and administrative agencies, and private citizens attempting to regulate environmental quality.

Same as CLS C128.

Restriction: Criminology, Law and Society Majors only. Planning, Policy, and Design Majors only.

**UPPP 139. Water Resource Policy. 4 Units.**

Examination of contemporary water problems worldwide, with particular attention to the competing water demands in the western U.S., and water demand by the poor in developing countries. History and analysis of U.S. water policies at local, state, and federal levels.

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 142. Environmental Hazards in an Urbanizing World. 4 Units.**

Development patterns, including urbanization, can contribute to environmental hazard severity. Humans can plan, mitigate, and prepare to reduce costly hazard losses. Students learn about environmental hazards and human response to these threats.

(III)

**UPPP 145. Environmental Governance. 4 Units.**

How should the environment be managed and who should be responsible? What is effective environmental management, and for whom? These questions are answered by exploring traditional and emerging theoretical frameworks and applying them to real world environmental challenges.

**UPPP 146. Principles of Economics for Planning and Policy. 4 Units.**

Provides an introduction into economics for planning and policy students.

**UPPP 152. Cultural Ecology and Environmental Design. 4 Units.**

Introduction to cultural ecology and environmental and architectural design. Addresses the understanding of people's relationships with their built environments, the basic elements of architecture, architectural analysis, and cultural analysis are covered. Examines values in design and design for multicultural societies.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 153. Elements of Environmental Design. 4 Units.**

Basic elements of environmental design such as scale, proportion, rhythm, color, sound, lighting, surfaces, texture, architectural definition of spaces, volumes, massing volumetric analysis, solids and voids, and cultural aspects of design. Excitement and creativity in design, imageability.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 155. Urban Design Principles. 4 Units.**

Introduction to principles of urban design and its applications. Study of contemporary and traditional theories of urban design formulated to improve physical characteristics of built environment to facilitate an enhanced quality of life. A variety of case studies are discussed.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 166. Urban Politics and Policy . 4 Units.**

Examines why and how urban policies are enacted and carried out in contemporary U.S. cities and regions. Topics include evolution and organization of city governments and policymaking over the past century; who directs public policy and controls how cities develop.

(III)

**UPPP 167. Public Policy and Management. 4 Units.**

Exposes students to best management practices that assure effective planning and implementation of policies and programs in government, business, and nonprofit sectors. Includes guest lecturers who are proven leaders in four principal institutions of community: business, education, government, and nonprofit.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.



**UPPP 170. Health Policy. 4 Units.**

Considers social and economic aspects of health and disease in the United States. What are the proper roles of the individual, community, and government in improving health and health care? International comparisons will be made wherever possible.

Same as PUBH 122.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 172. Latino Metropolis. 4 Units.**

Explores the processes of Latino urbanization in the United States and the spatialization of Latino identities, particularly in the context of Southern California with selected comparisons drawing from other cities.

Same as CHLT 154.

**(VII)****UPPP 177. Chicano Movement. 4 Units.**

Explores the history of Mexicans in the U.S. with particular attention paid to their integration into the U.S. capitalist economy. Examines this economic history and the Chicano movement, 'El Movimiento,' within the wide context of socio-economic change.

Same as CHLT 166.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 178. International Divided Cities. 4 Units.**

Investigates urban divisions in international cities where deep-seated nationalistic ethnic differences create pressures for intergroup conflicts, autonomy, or territorial separation, and can incite violence. Urban political polarization as it is manifest in the urban setting.

Same as PLSC 157B, SOCL 176.

**UPPP 190. Applied Statistics in Social and Behavioral Research. 4 Units.**

Covers statistical techniques used to describe and make generalizations about phenomena represented by data. Hands-on experience in data analysis and interpretation using statistical software (SPSS, STATA) is emphasized. Topics include data visualization, ANOVA, multiple regression, and categorical data analyses.

Prerequisite: SE 13

Same as CLS C190, SE 190, PSCI 190.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 202. History of Urban Planning. 4 Units.**

Introduction to the historical roots and fundamental perspectives of urban and regional planning. Exploration of the significant historical phases and personalities which have shaped the profession. The roles and responsibilities, the limitations and potential, of urban planning.

Restriction: Graduate students only.

**UPPP 203. Theoretical Foundations of Planning. 4 Units.**

Intellectual excursion into central themes in policy and planning, including philosophy of the market, institutionalization of space, hypostatizations of policy, constructions of communities, logics of spatial analysis. Objective is engagement of the professional in thoughtful reflections on practice and institutions.

Restriction: Graduate students only.

**UPPP 204. Plan Development and Communication . 4 Units.**

Graphic representation and communication of physical place characteristics, design and physical planning ideas, and concepts using a variety of graphic techniques of free hand drawing, sketching, orthographic representations, scale drawings, 3D representations, maps, photo-documentation, and various media.

Restriction: Urban and Regional Planning Majors only.

**UPPP 205. Environmental Economics and Policy. 4 Units.**

Provides a broad introduction to environmental economics and to environmental policy. Environmental problems facing the United States and Europe are analyzed, and whenever possible, the environmental problems facing developing countries.

Restriction: Graduate students only.

**UPPP 206. Microeconomic Analysis for Urban Planning. 4 Units.**

Provides students with a working knowledge of basic microeconomic concepts. Emphasizes applications related to urban planning and policy analysis. Topics covered include demand analysis, firm behavior, market structure, public goods, externalities, and the role of economics in land markets.

Restriction: Graduate students only.

**UPPP 207. Land-Use Law. 4 Units.**

Investigates legal and institutional frameworks for development control. Review of constitutional issues implicated in land-use regulation. Traces development control historically and analyzes contemporary approaches to land-use control which reflect environmental and economic development concerns.

Same as CLS C207.

Restriction: Graduate students only.

**UPPP 209. Qualitative Research Methods: Overview. 4 Units.**

Introduction to fundamentals of "qualitative" research and non-positivistic inquiry. Formulation of research questions, selection of method, data collection techniques, and analysis (briefly). Overview of selected methods from ethnography, naturalistic field research, phenomenology, ethnoarchaeology, critical approaches, and others.

Restriction: Graduate students only.

**UPPP 210. Practice Experience . 4 Units.**

Provides Master of Urban and Regional Planning students an opportunity to link classroom knowledge with real planning situations through a 10-week unpaid practice experience.

Restriction: Urban and Regional Planning Majors only.

**UPPP 212. Transportation Planning and Policy. 4 Units.**

Introduces current topics in transportation planning. Includes an analysis of the economic role of transportation in urban areas, land-use impacts of transportation projects, traffic congestion, air quality, alternatives to the automobile, and other transportation topics.

Restriction: Graduate students only.

**UPPP 213. Advanced Qualitative Methods: Analyzing Qualitative Data. 4 Units.**

Introduction to the theory and practice of analyzing qualitative data. Students must have already learned about data collection and research design for qualitative research and must have qualitative data they can analyze.

Same as MPHD 297K, PLSC 273A.

Restriction: Graduate students only.

**UPPP 214. Quantitative Analysis for Planners. 4 Units.**

Introduces students to the basic statistical concepts used to address issues of public concern. Prepares students to perform, interpret, and evaluate quantitative data analyses commonly used in professional studies.

Restriction: Graduate students only.

**UPPP 215. Analytical Methods for Planning. 4 Units.**

Emphasizes the development of analytical techniques proven useful in the fields of management and administration. Topics include multiple regression, cost-benefit analysis and discounting, decision trees, and other techniques useful for the purposes of community analysis and planning.

Restriction: Graduate students only.

**UPPP 220. Qualitative Methods: Fieldwork and Data Collection. 4 Units.**

Covers fieldwork, data collections techniques, and related issues for anti-positivistic research. Data collection techniques include observation, physical traces, participation, in-depth interview. Data checks include veracity, detail, completeness, rigor.

Restriction: Graduate students only.

**UPPP 221. Public Policy. 4 Units.**

Explores different approaches to public policy analysis, the diverse conceptions of the goals and objectives that should be served by policy, and the appropriate role of the policy analyst. Policy consequences are traced to indirect and subtle incentives and disincentives.

Same as CLS C255, PLSC 221A.

Restriction: Graduate students only.

**UPPP 224. Environmental Politics and Policy. 4 Units.**

Reviews and critiques literature on discussion topics including: the nature and effectiveness of environmental movements and policies; the role of science and technology; the use of economic incentives in policy; decentralization of decision making; and creating arenas for public involvement.

Restriction: Graduate students only.

**UPPP 228. Demographics for Planning and Policy. 4 Units.**

Provides planning and policy practitioners with a condensed, nonspecialist orientation to the sources, applications, and interpretation of population statistics, and conveys the steps used in constructing local-area population forecasts and projections.

Restriction: Graduate students only.

**UPPP 231. Transportation and Environmental Health. 4 Units.**

Critically evaluates how transportation can promote sustainable, healthy, and equitable cities. Examines the interaction of transportation systems with urban form, land use, community health, and environmental quality.

Restriction: Graduate students only.

**UPPP 235. Geographic Information Systems (GIS) Problem Solving in Planning. 4 Units.**

Explores the application of geographic information systems (GIS) in urban planning. Steps through a GIS-based planning procedure that balances housing, jobs, tax base, utilities, transportation, and the natural environment.

Restriction: Graduate students only.

**UPPP 237. Introduction to Geographic Information Systems. 4 Units.**

Application of Geographic Information Systems (GIS) to the field of urban and regional planning. Emphasizes current issues that occur in actual implementation settings. Lecture/discussion followed by laboratory demonstrating the area of GIS discussed. Offers 'hands-on' student usage of GIS software.

**UPPP 239. Urban Design Theories and Applications. 4 Units.**

Introduction to contemporary and traditional theories of urban design and their applications. Organized around one question: How might planning and design of built environment contribute to making a good city? National and international case studies are introduced.

Restriction: Graduate students only.

**UPPP 243. Health Policy and Management. 4 Units.**

Multidisciplinary inquiry into theory and practice concerned with delivery, quantity, costs of health care for individuals and populations. Explores managerial and policy concerns regarding structure, process, outcomes of health services including the costs, financing, organization, outcomes, and accessibility of care.

Same as PUBH 222.

Restriction: Master of Public Health Degree students have first consideration for enrollment. Master of Public Policy Degree students have first consideration for enrollment. Graduate students only. Public Health Majors have first consideration for enrollment. Urban and Regional Planning Majors have first consideration for enrollment.

**UPPP 244. Land-Use Policy. 4 Units.**

Examination of the role of public policy in guiding growth and development in urban and suburban environments. Description of a wide-ranging set of growth policies, the rationales underlying their use, controversies and legal constraints, and evaluation of their effectiveness.

Restriction: Graduate students only.

**UPPP 246. Housing Policy. 4 Units.**

Examines theories and practices of housing policy and the relationship of housing to larger neighborhood, community, and regional development issues. Considers the roles of private for-profit and not-for-profit developers, lenders, and all levels of government in the provision of housing.

Prerequisite: Familiarity with basic statistics is required.

**UPPP 251. Poverty and Development . 4 Units.**

Examines competing conceptualizations, methods of measurement, and poverty alleviation strategies widely used in developing countries. Focuses on poverty conceptualized as economic deprivation, well-being, vulnerability, and social exclusion.

Same as SOCL 235.

Restriction: Graduate students only.

**UPPP 252. Issues in Environmental Law and Policy. 4 Units.**

Treatment of legal and policy strategies for promoting environmental protection and deterring environmental degradation within the context of other societal objectives. Topical approach with a focus on problems of special interest to criminologists and to environmental policy specialists.

Same as CLS C252.

Restriction: Graduate students only.

**UPPP 266. Economic Democracy . 4 Units.**

Explores a wide range of radical democratic and egalitarian visions (including but not limited to the Marxist tradition) for a more sane, just, and sustainable future.

Restriction: Graduate students only.

**UPPP 273. Global Urbanization. 4 Units.**

Examines the spread of cities worldwide in the 20th century. What are the political and economic causes of this process? What are the social-cultural, political, and economic effects? How is contemporary urbanization linked to global restructuring of other kinds.

Same as SOCL 252A.

Restriction: Graduate students only.

**UPPP 275. Special Topics in Urban Planning. 4 Units.**

Special topics in urban and regional planning are offered from time to time, but not on a regular basis. Course content varies with interest of the instructor.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**UPPP 279. Theories of Power and Empowerment. 4 Units.**

Studies different ways of thinking about power and its uses. Explores theories of power that inform various notions of empowerment, including resistance, participatory democracy, and workplace empowerment.

Same as MPHD 297R, PLSC 223A.

Restriction: Graduate students only.

**UPPP 281. Advanced Theory. 4 Units.**

Provides urban planning and public policy students with an introduction to advanced theory. Addresses broad theoretical approaches that cut across disciplinary and topical boundaries. Designed primarily for Ph.D. students.

**UPPP 282. Urban Design Studio for Planners: An Introduction. 4 Units.**

Introductory urban design for planners. Organized around a variety of assignments to encourage learning by design in a studio setting. Students work on design projects and drawing assignments to learn practical aspects of urban design.

Restriction: Graduate students only.

**UPPP 283. Collaborative Governance and Public Management. 4 Units.**

Introduction to inclusive management. To make effective use of public resources, public managers are inventing ways of managing that alter relationships within organizations, between organizations, between sectors, and with the public. Requires rethinking fundamentals such as leadership and motivation.

Same as PPOL 283.

Restriction: Public Policy Majors have first consideration for enrollment.

**UPPP 292. Professional Report. 4 Units.**

Workshop designed to assist M.U.R.P. students in conducting their professional reports. Students select topics, design projects, conduct professional investigations, and write up reports.

**UPPP 294A. Urban Planning Practicum I. 4 Units.**

Engages students in practical planning projects in the community under a central theme within Planning. Students take a problem-solving approach and employ and further develop data gathering, analysis, graphic and oral communication, public engagement, and report writing skills.

Restriction: Graduate students only.

**UPPP 294B. Urban Planning Practicum II. 4 Units.**

Engages students in practical planning projects in the community under a central theme within Planning. Students take a problem-solving approach and employ and further develop data gathering, analysis, graphic and oral communication, public engagement, and report writing skills.

Prerequisite: PPD 294A

Restriction: Graduate students only.

**UPPP 296. Doctoral Dissertation Research and Writing. 2-12 Units.**

Dissertation research with Urban Planning and Public Policy faculty.

Prerequisite: Advancement to candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**UPPP 297. Research Design. 4 Units.**

Provides training in research design and methods. Students learn how to evaluate the strength of research findings based on the methods used by a researcher and learn to use lessons from the course to develop a research proposal.

Restriction: Graduate students only.

**UPPP 298. Directed Studies in Urban Planning. 2-4 Units.**

Directed studies in Urban Planning.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**UPPP 299. Independent Study in Urban Planning. 2-8 Units.**

Independent Study in Urban Planning.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

## Vietnamese (VIETMSE)

### Courses

**VIETMSE 1A. Fundamentals of Vietnamese. 5 Units.**

Designed for students with little or no exposure to Vietnamese. Natural approach with emphasis on four fundamental skills of listening, speaking, reading, and writing. Conducted in Vietnamese.

Prerequisite: Placement into VIETMSE 1A is required.

**VIETMSE 1B. Fundamentals of Vietnamese. 5 Units.**

Designed for students with little or no exposure to Vietnamese. Natural approach with emphasis on four fundamental skills of listening, speaking, reading, and writing. Conducted in Vietnamese.

Prerequisite: VIETMSE 1A. VIETMSE 1A with a grade of C or better. Placement into VIETMSE 1B is also accepted.

**VIETMSE 1C. Fundamentals of Vietnamese. 5 Units.**

Designed for students with little or no exposure to Vietnamese. Natural approach with emphasis on four fundamental skills of listening, speaking, reading, and writing. Conducted in Vietnamese.

Prerequisite: VIETMSE 1B or VIETMSE S1AB. VIETMSE 1B with a grade of C or better. VIETMSE S1AB with a grade of C or better. Placement into VIETMSE 1C is also accepted.

**(VI)****VIETMSE 2A. Intermediate Vietnamese. 4 Units.**

Designed for students to advance their Vietnamese language skills from introductory to intermediate level. Designed to develop writing and reading skills and communicative skills in authentic situations. Students are introduced to aspects of Vietnamese culture relating to lesson topics.

Prerequisite: VIETMSE 1C and VIETMSE S1BC. VIETMSE 1C with a grade of C or better. VIETMSE S1BC with a grade of C or better. Placement into VIETMSE 2A is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)****VIETMSE 2B. Intermediate Vietnamese. 4 Units.**

Designed for students to advance their Vietnamese language skills from introductory to intermediate level. Designed to develop writing and reading skills and communicative skills in authentic situations. Students are introduced to aspects of Vietnamese culture relating to lesson topics.

Prerequisite: VIETMSE 2A. VIETMSE 2A with a grade of C or better. Placement into VIETMSE 2B is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)****VIETMSE 2C. Intermediate Vietnamese. 4 Units.**

Designed for students to advance their Vietnamese language skills from introductory to intermediate level. Designed to develop writing and reading skills and communicative skills in authentic situations. Students are introduced to aspects of Vietnamese culture relating to lesson topics.

Prerequisite: VIETMSE 2B. VIETMSE 2B with a grade of C or better. Placement into VIETMSE 2C is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)****VIETMSE 10A. Vietnamese Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. VIETMSE 10A is for language mentors.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**VIETMSE 10B. Vietnamese Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. VIETMSE 10B is for language mentees.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**VIETMSE 50. Vietnamese Culture . 4 Units.**

Vietnamese culture and society in modern and historical contexts through the study of literary works, film, and other media. Philosophy and religious practices may also be examined. Course is taught in English.

**(IV)****VIETMSE 150. Vietnamese Literature and Culture in Translation. 4 Units.**

Major works in Vietnamese literature and culture in context.

Repeatability: Unlimited as topics vary.

# Visual Studies (VIS STD)

## Courses

**VIS STD 290A. Art History: Theories and Methods. 4 Units.**

Examines canonical texts and explores current directions in Art History.

**VIS STD 290B. Film & Media Studies: Theories and Methods. 4 Units.**

Examines canonical texts and explores current directions in Film and Media Studies.

**VIS STD 290C. Visual Studies: Theories and Methods. 4 Units.**

Examines canonical texts and explores current directions in Visual Studies.

**VIS STD 294. Getty Consortium Seminar. 4 Units.**

Special graduate seminar offered at the Getty Research Institute in Los Angeles, involving faculty and graduate students from the five graduate programs in Art History or Visual Studies located in southern California (UCI, UCLA, UCR, UCSB, and USC).

Repeatability: Unlimited as topics vary.

**VIS STD 295. Graduate Seminar in Visual Studies. 4 Units.**

Studies in selected areas of Visual Studies. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**VIS STD 296. Directed Reading. 4 Units.**

Directed reading on a specific topic agreed upon by student and instructor.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**VIS STD 297. Writing Practicum. 4 Units.**

Offered winter quarter each year and taught in a workshop format. Assists students with the preparation and revision of the dissertation prospectus so that they may advance to candidacy.

Prerequisite: VIS STD 290A and VIS STD 290B and VIS STD 290C

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**VIS STD 298A. Reading for the Preliminary Examination. 4-12 Units.**

Directed reading in preparation for the preliminary examination. Formerly Visual Studies 298.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**VIS STD 298B. Prospectus Research. 4-12 Units.**

Research and writing of the dissertation prospectus.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**VIS STD 299. Dissertation Research. 4-12 Units.**

Research and writing of the dissertation.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

# Women's Studies (WOMN ST)

## Writing (WRITING)

### Courses

**WRITING 30. The Art of Writing: Poetry. 4 Units.**

Beginners' workshop in the writing of poetry, evaluation of student manuscripts, and parallel readings.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

Repeatability: May be taken for credit 2 times.

(Ia)

**WRITING 31. The Art of Writing: Prose Fiction. 4 Units.**

Beginners' workshop in fiction writing, evaluation of student manuscripts, and parallel readings.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

Repeatability: May be taken for credit 2 times.

(Ia)

**WRITING 37. Intensive Writing. 6 Units.**

Critical reading and analysis conducted through literary, academic, journalistic, and fictional genres with additional instruction in paragraph development and sentence-level mechanics. Students analyze and apply rhetorical principles in a range of writing assignments.

Prerequisite: Students must have taken the UC Analytical Writing Placement Examination.

Grading Option: Letter Grade only.

Overlaps with WRITING 39A, WRITING 39B.

(Ia)

**WRITING 39A. Introduction to Writing and Rhetoric. 4 Units.**

Introduction to the principles of rhetoric through readings and writing assignments across a range of genres, including fiction, non-fiction, journalism and academic essays. Rigorous instruction in composition and style, including organization, paragraph development, and sentence-level mechanics.

Prerequisite: Placement via the UC Analytical Writing Placement Examination is required.

Grading Option: Letter Grade only.

Overlaps with WRITING 37, WRITING 39AP.

**WRITING 39AP. Introduction to Writing and Rhetoric with Lab. 6 Units.**

Introduces the principles of rhetoric through readings and writing assignments across a range of genres. Rigorous instruction in composition and style. Designed for students seeking additional English language support.

Prerequisite: Students must have taken the UC Analytical Writing Placement Examination and the Academic English Placement Test.

Grading Option: Letter Grade only.

Overlaps with WRITING 39A, WRITING 37.

**WRITING 39B. Critical Reading and Rhetoric. 4 Units.**

Critical reading and analysis conducted through literary, academic, journalistic, and fictional genres. Students analyze and apply rhetorical principles in a range of writing assignments.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

Overlaps with WRITING 37.

(Ia)



**WRITING 39C. Argument and Research. 4 Units.**

Intensive instruction in research methods, argumentation, and rhetorical invention. Readings selected from current nonfiction and materials located by students from the University library's holdings, to include databases across a range of disciplines.

Prerequisite: WRITING 37 or WRITING 39B or AP36 or AP37. WRITING 37 with a grade of C or better. WRITING 39B with a grade of C or better. AP36 with a minimum score of 4. AP37 with a minimum score of 4

(Ia)

**WRITING 90. Intermediate Poetry Writing. 4 Units.**

Intermediate workshop in the writing of poetry, evaluation of student manuscripts, and parallel readings.

Prerequisite: WRITING 30

Repeatability: May be taken for credit 2 times.

**WRITING 91. Intermediate Fiction Writing. 4 Units.**

Intermediate workshop in the writing of fiction, evaluation of student manuscripts, and parallel readings.

Prerequisite: WRITING 31

Repeatability: May be taken for credit 2 times.

**WRITING 101W. Undergraduate Seminar: Applications in Literary Theory and Criticism for Creative Writing. 4 Units.**

Readings in literature, with discussions and written rhetorical responses on their making.

Prerequisite: (WRITING 30 or WRITING 31) and (WRITING 90 or WRITING 91) and (WRITING 30 or WRITING 31 or WRITING 90 or WRITING 91 or ENGLISH 16 or ENGLISH 17). Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: English Majors only. Literary Journalism Majors only.

(Ib)

**WRITING 110. Short Story Writing. 4 Units.**

Three-hour workshop in short fiction; discussion of student writing and of relevant literary texts.

Repeatability: May be taken for credit 2 times.

**WRITING 111. Poetry Writing. 4 Units.**

Three-hour advanced poetry writing workshop; discussion of student writing and of relevant literary texts.

Repeatability: May be taken for credit 2 times.

**WRITING 113. Novel Writing. 4 Units.**

Three-hour advanced workshop in fiction writing; discussion of student writing and of relevant literary texts.

**WRITING 139W. Advanced Expository Writing. 4 Units.**

Study of rhetoric, disciplinary genres, and modes of knowledge production; practice in writing effective prose. Essays of varying lengths, totaling at least 4,000 words.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only.

(Ib)

**WRITING 197. Writing Internship . 2-4 Units.**

Internships focused on writing. In consultation with a faculty advisor, students create a course from response essays, research essays, and assessment project data. Internships may include editing and publication projects, supervised teaching and tutoring assignments, community literacy projects.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**WRITING 250A. Graduate Writers' Workshop (Fiction). 4 Units.**

Graduate fiction workshop open to students enrolled in the MFA program in Writing.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**WRITING 250B. Graduate Writers' Workshop (Fiction). 4 Units.**

Graduate fiction workshop open to students enrolled in the MFA program in Writing.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**WRITING 250C. Graduate Writers' Workshop (Poetry). 8 Units.**

Graduate poetry workshop open to students enrolled in the M.F.A. Programs in Writing.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**WRITING 251A. Writing in Conference (Fiction). 4 Units.**

Graduate fiction workshop open to students enrolled in the MFA program in Writing.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**WRITING 251B. Writing in Conference (Fiction). 4 Units.**

Graduate fiction workshop open to students enrolled in the MFA program in Writing.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**WRITING 251C. Writing in Conference (Poetry). 8 Units.**

Graduate poetry workshop open to students enrolled in the M.F.A. Programs in Writing.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

# Appendix

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## On This Page:

- University Administration
- The Regents of the University of California
- Office of the President
- Chancellors
- UCI Officers
- UCI Deans and Chairs of Independent Academic Units
- UCI Administrators

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## University Administration

Under the State constitution, governance of the University is entrusted to The Board of Regents. The Regents appoint the President of the University, and with the President's advice, the officers of the University. Authority in academic matters is delegated by The Regents to the Academic Senate, which consists of faculty and certain administrative officers. The Academic Senate determines academic policy for the University as a whole, sets conditions for admission and the granting of degrees, authorizes and supervises courses and curricula, and advises the University administration on faculty appointments, promotions, and budgets. Additionally, each campus has a divisional Academic Senate.

The President is executive head of the total institution. Each campus has a Chancellor as its chief administrative officer. Students participate in policy-making at both the campus and Universitywide levels.

## The Regents of the University of California

### Regents Ex Officio

Governor of California: Gavin Newsom

Lieutenant Governor of California: Eleni Kounalakis

Speaker of the Assembly: Anthony Rendon

State Superintendent of Public Instruction: Tony Thurmond

President of the Alumni Associations of the University of California: Darin Anderson

Vice President of the Alumni Associations of the University of California: Jason Morimoto

President of the University: Michael V. Drake

### Appointed Regents <sup>1</sup>

Maria Anguiano (2028)

Richard C. Blum (2026)

Laphonza Butler (2030)

Michael Cohen (2030)

Gareth Elliott (2025)

Cecilia Estolano (2022)

Howard Guber (2029)

George Kieffer (2021)

Sherry L. Lansing (2022)

Richard Leib (2026)

Hadi Makarechian (2020)

Jamaal Muwwakkil (Student Regent - July 1, 2020 - June 30, 2021)

Eloy Otiz Oakley (2024)

Lark Park (2029)

John Pérez (2024)

Janet Reilly (2028)

Richard Sherman (2025)

Jonathan Sures (2032)

Charlene Zettel (2021)

### Regents-Designate <sup>2</sup>

Cheryl Lott (July 1, 2020 - June 30, 2021)

Art Torres (July 1, 2020 - June 30, 2021)

- <sup>1</sup> Regents except ex-officio Regents and the student Regent, are appointed by the Governor to 12-year terms commencing on March 1. Ex-officio Regents serve by virtue of their elected or appointed positions; the student Regent is appointed by the Regents to a one-year term commencing on July 1.
- <sup>2</sup> One-year terms expiring June 30.

### **Faculty Representatives to The Regents**

Kum-Kum Bhavnani (September 1, 2018 - August 31, 2020)

Mary Gauvain (September 1, 2019 - August 31, 2021)

### **Staff Advisors to The Regents**

Ann Jeffrey (July 1, 2020 - June 30, 2021)

### **Principal Officers of The Regents**

General Counsel and Vice President – Legal Affairs: Charles F. Robinson

Treasurer of The Regents and Chief Investment Officer and Vice President – Investments: Jagdeep Singh Bachher

Secretary and Chief of Staff to The Regents: Anne Shaw

Senior Vice President – Chief Compliance and Audit Officer: Alexander Bustamante

### **Office of the President**

President of the University: Michael V. Drake

Interim Vice President – Office of the National Laboratories: Craig Leasure

Interim Executive Vice President – Chief Financial Officer: Paul Jenny

Provost and Executive Vice President – Academic Affairs: Michael Brown

Executive Vice President – UC Health: Carrie L. Byington

Executive Vice President – Chief Operating Officer: Rachael Nava

### **Chancellors**

Chancellor at Berkeley: Carol Christ

Chancellor at Davis: Gary S. May

Chancellor at Irvine: Howard Gillman

Chancellor at Los Angeles: Gene D. Block

Chancellor at Merced: Juan Sánchez Muñoz

Chancellor at Riverside: Kim A. Wilcox

Chancellor at San Diego: Pradeep K. Khosla

Chancellor at San Francisco: Sam Hawgood

Chancellor at Santa Barbara: Henry T. Y. Yang

Chancellor at Santa Cruz: Cynthia Larive

### **UCI Administrative Officers**

Chancellor: Howard Gillman

Interim Provost and Executive Vice Chancellor: Hal S. Stern

Chief Financial Officer and Vice Chancellor, Division of Finance and Administration: Ronald Cortez

Vice Chancellor, Research: Pramod Khargonekar

Vice Chancellor, Equity, Diversity and Inclusion: Douglas M. Haynes

Vice Chancellor, Student Affairs: Willie L. Banks, Jr.

Vice Chancellor, University Advancement: Brian Hervey

Vice Chancellor, Health Affairs: Steven A. N. Goldstein

Chief Executive Officer, Medical Center: Chad T. Lefteris

Vice Provost, Academic Personnel: Diane K. O'Dowd

Acting Vice Provost, Academic Planning: Valerie Jenness

Vice Provost, Career Pathways: Gary W. Matkin

Vice Provost, Graduate Education: Gillian R. Hayes

Vice Provost, Teaching and Learning: Michael Dennin

### **UCI Deans and Other Academic Officers**

Dean, Claire Trevor School of the Arts: Stephen Barker

Dean, School of Biological Sciences: Frank M. LaFerla

Dean, The Paul Merage School of Business: Eric Spangenberg

Dean, School of Education: Richard Arum

Interim Dean, The Henry Samueli School of Engineering: Michael Green

Dean, School of Humanities: Tyrus Miller

Dean, Donald Bren School of Information and Computer Sciences: Marios Papaefthymiou  
 Dean, School of Law: L. Song Richardson  
 Dean, School of Medicine: Michael Stamos  
 Dean, Sue and Bill Gross School of Nursing: Adeline Nyamathi  
 Dean, School of Physical Sciences: James Bullock  
 Dean, School of Social Ecology: Nancy Guerra  
 Dean, School of Social Sciences: William M. Maurer  
 Director and Founding Dean, Pharmaceutical Sciences: Jan Hirsch  
 Director and Founding Dean, Population Health: Bernadette Boden-Albala  
 Dean, Graduate Division: Gillian R. Hayes  
 Dean, Division of Undergraduate Education: Michael Dennin  
 Dean, Division of Continuing Education: Gary W. Matkin  
 University Librarian: Lorelei Tanji

Refer to <http://www.oit.uci.edu/telephone/principal-officers/> for a complete list of UCI administrators.

## Academic Integrity Policy

### THE MANUAL OF THE IRVINE DIVISION OF THE ACADEMIC SENATE

#### PART III - APPENDICES OF THE IRVINE DIVISION

##### Appendix VIII: UCI Academic Senate Policy on Academic Integrity

Revised: 12/12/96, 10/12/00, 11/21/02, 1/21/03, 1/26/06, 4/05/07, 6/7/2007, 6/5/08, 4/23/15

#### I. Preamble

The University of California, Irvine is an institution of learning, research, and scholarship that is strengthened by the existence of an environment of integrity. As members of the academic community, instructors, students, and administrators are responsible for maintaining this environment. It is essential that all members of the University practice academic integrity and accept individual responsibility for their work and actions. Violating the Academic Integrity Policy is unacceptable, devaluing the teaching and learning experience for the entire community. While at UCI, members of the academic community should become better educated about the ethical framework underpinning academic integrity and improve their moral standards supporting it.

The UCI Academic Senate Policy on Academic Integrity states the general rules and procedures associated with student academic integrity. This Academic Integrity Policy applies to undergraduate and graduate students enrolled in a UCI course. A separate policy governs the integrity of research.

Medical students are governed by policies specified in the UCI School of Medicine Handbook (<https://ucisom.instructure.com/courses/106/>).

Law students are governed by policies specified in School of Law Academic Honor Code ([http://www.law.uci.edu/academics/registrar/policies/UCI\\_Law\\_Honor\\_Code.pdf](http://www.law.uci.edu/academics/registrar/policies/UCI_Law_Honor_Code.pdf)).

#### II. Defined Terms

1. Academic Integrity Policy: the UCI Academic Senate Policy on Academic Integrity.
2. Academic Integrity Policy Violations: outlined in the **Procedures** document of the Academic Integrity Policy.
3. Academic Consequences: grades assigned by Instructor.
4. Administrative Sanctions: outlined in the **Procedures** document of the Academic Integrity Policy.
5. AIAO: Academic Integrity Administrative Office.
6. Instructor: faculty member or instructor of record.
7. Student: any student or students who have allegedly violated the Academic Integrity Policy.
8. Hearing Panel: subcommittee of the Council of Student Experience as outlined in the **Procedures** document of the Academic Integrity Policy.

#### III. Students' Responsibilities

All students are expected to complete a course in compliance with the Instructor's standards. No student shall engage in any activity involving any Academic Integrity Policy Violations. No student shall engage in any activity that involves attempting to receive a grade by means other than honest effort, and shall not aid another student who is attempting to do so. All students are encouraged to notify instructors, but may also notify the AIAO, about observed incidents of Academic Integrity Policy Violations. Instructors should take reasonable steps to preserve the confidentiality of students making such reports.

All students have the responsibility to become familiar with and abide by the Academic Integrity Policy.

#### IV. Instructors' Responsibilities

Instructors should create an environment in their classes where academic integrity is understood and supported. They should assign grades in a transparent and equitable manner. Specifically:

When an Instructor believes that a Student has violated the Academic Integrity Policy, the Instructor should report the incident to the AIAO within thirty instructional days of discovering the possible Academic Integrity Policy Violation. The Instructor shall participate in the process according to the Academic Integrity Policy.

In all cases, the Instructor shall determine the Student's grade in the course.

#### V. Teaching Assistant's (TA) and Reader's Responsibilities

A student acting in the capacity of a Teaching Assistant (TA) or Reader has a special responsibility to safeguard academic integrity. A TA/Reader shall equitably grade student work in the manner set by the Instructor. A TA/Reader shall not provide a student with any information or collaboration that would aid the student in completing the course in a dishonest manner (e.g. providing access to unauthorized material related to tests, examinations, or homework).

When a TA/Reader has evidence of an Academic Integrity Policy Violation, the TA/Reader should report the incident to the Instructor. The Instructor should report the incident to the AIAO.

#### VI. Responsibility for Resolution of Cases of Violation of the Policy

The responsibility for maintaining the standards of academic integrity rests with two University authorities: the Instructor and the AIAO. Under the Standing Orders of the Regents, discipline is the exclusive responsibility of the campus administration while authority over courses and curricula is under the exclusive authority of the Instructor through the Academic Senate.

##### A. Role of the Instructor

The Instructor shall assign grades in the course as appropriate to the work involved. All Academic consequences (e.g. scores on the assignments and course grades) are under the sole purview of the Instructor in the course.

##### B. Role of The AIAO

The AIAO manages the cases for all students accused of Academic Integrity Policy Violations and is the central repository for all case-related materials. The AIAO is the initial contact for the Instructor or students on all cases of Academic Integrity Policy Violations.

The AIAO is also responsible for imposing administrative sanctions. These sanctions shall be in accordance with guidelines authorized by the Council on Student Experience. Administrative sanctions range in severity from administrative probation to dismissal from the University. Students found responsible for multiple cases of Academic Integrity Policy Violations may be subject to dismissal from the University.

The AIAO must notify the Student (and if needed, the Instructor) of any allegations of Academic Integrity Policy Violations. The AIAO adjudicates cases when the Student disputes the possible imposition of administrative sanctions related to Academic Integrity Policy Violations. The AIAO can request meetings with the Instructor and Student to discuss the case, sanction, or procedure. The AIAO must follow the procedures and communicate in a timely manner. He or she may extend any timelines in the Academic Integrity Policy when practical exigencies so dictate, in which case all involved parties will be notified in writing and via email.

If the Student appeals the AIAO's decision, the AIAO shall schedule a Hearing Panel (see below) to review the case and make a final determination of the appropriate sanction.

The duty of the AIAO is not merely disciplinary. The office is encouraged to work with faculty and students to create a culture in which academic integrity is valued.

##### C. Records Management

The AIAO must archive its records to reflect the resolution of the case, and shall maintain a record of all cases as described in the **Procedures** document. The AIAO shall report annually to the Academic Senate Council on Student Experience, to the Vice Chancellor of Student Affairs, the Provost and Executive Vice Chancellor, the Associated Undergraduate Students of the University of California, Irvine, and the Associated Graduate Students of the University of California, Irvine on all of the following: (1) the number, nature, and type of cases; (2) the pattern of decision-making; (3) the severity and type of academic consequences and administrative sanctions; and (4) other relevant matters as directed by the Council on Student Experience.

##### D. Role of the Hearing Panel

If the Student requests a hearing, the AIAO will request the Subcommittee on Academic Integrity of the Council on Student Experience to convene a Hearing Panel to review the case. (See the **Procedures** document.) The Hearing Panel will hear evidence on the case from the Student, Instructor, and other relevant parties as determined by the panel. The Hearing Panel shall communicate the final decision to the AIAO.

## VII. Procedures for Resolution of Cases of Academic Integrity Policy Violations

These are described in the **Procedures** document of the Policy.

## VIII. MAINTENANCE OF DISCIPLINARY RECORDS

The AIAO will maintain a record of each student who receives a letter(s) of Academic Integrity Policy Violations as described in the **Procedures** document. Maintaining such a record is not an administrative sanction.

# Academic Integrity Procedures

## PROCEDURES FOR RESOLUTION OF CASES OF ACADEMIC INTEGRITY POLICY VIOLATIONS

### I. Overview

The procedure for resolution of Academic Integrity Policy Violations is divided into four phases:

1. **The Reporting Phase.** During this phase, the Instructor or a student communicates to the AIAO about any alleged Academic Integrity Policy Violation;
2. **The Review Phase.** During this phase, the Student is afforded the opportunity to review the charges. The AIAO reviews the evidence in consultation with the various parties and decides responsibility.
3. **The Decision Phase.** During this phase, the AIAO decides on the Administrative Sanctions and communicates the decision to the various parties; and
4. **The Hearing Phase.** During this phase, if the Student chooses to contest the sanctions, a Hearing Panel will be convened to review the case and make a final decision.

The four phases are described in more detail below.

### II. The Reporting Phase

When an Instructor has evidence that a Student has committed an Academic Integrity Policy Violation, the Instructor should meet with the Student to discuss the alleged Academic Integrity Policy Violation. If the Instructor suspects that there is evidence of an Academic Integrity Policy Violation, he or she should submit a formal charge describing the alleged Academic Integrity Policy Violation to the AIAO and the AIAO will send a copy of the charge to the Student.

All cases of alleged Academic Integrity Policy Violations should be reported to the AIAO. Within thirty (30) instructional days of the confirmation of evidence of an Academic Integrity Policy Violation, the Instructor should notify the AIAO of the case by submitting through an online form the following information: the Student's name, the Student's ID, the course name and number, the date of the incident, and a description of the incident.

If, after reporting a charge to the AIAO, the Instructor decides to withdraw the charge, the Instructor shall notify the AIAO via email of his or her decision. The AIAO shall notify the Student and the appropriate Associate Dean (if necessary) that the Instructor has withdrawn the charge against the Student. All notation of the charge shall be removed from the Student's academic record. Should new evidence become available, the charge may be reinstated in accordance with the Academic Integrity Policy.

In all cases, the Instructor shall determine the grade for the assignment and for the course.

If a student reports an incident of a violation of academic integrity to the AIAO, the AIAO shall communicate the allegation to all involved parties.

### III. The Review Phase

Once the Instructor or student has reported a charge of an Academic Integrity Policy Violation to the AIAO, the AIAO shall notify the Student in writing and via email that the Student is charged with an Academic Integrity Policy Violation. The official notice shall be sent to the Student's UCI email address. Reference to (or a copy of) the UCI Academic Senate Policies on Academic Integrity should be included in the notice. The letter may include a notification to the student to schedule a meeting with the AIAO to discuss the case. The student will have ten (10) instructional days to schedule the meeting to review the case. If the student does not schedule or fails to attend a scheduled meeting, the AIAO will move forward with determining a policy violation and will impose sanctions without the students input.

If the Student schedules a review, the AIAO shall review the charge(s) with the Student and may advise the student regarding possible administrative sanctions and the process for resolution of the charge(s) of an Academic Integrity Policy Violation. The AIAO will conduct the review by collecting the relevant documents, including the facts of the charge and the Student's description of the disagreement with the facts of the charge. The AIAO can request meetings with the Instructor and Student to discuss the case, the sanctions, or the procedures. The AIAO decides, based on the preponderance of the evidence, whether there was an Academic Integrity Policy Violation justifying administrative sanctions.

### IV. The Decision Phase



If the Student is found responsible for an Academic Integrity Policy Violation, administrative sanctions shall be determined by the AIAO. Administrative sanctions can range from administrative probation to dismissal from the University, depending on the severity of the case, any previously recorded offenses, and any mitigating circumstances. In such cases, these sanctions, as described below, will be administered by the AIAO.

In the decision letter, the student will be notified of the hearing process and will be provided with a link to the procedures.

The AIAO shall notify the Instructor and the appropriate Associate Dean(s) of the administrative sanction(s). A record of the administrative sanction(s) shall be maintained by the AIAO. The AIAO shall notify the Student of the decision.

## V. The Hearing Phase

Once the AIAO has issued a decision and sanctions, the Student may contest the decision and/or sanctions within ten instructional days of receiving notification by the AIAO, by requesting an Academic Integrity Hearing Panel. The Student may request a hearing by submitting a written appeal to the AIAO. The AIAO will forward the appeal to the Academic Integrity Review Board (AIRB), which will schedule a hearing of the case before the Hearing Panel. The hearing will be scheduled as soon as possible, but no later than sixty (60) instructional days after the Student requests a hearing.

## VI. Hearing Panel on Academic Integrity

The AIRB will hear undergraduate and graduate student cases. The AIRB will be a standing senate committee comprised of fourteen senate faculty members, three Associate Deans representing undergraduate student education, and three Associate Deans representing graduate student education.

## VII. Hearings

If the Student requests a hearing, the AIRB shall schedule a hearing of the case. The student will be afforded two options.

*Option A: (for outcomes of warning, probation and educational sanctions)*

1. A student contests in writing within ten (10) instructional days to request a hearing;
2. The student contests outcome(s) based on three criteria
  - a. New evidence which could not be adduced earlier which is likely to change the results;
  - b. Violation of due process; or
  - c. An imposed sanction that is too harsh given the findings of fact.
3. The student is not present; hearing panel reviews all written information;
4. The hearing panel will convene and review the written request, and all materials that were utilized in the original finding of responsibility;
5. The hearing panel will complete review and may affirm, modify, or reverse original sanction;
6. Decision is final and communicated to AIAO to notify student.

*Option B: (for outcomes of suspension and dismissal)*

1. A student contests decision in writing within ten (10) instructional days to request a hearing;
2. The request is to hear the case from the beginning;
3. The student is present;
4. The student will have the opportunity to present to the hearing panel, have an advisor \*;
5. The AIAO will present all relevant information to the hearing panel;
6. The hearing panel will determine a finding and sanctions, if appropriate; they may affirm, modify or reverse original sanction
7. Decision is final and communicated to AIAO to notify student.

• Students are allowed to have an advisor. An advisor can be an attorney, parent, friend, etc. During the hearing, an advisor may act as a consultant for the student; however, an advisor may not speak on behalf of the student. If a student chooses to have an attorney as the advisor, the student shall pay all fees, costs, and expenses for the retention of an attorney. If the student chooses to be accompanied by an advisor or attorney during the hearing, the student must sign a Family Educational Rights and Privacy Act of 1974 (FERPA) waiver, to grant access to the information. In the interest of expediency, as a general practice, hearings shall not be delayed due to the unavailability of an advisor/attorney.

Once the hearing is scheduled, the AIRB must provide written notice to the parties involved regarding the date, time, and place of the hearing. The AIRB will rule on all questions of procedure, the admission or exclusion of evidence, and the need to call witnesses for additional testimony. Hearings shall be held in accordance with generally accepted standards of procedural due process.

Hearings will be closed. Reasonable efforts will be made by all parties to preserve confidentiality during the process. The Chancellor shall establish and publish campus regulations providing for the handling of academic integrity cases in accordance with basic standards of procedural due process. Authority may be delegated to the Vice Chancellor of Student Affairs as outlined in Section 11.00 Authority of the University of California Policies Applying to Campus Activities, Organizations and, Students (<http://ucop.edu/student-affairs/policies/student-life-policies/pacaos.html>). Consistent with this requirement, procedures specified in such regulations shall be appropriate to the nature of the case and the severity of the potential discipline.



When a formal hearing is held, the following minimum procedural standards will ensure the accused student a fair hearing:

1. Written notice within a reasonable time before the hearing. The written notice shall include the following information: (1) a brief statement of the factual basis of the charges; (2) the University policies or campus regulations allegedly violated; and (3) the time and place of the hearing.
2. The opportunity for a prompt and fair hearing where the University shall bear the burden of proof, and at which the student shall have the opportunity to present documents and witnesses, to contest evidence, and to confront and cross-examine witnesses presented by the University. Notwithstanding the preceding sentence, no inference shall be drawn from the silence of the accused student.
3. A record of the hearing and an expeditious written decision based upon the preponderance of evidence, which shall be accompanied by a written summary of the findings of fact.

#### **VIII. Report of the AIRB Hearing Panel on Academic Integrity Hearing Panel**

After the hearing, the Hearing Panel shall arrive at a final decision. When a decision is reached, the AIAO will be informed of the decision. There are no further appeals or processes.

#### **IX. IMPLEMENTATION**

Once the decision has been rendered, the AIAO will notify the Student by issuing a letter to the Student and initiate any other necessary administrative actions. In case of a change in sanctions, the AIAO shall notify the Instructor and the appropriate Associate Dean(s) of the new administrative sanction(s). A record of the administrative sanction(s) shall be maintained by the AIAO.

Students found in violation of the Academic Integrity Policy must complete an online tutorial reviewing the Academic Integrity Policy. Students must complete this before they can enroll for courses during the year following the incident or, in the case of seniors, before a degree is awarded.

When, as a result of violations of the Academic Integrity Policy, a student is suspended or dismissed, a notation that the discipline was imposed must be posted on the academic transcript for the duration of the suspension or dismissal.

If a student receives a reduced grade in a course because of an Academic Integrity Policy Violation, the reduced grade will remain on the transcript even if the student retakes the course and obtains an improved grade.

Students with Academic Integrity Policy Violations may be excluded by the Associate Deans from consideration for academic honors at graduation. For students who wish to change majors, individual majors may take into account the commission of an act of dishonesty. Exclusions from consideration for honors and exclusion from major change are not determined at the time of the violation and do not fall under this Policy. Thus, students so affected are not eligible to request a formal hearing on the exclusion.

#### **X. MAINTENANCE OF DISCIPLINARY RECORDS**

The AIAO will maintain a record of each student who receives letter(s) of Academic Integrity Policy Violations and produce annual reports. The AIAO is required to report annually to the Academic Senate Council on Teaching, Learning, and Student Experience (CTLSE), the Vice Chancellor of Student Affairs, the Provost and Executive Vice Chancellor, the Associated Undergraduate Students of the University of California, Irvine, and the Associated Graduate Students of the University of California, Irvine, as outlined in Section VI.C. of the Academic Integrity Policy.

Records will normally be destroyed after seven years, unless the AIAO determines in any particular case that there is good reason to extend the period of retention. To ensure that minor (refers to anything below a suspension) and nonrecurring infractions do not hurt a student's career beyond UCI, the AIAO will expunge academic records upon reward of degree. The University will release a student's disciplinary records to potential employers, governmental agencies, other educational institutions, or other organizations or individuals only if authorized to do so by the student in question or if compelled by law. Any record expunged by the AIAO will also be expunged in the offices of the appropriate Associate Deans.

#### **XI. TYPES OF ACADEMIC INTEGRITY POLICY VIOLATIONS**

Academic integrity applies equally to electronic media and print, and involves text, images, and ideas. Violations include but are not limited to the following examples:

##### **A. Cheating**

1. Copying from others during an examination.
2. Communicating examination answers to other students during an examination, or communicating examination questions to students who will take the same examination later.
3. Offering another person's work as one's own.
4. Taking an examination for another student.
5. Asking or allowing a student to take an examination for oneself or another student.
6. Sharing or collaborating on answers for a take-home examination or assignment unless specifically authorized by the instructor.
7. Tampering with an examination after it has been graded, and then returning it in an attempt to earn more credit.
8. Using unauthorized materials, prepared answers, written notes, or other information concealed in a blue book or elsewhere during an examination.

**B. Dishonest Conduct**

1. Stealing or attempting to steal an examination or answer key from the instructor.
2. Submitting substantial portions of the same work for credit in more than one course without consulting all instructors involved.
3. Falsifying or forging academic documents or records.

**C. Plagiarism**

Plagiarism is intellectual theft. It means use of the intellectual creations of another without proper attribution. Plagiarism may take two main forms, which are clearly related:

1. To steal or pass off as one's own the ideas or words, images, or other creative works of another.
2. To use a creative production without crediting the source, even if only minimal information is available to identify it for citation.

Credit must be given for every direct quotation, for paraphrasing or summarizing a work (in whole, or in part), and for information which is not common knowledge.

**D. Collusion**

Any student who knowingly or intentionally helps another student perform any of the above acts of cheating or plagiarism is subject to discipline under the Academic Integrity Policy. Examples of collusion include:

1. Allowing others to do the research and writing of an assigned paper (including use of the services of a commercial term-paper company).
2. Allowing another student to copy one's own work during a test or take-home assignment.

**XII. GUIDELINES FOR ADMINISTRATIVE SANCTIONS FOR POLICY VIOLATIONS**

When a student is found to have violated University policies or campus regulations, any of the following disciplinary actions may be imposed. Any sanction imposed should be appropriate to the violation, taking into consideration the context and seriousness of the violation.

**A. Educational Course**

A tutorial or course which the student will be required to take.

**B. Warning**

Written notice or reprimand to the student that a violation of specified University policies or campus regulations has occurred, and that continued or repeated violations of University policies or campus regulations may be cause for further disciplinary action, normally in the form of disciplinary probation, loss of privileges and exclusion from activities, suspension, dismissal, or any combination of the preceding disciplinary actions.

**C. Disciplinary Probation**

Disciplinary probation is a status imposed for a specified period of time during which a student must demonstrate conduct that conforms to University standards of conduct. Conditions restricting the student's privileges or eligibility for activities may be imposed. Violation of any conditions of the probation or the policy may result in further disciplinary action, normally in the form of suspension or dismissal.

**D. Suspension**

Suspension is termination of student status at the campus for a specified period of time with reinstatement thereafter certain, provided that the student has complied with all conditions imposed as part of the suspension and provided that the student otherwise qualifies for reinstatement. Violation of the conditions of suspension or of University policies or campus regulations during the period of suspension may be cause for further disciplinary action, normally in the form of dismissal.

**E. Dismissal**

Dismissal is termination of student status for an indefinite period. Readmission to the University shall require the specific approval of the Chancellor of the campus to which a dismissed student has applied. Readmission after dismissal may be granted only under exceptional circumstances.

**F. Revoking Awarding of Degree**

Subject to the concurrence of the Academic Senate, a student's degree may be revoked if obtained by fraud. Such revocation is subject to review on appeal by the Chancellor.

**G. Other**

Other disciplinary actions may include community service.

**Principles of Community**

UCI is a multicultural community of people from diverse backgrounds. Our activities, programs, classes, workshops, lectures, and everyday interactions are enriched by our acceptance of one another, and we strive to learn from each other in an atmosphere of positive engagement and mutual respect.

Our legacy for an increasingly multicultural academic community and for a learning climate free from expressions of bigotry is drawn from the United States and California constitutions and from the charter of the University of California, which protects diversity and reaffirms our commitment to the protection of lawful free speech. Affirmation of that freedom is an effective way of ensuring that acts of bigotry and abusive behavior will not go unchallenged within the university. Tolerance, civility and mutual respect for diversity of background, gender, ethnicity, race and religion are as crucial within our campus community as are tolerance, civility and mutual respect for diversity of political beliefs, sexual orientation, and physical abilities. Education and a clear, rational and vigorous challenge are positive responses to prejudice and acts of bigotry.

The university's nondiscrimination policy, in compliance with applicable federal and state law, covers treatment in university programs and activities as well as admission and employment. UCI expects all those affiliated with it to adhere to the letter and the spirit of university nondiscrimination policies and related federal and state laws. Information concerning these policies is available at the University of California Office of the President (<http://www.ucop.edu/>).

Allegations of physical abuse, threats of violence, or conduct that threatens the health or safety of any person on university property or in connection with official university functions will be investigated promptly and, where found to exist, appropriate actions will be taken in accordance with university policy.

All who work, live, study and teach at UCI are here by choice and, as part of that choice, should be committed to these Principles of Community (<https://aisc.uci.edu/policies/pacaos/principles-of-community.php>) which are an integral part of the guidelines by which the university community can successfully conduct its affairs.

Click here to visit the Rights of Free Speech and Academic Freedom website. (<http://freespeech.uci.edu/>)

## Student Conduct and Discipline

Students enrolling in the university are expected to assume an obligation to conduct themselves in a manner compatible with the university's function as an educational institution. The *University of California Policies Applying to Campus Activities, Organizations and Students* set forth standards of conduct expected of UCI students. The *Policies* lists rules concerning conduct and related matters, as established by the policies of the Regents and the President of the University, and incorporates campus regulations.

## Anti-Hazing Compliance

The State of California and the University of California have expressly and repeatedly asserted their opposition to hazing and preinitiation activities which do not contribute to the positive development and welfare of the individuals involved.

In February 2006, the Education Code of the State of California was repealed and amended to codify within the Penal Code a new definition of hazing. In accordance with the revised Education Code and Penal Code, students are advised of the following:

### Education Code 32052

Any person who participates in the hazing of another, or any corporation or association which knowingly permits hazing to be conducted by its members or by others subject to its direction or control, shall forfeit any entitlement to State funds, scholarships or awards which are enjoyed by him, by her, or by it, and shall be deprived of any sanction or approval granted by any public educational institution or agency.

### Penal Code 245.6

Section 245.6 of the Penal Code reads:

1. It shall be unlawful to engage in hazing, as defined in this section.
2. "Hazing" means any method of initiation or preinitiation into a student organization or student body, whether or not the organization or body is officially recognized by an educational institution, which is likely to cause serious bodily injury to any former, current or prospective student of any school, community college, college, university or other educational institution in this state. The term "hazing" does not include customary athletic events or school-sanctioned events.
3. A violation of this section that does not result in serious bodily injury is a misdemeanor, punishable by a fine of not less than one hundred dollars (\$100), nor more than five thousand dollars (\$5,000), or imprisonment in the county jail for not more than one year, or both.
4. Any person who personally engages in hazing that results in death or serious bodily injury as defined in paragraph (4) of subdivision (f) of Section 243 of the Penal Code, is guilty of either a misdemeanor or a felony, and shall be punished by imprisonment in county jail not exceeding one year, or by imprisonment in the state prison.
5. The person against whom the hazing is directed may commence a civil action for injury or damages. The action may be brought against any participants in the hazing, or any organization to which the student is seeking membership whose agents, directors, trustees, managers or officers authorized, requested, commanded, participated in or ratified the hazing.
6. Prosecution under this section shall not prohibit prosecution under any other provision of law.

## Campus Safety and Security

The UCI Police Department is responsible for the safety and security of the UCI campus and the UC Irvine Health Medical Center campus. Safety and security at UCI and UC Irvine Health is a collaborative effort. UCI Police Department strives to foster a secure and supportive environment at UCI and UC Irvine Health.

### Crime Prevention

The UCI Police Department offers many educational programs and presentations to the campus community. The UCI Police Department teaches a variety of prevention and awareness topics. These topics include workplace violence and active shooter, drug and alcohol abuse prevention education, dating violence, domestic violence, sexual assault, and stalking awareness and prevention programs, identity theft, property and auto theft, and personal safety. For more information or to schedule a presentation, call 949-824-5223 or visit the UCI P (<http://www.police.uci.edu/>) public Safety website (<http://www.police.uci.edu/>). Crime prevention tips are also available on the website. In addition, the UCI Police Department maintains a Daily Crime and Fire Log for both the UCI and UC Irvine Health Medical Center campuses which contains a record of all crime reported to the UCI Police Department that occurred on or near UCI and the UC Irvine Health Medical Center for the most recent 60 day period. The Daily Crime and Fire Logs are open to the public at the front desk of the UCI Police Department administrative lobby during normal business hours (generally Monday through Friday, 8:00 a.m. - 5:00 p.m.). For more information, visit <https://www.police.uci.edu/clery/about-crime-fire-log.php>.

### Safety Tips

All members of the UCI community should be aware of their surroundings. Theft is the most common crime on the UCI campus. In order to help prevent theft, personal belongings (e.g. backpack, laptop computer, cellular phone) should be kept in sight, within arm's length or secured in a locked place. Students living on the UCI campus should keep their doors and windows locked at all times. Faculty and staff should keep valuables locked up while they are in their workplace. The last person to leave a laboratory or building should lock the doors before they leave. Report the presence of suspicious activity to the UCI Police Department as soon as possible by dialing 949-824-5223.

While on the UCI campus at night, it is suggested that you do not walk alone. The UCI Safety Escort Program is a free service available to all members of the UCI community. Safety escorts are also available at the UC Irvine Health Medical Center. Safety escorts will offer immediate (or as soon as possible) or pre-arranged safety escorts. Safety escorts on the UCI campus may be requested for free by dialing 949-824-7233 (SAFE) and on the UC Irvine Medical Center campus by dialing 714-456-5493. For more information, visit <https://www.police.uci.edu/how-do-i/safety-escort.php>.

### Emergency Call Boxes (Blue Light Phones)

Blue Light emergency call boxes are located throughout the UCI campus and the UC Irvine Health Medical Center campus. These call boxes are to be used to report emergencies, crimes, suspicious persons or activities, accidents, and safety hazards.

The UCI campus has over 150 Blue Light emergency phones installed around the ring mall, housing communities, and in parking structures and parking lots. Blue Light emergency phones are represented by a diamond on the UCI campus map (<https://uci.edu/visit/maps.php>). Blue Light call boxes are easily identified by the blue light on top of the terminal and the boxes have the ability to detect all sounds within a 15-foot radius. In order to activate the emergency call box, push the red button located on the front of the terminal. This will automatically connect the blue light phone to the UCI Police Department Dispatch Center. The UC Irvine Health Medical Center has emergency call boxes located throughout the complex and in the southeast corner of the Manchester parking lot. These call boxes are also connected to the UC Irvine Police Department Dispatch Center.

### Emergency Procedures and zotALERT Emergency Notification

The Emergency Management Division is charged with helping to continuously improve the resilience and readiness of the UCI campus community to respond to and recover from natural and human caused emergencies through mitigation, preparedness, response, and recovery. Emergency preparedness and evacuation information is provided to ensure the UCI community is prepared to respond in the event of a campus emergency. The UCI emergency procedures, preparedness, and evacuation information is available on the UCI Public Safety website (<https://www.police.uci.edu/>)

zotALERT (<http://www.oit.uci.edu/zotalert/>) is an emergency alert system that uses cell phone text messaging and UCI email to quickly notify the UCI community when a significant emergency or dangerous situation is confirmed, which poses an immediate threat to the health or safety of the UCI campus community. The zotALERT system is also available to members of the UC Irvine Health Medical Center community.

Students are strongly encouraged to sign up for zotALERT messages. A "text-enabled" mobile phone is needed. In order to sign up:

1. Login to StudentAccess (<https://www.reg.uci.edu/access/student/welcome/>)
2. Click "Contact Information"
3. Enter your mobile phone number
4. Click the "submit changes" button

### Timely Warning (Crime Alert) Notifications

In order to help safeguard the UCI and UC Irvine Health Medical Center campus communities and to increase crime awareness, a Crime Alert may be issued following the timely report of a Clery Act reportable crime to the UCI Police Department where the reported crime is considered by the UCI Police Department to represent a serious or continuing threat to students and employees. Crime Alerts are used to alert the entire community about certain crimes in a manner that aids in the prevention of similar crimes and to allow people to take precautions for their personal safety. The determination to

issue a Crime Alert is made on a case-by-case basis in light of all of the facts surrounding a reported crime. Each Crime Alert is sent community-wide at UCI and/or UC Irvine Health Medical Center via the Zot Mail email system.

### Community Advisory Notifications

The UCI Police Department may issue a Community Advisory notification for reported incidents that do not rise to the level of a zotALERT or Crime Alert notification. A community advisory notification may be issued for a specific segments of the campus population and may be sent to certain school and/or department head personnel for notification to their respective populations, as deemed necessary on a case-by-case basis. Community advisories may be distributed via electronic or physical distribution methods.

### Substance Abuse Policies

UCI is designated a drug-free environment. The sale, manufacture, distribution, or possession of any illegal controlled substance is a violation of both state and federal laws and will be strictly enforced by UCI Police Department. The consumption of alcohol is allowed only under certain conditions in compliance with state law. All members of the UCI community who violate substance abuse laws are subject to disciplinary action, criminal prosecution, fines, and/or imprisonment.

The sale, consumption, and furnishing of alcohol on the UCI campus is restricted by UCI's Alcohol Policy and California State law. These laws are controlled by the California Department of Alcohol and Beverage Control (ABC). ABC and UCI Police Department share the enforcement responsibility of alcohol laws on the UCI campus. It is unlawful to sell, furnish, or give alcohol to a person under the age of 21 years old (including at the Anthill Pub & Grille on the UCI campus). The possession of alcohol by anyone under 21 years old in a public place, or in a place open to the public, is also illegal. Additionally, it is also a violation of UCI's Alcohol Policy for anyone under the age of 21 to consume or possess alcohol in any public or private housing area on campus. Students and employees found violating alcohol/substance policies or laws could be subject to disciplinary sanctions by UCI.

### Weapons Policy

The California Penal Code contains several sections regarding the possession or control of weapons on college campuses. The UCI Police Department encourages all members of the campus community to be familiar with the following statutes that regulate the possession or control of weapons:

*Penal Code Section 626.9* – Felony Violation – Bringing or possessing a firearm on the grounds of a University of California campus, or any property owned or operated by the University of California, without written permission from the UCPD Chief of Police.

*Penal Code Section 626.10(b)* – Misdemeanor or Felony Violation – Bringing or possessing any dirk, dagger, ice pick, or knife having a fixed blade longer than 2 ½ inches on university grounds.

*Penal Code Section 16590* – Misdemeanor or Felony Violation – Possessing an undetectable firearm, cane gun, wallet gun, zip gun, belt buckle knife, blackjack, billy club, nunchaku, shuriken, metal knuckles and other prohibited weapons.

*Penal Code Section 21510* – Misdemeanor Violation – Carry upon the person, or in the passenger or driver's area of a vehicle, a switch blade knife having a blade longer than 2 ½ inches in length.

Immediately report any situation in which a person states they have a firearm on campus, or that they intend to use a firearm on campus, to the UCI Police Department by dialing 9-1-1. The UCI Police Department Dispatch Center may also be reached 24/7 on its non-emergency telephone line by dialing 949-824-5223. You can choose to remain anonymous when making a report.

### To Report an Incident

UCI Police Department needs your help to build and maintain a safe community. If you witness suspicious or unusual behavior on campus, please contact UCI Police Department immediately 24/7 by dialing 949-824-5223. UCI police officers will assess the situation and take the appropriate action. Please report all crimes. You can ask to remain anonymous.

On the UCI and UC Irvine Medical Center campuses, dial 9-1-1 for a police, medical, or fire emergency. For non-emergency police services, dial 949-824-5223 on the UCI campus and 714-456-5493 on the UC Irvine Medical Center campus.

The UCI Police Department's campus office is open 24/7 and is located on the ground floor of the Public Services Building, at the corner of East Peltason Drive and Pereira Drive, 100 Public Services Building.

Crimes occurring off campus should be reported immediately to the city or state law enforcement agency where the crime occurred.

The UCIPD Resource Guide can be found here ([http://catalogue.uci.edu/appendix/%20https://www.police.uci.edu/how-do-i/\\_brochures/resource-guide.pdf](http://catalogue.uci.edu/appendix/%20https://www.police.uci.edu/how-do-i/_brochures/resource-guide.pdf)).

### Annual Disclosure Notification - Clery Act Annual Security Report and Annual Fire Safety Report

The UCI Police Department publishes and makes available to all current and prospective students, staff, and faculty the UCI and UC Irvine Health Medical Center Annual Security Report and UCI Annual Fire Safety Report pursuant to the federal Clery Act (<http://www.police.uci.edu/police/clery/>). Both of these annual reports may be directly accessed at:

[https://www.police.uci.edu/clery/annual-reports/uci\\_security\\_report.pdf](https://www.police.uci.edu/clery/annual-reports/uci_security_report.pdf)

[www.ehs.uci.edu/programs/fire/UCI\\_HEOA\\_Report.pdf](http://www.ehs.uci.edu/programs/fire/UCI_HEOA_Report.pdf) ([http://www.ehs.uci.edu/programs/fire/UCI\\_HEOA\\_Report.pdf](http://www.ehs.uci.edu/programs/fire/UCI_HEOA_Report.pdf))

The Annual Security Report, coordinated by the UCI Police Department, includes information about crime prevention and reporting; emergency response and evacuation; emergency notifications; timely warnings; alcohol, drug, and weapon policies; security and safety policy information; sexual violence prevention; and other topics. This report also includes statistics for the past three calendar years for crimes that occurred at the UCI and UC Irvine Health Medical Center campuses; in certain off-campus buildings or property; and on public property within, or immediately adjacent to and accessible from each campus.

The Annual Fire Safety Report, coordinated by UCI Environmental Health & Safety department, includes information on fire safety policies and fire safety systems as well as statistics for the past three calendar years for fires that occurred in UCI on-campus student housing facilities.

Paper copies of these reports are available upon request by calling the UCI Police Department at 949-824-1885 or at 100 Public Services Building at UCI during normal business hours.

## **Computer- and Network-Use Policy**

The University of California, Irvine provides computing resources and worldwide network access to members of the UCI electronic community for legitimate academic and administrative pursuits to communicate, access knowledge, and retrieve and disseminate information. All members of the UCI community (faculty, staff, students, and authorized guests) sharing these resources also share the rights and responsibilities for their use.

### **Rights and Responsibilities**

Worldwide, open-access electronic communication is a privilege and continued access requires that users act responsibly. Users should be able to trust that the products of their intellectual efforts will be safe from violation, destruction, theft, or other abuse. Users sharing computing resources must respect and value the rights and privacy of others, respect the integrity of the systems and related physical resources, and observe all relevant laws, regulations, and contractual obligations. Users are responsible for refraining from acts that waste resources, prevent others from using them, harm resources or information, or abuse other people. To help protect files, users are responsible for setting passwords appropriately and for keeping passwords confidential by not giving them to another person.

Most UCI-owned computers are under the control of a system administrator or lab manager. These administrators are expected to respect the privacy of computer system users. However, UCI computer system administrators may access user files or suspend services on the systems they manage without notice as required to protect the integrity of computer systems or to examine accounts that are suspected of unauthorized use, misuse, or have been corrupted or damaged. This includes temporarily locking vulnerable accounts, removing hung jobs, reprioritizing resource intensive jobs, and such.

Many UCI departments have their own computing and networking resources and policies. When accessing computing resources, users are responsible for obeying both the policies described here and the policies of other departments. Student responsibilities are also described in the University of California Policies Applying to Campus Activities, Organizations, and Students (<http://ucop.edu/student-affairs/policies/student-life-policies/pacaos.html>). In addition, all users are responsible for obeying policies of off-campus network services accessed using UCI resources.

### **Examples of Misuse**

Examples of misuse include, but are not limited to:

- Knowingly running or installing on any computer system or network, or giving to another user, a program intended solely for the purpose of damaging or placing excessive load on a computer system or network. This includes, but is not limited to, computer viruses, Trojan horses, worms, bots, flash programs, or password cracking programs.
- Attempting to circumvent data protection schemes or uncover security loopholes without prior written consent of the system administrator. This includes creating and/or running programs that are designed to identify security loopholes and/or intentionally decrypt secure data.
- Using computers or electronic mail to act abusively toward others or to provoke a violent reaction, such as stalking, acts of bigotry, threats of violence, or other hostile or intimidating "fighting words." Such words include those terms widely recognized to victimize or stigmatize individuals on the basis of race, ethnicity, religion, sex, sexual orientation, disability, and other protected characteristics.
- Posting on electronic bulletin boards or Web pages materials that violate the University's codes of conduct (faculty, student). This includes posting information that is slanderous or defamatory in nature or displaying graphically disturbing or sexually harassing images or text in a public computer facility or location that are in view of other individuals.
- Attempting to monitor or tamper with another user's electronic communications or reading, copying, changing, or deleting another user's files or software without the explicit agreement of the owner.
- Violating terms of applicable software licensing agreements or copyright laws.
- Using campus networks to gain, or attempt to gain, unauthorized access to any computer system.
- Using a computer account or obtaining a password without appropriate authorization.
- Facilitating or allowing use of a computer account and/or password by an unauthorized person.
- Employing, either directly or by implication, a false identity when using an account or other electronic resources. This includes sending unauthorized mail that appears to come from someone else.
- Performing an act without authorization that will interfere with the normal operation of computers, terminals, peripherals, networks, or will interfere with others' ability to make use of the resources.



- Using an account for any activity that is commercial in nature not related to work at UCI, such as consulting services, typing services, developing software for sale, advertising products, and/or other commercial enterprises for personal financial gain.
- Deliberately wasting computing resources, such as playing games (for example, MUDES or IRC) while someone else is waiting to use the computer for UCI-related work, sending chain letters, spamming, treating printers like copy machines, storing or moving large files that could compromise system integrity or preclude other users' right of access to disk storage, and the like.

### Consequences of Misuse

Misuse of computing, networking, or information is unacceptable, and users will be held accountable for their conduct. Serious infractions can result in temporary or permanent loss of computing and/or network privileges and/or Federal or State legal prosecution. Appropriate corrective action or discipline may be taken in conformance with applicable personnel policies, student policies, collective bargaining agreements, and procedures established by the Academic Senate. California Penal Code, Section 502 makes certain computer abuses a crime, (such as illegal reproduction of software protected by U. S. copyright law) and penalties can include a fine and/or imprisonment. Files may be subject to search under proper authorization.

Minor infractions of this policy, such as poorly chosen passwords, overloading systems, excessive disk space consumption, are typically handled internally to the department in an informal manner. More serious infractions such as abusive behavior, account invasion or destruction, attempting to circumvent system security, and the like are handled formally through the Office of the Dean of Students or by other appropriate officials.

### Contact Information

For additional information, contact the Office of Information Technology by calling 949-824-2222, or by sending email to [oit@uci.edu](mailto:oit@uci.edu). OIT Help Desk offices are located in Administrative Module B, Building 423 - parking lot 16.

### Privacy and Student Records

The University of California campuses maintain various types of records pertaining to students; some are maintained for academic purposes; others, such as hospital and employment records, are maintained for other specific purposes. Student records—that is, those pertaining to students in their capacity as students—include but are not limited to academic evaluations, transcripts, test scores and other academic records, general counseling and advising records, disciplinary records, and financial aid records. At UCI, an “applicant” becomes a “student” at the time of submission of their Statement of Intent to Register form.

The disclosure of information from student records is governed in large measure by the Federal Family Educational Rights and Privacy Act of 1974 (FERPA), by the State of California Education Code, and by University policy and procedures implementing these laws which protect the student's right of privacy, provide safeguards for the confidentiality of student records, and permit students access to their own records.

Pursuant to the Federal Family Educational Rights and Privacy Act of 1974 and the University of California Policies Applying to the Disclosure of Information from Student Records, students at the University have the following five rights:

1. To inspect and review records pertaining to themselves in their capacity as students.
2. To inspect records maintained by the campus of disclosure of personally identifiable information from their student records.
3. To seek correction of their student records through a request to amend the records or a request for a hearing.
4. To file complaints regarding alleged violation of the rights accorded students by the Federal Act with the Family Policy Compliance Office (<http://www2.ed.gov/policy/gen/guid/fpco/>), U.S. Department of Education, 400 Maryland Avenue S.W., Washington, D.C. 20202-5920.
5. To have withheld from disclosure, in the absence of their prior consent for release, personally identifiable information from their student records, with exceptions as noted in the University student records policies.

There are instances in which information can be disclosed without prior written consent of the student. University officials may require access to student records in the course of the performance of their assigned duties. Further, confidential information can be disclosed without prior written consent of the student (a) in connection with conditions of certain financial aid awards; (b) when the campus is complying with a judicial order or subpoena; and (c) when authorized federal or State officials are conducting an audit or evaluation of federally supported educational programs. There are also other situations in which the University is required to disclose information. The *University of California Policies Applying to Campus Activities, Organizations, and Students*, Part B, Section 130.721 contains a list of exceptions.

Normally, the campus will release the following as personally identifiable information which can be made public:

- student's name
- photo
- date and place of birth
- telephone numbers
- campus email address
- dates of attendance
- major field of study
- grade level
- number of course units in which enrolled

- enrollment status, (e.g., undergraduate or graduate, full-time, or part-time)
- degrees and honors received
- most recent previous educational institution attended
- participation in officially recognized activities, including intercollegiate athletics
- name, weight, and height of participants on intercollegiate University athletic teams

However, students have the right to refuse to permit any or all of these categories to be designated public information with respect to themselves. Students should view the Privacy section on the University Registrar's website (<http://www.reg.uci.edu/>) to see what information is available for release, and what groups may have access to that information.

Students wishing to restrict release of public information should contact the University Registrar for instructions on how to do so.

If a student requests that information from his or her records not be regarded as public information, then the information will not be released to anyone without the written consent of the student. The student should be aware of the important implications of exercising this right. For example, if a request is made to withhold from disclosure a student's name and degrees and honors received, the campus cannot release for publication information on any honors received by the student, such as election to Phi Beta Kappa, and cannot include the student's name and degree earned in the campus commencement program without the written consent of the student. Similarly, if a request is made to withhold from disclosure a student's name and dates of attendance, a student's status as a student cannot be verified for potential employers without the written consent of the student. Further, if a student's last instruction to the campus was to withhold from disclosure the degree granted to that student and the date on which the degree was conferred, that information cannot be confirmed for a third party in connection with the appointment of that graduate to a new position or in connection with an honor that individual received without the written consent of the student.

It is extremely important for each student to keep the University Registrar currently informed as personal data changes occur to assure that accurate and complete records are maintained.

Students are informed annually of their rights under the University's student records policies and FERPA. Copies of the FERPA and University and campus policies are available for review in the Reference Room, Langson Library. In addition, University policies are published in the *University of California Policies Applying to Campus Activities, Organizations, and Students* (<http://ucop.edu/student-affairs/policies/student-life-policies/pacaos.html>).

Complaints regarding alleged violation of the rights accorded students by FERPA may be filed with the University Registrar. A complaint must be made within 180 days of when the alleged violation was discovered (not necessarily when the alleged violation may have occurred). Additionally, a student may file a complaint with the U.S. Department of Education's Family Policy Compliance Office (<http://www2.ed.gov/policy/gen/guid/fpco/>).

Types and locations of major student records maintained by the campus are listed in the following table; consult the UCI website (<http://www.uci.edu/>), or the Campus Directory, or building directories for room numbers.

Type of Record	Location of Record	Responsible Official
School, department, or program	Administrative office for particular unit	Dean, Chair, or Director
Academic Testing Center	Anteater Instruction and Research Bldg. (AIRB) Room 3040	Director, Testing Center
Admissions—Undergraduate	Aldrich Hall	Director, Admissions and Relations with Schools
Admissions—Graduate	Aldrich Hall	Dean, Graduate Division
Admissions—School of Law	Law Building	Assistant Dean, Admissions
Admissions—School of Medicine	Medical Education Building	Director, Admissions
Career Pathways	Student Services I	Director, Division of Career Pathways
Child Care Services	Early Childhood Education Center	Director, Child Care Services
Counseling	Student Services I	Director, Counseling Services
Dean of Students	Student Center	Dean of Students
Disability Services	Disability Services Center	Director, Disability Services
Education Abroad Program	Student Services II	Coordinator, Study Abroad Center
Financial Aid	Aldrich Hall	Director, Financial Aid
Financial Services (Cashier, Collections)	Aldrich Hall	Manager, Financial Services
Housing	Student Center	Director, Housing
International Center	Student Center	Director, International Center
Learning and Academic Resource Center	Second Floor, Rowland Hall	Director, Learning and Academic Resource Center
Ombudsman Services	205 Multipurpose Science & Technology Bldg. (MSTB)	University Ombudsman
Parking	Public Services Building	Parking Supervisor



Registrar—Graduate/Undergraduate	Aldrich Hall	University Registrar
Registrar—School of Medicine	Medical Education Building	Assistant Deputy Registrar
Registrar—School of Law	Law Building	Law School Registrar
Relations with Schools	Aldrich Hall	Director, Admissions and Relations with Schools
Academic Integrity & Student Conduct	800 W. Peltason Dr.	Director, Academic Integrity & Student Conduct
Student Health	Student Health Center	Director, Student Health
Summer Session	UCI Division of Continuing Education	Director, Summer Session
Undergraduate Education	Aldrich Hall	Dean, Undergraduate Education
UCI Division of Continuing Education	UCI Division of Continuing Education	Dean, Continuing Education
Veterans	Student Center	Coordinator, Veterans Student Services
Incidental Records (minutes of various committees, copies of correspondence in offices not listed above, and other records not listed)	Aldrich Hall	Vice Chancellor Student Affairs, or other Student Affairs officials (for conduct issues, could be Dean of Students, Dean of Undergraduate Education, or Dean of the Graduate Division)

NOTE: Pursuant to the Federal Family Educational Rights and Privacy Act of 1974 (FERPA), individual institutions may implement disclosure policies that exceed those outlined in the Act. It should be noted that University of California policies are more restrictive than those outlined in FERPA. The disclosure policies for the UC campuses are outlined in the *University of California Policies Applying to Campus Activities, Organizations, and Students*, sections 130.00-134.00.

## Employment and Salary Information

### Average Salaries by Discipline <sup>1</sup>

Field of Study	Bachelor's
Business	\$53,192.00
Computer & Information Sciences	\$81,292.00
Engineering	\$69,180.00
Liberal Arts and Humanities	\$45,350.00
Mathematics and Statistics	\$68,785.00
Social Sciences	\$53,792.00

<sup>1</sup> Source: The National Association of Colleges and Employers (NACE) collected salary data from July 10, 2019, through September 27, 2019, from 89 colleges and universities nationwide that participate in NACE's national First-Destination Survey. The figures reported are for base salaries only and do not include bonuses, commissions, fringe benefits, or overtime rates. It should be noted that a wide variation in starting salaries exists within each discipline based on job location, type of employer, personal qualifications of the individual, and employment conditions at the time of job entry.

## Graduation Rates

### UCI Six-Year Graduation Rates by Sex and Ethnicity

#### Fall 2013

##### Men

Ethnicity	Entered	Graduated	% Graduated
International Student	428	336	78.5%
African American	42	31	73.8%
American Indian / Alaskan Native	3	1	33.3%
Asian / Asian American	953	809	84.9%
Hispanic	529	408	77.1%
Pacific Islander	13	12	92.3%
White	320	279	87.2%
Two or more ethnicities	64	53	82.8%
Unknown / declined to state	48	41	85.4%
Total	2,400	1,970	82.1%

**Women**

<b>Ethnicity</b>	<b>Entered</b>	<b>Graduated</b>	<b>% Graduated</b>
International Student	446	386	86.5%
African American	51	44	86.3%
American Indian / Alaskan Native	5	5	100.0%
Asian / Asian American	1,242	1,132	91.1%
Hispanic	820	651	79.4%
Pacific Islander	13	10	76.9%
White	356	303	85.1%
Two or more ethnicities	79	66	83.5%
Unknown / declined to state	37	32	86.5%
<b>Total</b>	<b>3,049</b>	<b>2,629</b>	<b>86.2%</b>

**Total Entering Freshmen**

<b>Ethnicity</b>	<b>Entered</b>	<b>Graduated</b>	<b>% Graduated</b>
International Student	874	722	82.6%
African American	93	75	80.6%
American Indian / Alaskan Native	8	6	75.0%
Asian / Asian American	2,195	1,941	88.4%
Hispanic	1,349	1,059	78.5%
Pacific Islander	26	22	84.6%
White	676	582	86.1%
Two or more ethnicities	143	119	83.2%
Unknown / declined to state	85	73	85.9%
<b>Total</b>	<b>5,449</b>	<b>4,599</b>	<b>84.4%</b>

NOTE: Students who declined to state their gender are included in Men.

Source: UC Irvine Office of Institutional Research

**UCI Six-Year Graduation Rates of Freshmen Who Received Athletically Related Financial Aid****Fall 2013 Entering Freshmen****Men**

<b>Total Entered</b>	<b>Total Graduated</b>	<b>Total % Graduated</b>
25	19	76.0%

**Women**

<b>Total Entered</b>	<b>Total Graduated</b>	<b>Total % Graduated</b>
13	8	61.5%

Source: UC Irvine Office of Institutional Research

**Nondiscrimination and Sexual Harassment Policy Statements**

UC Irvine is committed to creating and maintaining an environment in which all persons who participate in university programs and activities can work and learn together in an atmosphere free of all forms of discrimination and harassment. Such behavior is prohibited by law and university policy. The university will respond promptly and effectively to reports of discrimination and harassment, and will take appropriate action to prevent, to correct, and when necessary, to discipline behavior that violates university policy.

**Student-Related Matters.** The University of California, in accordance with the applicable Federal and State law and university policy, does not discriminate on the basis of race, color, national origin, religion, sex, gender identity, pregnancy,<sup>1</sup> physical or mental disability, medical condition (cancer-related or genetic characteristics), ancestry, marital status, age, sexual orientation, citizenship, or service in the uniformed services.<sup>2</sup> The university also prohibits sexual harassment. This nondiscrimination policy covers admission, access, and treatment in university programs and activities.

**Employment Practices.** The University of California prohibits discrimination against any person employed; seeking employment; or applying for or engaged in a paid or unpaid internship or training program leading to employment with the University of California on the basis of race, color, national origin, religion, sex, gender, gender expression, gender identity, gender transition status, pregnancy,<sup>1</sup> physical or mental disability, medical condition (cancer-related or genetic characteristics), genetic information (including family medical history), ancestry, marital status, age, sexual orientation,

citizenship, or service in the uniformed services,<sup>2</sup> including protected veterans.<sup>3</sup> This policy applies to all employment practices, including recruitment, selection, promotion, transfer, merit increase, salary, training and development, demotion, and separation.

In addition, the university prohibits harassment based on the above protected categories of an employee, applicant, paid or unpaid intern, volunteer, person participating in a program leading to employment, or person providing services pursuant to a contract. If the harassment is sexual in nature, the university's Sexual Violence and Sexual Harassment policy will apply.

Consensual sexual or romantic relationships between members of the university community are subject to other university policies, including the Faculty Code of Conduct and the UCI Policy on Conflicts of Interest Created by Consensual Relationships.

University policy also prohibits retaliation against any person employed; seeking employment; providing services pursuant to a contract; or applying for or engaged in a paid or unpaid internship, volunteer capacity, or training program leading to employment with the university for bringing a complaint of discrimination or harassment pursuant to these policies or against a person who assists someone with a complaint of discrimination or harassment, or who participates in any manner in an investigation or resolution of a complaint of discrimination or harassment. Retaliation includes threats, intimidation, reprisals, and/or adverse actions related to employment.

In addition, it is the policy of the university to undertake affirmative action, consistent with its obligations as a federal contractor, to assure equal employment opportunity for minorities and women, for persons with disabilities, and for protected veterans.

University policy is intended to be consistent with the provisions of applicable State and Federal laws. Inquiries regarding the University's nondiscrimination and sexual harassment policies may be directed to: Kirsten K. Quanbeck, Associate Chancellor of Equal Opportunity and Compliance or the Title IX Officer in the UCI Office of Equal Opportunity and Diversity, 103 Multipurpose Science and Technology Building, Irvine, CA 92697-1130; [oeod@uci.edu](mailto:oeod@uci.edu); telephone 949-824-5594 (voice), 824-7593 (TDD).

<sup>1</sup> Pregnancy includes pregnancy, childbirth, and medical conditions related to pregnancy or childbirth.

<sup>2</sup> 'Service in the uniformed services' as defined by the Uniformed Services Employment and Reemployment Rights Act of 1994 (USERRA), as well as state military and naval service.

<sup>3</sup> Protected veterans includes veterans with disabilities, recently separated veterans, Vietnam-era veterans, active duty wartime or campaign badge veteran, or Armed Forces service medal veterans.

## Sexual Violence and Sexual Harassment Policy

UC Irvine is committed to creating and maintaining a community dedicated to the advancement, application, and transmission of knowledge and creative endeavors through academic excellence, where all individuals who participate in University programs, activities, and services can work and learn together in an atmosphere free of harassment, exploitation, or intimidation. Sexual violence, sexual harassment, retaliation, and other behavior prohibited by this policy interfere with those goals. The university will respond promptly and effectively to reports of such conduct. This includes action to stop, prevent, correct, and when necessary, discipline behavior that violates this policy.

Questions or reports regarding the University's policy on sexual violence and sexual harassment may be directed to Kirsten K. Quanbeck, Associate Chancellor of Equal Opportunity and Compliance or the Title IX Officer in the UCI Office of Equal Opportunity and Diversity, 103 Multipurpose Science and Technology Building, Irvine, CA 92697-1130; telephone 949-824-5594 5594 (voice), 824-7593 (TDD); [oeod@uci.edu](mailto:oeod@uci.edu).

Links to the full text of the university policies on Nondiscrimination, Sexual Violence/Sexual Harassment, the Faculty Code of Conduct, and Conflicts of Interest Created by Consensual Relationships are available at the Office of Equal Opportunity and Diversity Policies and Laws that Guide OEOD Investigations website (<http://oeod.uci.edu/policies/>). Information about how to prevent and respond to sex offenses, as well as resources for Complainants and Respondents, are available at [sexualviolence.uci.edu](http://sexualviolence.uci.edu) (<http://sexualviolence.uci.edu/html>).

# Chancellor's Welcome

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**Welcome to the University of California, Irvine.** As a UC Irvine student, you have access to resources that extend across our campus, throughout our state, and beyond. This *Catalogue* will serve as an invaluable guide to enhancing your UCI experience.

UCI is consistently ranked among the nation's best universities. Achievements in the sciences, arts, humanities, medicine, and management have garnered top 50 national rankings for more than 40 academic programs. Three UCI researchers have won Nobel Prizes—two in chemistry and one in physics. We were the youngest campus ever to be welcomed into the prestigious Association of American Universities. *The New York Times*, in its College Access Index, ranked UCI as number one in the nation for economic diversity in its student body, citing us as 'doing the most for the American dream.' And you will be especially glad to hear that *Money* magazine named UCI the top university for beach lovers.

These are some of the reasons why UCI attracted more than 116,000 undergraduate applications in 2017, the third largest number of applications in the entire nation, for only 8,300 spots. Our graduate programs are also extremely competitive. You are on this campus because we know you have what it takes to succeed at the highest level.

UCI reaches beyond the classroom and laboratory to help solve societal issues and support human development. We are a hub for stem cell research, a trailblazer in understanding global warming, and a leader in the fight against breast cancer. Our nationally ranked medical center in Orange serves as Orange County's only Level I trauma center, and our state-of-the-art UC Irvine Douglas Hospital has been ranked among the country's top 50 hospitals for more than 10 years, providing outstanding care for the region's citizens. We ranked fourth in the University Global Health Impact Report Card, which evaluates top U.S. and Canadian research universities on their contributions to urgent global health research and access to treatment worldwide. Our law school, the state's first public law school to open in more than 40 years, graduated its first class in 2012. In July 2012, the Regents established the UC Irvine School of Education from the existing Department of Education in recognition of its national academic profile. Our newest school, the Sue and Bill Gross School of Nursing, was established in January 2017.

A major intellectual and cultural center, UCI offers numerous public activities and events. The Claire Trevor School of the Arts and the School of Humanities produce engaging and entertaining cultural programs, including the award-winning New Swan Theater, our summertime outdoor Shakespeare Festival. UCI's Anteater athletes have won more than two dozen national championships.

We are also national leaders in research and practice relating to sustainability and environmental protection. UCI is the most energy-efficient campus in California, with among the most LEED Platinum and Gold certified buildings in the U.S. We are consistently among the top 10 "Coolest Schools" in *Sierra* magazine's annual ranking of the nation's greenest universities.

UCI is benefiting the community and the world in countless ways through its scholarly, scientific, creative, and economic contributions. Orange County's second largest employer, UCI generates an annual economic impact on the county of \$5 billion.

I encourage you to take advantage of all that UCI has to offer. I look forward to seeing you on campus and to being a part of this very important time in your life.

Sincerely,

Howard Gillman  
Chancellor

# Claire Trevor School of the Arts

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**Stephen Barker, Dean**

Office of Student Affairs  
101 Mesa Arts Building  
949-824-6646  
<http://www.arts.uci.edu/>

The Claire Trevor School of the Arts is among the nation's most acclaimed creative centers for the performance and study of the arts through their history, theory, and cultural context. The School consists of four departments: Art, Dance, Drama, and Music, offering a B.A., B.F.A., and B.Mus. at the undergraduate level, and M.F.A.s in a variety of specializations. The Drama and Music Departments house a total of three doctoral programs - Drama's in Performance Theory (jointly with UC San Diego's Department of Theater and Dance), and Music's in Integrated Composition, Improvisation, and Technology (ICIT) and History and Theory of Music. The Art Department also offers minors in Digital Arts and Digital Filmmaking, and the Drama Department offers a minor in Drama.

The School's departments are located in and around UCI's Arts Village, providing daily interaction among students and faculty in all Arts disciplines. The School's facilities are creative laboratories for the development of skills and for the exploration and articulation of the human experience. They include studios and technologically enhanced classrooms, five theatres (including the Irvine Barclay Theatre, located on the UCI campus), the Experimental Media Performance Laboratory (xMPL), a theatre/concert hall, three art galleries, the Donald R. and Joan F. Beall Center for Art + Technology, the Gassman Electronic Music Studio, the Motion Capture Studio, the Arts Media Center, the Arts Computing Laboratory, the Digital Arts Teaching and Research Laboratories, a television studio, professionally managed and staffed production shops, and publicity and box offices supporting the School's extensive production, performance, and exhibition schedule.

The Steven Ehrlich-designed Contemporary Arts Center, the latest major expansion of the School, provides 59,000 square feet of technology-driven instructional and research spaces, as well as a 4,000-square-foot gallery and a "black-box" performance space. Along with its motion-capture studio, these facilities place the School of the Arts and UCI at the forefront of these fields.

Arts students work collaboratively across disciplines in addition to deeply exploring their own chosen disciplinary fields. Faculty and students from across the campus are engaged in the School's Institute for 21st Century Creativity, a platform for theoretical and practical exploration of the creative process.

The School's artists, performers, and scholars' work are regularly recognized globally. The School has an extensive program of visiting and residential distinguished artists and teachers featured in numerous School activities.

Students receive assistance with program planning and a variety of other services from the professional and student-support staff in the School's Office of Student Affairs; the staff also provide academic counseling to Arts students. An extensive network of School of the Arts alumni work with faculty and staff to provide mentorship and professional guidance for current and graduating students.

The Claire Trevor School of the Arts is committed to the highest levels of excellence in exploring, researching, studying, and presenting the best of both traditional art forms and to playing a central role in creating new, emerging art forms for the 21st century.

## Change of Major

Students wishing to change to an Arts major should contact the Arts Student Affairs Office for information about change-of-major requirements, procedures, and policies. Additionally, students should refer to the Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>) for more information.

## Special Programs of Study

### Campuswide Honors Collegium

The Campuswide Honors Collegium is available to selected high-achieving students from all academic majors from their freshman through senior years. For more information contact the Campuswide Honors Collegium, 1200 Student Services II; 949-824-5461; [honors@uci.edu](mailto:honors@uci.edu); or visit the Campuswide Honors Collegium website (<http://honors.uci.edu/>).

### UC Education Abroad Program

Upper-division and, in some cases, graduate students have the opportunity to experience a different culture while making progress toward degree objectives through the University's Education Abroad Program (UCEAP). UCEAP is an overseas study program which operates in cooperation with host universities and colleges throughout the world. For additional information, visit the Study Abroad Center website (<http://www.studyabroad.uci.edu/>).

## Honors

Students who have distinguished themselves academically will be considered for honors at graduation. General criteria are that students must have completed at least 72 units in residence at a University of California campus and must have a cumulative grade point average of 3.5 or better, including the grades from the final quarter. In keeping with the Academic Senate Resolution, no more than 16 percent of the graduating seniors may receive such

academic honors. For additional information, visit the Honors page. Individual departments may offer other special honors to students who have excelled in their major subject.

## Creative Connections Opportunities

Arts Outreach at the Claire Trevor School of the Arts partners with local school districts, arts organizations, and community centers to share the School's talents and knowledge beyond the UCI campus. One such outreach program is Creative Connections, which provides exceptional opportunities for School of the Arts students to earn valuable practical experience in K–12 classrooms and in community settings. Projects range from integrating arts into core curriculum in K–6, to workshops in the arts for middle and high schools, to college application mentorship for high school juniors and seniors interested in arts majors. One to four units of independent study credit are available, and in some cases stipends may be available. All Claire Trevor School of the Arts students who hold a minimum 3.0 GPA may apply for these programs.

## Scholarships

The Claire Trevor School of the Arts has some scholarship monies available to incoming and to continuing students on both the undergraduate and graduate levels.

**AstaireAwards™ Scholarship:** Up to \$2,000 awarded to an outstanding student majoring in Dance.

**Edna Helen Beach Scholarship:** Up to \$3,000 awarded to an incoming freshman student and transfer student. Recipient must be gifted and talented, and will be selected from eligible students with special emphasis on those from underprivileged backgrounds who would not otherwise be able to attend a major research institution.

**Steven Criqui Memorial Scholarship:** Up to \$2,375 awarded to outstanding undergraduate students majoring in Art or Art History with financial need.

**Kris and Linda Elftmann Scholarship:** Up to \$3,000 awarded to an outstanding student.

**Leo Freedman Graduate Fellowship:** For outstanding applicants from Orange County, California, preferably from Anaheim; two fellowships of approximately \$7,000 each for the academic year.

**William J. Gillespie Foundation Scholarships:** Several scholarships in varying amounts, awarded to outstanding Dance majors with an emphasis in ballet.

**William C. Holmes Fellowship:** For graduate students studying Music.

**Cloud Hsueh Foundation Scholarship:** Up to \$3,000 awarded to outstanding undergraduate students.

**Alice Lowell Memorial Scholarship:** For students majoring in Music.

**Beth & Walter, Beth L. Koehler Scholarship:** For dancers who show potential in the area of contemporary modern dance, a high level of creative achievement, and high academic performance.

**Norma Barnard MacLeod Scholarship:** For Music students studying Guitar or Lute.

**Margie McDade Memorial Scholarship:** For students majoring in Music and studying piano.

**Donald McKayle Scholarship:** One or more scholarships awarded to current Dance students based on their abilities in contemporary modern dance.

**Medici Circle Scholarship:** Up to \$1,425 awarded to students participating in research, exhibitions, festivals, or conferences.

**Gregory Browne Osborne Memorial Scholarship:** Several scholarships in varying amounts, awarded to outstanding Dance majors with an emphasis in ballet.

**Marjorie and Robert Rawlins Scholarship:** For full-time students majoring in Music and studying piano, violin, viola, or cello.

**Frederick & Sylvia Reines Music Scholarship:** For undergraduate and graduate students studying Music.

**Sylvia Reines Dance Scholarship:** \$1,000 awarded to graduate and undergraduate students in Dance.

**Harry and Marjorie Ann Slim Memorial Scholarship:** For students majoring in Music.

**Winifred W. Smith Scholarship:** For students majoring in Music and studying cello, violin, or piano (preferably cello).

**Elizabeth and Thomas Tierney Scholarship:** Up to \$3,000 awarded annually to an outstanding student.

**Phyllis Kovach Vacca Memorial Scholarship:** For students majoring in Music and studying cello, piano, or violin.

**Bette and Steven Warner Scholarship:** For outstanding students in the Music Department's voice program and the Drama Department.

**H.B. and Isabelle Yolen Memorial Scholarship:** Up to \$2,000 awarded to students majoring in Art or Drama with financial need.

- Department of Art
- Department of Dance
- Department of Drama
- Department of Music
  
- Art, B.A.
- Art, M.F.A.
- Dance, B.A.
- Dance, B.F.A.
- Dance, M.F.A.
- Digital Arts, Minor
- Digital Filmmaking, Minor
- Drama and Theatre, Ph.D.
- Drama, B.A.
- Drama, M.F.A.
- Drama, Minor
- History and Theory of Music, Ph.D.
- Integrated Composition, Improvisation, and Technology, Ph.D.
- Music Theatre, B.F.A.
- Music, B.A.
- Music, B.Mus.
- Music, M.F.A.

Applications are accepted for fall quarter admission only, and ordinarily must be completed by January 15 for the Ph.D. in Drama and Theatre, the M.F.A. in Art, the M.F.A. in Dance, and the M.F.A. in Music, and by March 1 for the M.F.A. in Art with a concentration in Critical and Curatorial Studies. Applications for the M.A. and Ph.D. in ICIT must be submitted by December 1. The number of graduate students that can be admitted to the Claire Trevor School of the Arts is limited. Applicants are advised to arrange for auditions, interviews, and the submission of portfolios, compositions, and dossiers by the appropriate deadlines. Students applying for scholarships and fellowships should do so by January 15, and are also encouraged to apply for financial assistance through the Office of Financial Aid and Scholarships. The Claire Trevor School of the Arts has a modest number of teaching assistantships available in all areas, and all candidates are automatically reviewed for teaching assistantship positions; the School informs successful candidates by June 1 for the following academic year.

Upon admission to the program the student is assigned an advisor. Students should discuss with their advisor the scope of undergraduate preparation to determine any areas which may need strengthening if full benefit from graduate study is to be derived.

## Faculty

Kei Akagi, B.A. International Christian University, *Professor of Music; Asian American Studies*

Lonnie R. Alcaraz, M.F.A. University of California, Irvine, *Professor of Drama* (lighting design, digital imaging)

David Allan, Choreographer/Former Soloist, National Ballet of Canada; Choreographer, ballet companies, operas, film, and television, *Professor Emeritus of Dance* (ballet, pas de deux, choreography)

Rhea Anastas, Ph.D. The Graduate Center of The City University of New York, *Associate Professor of Art* (20th century experimentalism in the visual arts, critical theory, cultural theory)

Kevin H. Appel, M.F.A. University of California, Los Angeles, *Department Chair and Executive Director of University Art Galleries and Professor of Art* (painting)

Sarah Awad, M.F.A. University of California, Los Angeles, *Assistant Professor of Teaching of Art* (drawing, painting)

Stephen F. Barker, Ph.D. University of Arizona, *Dean of the Claire Trevor School of the Arts and Professor of Drama* (post-modern theatre, Beckett, critical theory)

Cynthia M. Bassham, M.F.A. American Conservatory Theatre, *Associate Professor of Teaching of Drama* (voice, speech for actors, acting)

Amy Bauer, Ph.D. Yale University, *Associate Professor of Music*



Haroutune Bedelian, M.A. Royal Academy of Arts, *Professor of Music*

Lorna Griffitt Bedelian, D.M.A. Indiana University, *Professor of Teaching of Music*

Frances Bennett, B.F.A. University of California, Irvine, *Lecturer of Music*

Andrew L. Borba, M.F.A. New York University, *Co-Head of Acting and Assistant Professor of Drama* (acting)

Jennifer Bornstein, M.F.A. University of California, Los Angeles, *Associate Professor of Art* (photography)

Richard A. Brestoff, M.F.A. New York University, *Professor of Drama* (film and television acting)

David Brodbeck, Ph.D. University of Pennsylvania, *Professor of Music; European Languages and Studies*

Juliette A. Carrillo, M.F.A. Yale University, *Assistant Professor of Drama* (directing)

Juli C. Carson, Ph.D. Massachusetts Institute of Technology, *Professor of Art* (art history, critical theory, curatorial practice )

Dennis R. Castellano, M.F.A. University of California, Irvine, *Professor of Teaching Emeritus of Drama* (music theatre)

Eleanore Choate, M.A. California State University, Long Beach, *Lecturer of Music*

Patricia Cloud, M.M. University of Southern California, *Lecturer of Music*

Robert S. Cohen, D.F.A. Yale University, *Professor Emeritus of Drama* (acting theory, acting, directing)

Miles C. Coolidge, M.F.A. California Institute of the Arts, *Professor of Art* (photography)

Mary Corey, M.A. University of California, Riverside; Certified Professional Labanotator, *Professor of Dance* (dance history, dance notation and reconstruction)

John L. Crawford, Media Artist and Software Designer, *Professor of Dance; Informatics* (screendance, interactive media, telematic performance, motion capture, digital arts)

Jonathan Davis, D.M.A. Juilliard School, *Lecturer of Music*

Myrona L. DeLaney, Ed.D. University of California, Irvine, *Head of Music Theatre and Associate Professor of Teaching of Drama* (music theatre, singing, acting)

Tony Delap, Claremont Graduate University, *Professor Emeritus of Art*

Michael Dessen, Ph.D. University of California, San Diego, *Professor of Music*

Diane L. Diefenderfer, Former Soloist, Los Angeles Ballet, Eglevsky Ballet Company, Frankfurt Ballet Company, Director of Pilates Program for Dance Wellness, Undergraduate Advisor, *Associate Professor of Teaching of Dance* (ballet, pointe, repertory)

John Christopher Dobrian, Ph.D. University of California, San Diego, *Professor of Music; Informatics*

Holly Durbin, M.F.A. University of California, Los Angeles, *Professor of Drama* (costume design)

Clifford L. Faulkner, M.A. California State University, Long Beach, *Professor of Teaching Emeritus of Drama* (scenery design, history of design, gay theatre)

Nohema Fernandez, D.M.A. Stanford University, *Professor Emerita of Music*

Jennifer J. Fisher, Ph.D. University of California, Riverside; founder and editor of Dance Major Journal, *Professor of Dance* (critical dance studies)

Keith Fowler, D.F.A. Yale University, *Professor Emeritus of Drama* (directing, acting)

Marcia G. Froehlich, M.F.A. University of Michigan, *Assistant Professor of Drama* (costume design)

Israel Gabriel, Bat-Dor Dance Company; Former Assistant Artistic Director, *Associate Professor of Teaching Emeritus of Dance* (ballet, modern, pas de deux, repertory)

Michel Gervais, *Lecturer of Dance*

Martha Gever, Ph.D. City College of the City University of New York, *Professor Emerita of Art* (history and criticism: video, media studies, popular culture)



Lindsay Gilmour, M.F.A. University of Wisconsin, Milwaukee, *Assistant Professor of Dance* (modern choreography, improvisation)

Douglas S. Goheen, Ph.D. University of Denver, *Professor Emeritus of Drama* (scenery design, digital imaging)

Frederick Greene, B.M. University of Southern California, *Lecturer of Music*

Charlotte Griffin, M.F.A. University of Texas, Austin, *Assistant Professor of Dance* (choreography, modern, screen dance)

Nicole Grimes, Ph.D. University of Dublin, *Associate Professor of Music*

Chad Michael Hall, M.F.A. Ohio State University, *Artistic Director - MULTIPLEX DANCE and Assistant Professor of Dance* (contemporary technique, choreography, improvisation, dance, and video)

Stephan Hammel, Ph.D. University of Pennsylvania, *Assistant Professor of Music*

Matthew Hare, D.M.A. University of Iowa, *Lecturer of Music*

Jason Harnell, *Lecturer of Music*

George C. Harvey, M.F.A. University of California, Irvine, *Professor Emeritus of Drama* (artistic direction, producing, lighting design)

Gary Heaton-Smith, D.M.A. University of California, Los Angeles, *Lecturer of Music*

Donald D. Hill, M.F.A. University of Southern California, *Department Chair and Co-Head of Stage Management, Associate Producer and Professor of Teaching of Drama* (stage management, directing, acting)

Michael K. Hooker, M.F.A. California Institute of the Arts, *Head of Design and Professor of Drama* (sound design)

Joseph Huszti, MM Northwestern University, *Professor Emeritus of Music*

Bryan Jackson, M.F.A. University of California, Los Angeles, *Continuing Lecturer of Art* (digital filmmaking)

Jesse C. Jackson, M.A. University of Toronto, *Director of the Minor in Digital Arts and Associate Professor of Art; Informatics* (digital art, informatics, design, architecture)

Ulysses S. Jenkins, M.F.A. Otis Art Institute, *Professor of Art; African American Studies* (video, performance art)

Ketu H. Katrak, Ph.D. Bryn Mawr College, *Professor of Drama; Comparative Literature; English* (drama and performance, African drama and Ancient Sanskrit drama [from India], postcolonial literature and theory, women writers and feminist theory)

Mari Kimura, D.M.A. Juilliard School, *Professor of Music*

Sarah Koo, M.M. The Juilliard School, *Lecturer of Music*

Jerzy Kosmala, D.M. Indiana University, *Lecturer of Music*

Madeline Kozlowski, M.F.A. Brandeis University, *Professor Emerita of Drama* (costume design)

Peter O. Krapp, Ph.D. University of California, Santa Barbara, *Professor of Film and Media Studies; English; European Languages and Studies; Informatics; Music; Visual Studies* (digital culture, media history, cultural memory)

Anthony James Kubiak, Ph.D. University of Wisconsin-Madison, *Professor of Drama* (American and modern drama, modern poetry, critical theory, philosophy)

Antoinette Lafarge, M.F.A. School of Visual Arts, *Professor of Art* (digital media)

Daphne Pi-Wei Lei, Ph.D. Tufts University, *Head of Doctoral Studies and Professor of Drama; Asian American Studies* (Asian theatre, Asian American theatre, intercultural theatre, gender theory, performance theory)

Simon Leung, B.A. University of California, Los Angeles, *Professor of Art; Asian American Studies* (new genres, critical theory, contemporary art history, performance)

Joseph S. Lewis, M.F.A. Maryland Institute College of Art, *Professor of Art* (public art)

Lukas Ligeti, *Assistant Professor of Music*

Eric Lindsay, D.M. Indiana University, *Lecturer of Music*

Loretta Livingston, Ph.D. Texas Woman's University; Certified Laban Movement Analyst; former principal with Bella Lewitzky Dance Company, Graduate TA Advisor, Co-Advisor for B.F.A. Choreography/Senior Thesis/Honors Thesis concerts, *Professor of Dance* (choreography, Laban movement analysis, body and practice)

Mara Jane Lonner, M.F.A. California Institute of the Arts, *Associate Professor of Teaching Emerita of Art* (drawing, painting, 3D design)

Catherine B. Lord, M.F.A. State University of New York at Buffalo, *Professor Emerita of Art* (queer theory, feminism, photography)

Annie M. Loui, *Co-Head of Acting and Professor of Drama* (movement, directing, acting)

Lar Lubovitch, Honorary Doctorate, Juilliard School of the Arts, *Founder and Director of New York-based Lar Lubovitch Dance Company and UCI Distinguished Professor of Dance* (choreography, repertory, technique, and special projects)

Molly L. Lynch, M.F.A. University of California, Irvine; Pilates Certified; Choreographer/Artistic Director of the National Choreographers Initiative, *Department Chair and Professor of Dance* (ballet, repertory, arts management, and senior seminar)

Monica Majoli, M.F.A. University of California, Los Angeles, *Professor of Art* (painting)

Mihai Maniutiu, Ph.D. Caragiale Academy of Theatrical Arts and Cinematography, *UCI Distinguished Professor of Drama* (directing)

Daniel J. Martinez, B.F.A. California Institute of the Arts, *Claire Trevor Professor and Professor of Art* (public art, sculpture, installation, performance)

Kevin McKeown, M.A. University of California, Los Angeles, *Lecturer of Music*

Irene Messoloras, D.M.A. University of California, Los Angeles, *Lecturer of Music*

Yong Soon Min, M.F.A. University of California, Berkeley, *Professor Emerita of Art* (minority, diasporic, and third cinemas; media, nationalism, and globalization; race, sexuality, and popular culture)

Elliott Moreau, M.M. University of Southern California, *Lecturer of Music*

Ian Andrew Munro, Ph.D. Harvard University, *Associate Professor of Drama; English* (European drama and performance, early modern popular culture, theatrical performance of wit)

Margaret Murata, Ph.D. University of Chicago, *Professor Emerita of Music*

Lisa Marie Naugle, Ph.D. New York University, *Director of International Initiative for CTSA, Artistic Director for DTM2 Performance Ensemble and Professor of Dance* (modern dance, choreography, online/interactive technology, improvisation, teaching of dance)

Adedeji Ogunfolu, M.M. University of Michigan, Ann Arbor, *Lecturer of Music*

Dariusz Oleszkiewicz, B.A. California Institute of the Arts, *Lecturer of Music*

Deborah Oliver, M.F.A. California Institute of the Arts, *Lecturer of Art* (performance art, new genres)

Vincent Olivieri, M.F.A. Yale University, *Associate Dean of Graduate Affairs and Professor of Drama* (sound design)

Hossein Omoumi, Ph.D. University of Florence, *Maseeh Professor in Persian Performing Arts and Professor of Music*

Jane M. Page, M.F.A. Indiana University, *Head of Directing and Professor of Drama* (directing, acting)

Andrew A. Palermo, B.F.A. University of Cincinnati, College-Conservatory of Music, *Associate Professor of Drama* (music theatre choreography)

Jennifer Pastor, M.F.A. University of California, Los Angeles, *Professor of Art* (sculpture)

Simon G. Penny, M.F.A. Sydney College of the Arts, *Professor of Art; Informatics* (informatics, robotic sculpture, interactive environments, electronic media)

James W. Penrod, M.F.A. University of California, Irvine; C.M.A. Laban Institute of Movement Studies, *Professor Emeritus of Dance* (ballet, modern, dance notation, choreography, movement analysis)

Barry Perkins, M.A. New England Conservatory of Music, *Lecturer of Music*

Gerald Pinter, B.A. University of North Texas, *Lecturer of Music*

Janice G. Plastino, Ph.D. University of Southern California, *Professor Emerita of Dance* (kinesiology/anatomy, research methods, choreography, dance science/medicine)

Yvonne Rainer, *Claire Trevor Professor and Professor Emerita of Art* (performance, dance, video)

Colleen Reardon, Ph.D. University of California, Los Angeles, *Professor of Music*

Janelle Reinelt, Ph.D. Stanford University, *Professor Emerita of Drama* (British theatre, political theory, performance)

Bryan R. Reynolds, Ph.D. Harvard University, *UCI Chancellor's Professor and Claire Trevor and Professor of Drama* (Shakespeare, Renaissance drama, critical theory, feminist theory, performance theory, cultural studies)

William S. Roberts, M.F.A. California Institute of the Arts, *Associate Professor of Teaching of Art* (photography)

Tara Rodman, Ph.D. Northwestern University, *Assistant Professor of Drama; Asian American Studies* (modernist performance, Japanese theatre and dance, transnationalism, racial formation, global Asias)

Bobby Rodriguez, D.M.A. University of California, Los Angeles, *Lecturer of Music*

Amanda Ross-Ho, M.F.A. University of Southern California, *Associate Professor of Art* (sculpture)

Nancy L. Ruyter, Ph.D. Claremont Graduate University, *Professor Emerita of Dance* (dance history, Spanish dance, bibliography and research)

Constance J. Samaras, M.F.A. Eastern Michigan University, *Professor Emerita of Art* (photography, intermedia, cultural criticism)

John Schneiderman, M.F.A. University of California, Irvine, *Professor of Teaching of Music*

Nina Scolnik, B.M. Oberlin College, *Professor of Teaching of Music*

Kelli Sharp, D.P.T. Chapman University, *Assistant Professor of Dance; Physical Medicine and Rehabilitation* (somatic practices, dance science, kinesiology, physical therapy, motor learning and performance)

Eli Simon, M.F.A. Brandeis University, *UCI Chancellor's Professor and Professor of Drama* (acting, directing)

Jaymi Smith, B.F.A. DePaul University, *Professor of Drama* (lighting design)

David Stetson, B.M. University of Southern California, *Lecturer of Music*

Darryl Taylor, D.M.A. University of Michigan, *Professor of Music; African American Studies*

Alan Terricciano, M.A. Eastman School of Music, *Associate Dean for Undergraduate Affairs and Professor of Dance; Music* (music for dance, musical resources, critical issues in dance, music theory, keyboard skills, and repertoire)

Philip D. Thompson, M.F.A. University of California, Irvine, *Professor of Drama* (voice, speech for actors, acting)

David K. Trend, Ph.D. Miami University, *Professor of Art* (visual culture)

Richard J. Triplett, M.A. Otis Art Institute, *Professor Emeritus of Drama* (scenery and costume design, history of design)

Stephen Tucker, D.M.A. University of California, Los Angeles, *Robert and Marjorie Rawlins Chair in Music and Associate Professor of Music*

Kojiro Umezaki, M.A. Dartmouth College, *Professor of Music; Computer Science*

Joel R. Veenstra, M.F.A. University of California, Irvine, *Co-Head of Stage Management and Associate Professor of Teaching of Drama* (stage management, acting)

Sunil P. Verma, M.D. University of Southern California, *Assistant Dean of Workforce Development and Health Sciences Associate Clinical Professor of Otolaryngology; Music*

Amanda Jane Walker, M.F.A. University of California, Los Angeles, *Lecturer of Music*

Tong Wang, M.F.A. University of Utah; Principal dancer with the Shanghai Ballet, Tulsa Ballet Theatre, Dayton Ballet, Ballet West, *Associate Professor of Dance* (ballet, choreography, men's ballet, pas de deux)

S. Ama Wray, Ph.D. University of Surrey, *Associate Professor of Dance; African American Studies* (jazz, choreography, improvisation, teaching of dance, jazz ensemble)

Bruce N. Yonemoto, M.F.A. Otis Art Institute, *Professor of Art; Asian American Studies* (video, experimental media, film theory)

## Arts Courses

### **ARTS 1. ArtsCore. 4 Units.**

An introduction to the arts in general, and to the arts at UCI. Concentration on (1) the interdisciplinary nature of the arts, and (2) the content of particular arts disciplines.

(IV)

### **ARTS 75. Digital Media: Exhibition. 4 Units.**

A discussion and critique course in all media arts. Includes a review of key media arts concepts and the preparation of an end-of-quarter exhibition.

Prerequisite: Proposal submission required.

### **ARTS H81. Improvisation and Modes of Research / Creative Expression. 4 Units.**

Through immersion, readings, analysis, and observation, students are trained to recognize, build, and engage a set of "improvisatory" cognitive skills in order to enhance artistic creation, the generation of language, data analysis, and the application of the scientific method.

Restriction: Campuswide Honors Collegium students only. Seniors only.

(IV)

### **ARTS 173. Athletics Bands . 1-2 Units.**

Bands support athletics events. Includes Pep Band: Rehearsal and performance of band standards; Marching Band: Exercises and performance involving marching fundamentals, formations, and half-time pageantry; and, Drumline: Study and rehearsal of rudiments, cadences, and arrangements.

Repeatability: Unlimited as topics vary.

### **ARTS 199. Independent Study. 1-4 Units.**

Individual study or directed projects as arranged with faculty member.

Repeatability: May be repeated for credit unlimited times.

## Art Courses

### **ART 1A. Art in Context: History, Theory, and Practice. 4 Units.**

First in a three-quarter foundation sequence introducing students to a broad range of contemporary art, media, and practices in relation to their twentieth-century cultural and historical antecedents. ART 1A deals specifically with contemporary painting and photography.

Restriction: Art Majors have first consideration for enrollment.

(IV)

### **ART 1B. Art in Context: History, Theory, and Practice. 4 Units.**

Deals with film/video/performance. Concerned with the development of modern/contemporary film, video, and performance, with a focus on experimental and avant-garde production from the early twentieth-century to today.

Restriction: Art Majors have first consideration for enrollment.

(IV)

### **ART 1C. Art in Context: History, Theory, and Practice. 4 Units.**

Third in a three-quarter foundation sequence introducing students to a broad range of contemporary art, media, and practice in relation to their twentieth-century cultural and historical antecedents. Deals specifically with space and cyberspace.

Restriction: Art Majors have first consideration for enrollment.

(IV)

### **ART 8. Changing Creativity. 4 Units.**

Explores creativity as a changing concept in historical and contemporary terms from the perspectives of producers, consumers, and institutions. Encompasses international perspectives and the role of new technologies in considering creativity as a resource for innovation and social change.

(IV)

**ART 9A. Visual Culture: Media, Art, and Technology. 4 Units.**

Examines creative activities in all spheres of life, including the 'artistic' impulses that dwell in the individual. Culture is addressed in broad terms of the many institutions and cultural forces that shape everyday activities of listening, seeing, doing.

Restriction: Art Majors have first consideration for enrollment.

(IV)

**ART 9B. Visual Culture: A Culture Divided. 4 Units.**

Throughout the 1980s and 1990s, controversies flourished in the mainstream media over purportedly obscene art, anti-American writing, and moral decay, among other issues. Examines these new conflicts as they manifest themselves in public life and everyday experience.

Restriction: Art Majors have first consideration for enrollment.

(IV)

**ART 9C. Visual Culture: Thematic Investigations. 4 Units.**

Considers a broad range of concerns and questions raised by various acts of appropriation in contemporary art and visual culture, such as originality, authenticity, authorship, translation, audience and aesthetics, temporal dimensions of a work, and context.

Restriction: Art Majors have first consideration for enrollment.

(IV)

**ART 11A. Topics in History of Contemporary Art. 4 Units.**

Surveys mid-nineteenth and twentieth-century art production, from modernity through post-modernity, in a historical and cultural context.

Prerequisite: ART 9A

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Art Majors only.

**ART 12A. Art, Design, and Electronic Culture. 4 Units.**

Introduction to historical and theoretical foundations of digital media art, tracing how information technologies seeded growth of new expressive medium. Considers how today's pervasive digital culture evolved through interdisciplinary collaborations between artists, engineers, scientists, scholars.

(IV)

**ART 12B. Technology, Culture, and Society: Steam to Steampunk. 4 Units.**

A survey of the ongoing interactions between technological and social change through the 19th century and 20th century, with special attention to the history of computing, changing arts and cultural practices, and the idea of the Anthropocene.

(IV)

**ART 12C. Intelligences of Arts. 4 Units.**

Introduces contemporary neuroscience and new approaches to cognition – embodied, enactive, extended, situated, distributed. Reviews the history of related ethological, biological, psychological, technological, and philosophical traditions. Considers arts and cultural practices from these and other perspectives, and considers case studies.

(III)

**ART 20A. Basic Drawing I. 4 Units.**

Encourages an investigation of the premises and limits of drawing, primarily, but not inevitably, as a two-dimensional medium. Includes slide presentations and discussions of the historical uses of a wide range of drawing. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 20B. Basic Drawing II. 4 Units.**

Continuation of the investigation initiated in ART 20A, with an emphasis on experimentation, personal investigation, and development of conceptual working premises, as well as the acquisition of necessary skills. Group discussion and critique are emphasized. Materials fee.

Prerequisite: ART 20A

Restriction: Art Majors have first consideration for enrollment.

**ART 30A. Basic Painting I. 4 Units.**

Examination of the fundamental components of painting: color, form, space, surface, scale, and content. Studio work, slide presentations, and critiques of student work. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 30B. Basic Painting II. 4 Units.**

Further examinations of the essential qualities of painting: color, form, space, surface, scale, and content. Studio work, slide presentations, and critiques of student work. Materials fee.

Prerequisite: ART 30A

Restriction: Art Majors have first consideration for enrollment.

**ART 40. Basic Sculpture. 4 Units.**

The practice of sculpture in the contemporary arts; inclusion of spatial interventions, site-specific and environmental design, appropriation of found materials; techniques in cutting joining, and assembly of wood, metals, and plastics. May include casting, welding, and ceramics. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 50A. Matter and Media . 4 Units.**

A project-based introduction to tools and approaches for creating and sharing digital media content within Internet-mediated social environments, with a particular emphasis on art-making and personal expression. Includes an overview of basic user experience and interaction design principles.

**ART 50B. Interaction and Experience. 4 Units.**

An overview of digital video and audio production for the Web, emphasizing art-making and personal expression. Includes digital media aesthetics and conceptual design, basic audio and video recording, and fundamentals of desktop video, audio, and Web authoring software applications.

Prerequisite: ART 50A

**ART 50C. Digital Media: Interaction Design. 4 Units.**

Principles and practices of interaction design for interactive digital media systems that provide for active involvement of the participant. Students gain experience with interaction design issues through a series of media art projects, emphasizing art-making and personal expression.

Prerequisite: ART 12A and ART 12B and ART 50A and ART 50B

**ART 51. Basic Ceramic Sculpture. 4 Units.**

Exploration of use of clay as sculptural basis with an emphasis on development of an idea and its relation to contemporary and experimental art practice. Hand-building, glazing, finishing processes, and use of other structural materials. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 65A. Foundations in Media Design. 4 Units.**

Provides an overview of media design in the digital age, covering principles of design for different media (2D, time-based, interactive); history of relationship between art and design; and practice in working with different design approaches. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 65B. Foundations in Internet Art and Design. 4 Units.**

Introduction to creating art for the Internet, covering history and structure of networks; key types of net-based interactivity; basics of Web design and scripting. Materials fee.

Prerequisite: ART 65A. Recommended: ART 11B.

Restriction: Art Majors have first consideration for enrollment.

**ART 65C. Gizmology and Kinetics. 4 Units.**

Provides students with basic skills in materials, construction and design applicable to making machines, musical instruments and things with moving parts enabling work in kinetic sculpture, custom interactive systems, Mechatronics, Robotics, and Maker/DIY culture. Materials fee.

**ART 71A. Introduction to Photography I. 4 Units.**

Introduction to technical underpinnings emphasizing photography as a contemporary art practice. Topics include 35mm non-automatic camera operation, exposure and lighting, black and white printing, introduction to digital photography, discussion of critical and historical issues. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 71B. Introduction to Photography II. 4 Units.**

Techniques covered include medium and large format cameras, digital photography, studio lighting, digital and analog color printing, mural room. Conceptual direction is developed through critiques, critical readings, discussions, slide lectures. Materials fee.

Prerequisite: ART 71A

Restriction: Art Majors have first consideration for enrollment.

**ART 81A. Digital Filmmaking Production I. 4 Units.**

Introduction to three production stages of video making. Study of the narrative structure of cinema and acquisition of video production skills in camera, lighting, sound, and editing. Production work, readings, and screenings outside of class are assigned. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 81B. Digital Filmmaking Production II. 4 Units.**

Focuses on video stage production, technical skills including camera operation, stage lighting, sound recording, and construction of basic scenic elements. Emphasis is placed on the function and responsibilities of the production crew and proper working and safety procedures. Materials fee.

Prerequisite: ART 81A

Restriction: Art Majors have first consideration for enrollment.

**ART 91. Basic Performance Art. 4 Units.**

Exploration of objects, gesture, action, text, image, and media to create narrative or non-narrative works. Elements of theory and history of performance art are discussed to illustrate techniques and styles to understand, identify, and articulate artistic vision and voice.

Repeatability: May be taken for credit 2 times.

Restriction: Art Majors have first consideration for enrollment.

**ART 95. SPECIAL TOPICS IN BASIC MEDIA. 4 Units.**

Basic instruction in media or disciplines not otherwise represented in the regular curriculum. Topics vary according to the instructor.

Repeatability: Unlimited as topics vary.

Restriction: Art Majors have first consideration for enrollment.

**ART 100. Special Topics in Art. 4 Units.**

Materials fee, topic dependent.

Prerequisite: ART 9A. Lower-division writing strongly recommended.

Repeatability: May be taken for credit 6 times as topics vary.

Restriction: Art Majors only.

**ART 101W. Artists as Writers. 4 Units.**

Contemporary art practice involves text, as final form or an integral element. Many contemporary artists consider writing as essential to their practice. Covers historical and contemporary uses of text and image as well as artists' writing.

Prerequisite: ART 9A and ART 11A. Satisfactory completion of the lower-division writing requirement.

Restriction: Art Majors only.

**(Ib)****ART 106A. Programming for Artists. 4 Units.**

Programming as a means to create interactive artworks with an emphasis on the integration of video, sound, text, and stills. Topics include basic concepts in programming, understanding the limits of code, working with video and audio files, interface design. Materials fee.

Prerequisite: ART 65A. Recommended: ART 11B.

Repeatability: May be taken for credit 2 times.

Restriction: Art Majors only.



**ART 106C. Design for Print. 4 Units.**

Investigates the use of print for communication as an artist. Covers the fundamentals of print design and output using digital media. Materials fee.

Prerequisite: ART 65A. Recommended: ART 11B.

Repeatability: May be taken for credit 2 times.

Restriction: Art Majors only.

**ART 108. Digital Filmmaking Project I. 4 Units.**

Students learn to conceive, develop, and produce original video works building directly upon previously learned skills. Use of video stage and post-production editing facilities. Lectures on video/film subjects, production strategies, readings, screening, field trips, and group critiques. Materials fee.

Prerequisite: ART 81A and ART 81B

Restriction: Art Majors only.

**ART 109. Performance and the Camera. 4 Units.**

Surveys the development of contemporary artists who use performance strategies in the making of videos and films. Students analyze the artist's conceptual approach to performative gestures, actions, and landscapes created for their video or film art.

Prerequisite: ART 1B or ART 81A or ART 91 or ART 128

Restriction: Art Majors only.

**ART 110A. Mechatronic Art I. 4 Units.**

Introduces the practice and theory of analog electronics, emphasizing the design and development of simple interactive systems and the integration of such systems into real-world contexts of performance, installation, sculpture, and automated artifacts. Materials fee.

**ART 110B. Mechatronic Art II. 4 Units.**

Introduces the practice and theory of embedded microcontrollers, digital electronics, coding, sensor interfacing, motor control, and output stages along with mechanical and electromechanical design and construction, emphasizing the integration of such systems into real-world contexts of performance, installation, and art-making. Materials fee.

Prerequisite: ART 110A

**ART 110C. Mechatronic Art III. 4 Units.**

As the capstone to the Mechatronic Art series, students develop major projects utilizing electronics, microcontrollers, sensors, and electromechanical devices, in a methodical and supervised context, with technical, design, and aesthetic advice and critique. Materials fee.

Prerequisite: ART 110A

**ART 113. How to be Clever with Stuff. 4 Units.**

How to Be Clever with Stuff is an introduction to the skilled embodied practices of arts and crafts, working with hand tools, wood, and steel. Class includes technical lecture/demos, short technical assignments, a self-initiated final project, and design drawing. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 115W. Writing Nearby. 4 Units.**

Art writing is increasingly an area of scholarship unto itself as well as a discursive arm of contemporary art practice. Investigates the politics of art writing as well as training students in its various writing practices.

Prerequisite: ART 9A and ART 11A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only.

**(Ib)****ART 119. Issues in Contemporary Painting. 4 Units.**

Investigation of issues in modern and contemporary art work and criticism, wherein an assessment of Modernist influences is followed by the examination of contemporary painting as a cross-disciplinary practice employing popular culture, 'high art,' theory, and new technology.

Prerequisite: ART 9A. Recommended: Satisfactory completion of the upper-division writing requirement.

Repeatability: May be taken for credit 2 times.

Restriction: Art Majors only.



**ART 119A. Issues in Contemporary Drawing. 4 Units.**

Investigation of drawing as a primary practice rather than a developmental tool. Explores the relationship between Conceptualism, process and content, and considers the historical changes in method, presentation, and theory, from past to present.

Prerequisite: ART 9A

**ART 121A. Afro-Futurism I. 4 Units.**

First of a two-part course on the futuristic artistic vision of Black film, video, and cyberspace. Deals with critical analyses of the Black image in Western Art history, and its association to contemporary Hip Hop culture, art, and music.

Prerequisite: ART 9A. Satisfactory completion of upper-division writing strongly recommended.

Restriction: Art Majors only.

**ART 121B. Afro-Futurism II. 4 Units.**

Second of a two-part course on the futuristic artistic visions of Black film, video, and cyberspace. Deals with modern techno-culture, digital activism, and designing technology based on African aesthetic principles of contemporary Hip Hop International Culture.

Prerequisite: ART 9A. Satisfactory completion of upper-division writing strongly recommended.

Restriction: Art Majors only.

**ART 123B. Issues in Media, Violence, and Fear. 4 Units.**

Violence has been instrumental in story-telling throughout history in art, literature, religion, and entertainment. Continuing presence of media violence provoked debates among parents, politicians, media producers, and academics. Examines history, theory, aesthetics, economics, and politics of violent representation.

Prerequisite: ART 9A. Satisfactory completion of the Upper-Division Writing requirement is recommended.

Restriction: Art Majors only.

**ART 125. Issues in Photography. 4 Units.**

Rigorous investigation of photographic practices and critical writings, the relationship of photography to the construction and maintenance of cultural institutions, the circulation of photographic ideas in society, and photography and technology.

Prerequisite: ART 1A or ART 71A or ART 71B or ART 152A or ART 152B or ART 152C or ART 152D or ART 152E or ART 190B. Recommended: Satisfactory completion of the Upper-Division Writing requirement.

Repeatability: May be taken for credit 2 times.

Restriction: Art Majors only.

**ART 126. Issues in Media and Migration: Asia. 4 Units.**

Media and migration are profound, twinned influences on contemporary globalized experience. A discourse on Asian cultural production and of its transnational dimensions. Students will explore migration in its multiple facets to include migrations of people, ideas, and technologies.

Prerequisite: ART 9A

**ART 126B. Issues in Techno-Arts. 4 Units.**

Addresses issues related to artmaking practices that emerge in tandem with new technologies. Topics include sociopolitical contexts of techno-art; utopic/dystopic framings; key moments in the history of techno-arts.

Prerequisite: ART 9A. Recommended: ART 11B.

Restriction: Art Majors only.

**ART 127B. Issues in Experimental Film History. 4 Units.**

A critical study of experimental film/video art genres and production techniques considering their narrative, structural, iconographic, and cultural aspects. Hollywood narrative, Nouvelle Vague, American Independent, and Video Art compared in terms of production innovation, design, and conceptual content. Materials fee.

Prerequisite: ART 9A

Restriction: Art Majors only.

**ART 128. Issues in New Genres. 4 Units.**

Investigates issues in post-studio practices, including concepts of time, relational aesthetics, site-specificity, institutional critique, and the post-medium condition.

Prerequisite: ART 9A. Recommended: Satisfactory completion of the Upper-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Art Majors only.

**ART 130A. Projects in New Technologies. 4 Units.**

Working with media such as electronic still cameras, desktop publishing, faxes, satellites, virtual reality, digitized imaging. Cultural issues pertinent to the emergence of new technology (e.g., ethical concerns, social impact, copyright laws, nontraditional approaches to distribution, cyberpunk, global markets).

Prerequisite: ART 65A. Recommended: ART 11B and ART 106A.

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 131. Projects in Installation. 4 Units.**

Investigates interior installation in particular spaces. Working in teams, students install, discuss, and remove projects. Technical information and hands-on experience with various media is provided. Materials fee.

Prerequisite: ART 40

Repeatability: May be repeated for credit unlimited times.

**ART 132A. Digital Filmmaking Pre-Production. 4 Units.**

Examines the preparatory and planning stages of video production, including script writing, story boarding, location scouting, script breakdown, and budgeting. Projects may encompass one or more of these stages which will be explored through readings, discussions, and demonstrations. Materials fee.

Prerequisite: ART 81A and ART 81B

Restriction: Art Majors only.

**ART 132B. Digital Filmmaking Post-Production. 4 Units.**

Examines procedures and techniques utilized in video production after principal shooting is completed, including effects processing, composting, sound design, and DVD authoring. Projects focus on these processes, and are explored through readings, discussions, and demonstrations. Materials fee.

Prerequisite: ART 81A and ART 81B

Restriction: Art Majors only.

**ART 133. The Graphic Novel . 4 Units.**

An intensive workshop during which students will create a short graphic novel, taking the process all the way from concept to publication. Course work will focus on understanding how narrative emerges from a combination of visual and textual elements.

Prerequisite: ART 65A. Strongly recommended: ART 106C.

**ART 138. Place Making and Public Art. 4 Units.**

How do art interventions in public spaces inform our definition of 'place' and develop culturally informed audiences? Students will engage in class projects and group investigations that question the traditional and institutional conceptual boundaries of exhibition/distribution.

Prerequisite: ART 40 and ART 9A

Restriction: Art Majors only.

**ART 141. Digital Filmmaking Advanced Project I. 4 Units.**

Incorporating narrative structures in a multi-screen context. Students design and produce an active space in which activities will move from one screen to another. Materials fee.

Prerequisite: ART 81A and ART 81B

Restriction: Art Majors only.

**ART 144. Artist Books as Objects. 4 Units.**

Are artist books still relevant in the contemporary creative community? Focusing on intellectual content and raw physicality, students will explore this question and image/text relationships by creating handmade one-of-a-kind or edition book projects utilizing various mechanical reproduction techniques.

Prerequisite: (ART 20A or ART 30A or ART 40 or ART 51 or ART 65A or ART 71A or ART 81A or ART 91) and ART 9A

**ART 150. Advanced Studio Topics--Painting. 4 Units.**

Provides an intensive and specialized working environment. Thematic issues and material strategies will be explored. Materials fee.

Prerequisite: ART 30B

Repeatability: Unlimited as topics vary.

Restriction: Art Majors only.

**ART 150C. Advanced Drawing . 4 Units.**

Advanced studio problems in visual exploration. Students pursue individual solutions to self-defined and presubscribed projects. Techniques/materials are individual choice. Continual analysis of the personal process.

Prerequisite: ART 20B

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 150F. Advanced Figure Drawing. 4 Units.**

Students develop technical skills in rendering the figure. Live model sessions and an introduction to anatomy. Investigates use of the figure in contemporary art. Materials fee.

Prerequisite: ART 20B

Repeatability: May be taken for credit 2 times.

Restriction: Art Majors only.

**ART 150G. Advanced Figure Painting. 4 Units.**

Students develop technical skills in painting the figure. Live model sessions and projects that investigate the use of the figure in contemporary art.

Prerequisite: ART 150F

**ART 151. Advanced Studio Topics--Sculpture. 4 Units.**

Provides an intensive and specialized working environment. Thematic issues and material strategies will be explored. Materials fee.

Prerequisite: ART 40

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 152A. Advanced Studio Topics: Photography. 4 Units.**

Focused investigation of a range of issues in photographic practice, with an emphasis on developing individual student projects, refining critical thinking, and conceptual framing. Technical topics covered as required. Readings, lectures, critiques, labs. Materials fee.

Prerequisite: ART 71B

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 152B. Documentary Photography. 4 Units.**

Documentary practice is examined through the realization of photo-based projects. Thematic focus of student's choosing will be refined through lectures, discussion, technical demonstrations, field trips, labs, and individual meetings. Materials fee.

Prerequisite: ART 71B

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 152C. The Public Image. 4 Units.**

Strategies for artistic intervention in the public circulation of images are examined alongside the role images play in constructing public identity. Individual or collaborative student projects will be directed around course themes. Materials fee.

Prerequisite: ART 71B

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 152D. The Photographic Tableau. 4 Units.**

Examines and develops photographic projects intended for traditional artistic venues (i.e., galleries and museums). In addition to exploring appropriate techniques and presentation strategies, students consider the interdependency between construction of images and semantic shaping of traditional art venues. Materials fee.

Prerequisite: ART 71B

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 152E. The Constructed Image. 4 Units.**

A studio investigation of theoretical ideas, critical possibilities, historical precedents, and various techniques involving the production of fabricated images. Techniques may include montage, digital, chemical and in-camera manipulations, studio constructions, appropriations, performance, and projected images. Materials fee.

Prerequisite: ART 71B

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 152F. Seminar Production Component. 4 Units.**

Photographic and/or inter-media production course tied to a specific Issues course (for example, Issues in Photography, Issues in Feminism, Issues in New Genres). Critiques, labs, field trips, discussion, demonstrations. Materials fee.

Prerequisite: ART 71B

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 153. Digital Filmmaking Advanced Project II. 4 Units.**

Directed to the production of individual or collaborative videotapes, using studio, portable camera, editing facilities, and sound and computer elements. Emphasis will be on individually initiated projects. Readings and screenings are assigned. Materials fee.

Prerequisite: ART 81A and ART 81B

Restriction: Art Majors only.

**ART 154. Advanced Studio Topics: Performance. 4 Units.**

An intensive investigation of the practice of performance art, with an emphasis on the development of individual projects, and the refinement of various technical skills, as well as audiences, spaces, and cultural connections.

Prerequisite: ART 91 or ART 109 or ART 128

Repeatability: May be taken for credit 3 times.

Restriction: Art Majors only.

**ART 156. Advanced Studio Topics: Ceramic Sculpture. 4 Units.**

Discussion of ideas, techniques, and personal control of form. Clay body, fabrication, glazing, and firing. Emphasis on development of personal direction. Materials fee.

Prerequisite: ART 51

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 166A. Digital Filmmaking Web Series. 4 Units.**

Original video projects produced in collaborative teams combining advanced video students with students from other areas, including Dance, Drama, and Music. Shoots may be carried out on the video stage as well as field locations. Materials fee.

Prerequisite: ART 81A and ART 81B

Restriction: Art Majors only.

**ART 170. Advanced Projects. 4 Units.**

Students working in different mediums will focus on ambitious research, planning, development, and experimentation, leading to a single work or focused series that is large in scope. The project will be exhibited and documented at the end of the quarter. Materials fee.

Prerequisite: ART 150 or ART 150C or ART 151 or ART 152A or ART 152B or ART 152C or ART 152D or ART 152E or ART 152F or ART 153 or ART 166A or ART 190 or ART 190B or ART 190C

Restriction: Art Majors only.

**ART 189. Critical Aesthetics . 4 Units.**

Surveys critical thought that has influenced twentieth-century art production, preparing the student to engage contemporary art with a critical eye, specifically addressing aesthetic and political debates of the historical avant-garde, the neo-avant garde, and postmodern culture.

Prerequisite: ART 1A and ART 1B and ART 1C

Restriction: Upper-division students only. Art Majors only.

**ART 190. Senior Project and Critique. 4 Units.**

Directed-study critique class in preparation for final project and life after graduation; documentation and portfolio preparation for graduate school. Investigation of exhibition spaces and funding opportunities, participation in artists' communities outside the university, and artists' rights issues.

Repeatability: May be repeated for credit unlimited times.

Restriction: Seniors only. Art Majors only.

**ART 190B. Senior Projects and Critique in Photography. 4 Units.**

Directed group study focused on production of photographic projects of significant scope and ambition. Emphasis on preparation for continued study and/or practice in photography in advanced settings beyond the undergraduate university experience. Materials fee.

Prerequisite: ART 1A and ART 1B and ART 1C and ART 71A and ART 71B

Repeatability: May be repeated for credit unlimited times.

Restriction: Seniors only. Art Majors only.

**ART 197. Art Internship. 1-4 Units.**

Under faculty supervision, students participate directly in a variety of art institution settings, including museums, galleries, and nonprofit organizations.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

Restriction: Juniors only.

**ART 198. Honors Exhibition. 4 Units.**

Preparation, installation, and participation in the annual honors exhibition. Materials fee.

Grading Option: Pass/no pass only.

Restriction: Upper-division students only. School of Arts Honors students only.

**ART 199. Independent Study. 1-4 Units.**

Individual study or directed creative projects as arranged with faculty member. Materials fee.

Repeatability: May be repeated for credit unlimited times.

**ART 210. First-Year Graduate Seminar. 4 Units.**

Introductory theory class to contemporary art: intellectual history, theoretical antecedents, and current critical concerns.

Restriction: Graduate students only.

**ART 215. Graduate Seminar Topics. 4 Units.**

In-depth discussion of contemporary art production in relation to a variety of theoretical, cultural, and historical topics. Material is determined by the given instructor's current research interest. Topics vary.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ART 220. Graduate Seminar: Issues in Contemporary Art. 4 Units.**

Classroom interaction with artists, curators, critics, lecturers from fields outside of the arts or from cross-disciplines. Includes recommended readings, discussions, panel participation, writing assignments.

Prerequisite: ART 210

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**ART 230. Graduate Group Critique. 4 Units.**

Focus on studio production. Students are expected to help foster and develop an environment in which serious and sophisticated peer critique can take place.

Repeatability: May be taken for credit 9 times.

Restriction: Graduate students only.

**ART 236. Graduate Topics in Studio Production. 4 Units.**

Graduate group study of a specific medium or art practice (e.g., painting; video, installation, photography, sculpture/3D, performance, digital media, public art, sound art; film). Includes consideration of technical, theoretical, historical, and/or formal issues.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ART 240. Interdisciplinary Projects. 4 Units.**

Intensive faculty-led discussion of in-progress graduate studio projects--can be discipline driven or working across fields in a rigorous interdisciplinary studio environment where students meet with the professor both individually and in small groups.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ART 250. Directed Reading and Research. 4 Units.**

Independent study with a supervising faculty member to direct academic research, develop bibliographies, and discuss assigned readings.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ART 251. Special Topics Seminar. 4 Units.**

Directed reading and/or study group on a given research topic. Agreed-upon meeting structure may be flexible in order to accommodate off-campus field trips and travel.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ART 255. Graduate Interdisciplinary and Collaborative Projects. 4 Units.**

For graduate students working collaboratively across the School of the Arts or cross-university. May be team taught with one of the faculty members based in the Department of Art.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ART 261. Graduate Thesis Writing Seminar. 4 Units.**

Seminar for writing as a component of the thesis. Different models of writing, text, and spoken word will be discussed. Required second year.

Corequisite: ART 262

Prerequisite: ART 210 and ART 215 and ART 220

Restriction: Graduate students only.

**ART 262. Graduate Thesis Independent Study. 1-4 Units.**

Tutorials and directed study in thesis writing, research and/or studio production with thesis committee chair and/or thesis committee members to be taken during final quarters of study.

Corequisite: ART 261

Prerequisite: ART 210 and ART 215 and ART 220

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ART 263. Graduate Thesis, Exhibition Critique. 4 Units.**

Group critique required for matriculating M.F.A. students during the quarter in which their thesis exhibitions are scheduled. Public presentation/lecture on student's work required.

Prerequisite: ART 210 and ART 215 and ART 220 and ART 230 and ART 240 and ART 261 and ART 262

Restriction: Graduate students only.

**ART 264. Critical and Curatorial Thesis Exhibition. 8 Units.**

Intensive tutorial geared toward execution of professional gallery exhibition, which is one half of the degree requirement for the M.F.A. concentration in Critical and Curatorial Studies. Must be taken under direction of Committee Chair.

**ART 280. Contemporary Exhibition Systems. 4 Units.**

Investigates contemporary case studies of curatorial practice. Sometimes taught in collaboration with a host institution. The history, theory and criticism or curatorial practice are tested through the explication of real exhibitions.

Prerequisite: ART 280A

Repeatability: May be taken for credit 4 times.

**ART 280A. Introduction to Exhibition Systems. 4 Units.**

Introduces the basics of curating, covering the fundamentals of collection, research, fundraising, publicity, and installation. Also introduces the related categories of public programming and art criticism.

Restriction: M.F.A. students only.

**ART 399. University Teaching. 4 Units.**

Limited to Teaching Associates working under the active guidance and supervision of a regular rank faculty member responsible for curriculum and instruction at the University.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit for 12 units.

Restriction: Graduate students only.

## Dance Courses

### **DANCE 2. Dance Health and Injury Prevention. 4 Units.**

An overview of factors that affect the health of dancers. Includes evaluation of general health measures and prevention and management of common dance injuries.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

### **DANCE 3. Scientific Concepts of Health. 4 Units.**

Introduction to the scientific foundations of health, emphasizing those pertaining to success in college and lifetime wellness. Includes principles of cardiorespiratory, musculoskeletal, flexibility, and nutritional fitness. A variety of learning experiences are offered to apply science to real life.

## **(II)**

### **DANCE 14. Social Dance. 2 Units.**

Contemporary and historical forms. Current ballroom, disco, and Western square dance forms; Latin ballroom dances; dances from the 20s, 30s, and 40s.

Grading Option: Pass/no pass only.

### **DANCE 21A. Music for Dancers. 4 Units.**

Emphasis on the development of musical skills most pertinent to the dancer: vocabulary, notational literacy, rhythmic and melodic acuity, score reading, and fundamental analysis; working with live accompaniment.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

### **DANCE 30A. Studio Workshop in Ballet I. 2 Units.**

Beginning ballet: fundamentals and principles of classical ballet with an emphasis on technique.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

### **DANCE 30B. Studio Workshop in Ballet I. 2 Units.**

Beginning ballet: fundamentals and principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 30A

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

### **DANCE 30C. Studio Workshop in Ballet I. 2 Units.**

Beginning ballet: fundamentals and principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 30A and DANCE 30B

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

### **DANCE 34. Men's Studio Workshop in Ballet. 2 Units.**

Emphasis on men's traditional ballet, techniques, and movements.

Prerequisite: DANCE 30A and DANCE 30B and DANCE 30C

Repeatability: May be repeated for credit unlimited times.

### **DANCE 40A. Studio Workshop in Modern I. 2 Units.**

Fundamentals of modern dance: principles of modern tradition developed from Graham, Humphrey, and Wigman.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.



**DANCE 40B. Studio Workshop in Modern I. 2 Units.**

Fundamentals of modern dance: principles of modern tradition developed from Graham, Humphrey, and Wigman.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**DANCE 40C. Studio Workshop in Modern I. 2 Units.**

Fundamentals of modern dance: principles of modern tradition developed from Graham, Humphrey, and Wigman.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**DANCE 50A. Studio Workshop on Jazz I. 2 Units.**

Fundamentals of jazz: principles of jazz dance and contemporary forms incorporating the personal point of view of the instructor.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**DANCE 50B. Studio Workshop on Jazz I. 2 Units.**

Fundamentals of jazz: principles of jazz dance and contemporary forms incorporating the personal point of view of the instructor.

Prerequisite: DANCE 50A

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**DANCE 50C. Studio Workshop on Jazz I. 2 Units.**

Fundamentals of jazz: principles of jazz dance and contemporary forms incorporating the personal point of view of the instructor.

Prerequisite: DANCE 50B

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**DANCE 52A. Workshop in Tap I. 2 Units.**

Beginning tap: principles of rhythm and basic tap steps.

Repeatability: May be taken for credit 2 times.

**DANCE 52B. Workshop in Tap I. 2 Units.**

Beginning tap: principles of rhythm and basic tap steps.

Prerequisite: DANCE 52A

Repeatability: May be taken for credit 2 times.

**DANCE 52C. Workshop in Tap I. 2 Units.**

Beginning tap: principles of rhythm and basic tap steps.

Prerequisite: DANCE 52B

Repeatability: May be taken for credit 2 times.

**DANCE 60A. Choreography. 4 Units.**

Beginning-to-intermediate study of principles of dance composition. May include composition assignments for stage and video. By audition, works may be shown quarterly in public studio performances.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 60B. Choreography. 4 Units.**

Beginning-to-intermediate study of principles of dance composition. May include composition assignments for stage and video. By audition, works may be shown quarterly in public studio performances.

Prerequisite: DANCE 60A

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 60C. Choreography. 4 Units.**

Beginning-to-intermediate study of principles of dance composition. May include composition assignments for stage and video. By audition, works may be shown quarterly in public studio performances.

Prerequisite: DANCE 60A and DANCE 60B

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 80. Introduction to Ballet and Modern Dance. 4 Units.**

Survey of nineteenth and twentieth-century ballet, modern dance, and theatre dance.

Overlaps with DANCE 90B, DANCE 90C, DANCE 90A.

Restriction: Non-major only.

**(IV, VIII)**

**DANCE 81. American Ballet and Modern Dance since 1900. 4 Units.**

A survey of American ballet and modern dance in the twentieth and twenty-first centuries. Lectures are supplemented by video.

Overlaps with DANCE 90C.

Restriction: Non-major only. Dance 81 and Dance 90C may not both be taken for credit.

**(IV)**

**DANCE 82. Topics in World Dance. 4 Units.**

Various topics in world dance studies focusing on historical, social, and cultural contexts.

Repeatability: May be repeated for credit unlimited times.

**(VIII)**

**DANCE 83. Dance in Feature Film. 4 Units.**

Dance in film musicals and commercial dance films, concentrating especially on films from the 1930s through the 1970s.

**(IV)**

**DANCE 85. What Dance Does: From Ballet to Hip-Hop. 4 Units.**

Explores the way dance reflects culture and embodies new ideas. Examples for viewing and analysis come from ballet (with roots in Europe) and hip-hop (with roots in the African diaspora). Themes include gender, perceived racial difference, identity.

**(IV)**

**DANCE 90A. Dance History I. 4 Units.**

Global perspectives. Topics and histories of dance and movement practices from various parts of the world.

Overlaps with DANCE 80.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**(IV and VIII ).**

**DANCE 90B. Dance History II. 4 Units.**

The history of dance in the western tradition from the Renaissance through the 19th century.

Prerequisite: DANCE 90A

Overlaps with DANCE 80.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

(IV and VIII ).

**DANCE 90C. Dance History III. 4 Units.**

The history of dance in the western tradition in the the 20th and 21st centuries.

Prerequisite: DANCE 90B

Overlaps with DANCE 80, DANCE 81.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

(IV ).

**DANCE 100. Kinesiology for Dance. 4 Units.**

The study of the production of dance movement by the musculoskeletal system. Anatomical and dynamic analysis of dance movement.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 103. Pilates. 2 Units.**

Basics of technique emphasizing alignment, breath control, correction of muscular imbalances.

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 104. Pilates Reformer. 2 Units.**

Utilizes the Universal Reformer apparatus, aiding the student in core stabilization, correcting muscular imbalances, increasing flexibility, and improving strength.

Prerequisite: DANCE 103

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 110. World Dance . 2 Units.**

Studio workshop of dances and movement sources of specified countries or areas.

Repeatability: May be taken for credit 6 times as topics vary.

**DANCE 125A. Teaching of Dance. 4 Units.**

Pedagogy. The methods and theory of teaching dance forms.

Prerequisite: DANCE 133A and DANCE 133B and DANCE 133C and DANCE 143A and DANCE 143B and DANCE 143C

Restriction: Upper-division students only. Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 127A. Costume Design for Dance. 4 Units.**

Costume design and construction specific to the body in motion. Theoretical study and practical execution.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 130A. Pointe Class. 2 Units.**

Beginning and intermediate pointe work; principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 132A and DANCE 132B and DANCE 132C

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 132A. Studio Workshop in Ballet II. 2 Units.**

Intermediate ballet and beginning pointe work; principles of classical ballet with an emphasis on technique.

Prerequisite: (DANCE 30A and DANCE 30B and DANCE 30C) or audition. Prerequisites are for non-Dance majors only.

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 132B. Studio Workshop in Ballet II. 2 Units.**

Intermediate ballet and beginning pointe work; principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 132A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 132C. Studio Workshop in Ballet II. 2 Units.**

Intermediate ballet and beginning pointe work; principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 132A and DANCE 132B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 133A. Advanced Studio Workshop in Ballet III. 2 Units.**

Advanced intermediate ballet and pointe work; principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 132C. DANCE 132C with a grade of B+ or better. Placement by audition is also accepted.

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 133B. Advanced Studio Workshop in Ballet III. 2 Units.**

Advanced intermediate ballet and pointe work; principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 133A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 133C. Advanced Studio Workshop in Ballet III. 2 Units.**

Advanced intermediate ballet and pointe work; principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 133A and DANCE 133B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 134A. Advanced Studio Workshop in Ballet IV. 4 Units.**

Advanced ballet, pointe work, and performance styles: principles of classical ballet.

Prerequisite: DANCE 133A and DANCE 133B and DANCE 133C. DANCE 133C with a grade of B+ or better. Placement by audition is also accepted.

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 134B. Advanced Studio Workshop in Ballet IV. 4 Units.**

Advanced ballet, pointe work, and performance styles: principles of classical ballet.

Prerequisite: DANCE 134A

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 134C. Advanced Studio Workshop in Ballet IV. 4 Units.**

Advanced ballet, pointe work, and performance styles: principles of classical ballet.

Prerequisite: DANCE 134A and DANCE 134B

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 135A. Advanced Studio Workshop in Ballet V. 4 Units.**

Advanced ballet, pointe work, and performance styles: principles of classical ballet.

Prerequisite: DANCE 134A and DANCE 134B and DANCE 134C. DANCE 134C with a grade of B+ or better. Placement by audition is also accepted.

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 135B. Advanced Studio Workshop in Ballet V. 4 Units.**

Advanced ballet, pointe work, and performance styles: principles of classical ballet.

Prerequisite: DANCE 135A

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 135C. Advanced Studio Workshop in Ballet V. 4 Units.**

Advanced ballet, pointe work, and performance styles: principles of classical ballet.

Prerequisite: DANCE 135A and DANCE 135B

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 137. Repertory . 2 Units.**

Rehearsal and performance of repertoire from established ballet, modern, or jazz choreographers.

Prerequisite: (DANCE 133A and DANCE 133B and DANCE 133C) or (DANCE 143A and DANCE 143B and DANCE 143C)

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 139. Partnering. 2 Units.**

Principles of partnering techniques in various dance performance styles.

Prerequisite: DANCE 133A and DANCE 133B and DANCE 133C and DANCE 143A and DANCE 143B and DANCE 143C

Repeatability: May be taken for credit 4 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 142A. Studio Workshop in Modern II. 2 Units.**

Introduction to the principles of motion, including the use of breath, gravity, spatial awareness, and time values.

Prerequisite: DANCE 40A and DANCE 40B and DANCE 40C. Prerequisites are for non-Dance majors only.

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 142B. Studio Workshop in Modern II. 2 Units.**

Introduction to the principles of motion, including the use of breath, gravity, spatial awareness, and time values.

Prerequisite: DANCE 142A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 142C. Studio Workshop in Modern II. 2 Units.**

Introduction to the principles of motion, including the use of breath, gravity, spatial awareness, and time values.

Prerequisite: DANCE 142A and DANCE 142B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 143A. Advanced Studio Workshop in Modern III. 2 Units.**

Builds on fundamentals of Dance 142A-B-C and introduces performance techniques.

Prerequisite: DANCE 142C. DANCE 142C with a grade of B+ or better

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 143B. Advanced Studio Workshop in Modern III. 2 Units.**

Builds on the fundamentals of DANCE 142A-DANCE 142B-DANCE 142C and introduces performance techniques.

Prerequisite: DANCE 143A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 143C. Advanced Studio Workshop in Modern III. 2 Units.**

Builds on fundamentals of DANCE 142A-DANCE 142B-DANCE 142C and introduces performance techniques.

Prerequisite: DANCE 143A and DANCE 143B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 144A. Advanced Studio Workshop in Modern IV. 2 Units.**

Synthesis of fundamentals and performance technique. Aims to bring students to the preprofessional level.

Prerequisite: DANCE 143C. DANCE 143C with a grade of B+ or better

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 144B. Advanced Studio Workshop in Modern IV. 2 Units.**

Synthesis of fundamentals and performance technique. Aims to bring students to the preprofessional level.

Prerequisite: DANCE 144A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 144C. Advanced Studio Workshop in Modern IV. 2 Units.**

Synthesis of fundamentals and performance technique. Aims to bring students to the preprofessional level.

Prerequisite: DANCE 144A and DANCE 144B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 152A. Intermediate Studio Workshop in Jazz II. 2 Units.**

Intermediate jazz: principles of jazz dance and contemporary forms incorporating the personal views of the instructor.

Prerequisite: Prerequisites for non-Dance majors: DANCE 50A and DANCE 50B and DANCE 50C.

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 152B. Intermediate Studio Workshop in Jazz II. 2 Units.**

Intermediate jazz: principles of jazz dance and contemporary forms incorporating the personal views of the instructor.

Prerequisite: DANCE 152A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 152C. Intermediate Studio Workshop in Jazz II. 2 Units.**

Intermediate jazz: principles of jazz dance and contemporary forms incorporating the personal views of the instructor.

Prerequisite: DANCE 152A and DANCE 152B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 153A. Advanced Studio Workshop in Jazz III. 2 Units.**

Advanced jazz: principles of jazz dance and contemporary forms incorporating the personal views of the instructor.

Prerequisite: DANCE 152C. DANCE 152C with a grade of B+ or better

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 153B. Advanced Studio Workshop in Jazz III. 2 Units.**

Advanced jazz: principles of jazz dance and contemporary forms incorporating the personal views of the instructor.

Prerequisite: DANCE 153A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 153C. Advanced Studio Workshop in Jazz III. 2 Units.**

Advanced jazz: principles of jazz dance and contemporary forms incorporating the personal views of the instructor.

Prerequisite: DANCE 153A and DANCE 153B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 154A. Advanced Jazz: Performance Techniques IV. 2 Units.**

Advanced jazz emphasizing performance techniques.

Prerequisite: DANCE 153C. DANCE 153C with a grade of B+ or better

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 154B. Advanced Jazz: Performance Techniques IV. 2 Units.**

Advanced jazz emphasizing performance techniques.

Prerequisite: DANCE 154A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 154C. Advanced Jazz: Performance Techniques IV. 2 Units.**

Advanced jazz emphasizing performance techniques.

Prerequisite: DANCE 154A and DANCE 154B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only.

**DANCE 160. Improvisation. 2 Units.**

Structured and experiential improvisation to heighten the personal intuitive processes, the kinesthetic sense, spatial and temporal awareness, and to encourage insights into the potential movement resources of the individual for performance and choreography. Course encourages freedom of exploration.

Repeatability: May be taken for credit 2 times.

**DANCE 162A. Choreography II. 4 Units.**

Directed choreographic projects for stage or video integrating the elements of stagecraft. In process or completed works may be shown quarterly in public studio or stage performances.

Prerequisite: DANCE 60A and DANCE 60B and DANCE 60C. Audition required.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 162B. Choreography II. 4 Units.**

Directed choreographic projects for stage or video integrating the elements of stagecraft. In process or completed works may be shown quarterly in public studio or stage performances.

Prerequisite: DANCE 162A. Audition required.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 162C. Choreography II. 4 Units.**

Directed choreographic projects for stage or video integrating the elements of stagecraft. In process or completed works may be shown quarterly in public studio or stage performances.

Prerequisite: DANCE 162A and DANCE 162B. Audition required.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.



**DANCE 163. Dance and Video Technology. 4 Units.**

Introduction to video and audio documentation of dance performance. Integrating dance performance within the film aesthetic. Techniques and technologies of video cameras, formats, editing, and projection. Overview of video compression and DVD authoring.

Prerequisite: DANCE 60A

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 164. Screendance. 4 Units.**

Overview of dance for film and choreography for the camera. Aesthetics of creating dance for the screen. Approaches for delivery of dance films to an audience, including projection, DVD, Web, and mobile devices. A final dance film project is required.

Prerequisite: DANCE 163

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 165. Choreographic Projects. 1-4 Units.**

Supervised choreographic projects for workshop productions.

Prerequisite: Audition required.

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 170. Dance Performance. 1-4 Units.**

Rehearsal and performance in a faculty-choreographed production.

Prerequisite: Audition required.

Repeatability: May be repeated for credit unlimited times.

**DANCE 171. Dance Workshop. 1-4 Units.**

Rehearsal and performance in a student-choreographed production.

Prerequisite: Audition required.

Repeatability: May be repeated for credit unlimited times.

**DANCE 172. Master of Fine Arts Concert. 1-4 Units.**

Rehearsal and performance in a graduate student-choreographed production.

Prerequisite: Audition required.

Repeatability: May be repeated for credit unlimited times.

**DANCE 174. UCI Dance Ensemble Performance. 1-4 Units.**

Performance with the UCI Dance Ensemble.

Repeatability: May be taken for credit 6 times.

Restriction: Sophomores only. Upper-division students only.

**DANCE 176. UCI Jazz Dance Ensemble. 2-4 Units.**

Rehearsal and performance in theatrical jazz dance, designed to provide an experience in assimilating various styles of jazz dance and in refining dance performance techniques. Students will master aspects of dance company promotion.

Prerequisite: DANCE 152A and DANCE 152B and DANCE 152C

Repeatability: May be taken for credit 6 times.

Restriction: Sophomores only. Upper-division students only.

**DANCE 178. Performance Laboratory. 2 Units.**

Rehearsal and performance of graduate student-choreographed dance works for the M.F.A. thesis.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**DANCE 179. UCI Etude Ensemble. 4 Units.**

Repertory and performances by undergraduate Dance majors. Concert presentations on and off campus. Faculty directed, student/faculty choreographed.

Prerequisite: Audition required.

Repeatability: May be taken for credit 9 times.

Restriction: Sophomores only. Upper-division students only.

**DANCE 180C. Laban Studies. 4 Units.**

Laban movement analysis.

Prerequisite: DANCE 21A

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 185W. Critical Issues in Dance. 4 Units.**

Critical thinking and writing about dance, with a section on dance criticism and a major emphasis on persuasive writing about significant issues in the dance world.

Prerequisite: DANCE 90A and DANCE 90B and DANCE 90C. Satisfactory completion of the lower-division writing requirement.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**(Ib)****DANCE 193. Selected Topics in Dance. 1-4 Units.**

Directed group studies of topics in dance.

Repeatability: May be taken for credit 3 times as topics vary.

**DANCE 194. Topics Vary. 4 Units.**

Seminar in Dance Studies. Variable topics related to gender, race, politics, and dance writing, and criticism, with attention to linking dance practices to the wider world.

Prerequisite: DANCE 90A and DANCE 90B and DANCE 90C

Repeatability: Unlimited as topics vary.

**DANCE 195. Arts Management. 4 Units.**

Designed for students interested in the developmental and management of nonprofit arts organizations. Examines the organizational structure and areas of operation such as marketing, fundraising, budgeting, production, and administration.

Repeatability: May be taken for credit 2 times.

**DANCE 197. Independent Study. 1-4 Units.**

Individual independent projects in experimental laboratory, library, field, performance, under instructor's direction. Students can receive conceptual, creative, and theoretical instruction in the successful completion of a written report or performance.

Repeatability: May be repeated for credit unlimited times.

**DANCE 199. Senior Thesis. 4 Units.**

Directed research or creative activity for senior Dance majors. Research consists of a substantial essay on dance history, research in dance science, or the creation of original or reconstructed choreography.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 201. Seminar in Kinesiology for Dance. 4 Units.**

Introduction to the anatomical, biomechanical, and physiological principles of dance movement.

Prerequisite: DANCE 100

**DANCE 222. Musical Resources. 4 Units.**

Detailed study of music as it relates to dance. Historical overview of musical form, style, and other elements. Analysis of various affinities between music and dance. Practical applications.

**DANCE 225. Seminar in the Teaching of Dance Techniques. 4 Units.**

Principles and theories of teaching dance techniques. Supervised presentation and teaching of technique class.

**DANCE 231A. Graduate Studio: Ballet. 2 Units.**

Advanced ballet, pointe work, and performance style: principles of the classical ballet with an emphasis on technique.

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 231B. Graduate Studio: Ballet. 2 Units.**

Advanced ballet, pointe work, and performance style: principles of the classical ballet with an emphasis on technique.

Prerequisite: DANCE 231A

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 231C. Graduate Studio: Ballet. 2 Units.**

Advanced ballet, pointe work, and performance style: principles of the classical ballet with an emphasis on technique.

Prerequisite: DANCE 231B

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 241A. Graduate Studio: Modern. 2 Units.**

Advanced modern dance: synthesis of fundamentals and performance technique. Aims to bring students to the preprofessional level.

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 241B. Graduate Studio: Modern. 2 Units.**

Advanced modern dance: synthesis of fundamentals and performance technique. Aims to bring students to the preprofessional level.

Prerequisite: DANCE 241A

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 241C. Graduate Studio: Modern. 2 Units.**

Advanced modern dance: synthesis of fundamentals and performance technique. Aims to bring students to the preprofessional level.

Prerequisite: DANCE 241B

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 251A. Graduate Studio: Jazz. 2 Units.**

Principles of jazz dance and contemporary forms, incorporating the personal views of the instructor.

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 251B. Graduate Studio: Jazz. 2 Units.**

Principles of jazz dance and contemporary forms, incorporating the personal views of the instructor.

Prerequisite: DANCE 251A

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 251C. Graduate Studio: Jazz. 2 Units.**

Principles of jazz dance and contemporary forms, incorporating the personal views of the instructor.

Prerequisite: DANCE 251B

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 252A. Graduate Studio: Tap. 2 Units.**

An overview of tap concentrating on the development of various technique forms using basic and intermediate principles.

Repeatability: May be taken for credit 4 times.

**DANCE 252B. Graduate Studio: Tap. 2 Units.**

An overview of tap concentrating on the development of various technique forms using basic and intermediate principles.

Prerequisite: DANCE 252A

Repeatability: May be taken for credit 4 times.

**DANCE 252C. Graduate Studio: Tap. 2 Units.**

An overview of tap concentrating on the development of various technique forms using basic and intermediate principles.

Prerequisite: DANCE 252B

Repeatability: May be taken for credit 4 times.

**DANCE 261A. Graduate Studio in Choreography. 4 Units.**

Graduate work in dance composition emphasizing the individual aesthetic. Assignments in movement discovery, solo and group forms, with the main emphasis on independent work.

Repeatability: May be repeated for credit unlimited times.

**DANCE 261B. Graduate Studio in Choreography. 4 Units.**

Graduate work in dance composition emphasizing the individual aesthetic. Assignments in movement discovery, solo and group forms, with the main emphasis on independent work.

Prerequisite: DANCE 261A

Repeatability: May be repeated for credit unlimited times.

**DANCE 264. Screendance. 4 Units.**

Overview of dance for film and choreography for the camera. Aesthetics of creating dance for the screen. Approaches for delivery of dance films to an audience, including projection, DVD, Web, and mobile devices. A final dance film project is required.

Prerequisite: DANCE 281

**DANCE 281. Dance and Video Technology. 4 Units.**

Introduction to video and audio documentation of dance performance. Integrating dance performance within the film aesthetic. Techniques and technologies of video cameras, formats, editing, and projection. Overview of video compression and DVD authoring.

**DANCE 282. Seminar in Movement Analysis. 4 Units.**

Theories of movement analysis and nonverbal communication applied to dance.

**DANCE 283. Critical Issues in Dance. 4 Units.**

Reading, writing, discussing, and presenting key issues that relate to dance studies. Basics of dance analysis and criticism. Special emphasis on effective ways of defining, clarifying, and arguing for points of view.

Prerequisite: DANCE 284

**DANCE 284. Bibliography and Research. 4 Units.**

Understanding the field of dance studies, available resources, research methods, and academic formats in preparation for thesis writing.

**DANCE 285. Graduate Projects. 4 Units.**

Projects may be educational, choreographic, scientific, historical, or philosophical in scope and must have faculty advisor approval.

Repeatability: May be taken for credit 6 times.

**DANCE 286. Thesis. 4 Units.**

Substantial research in a topic approved by the student's graduate committee. Results of the research must be written in approved thesis style.

Repeatability: May be taken for credit 6 times.

**DANCE 287. Graduate Lectures in Dance. 1-4 Units.**

A series of lectures and discussions of announced topics in dance. Content may be from history, ethnology, notation, medicine, music, or other areas in the field.

Repeatability: Unlimited as topics vary.

**DANCE 296. Proseminar in Dance History. 4 Units.**

Discussion seminar with emphasis on reading and thinking about problems in dance history; presentation of oral and written reports.

Repeatability: May be taken for credit 2 times as topics vary.

**DANCE 297. Directed Reading. 1-4 Units.**

Topic to be approved by instructor. Paper required.

Repeatability: May be repeated for credit unlimited times.

**DANCE 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Dance Majors only.

## Drama Courses

**DRAMA 10. Introduction to Theatre. 4 Units.**

An interactive introduction to the world of theatre that serves to develop an appreciation of theatrical arts, to establish an awareness of landmarks within the performance history, and to create an understanding of the collaborative roles and departments that exist.

(IV)

**DRAMA 11. The Rock and Roll Spectacle Show. 4 Units.**

A thorough overview to the development and cultural significance of the Rock 'n' Roll Spectacle show. Focus on historical and recent developments of the spectacle show, trends in the aesthetics of the field, and various sub-genres.

(IV)

**DRAMA 14. Performing Rock 'N' Roll. 4 Units.**

Explores major movements in the history of rock 'n' roll in terms of performance, not virtuosity necessarily of the performers as musicians, rather as performances of aesthetics in modes of embodied ideology, iconoclastic spectacle, mixed media fashion, and subcultural formation.

**DRAMA 15. Performance Now. 4 Units.**

Exposes students to what is most current in the world of performance and theatre. Begins with a series of lectures on the idea of performance, and the various theories that frame it.

Restriction: Music Theatre Majors have first consideration for enrollment. Drama Majors have first consideration for enrollment.

(IV)

**DRAMA 16. Performing Culture. 4 Units.**

Culture, aesthetics, and ideology (combined in the concept 'subculture') work to fashion social identities. Using theories and methodologies of performance studies, with an emphasis on American culture, this course explores why and how culture is reinforced through performance.

(IV)

**DRAMA 20A. Culture in Performance. 4 Units.**

A three-quarter foundation series exploring the rich depth of theatre, drama, and other genres of performance across a wide variety of worldwide forms, for performer and audience.

(IV)

**DRAMA 20B. Culture in Performance. 4 Units.**

A three-quarter foundation series exploring the rich depth of theatre, drama, and other genres of performance across a wide variety of worldwide forms, for performer and audience.

(IV)

**DRAMA 20C. Culture in Performance. 4 Units.**

A three-quarter foundation series exploring the rich depth of theatre, drama, and other genres of performance across a wide variety of worldwide forms, for performer and audience.

(IV)

**DRAMA 30A. Acting. 4 Units.**

Focuses on Stanislavski-based terminology and technique through theatre exercises and improvisation. The first part of a one-year series in basic acting technique and discipline.

Repeatability: May be taken for credit 2 times.

Restriction: Music Theatre Majors have first consideration for enrollment. Drama Majors have first consideration for enrollment.

**DRAMA 30B. Acting. 4 Units.**

Focuses on scene work and character development. The second part of a one-year series in basic acting technique and discipline.

Prerequisite: DRAMA 30A

Repeatability: May be taken for credit 2 times.

Restriction: Music Theatre Majors have first consideration for enrollment. Drama Majors have first consideration for enrollment.

**DRAMA 30C. Acting. 4 Units.**

Focuses on monologues, auditions, callbacks, and the profession of acting. The third part of a one-year series in basic acting technique and discipline.

Prerequisite: DRAMA 30A and DRAMA 30B

Repeatability: May be taken for credit 2 times.

Restriction: Music Theatre Majors have first consideration for enrollment. Drama Majors have first consideration for enrollment.

**DRAMA 34. Movement for Actors. 4 Units.**

A studio course in fundamentals of stretch, strength, and alignment; exploring spatial awareness and physical control through mime isolations, techniques, and related improvisation.

Repeatability: May be taken for credit 3 times.

**DRAMA 35. Speech for the Theatre. 4 Units.**

An introductory course in voice and speech for actors, combining the body-based approach to voice developed by Fitzmaurice, and speech work of Knight and Thompson. Designed for the needs of actors and is not a public speaking course.

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 40A. Development of Drama. 4 Units.**

The development of Western Drama, concentrating on the drama's intellectual, social, and artistic foundations. About 10 plays and supplementary critical material are read each quarter. Greek Drama through Shakespeare.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors have first consideration for enrollment. Drama Majors have first consideration for enrollment.

(IV and VIII ).

**DRAMA 40B. Development of Drama. 4 Units.**

The development of Western Drama, concentrating on the drama's intellectual, social, and artistic foundations. About 10 plays and supplementary critical material are read each quarter. Restoration Drama through Ibsen.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors have first consideration for enrollment. Drama Majors have first consideration for enrollment.

(IV and VIII ).

**DRAMA 40C. Development of Drama. 4 Units.**

The development of Western Drama, concentrating on the drama's intellectual, social, and artistic foundations. About 10 plays and supplementary material are read each quarter. Contemporary Drama. Post Naturalistic theatre.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors have first consideration for enrollment. Drama Majors have first consideration for enrollment.

(IV and VIII ).

**DRAMA 50A. Introduction to Costume Design. 4 Units.**

Introduction to the process and procedures employed by the costume designer for the theatre. The elements of design are discussed in the context of character development, historical period, and style. Exercises extend to drawing, rendering, and investigation of human proportions.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 50B. Introduction to Scenic Design. 4 Units.**

Introduction to the principles and practice of scenic design. Weekly problems include research into various periods and styles of production with an emphasis on the conceptual idea. Perspective drawing, rendering, and model building are covered in studio exercises and assignments.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 50C. Introduction to Lighting Design. 4 Units.**

Introduction to the principles, theories, and equipment employed by the lighting designer for the stage. Areas of investigation include history, technology, and script analysis. Detailed studio attention is given to the theory and practice of design.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 50D. Introduction to Sound Design. 4 Units.**

Principles, theories, equipment use, and terminology employed by the sound designer for the stage. Areas of study include history, technology, and script analysis. Focuses on the theory and practice of design.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 50E. Introduction to Stage Management. 4 Units.**

A basic study of theatrical, dance, and opera stage management practices, forms, and methods, from first script reading to closing night. Opportunity to observe professionals at work in regional and touring situations as available.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 60. Topics in Advanced Stage Management. 4 Units.**

Nurtures a greater appreciation for the stage manager and his or her process, and supports students who are interested in pursuing a career in professional stage management.

Repeatability: May be taken for credit 3 times as topics vary.

**DRAMA 65. Music Theatre Workshop I. 2 Units.**

Basic vocal technique and characterization of musical theatre repertoire explored.

Prerequisite: Audition required.

Repeatability: May be taken for credit 2 times.

**DRAMA 80. Directing I . 4 Units.**

Introduction to comprehensive directing process from pre-production to opening. Focus on fundamental skills: analysis, staging, action, actor coaching, and elements of design. Skills applied to scripted theatrical material. Develop a language for commenting on theatrical production. Attending and critiquing productions.

Prerequisite: DRAMA 30A and DRAMA 30B

**DRAMA 100. University Theatre . 4 Units.**

Rehearsal and performance in a faculty-directed.

Prerequisite: Audition required.

Repeatability: May be repeated for credit unlimited times.

**DRAMA 101A. Theatre Production: Costume. 1-6 Units.**

The production courses are offered to give students the opportunity to participate in departmental productions. Students engage in the production and construction of designed work as well as its applied execution during performance.

Repeatability: May be taken for credit for 24 units.

Restriction: May be taken for credit for a maximum of 24 units provided productions change.

**DRAMA 101B. Theatre Production: Scenic. 1-6 Units.**

The production courses are offered to give students the opportunity to participate in departmental productions. Students engage in the production and construction of designed work as well as its applied execution during performance.

Repeatability: May be taken for credit for 24 units.

Restriction: May be taken for credit for a maximum of 24 units provided productions change.

**DRAMA 101C. Theatre Production: Lighting. 1-6 Units.**

The production courses are offered to give students the opportunity to participate in departmental productions. Students engage in the production and construction of designed work as well as its applied execution during performance.

Repeatability: May be taken for credit for 24 units.

Restriction: May be taken for credit for a maximum of 24 units provided productions change.



**DRAMA 101D. Theatre Production: Stage Management. 1-8 Units.**

The production courses are offered to give students the opportunity to participate in departmental productions. Students engage in the production and construction of designed work as well as its applied execution during performance.

Repeatability: May be taken for credit 24 times.

Restriction: May be taken for credit for a maximum of 24 units provided productions change.

**DRAMA 101E. Theatre Production: Audio. 1-6 Units.**

The production courses are offered to give students the opportunity to participate in departmental productions. Students engage in the production and construction of designed work as well as its applied execution during performance.

Repeatability: May be taken for credit for 24 units.

Restriction: May be taken for credit for a maximum of 24 units provided productions change.

**DRAMA 101S. Theatre Production: Theatre Management. 1-6 Units.**

The production courses are offered to give students the opportunity to participate in departmental productions. Students engage in the production and construction of designed work as well as its applied execution during performance.

Repeatability: May be taken for credit for 24 units.

Restriction: May be taken for credit for a maximum of 24 units provided productions change.

**DRAMA 103. Lectures in Dramatic Literature. 4 Units.**

Courses include Medieval and Tudor Drama, Elizabethan and Jacobean Drama, Shakespeare, Restoration and Eighteenth Century Drama, Modern British Drama, Modern American Drama, Tragedy, and Comedy.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 103W. Lectures in Dramatic Literature. 4 Units.**

Courses include Medieval and Tudor Drama, Elizabethan and Jacobean Drama, Shakespeare, Restoration and Eighteenth-Century Drama, Modern British Drama, Modern American Drama, Tragedy, and Comedy.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 109. Special Topics in Theory and Criticism. 4 Units.**

Discussion of recent major trends and ideas in critical theory, concentrating on in-depth readings and lectures in particular facets of theory and criticism: Derrida, Butler, Lacan, Deleuze, and others.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 109W. Special Topics in Theory and Criticism. 4 Units.**

Discussion of recent major trends and ideas in critical theory, concentrating on in-depth readings and lectures in particular facets of theory and criticism: Derrida, Butler, Lacan, Deleuze, and others.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**(Ib)**

**DRAMA 110. Special Topics in Classical Dramas . 4 Units.**

Designed to introduce students to various classical traditions-early Greek and Roman theatres, to be sure, but also, by way of comparison, the classical traditions of non-European cultures.

Prerequisite: DRAMA 40A and DRAMA 40B and DRAMA 40C. Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 110W. Special Topics in Classical Dramas. 4 Units.**

Designed to introduce students to various classical traditions-early Greek and Roman theatres, to be sure, but also, by way of comparison, the classical traditions of non-European cultures.

Prerequisite: DRAMA 40A or DRAMA 40B or DRAMA 40C. Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**(Ib)****DRAMA 112. Special Topics in Early Modern and Neoclassical Theatre. 4 Units.**

Investigates aspects of European theatre and culture in the sixteenth, seventeenth, and eighteenth centuries; individual courses may focus on specific topics within this broad expanse.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 112W. Special Topics in Early Modern and Neoclassical Theatre. 4 Units.**

Investigates aspects of European theatre and culture in the sixteenth, seventeenth, and eighteenth centuries; individual courses may focus on specific topics within this broad expanse.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**(Ib)****DRAMA 116. Special Topics in Nineteenth-Century Dramas. 4 Units.**

Looks at the various trends and conventions of theatres in the nineteenth century, both Euro-American and beyond, paying special attention to the culture and political milieu within which these various traditions appeared.

Prerequisite: DRAMA 40A and DRAMA 40B and DRAMA 40C. Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 116W. Special Topics in Nineteenth-Century Dramas. 4 Units.**

Looks at the various trends and conventions of theatres in the nineteenth century, both Euro-American and beyond, paying special attention to the culture and political milieu within which these various traditions appeared.

Prerequisite: DRAMA 40A and DRAMA 40B and DRAMA 40C. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**(Ib)**

**DRAMA 118. Special Topics in Modern and Contemporary Drama. 4 Units.**

An investigation into the many forms and permutations of modern (1880-1945), and contemporary (since 1945) drama, paying special attention to the historical and philosophical interpretations of text and performance.

Prerequisite: DRAMA 40A and DRAMA 40B and DRAMA 40C. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 118W. Special Topics in Modern and Contemporary Drama . 4 Units.**

An investigation into the many forms and permutations of modern (1880-1945), and contemporary (since 1945) drama, paying special attention to the historical and philosophical interpretations of text and performance.

Prerequisite: DRAMA 40A and DRAMA 40B and DRAMA 40C. Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**(Ib)****DRAMA 121. Introduction to Asian Theatre. 4 Units.**

An introduction to some of the major traditional theatrical forms and dramatic texts from India, China, and Japan. Other than dramatic texts (in English translation), attention is also paid to theory, history, and performance styles of traditional Asian theatre.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 122. Asian American Theatre. 4 Units.**

An introduction to the history and development of Asian American theatre and drama. Besides play analysis, special attention is also paid to the history and politics of Asian American identity and experience, as well as to aspects of theatrical performance.

Prerequisite: DRAMA 40A and DRAMA 40B and DRAMA 40C

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 123. Multicultural Theatres. 4 Units.**

A study of the history, culture, aesthetics, and literature of various traditional performing arts and their connections to the contemporary multicultural society.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 126. African American Film and Drama. 4 Units.**

A critical investigation of films and plays written by African Americans, with emphasis on dramaturgical and cinematic strategies, individual and collective representation, and the legacy of African American political struggle.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 126W. African American Film and Drama. 4 Units.**

A critical investigation of films and plays written by African Americans, with emphasis on dramaturgical and cinematic strategies, individual and collective representation, and the legacy of African American political struggle.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Restriction: Music Theatre Majors only. Drama Majors only.

**(Ib)**

**DRAMA 129. Advanced Topics in Performance. 4 Units.**

Addresses particular issues in theatre and performance that typically lie outside of regular course offerings. May address such issues as the theatre of the Avant Garde, performing gender, transversality and performance, body art, installation and performance art, among other topics.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 129W. Advanced Topics in Performance. 4 Units.**

Addresses particular issues in theatre and performance that typically lie outside of regular course offerings. May address such issues as the theatre of the Avant Garde, performing gender, transversality and performance, body art, installation and performance art, among other topics.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**(Ib)****DRAMA 130. Intermediate Acting. 4 Units.**

Rehearsal and presentation of scenes from contemporary material. Focus on connection with scene partner, playing actions, and text analysis. Introduction to the credibility and theatricality of characterization and style.

Prerequisite: DRAMA 30A and DRAMA 30B and DRAMA 30C with an average grade of B or better. For transfer students: one year of beginning acting with an average grade of B or better.

Repeatability: May be taken for credit 2 times.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 132A. Writing for Performance. 4 Units.**

Completion of a full-length play or its equivalent; discussion of student writing and of relevant literary texts.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 134. Studio for Advanced Movement for Actors. 4 Units.**

Studio course in conditioning and partnering techniques to the practice of contact improvisation. Contact improvisation is explored and applied in scene study.

Prerequisite: DRAMA 34. DRAMA 34 with a grade of B or better

Repeatability: May be taken for credit 3 times.

**DRAMA 135. Master Classes in Acting. 1-4 Units.**

Advanced acting in specialized areas including acting for the camera: situation comedy, commercials; auditioning and industry preparation; Shakespeare; Molière; Chekov; improvisation; advanced movement and voice and speech for the actor; self-starting; stage combat; repertory acting, singing; comedy; clowning; and masks.

Prerequisite: DRAMA 130. DRAMA 130 with a grade of B or better

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 136. Music Theatre Acting. 4 Units.**

An acting class exclusive to the students in the B.F.A. in Music Theatre program.

Prerequisite: DRAMA 30A and DRAMA 30B and DRAMA 30C

Repeatability: May be taken for credit 4 times.

Restriction: Music Theatre Majors only.

**DRAMA 142. Music Theatre Workshop II. 4 Units.**

A workshop in audition technique and song interpretation.

Prerequisite: Audition required.

Repeatability: May be taken for credit 4 times.

**DRAMA 143A. Music Theatre Workshop III. 4 Units.**

Scene study and song repertoire examined by era for the advanced Music Theatre student. 1800s-1940.

Prerequisite: DRAMA 142. Audition required.

**DRAMA 143B. Music Theatre Workshop III. 4 Units.**

Scene study and song repertoire examined by era for the advanced Music Theatre student. 1940s-1970s.

Prerequisite: DRAMA 142. Audition required.

**DRAMA 143C. Music Theatre Workshop III. 4 Units.**

Scene study and song repertoire examined by era for the advanced Music Theatre student. 1970's-present.

Prerequisite: DRAMA 142. Audition required.

**DRAMA 144. Music Theatre Workshop IV. 4 Units.**

A performance class concentrating on role building. Work culminates with in-class performances of abbreviated versions of musicals.

Prerequisite: For B.F.A. students: DRAMA 143A, DRAMA 143B, DRAMA 143C, and audition. For Drama graduate students: audition required.

Repeatability: May be taken for credit 4 times.

Restriction: Graduate students only. Music Theatre Majors only. Drama Majors only.

**DRAMA 145. Music Theatre Singing. 1 Unit.**

Private weekly voice lessons for the advanced Music Theatre student.

Corequisite: DRAMA 143A

Repeatability: May be taken for credit 9 times.

Restriction: Music Theatre Majors only.

**DRAMA 146. NYSP-Preparation. 4 Units.**

Class preparation for the New York Satellite Program (NYSP) - an immersion experience in New York City for the musical theatre performer.

Prerequisite: Admission is by audition and the following prerequisites: DRAMA 30C and two quarters of DRAMA 148A, DRAMA 148B, or DRAMA 148C (if the 148 prerequisite is not complete at the time of auditions, student must enroll during the fall and winter quarters in the same year as the trip to New York); senior Drama majors must have successfully completed DRAMA 40C and DRAMA 120C; non-Drama majors must have sophomore standing or higher and must carefully plan their course schedule as many spring quarter classes cannot be taken while part of the NYSP.

Repeatability: May be taken for credit 2 times.

**DRAMA 148A. History of American Musical Theatre. 4 Units.**

A survey of the influential artists who produce, write, direct, and perform on America's musical stages. Surveys 1700s-1940s.

Restriction: Drama Majors only. Music Theatre Majors only.

Concurrent with DRAMA 248A.

**DRAMA 148B. History of American Musical Theatre. 4 Units.**

A survey of the influential artists who produce, write, direct, and perform on America's musical stages. Surveys 1940s-1970s.

Restriction: Drama Majors only. Music Theatre Majors only.

Concurrent with DRAMA 248B.

**DRAMA 148C. History of American Musical Theatre. 4 Units.**

A survey of the influential artists who produce, write, direct, and perform on America's musical stages. Surveys 1970s to present day.

Restriction: Drama Majors only. Music Theatre Majors only.

Concurrent with DRAMA 248C.

**DRAMA 149. Music Proficiency for Actors. 2 Units.**

A musicianship class introducing basic musical terminology, theory, and sight singing skills.

Repeatability: May be taken for credit 2 times.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 150. Costume Production Techniques. 4 Units.**

Studio instruction in pattern making, draping, millinery, and construction techniques.

Prerequisite: DRAMA 50A

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 157. Lighting Composition. 4 Units.**

Provides an opportunity for students to pursue stage lighting composition in a studio atmosphere. Laboratory practice includes weekly exercises in style and genre. Emphasis is placed on the realization of conceptual ideas.

Prerequisite: DRAMA 50C

Repeatability: May be repeated for credit unlimited times.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 158. Topics in Theatre Design. 4 Units.**

Examines the various functions of scenery and costume: locale, historical period, mood, and atmosphere, with special assignments in each area. Discussion of problems in scenic metaphors and visualization, emphasizing techniques of planning and presentation (e.g., floor plans, models, and rendering).

Prerequisite: DRAMA 50A or DRAMA 50B

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 159. Proseminar in Theatre Design. 4 Units.**

Topics in theatre design.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 164A. History of Costume. 4 Units.**

A study of the development of dress and the influence of cultural factors on clothing from the time of Egyptians to Early Baroque.

Prerequisite: DRAMA 50A

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 164B. History of Costume. 4 Units.**

A study of the development of dress and the influence of cultural factors on clothing from late Baroque to World War I.

Prerequisite: DRAMA 50A

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 176. Script and Score. 4 Units.**

A form and analysis seminar discussing the libretto and score of landmark musicals.

Prerequisite: Two courses from DRAMA 148A or DRAMA 148B or DRAMA 148C.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 177. Song Repertoire. 2 Units.**

A song coaching class culminating in a song recital or showcase. Each quarter will feature a different composer, lyricist, or musical style.

Repeatability: May be taken for credit 6 times.

Restriction: Music Theatre Majors only.

**DRAMA 180. Contemporary Dramatic Criticism and Theory. 4 Units.**

Reading and analysis of theories and critical approaches to contemporary theatre: Brecht, Artaud, and others who have contributed to the form and idea of the modern theatre. Writing of assigned exercises in dramatic criticism.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 180W. Contemporary Dramatic Criticism and Theory. 4 Units.**

Reading and analysis of theories and critical approaches to contemporary theatre: Brecht, Artaud, and others who have contributed to the form and idea of the modern theatre. Writing of assigned exercises in dramatic criticism.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only. Music Theatre Majors only.

**(Ib)****DRAMA 182A. Dance Technique, Level I. 4 Units.**

Advanced beginner and intermediate dance training including musical theatre, ballet, jazz and contemporary modern techniques and repertoire. Body conditioning is also a major component of the course.

Prerequisite: DRAMA 65 or DRAMA 142. Audition required.

Repeatability: May be taken for credit 4 times.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 182B. Dance Technique, Level I. 4 Units.**

Advanced beginner and intermediate dance training including musical theatre, ballet, jazz and contemporary modern techniques and repertoire. Body conditioning is also a major component of the course.

Prerequisite: (DRAMA 65 or DRAMA 142) and DRAMA 182A. Audition required.

Repeatability: May be taken for credit 4 times.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 183A. Dance Technique, Level II. 4 Units.**

Intermediate and advanced dance training including musical theatre, ballet, jazz and contemporary modern techniques and repertoire. Body conditioning is also a major component of the course.

Prerequisite: DRAMA 65 or DRAMA 142. Audition required.

Repeatability: May be taken for credit 4 times.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 183B. Dance Technique, Level II. 4 Units.**

Intermediate and advanced dance training including musical theatre, ballet, jazz and contemporary modern techniques and repertoire. Body conditioning is also a major component of the course.

Prerequisite: (DRAMA 65 or DRAMA 142) and DRAMA 183A. Audition required.

Repeatability: May be taken for credit 4 times.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 184. Directing II. 4 Units.**

The principles of stage directing, covering the director's functions in the areas of interpretation, composition, coaching, and styling a theatrical production. Directing exercises and projects; the final project is the preparation of a hypothetical proposal for a play production.

Prerequisite: DRAMA 30A and DRAMA 30B and DRAMA 40A and DRAMA 40B and DRAMA 40C and DRAMA 80

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 185. Advanced Directing. 4 Units.**

A seminar in directorial organization and research. Student prepares a textual and dramaturgical analysis, a production timetable, and a hypothetical production book of an assigned play.

Prerequisite: DRAMA 184

Repeatability: May be repeated for credit unlimited times.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 190. NYSP-Acting. 1-4 Units.**

New York Satellite Program acting classes taught by guest faculty in New York.

Prerequisite: DRAMA 146

Repeatability: May be taken for credit 2 times.

**DRAMA 191. NYSP - Dance. 4 Units.**

New York Satellite Program dance classes in ballet, tap, jazz, and musical theatre styles taught by guest faculty in New York.

Prerequisite: DRAMA 146

Repeatability: May be taken for credit 2 times.

**DRAMA 192. NYSP - Singing. 4 Units.**

New York Satellite Program private and group lessons in musical theatre singing taught by guest faculty in New York.

Prerequisite: DRAMA 146

Repeatability: May be taken for credit 2 times.

**DRAMA 193. NYSP - Performance. 4 Units.**

New York Satellite Program rehearsals and public, staged readings of original musicals in New York.

Prerequisite: DRAMA 146

Repeatability: May be taken for credit 2 times.

**DRAMA 194. NYSP-UCI Residency. 4 Units.**

New York Satellite Program follow-up classes and performances back on Irvine campus upon the return from New York.

Prerequisite: DRAMA 146

Repeatability: May be taken for credit 2 times.



**DRAMA 195. Music Theatre Dance - Special Topics. 1-4 Units.**

Advanced dance classes in specialized areas including the dance styles of a choreographer (de Mille, Fosse, Robbins, Tune, Stroman), genre (tap, ballroom, jazz, swing, hip-hop), or in musical theatre choreography.

Prerequisite: DRAMA 182A or DRAMA 182B or DRAMA 183A or DRAMA 183B. Audition required.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 198. Director Class Project. 1-8 Units.**

For students who are involved in the Director Class Projects at UCI as actors, directors, designers, stage managers and their assistants. M.F.A. Directors and the Head of Directing (HoD) supervise the projects.

Grading Option: Pass/no pass only.

Repeatability: Unlimited as topics vary.

**DRAMA H198. Honors Director Class Project. 1-4 Units.**

For graduate student actors and undergraduate directors who are candidates for Honors in Directing and involved in the Director Class Projects. The Head of Directing (HoD) supervises these students.

Repeatability: Unlimited as topics vary.

**DRAMA 199. Project in Theatre . 1-4 Units.**

Independent theatre projects with Drama faculty.

Repeatability: Unlimited as topics vary.

**DRAMA 200. Graduate Studio: Acting. 4 Units.**

Work in graduate studio taken in tandem with graduate studios in stage voice (DRAMA 201), stage speech (DRAMA 202), and stage movement (DRAMA 203).

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 201. Graduate Studio: Voice. 1 Unit.**

Graduate studio in vocal production for actors.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 202. Graduate Studio: Speech. 1 Unit.**

Graduate studio in speech for actors.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 203. Graduate Studio: Movement. 2 Units.**

Work in graduate studio: stage movement taken in tandem with nine graduate studios in acting (DRAMA 200), voice (DRAMA 201), speech (DRAMA 202), and voice/movement dynamics (DRAMA 206).

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 206. Graduate Studio: Voice/Movement Dynamics. 2 Units.**

Daily conditioning exercises.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 211. Graduate Studio: Directing. 4 Units.**

Graduate studio in directing.

Repeatability: Unlimited as topics vary.

Restriction: Drama graduate students only.

**DRAMA 219. Graduate Master Class. 1-4 Units.**

Various topics such as Shakespeare, comedy, Molière, improvisation, Kabuki, television acting.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 220. Seminar in Dramatic Literature. 4 Units.**

Topics in Dramatic Literature.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 225. Seminar on Theatre Pedagogy. 4 Units.**

A seminar on the major teaching systems in the dramatic arts with particular attention to professional arts training. Required prior to applying for Teaching Assistantships in studio areas.

Restriction: Drama graduate students only.

**DRAMA 240. Graduate Projects . 1-4 Units.**

Various projects depending on student's concentration (acting, design, musical theatre, directing).

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Drama and Theatre Majors only. Drama Majors only.

**DRAMA 241. Singing Pedagogy . 2 Units.**

Learning how to teach voice lessons and coach musical theatre singing. Experiences include both private voice lessons and observing the lessons given to the B.F.A./Music Theatre students.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate Music Direction students only.

**DRAMA 242. Conducting . 2 Units.**

Private conducting instruction to develop freedom of movement/expression, baton technique, ear training, and tempo memory for both rehearsal and performance situations in musical theatre.

Repeatability: May be taken for credit 9 times.

Restriction: Graduate Music Directors only.

**DRAMA 243. Script and Score . 4 Units.**

A form and analysis seminar discussing the libretto and score of landmark musicals.

Restriction: Graduate students only. Music Majors only.

Concurrent with DRAMA 176.

**DRAMA 244. Dramaturgy: Theory and Methods. 4 Units.**

Examines the practice, place, and theory of dramaturgy. Explores plays in terms of how they work: dramatic form and structure, historical context, and more. Study includes dramaturgy as a theatrical practice.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 246A. Musical Scene Study I. 4 Units.**

Musically directing scenes from musicals of various time periods. Features works from the late 19th and early 20th centuries, including songwriters Gilbert and Sullivan, Irving Berlin, George Gershwin, Rodgers and Hart, and Cole Porter.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate Music Director students only.

**DRAMA 246B. Musical Scene Study II. 4 Units.**

Musically directing scenes from musicals of various time periods. Features works from the middle of the 20th century including songwriters Rodgers and Hammerstein, Lerner and Loewe, Julie Styne, Kander and Ebb, and Jerry Herman.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate Music Directors only.

**DRAMA 246C. Musical Scene Study III. 4 Units.**

Musically directing scenes from musicals of various time periods. Features works from the late 20th and early 21st centuries including songwriters Stephen Sondheim, Andrew Lloyd Webber, Stephen Schwartz, Flaherty and Ahrens, and Jeanine Tesori.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate Music Directors only.

**DRAMA 247. Musicals Abridged . 4 Units.**

Musically directing abridged versions of musicals from various time periods and genres.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate Music Directors only.

**DRAMA 248A. History of American Music Theatre. 4 Units.**

A survey of the influential artists who produce, write, direct, and perform on America's musical stages. Surveys 1700s-1940s.

Restriction: Graduate students only.

Concurrent with DRAMA 148A.

**DRAMA 248B. History of American Musical Theatre. 4 Units.**

A survey of the influential artists who produce, write, direct and perform on America's musical stages. Surveys 1940s-1970s.

Restriction: Graduate students only.

Concurrent with DRAMA 148B.

**DRAMA 248C. History of American Musical Theatre. 4 Units.**

A survey of the influential artists who produce, write, direct and perform on America's musical stages. Surveys 1970s to present day.

Concurrent with DRAMA 148C.

**DRAMA 249. Graduate Music Direction. 4 Units.**

Various musical direction activities including the vocal direction, accompanying, and conducting of musical theatre performances.

Repeatability: May be taken for credit 9 times.

Restriction: Graduate students only. Music Majors only.

**DRAMA 251A. Foundations of Theatre. 4 Units.**

Seeks to create greater understanding in the roots and theories of theatrical models, aesthetics, action vs. reaction of differing thoughts in theatrical doctrine, and art, architecture, music, and fashion that contributed to the style and practice of theatre.

Restriction: Drama graduate students only.

**DRAMA 251B. Foundations of Theatre. 4 Units.**

Seeks to create greater understanding in the roots and theories of theatrical models, aesthetics, action vs. reaction of differing thoughts in theatrical doctrine, and art, architecture, music, and fashion that contributed to the style and practice of theatre.

Restriction: Drama graduate students only.

**DRAMA 251C. Foundations of Theatre. 4 Units.**

Seeks to create greater understanding in the roots and theories of theatrical models, aesthetics, action vs. reaction of differing thoughts in theatrical doctrine, and art, architecture, music, and fashion that contributed to the style and practice of theatre.

Restriction: Drama graduate students only.

**DRAMA 254. Graduate Stage Management. 4 Units.**

Studio exercises and projects in stage management.

Repeatability: May be repeated for credit unlimited times.

Restriction: Drama Majors only.

**DRAMA 255. Graduate Design Seminar. 4 Units.**

Projects, lectures, and critical discussion in costume, scenery, lighting, and sound design.

Restriction: Drama Majors only.

**DRAMA 256. Survival and Professional Practice in Design. 4 Units.**

Provides an in-depth examination of business skills needed to survive as a theatrical designer. Required 'Bridge' course in the Design MFA programs, relevant to all disciplines.

Restriction: Drama graduate students only.

**DRAMA 257A. Costume Thesis Project. 4 Units.**

Development of thesis project with focus on organization, research, timeline, and execution.

Prerequisite: DRAMA 240

Restriction: Drama graduate students only.

**DRAMA 257B. Scenic Thesis Project. 4 Units.**

Development of thesis project with focus on organization, research, timeline, and execution.

**DRAMA 257E. Thesis Writing Project-Stage Management. 4 Units.**

Development of thesis topic with focus on organization, research, timeline, and execution.

Prerequisite: 12 units of DRAMA 254.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Drama graduate students only.

**DRAMA 258. Drawing for Designers. 2 Units.**

A multi-skill level course in drawing technique focusing on skills essential to stage designers including line, proportion, perspective and creating dynamic compositions. Focus will primarily be in figure drawing but may include still-life, landscape, and architectural drawings. Materials fee.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 9 times.

**DRAMA 259. Theatre Colloquium. 1 Unit.**

Exposes students to a wider range of theatrical practitioners, theories, and topics through guest lecturers, special projects, and cross-disciplinary dialogue.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 260A. Digital Costume Rendering. 4 Units.**

A studio course in costume rendering for the theatre using computer image manipulation. Instruction in compositing and painting techniques and performance design conventions.

**DRAMA 260B. Digital Textile Design and Printing. 4 Units.**

A studio course in textile design using digital printing and embossing techniques. Instruction in state-of-the-art software and output manipulation for artistic expression.

**DRAMA 261. Digital Design: Drawing/Painting/Rendering. 4 Units.**

A studio course in scenic or costume rendering for the theatre using the computer for drawing/painting through the use of the digital pen/tablet.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 262. Digital Design: 2D/3D Modeling. 4 Units.**

A studio course in CAD's 2D drafting and 3D modeling capabilities for theatrical design. Instruction in state-of-the-art software for 2D and 3D object creation and theatrical presentation conventions.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 263. Digital Design: 3D Rendering. 4 Units.**

A studio course in theatrical design through 3d modeling on computer and use of state-of-the-art rendering software. Instruction emphasizes collaborative design process through the use of scenic designer/lighting designer teams for all projects.

Prerequisite: DRAMA 262

Restriction: Graduate students only. Drama and Theatre Majors only. Drama Majors only.

**DRAMA 264. Lighting Graphics. 4 Units.**

A studio course in the various graphic methods employed by lighting designers in the theatre. Projects include manual and CAD techniques for Light Plot and Paperwork creation.

Prerequisite: DRAMA 262

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 265. Digital Design: 2D CAD. 4 Units.**

A studio course in theatrical design and architectural lighting design on the computer. Instruction in state-of-the-art software for 2D object creation. Theatrical and architectural standards implemented in performance design.

Prerequisite: DRAMA 262

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 266. Digital Design: Digital Audio Systems. 4 Units.**

Comprehensive tutorial on digital audio including hard disk recording, editing, data compression, and ethernet audio distribution. Focus is on recording, editing, and delivery of audio as used by the sound designer in the digital domain.

Restriction: Drama graduate students only.

**DRAMA 267. Digital Design: Creating Sounds from Scratch. 4 Units.**

The process of analyzing sounds for their core timbral components and using that data to create new sounds - from realistic to fantastic - by means of digital manipulation.

Prerequisite: DRAMA 266

Restriction: Drama Majors only.

**DRAMA 271. Conceptual Sound Design. 4 Units.**

An intensive, project-based seminar for exploring relationships between sound and sight. Synesthesia, creative intent vs. audience perception, and sound/movement are typical of the many topics to be explored. A series of creative projects are assigned and critiqued in peer review.

Prerequisite: DRAMA 266

Restriction: Drama Majors only.

**DRAMA 272. Musical Theatre Sound/Concert Sound. 4 Units.**

A concept-to-opening study of the process of designing sound systems for musicals and live/touring sound. Special attention given to the paperwork and documentation required to package, build, and mix these shows.

Restriction: Drama Majors only.

**DRAMA 277. Critical Listening. 4 Units.**

Exploration of the many variables that affect (and effect) the audio chain. Perceiving and understanding these parameters unlocks the art of controlling sound and stylizing cues. Also includes the process of equalizing/aligning sound systems and the art of audio mastering.

Prerequisite: DRAMA 266

Restriction: Drama Majors only.

**DRAMA 279. Advanced Sound Design. 4 Units.**

An in-depth investigation into sound design for the theatre. Special emphasis is placed on text analysis, design conception, content creation, content delivery, and design organization. Class projects include creating paper designs and paperwork for different texts.

**DRAMA 280A. Techniques in Costume Design. 4 Units.**

Student exercises in the techniques and implementation of costume design.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only.

**DRAMA 280B. Techniques in Scenery Design. 4 Units.**

Student exercises in the techniques and implementation of scenic design.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only.

**DRAMA 280C. Techniques in Lighting Design. 4 Units.**

Student exercises in the techniques and implementation of lighting design.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only.

**DRAMA 280D. Techniques in Sound Design. 4 Units.**

Student exercises in the techniques and implementation of sound design.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only.

**DRAMA 282. Stage Electronics/Introduction to Show Control. 4 Units.**

Using computers and dedicated hardware to cue, control or automate sound, scenery, and lighting for live performance and themed entertainment applications.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 290. Dramatic Literature and Theatre History Prior to 1900. 4 Units.**

Studies in selected areas of dramatic literature and theatre history prior to 1900. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**DRAMA 291. Dramatic Literature and Theatre History, 1900 to Present. 4 Units.**

Studies in selected areas of dramatic literature and theatre history, 1900 to present. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**DRAMA 292. Cultural and Critical Theory. 4 Units.**

Studies in selected areas of cultural and critical theory. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**DRAMA 293. Directed Studies. 4-12 Units.**

Directed study with Drama faculty.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

**DRAMA 294. Dissertation Research. 4-12 Units.**

Dissertation research with Drama faculty.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**DRAMA 295. Professional Internship. 1-12 Units.**

An arranged internship at the South Coast Repertory Theatre, or other equity theatre company, for qualifying M.F.A. students. A stipend and equity points are provided by the theatre company.

Repeatability: May be repeated for credit unlimited times.

Restriction: Drama graduate students only.

**DRAMA 297. Dramaturgy Practicum. 4 Units.**

Requires doctoral students to identify two plays from the Drama Department's season to work as dramaturges. Students write a Dramaturgy Booklet recording their research and interactions with director, actors, and the design team. Students will work with doctoral faculty.

Restriction: Graduate students only. Drama and Theatre Majors only.

**DRAMA 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

## Music Courses

**MUSIC 3. Introduction to Music. 4 Units.**

Introduction to musical concepts and active listening skills. Students develop musical understanding through critical readings, selected repertoire, fundamental concepts related to rhythm, pitch, and genre. Students apply those concepts to music from a wide range of historical and cultural origins.

(IV)

**MUSIC 4. Introduction to Opera. 4 Units.**

Introduces students with no musical background to the dramatic and performance conventions of opera, and suggests ways of developing a critical stance vis-a-vis the social, political, gender-related and moral conflicts that are presented by composers and librettists.

(IV)

**MUSIC 5. Popular Music in the United States. 4 Units.**

Examines the cultural, social, political, and economic dimensions of popular music in the United States over the last century and a half, with an emphasis on matters related to class, race, ethnicity, and gender.

(IV)

**MUSIC 8. The Beatles and the Sixties. 4 Units.**

Through a study of the music of the Beatles, students are introduced to selected broader historical and cultural themes (e.g., race and music, gender and music, music and the counterculture) while developing an understanding of the basic elements of music.

(IV)

**MUSIC 9. Rock: The Early Years. 4 Units.**

Surveys the social and cultural fabric of the post-World War II United States (from the late 1940s through the early 1970s) as seen through the prism of music - rock and roll music.

(IV)

**MUSIC 10. Piano for Majors. 1 Unit.**

For Music majors with little or no piano experience. Provides the necessary background for realizing keyboard exercises required in the theory and harmony courses, and develops skills to play and sight-read simple music from different periods.

Repeatability: May be taken for credit 3 times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 15A. Musicianship I. 2 Units.**

Interval and chord quality identification, melodic and harmonic dictation, tonal and chromatic sight-singing, and rhythmic reading and dictation.

Corequisite: MUSIC 16A

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 15B. Musicianship II. 2 Units.**

Interval and chord quality identification, melodic and harmonic dictation, tonal and chromatic sight-singing, and rhythmic reading and dictation.

Corequisite: MUSIC 16B

Prerequisite: MUSIC 15A and MUSIC 16A. MUSIC 15A with a grade of C- or better. MUSIC 16A with a grade of C- or better

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 15C. Musicianship III. 2 Units.**

Interval and chord quality identification, melodic and harmonic dictation, tonal and chromatic sight-singing, and rhythmic reading and dictation.

Corequisite: MUSIC 16C

Prerequisite: MUSIC 15B and MUSIC 16B. MUSIC 15B with a grade of C- or better. MUSIC 16B with a grade of C- or better

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 16A. Music Theory. 4 Units.**

Review of music fundamentals. Triad and seventh chords, musical texture, chord spacing, embellishing tones, and introduction to diatonic harmony. Part-writing and model composition with tonic, dominant seventh, and subdominant harmonies.

Corequisite: MUSIC 15A

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 16B. Music Theory. 4 Units.**

Introduction to phrase structure. Part-writing and harmonization with predominants, linear dominants, 6/4 embellishing chords, leading-tone and other diatonic seventh chords. Advanced meters and rhythmic-metric dissonance. Diatonic sequence. Introduction to tonicization and modulation through motion to V and III.

Corequisite: MUSIC 15B

Prerequisite: MUSIC 15A and MUSIC 16A. MUSIC 15A with a grade of C- or better. MUSIC 16A with a grade of C- or better

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 16C. Music Theory. 4 Units.**

Tonicization and modulation to closely related keys. Simple binary and ternary forms. Voice-leading reductions and simple forms. Diatonic sequence with seventh chords. Introduction to chromatic harmony I: modal exchange and mixture chords, the Neapolitan and augmented sixth chords.

Corequisite: MUSIC 15C

Prerequisite: MUSIC 15B and MUSIC 16B. MUSIC 15B with a grade of C- or better. MUSIC 16B with a grade of C- or better

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 16D. Theory/Musicianship. 4 Units.**

Extended homophonic and contrapuntal formal designs (continuous variations, rondo form, sonata form, invention, fugue). Embellishing chromatic chords, dominant prolongation, modulations to foreign keys, extended harmonies, chromatic sequence, chromatic voice-leading and symmetrical divisions of the octave.

Prerequisite: MUSIC 15C and MUSIC 16C. MUSIC 15C with a grade of C- or better. MUSIC 16C with a grade of C- or better

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 21A. Keyboard Skills. 1 Unit.**

Designed to develop the foundational skills of sight-reading, harmonization, transposition, improvisation, figured bass realization, and score reading.

Repeatability: May be taken for credit 6 times.

Restriction: Lower-division students only. Music Majors only. Music - Performance Majors only.



**MUSIC 21B. Keyboard Skills. 1 Unit.**

Designed to develop the foundational skills of sight-reading, harmonization, transposition, improvisation, figured bass realization, and score reading.

Repeatability: May be taken for credit 6 times.

Restriction: Lower-division students only. Music Majors only. Music - Performance Majors only.

**MUSIC 21C. Keyboard Skills. 1 Unit.**

Designed to develop the foundational skills of sight-reading, harmonization, transposition, improvisation, figured bass realization, and score reading.

Repeatability: May be taken for credit 6 times.

Restriction: Lower-division students only. Music Majors only. Music - Performance Majors only.

**MUSIC 25. Fundamentals of Music. 4 Units.**

Gain comprehensive insight into the fundamental concepts of music theory, including notation, harmony, and score analysis. Designed for students of all levels to improve their understanding of how music is composed, performed, and heard. Formerly MUSIC 25A.

(IV)

**MUSIC 40B. History of European Music: From the Renaissance through the Baroque. 4 Units.**

An introduction to the analysis of musical styles and forms, to the sources for constructing music history and reconstructing historical music, and to J.S. Bach.

Prerequisite: MUSIC 16C. MUSIC 16C with a grade of C- or better

Restriction: Music Majors have first consideration for enrollment. Music - Performance Majors have first consideration for enrollment.

(IV and VIII ).

**MUSIC 40C. History of European Music: Hasse to Mahler. 4 Units.**

An introduction to the analysis of musical styles and forms, and to the sources for constructing music history and reconstructing historical music, to Richard Wagner.

Prerequisite: MUSIC 40B. MUSIC 40B with a grade of D or better. Recommended: MUSIC 16D

Restriction: Music Majors have first consideration for enrollment. Music - Performance Majors have first consideration for enrollment.

(IV and VIII ).

**MUSIC 40D. 20th Century Music. 4 Units.**

Survey of principal composers, movements, and compositional techniques of Western art music of the modern era.

Prerequisite: MUSIC 16C. MUSIC 16C with a grade of C- or better

Restriction: Music Majors have first consideration for enrollment. Music - Performance Majors have first consideration for enrollment.

(IV and VIII ).

**MUSIC 41. Major Composer. 4 Units.**

Study of the works of an important composer with emphasis on their significance in historical and social contexts. Composers selected represent a wide variety of historical periods, nationalities, and stylistic orientations.

Repeatability: May be taken for credit 2 times as topics vary.

(IV)

**MUSIC 42. Music and Gender. 4 Units.**

Explores various intersections between music and gender. Examines ways in which gender and sexuality have played a vital role in the creation, dissemination, and consumption of music ranging from medieval Christian mysticism to contemporary hip-hop artists.

(IV, VIII)

**MUSIC 44. Classical Music in Society. 4 Units.**

Examines some ways in which classical music has played an integral role in aspects of society. Studies pieces from different cultural, political, and historical contexts in order to understand how musical meaning is created and interpreted.

(IV, VIII)

**MUSIC 45. History of Film Music. 4 Units.**

Course provides an overview of film music history. Special emphasis will be placed on developing an analytic vocabulary for musical elements and cultivating an understanding of how music can function within a film.

(IV)

**MUSIC 46. Music in Multimedia. 4 Units.**

Students explore intersections between music and other media forms through creating multimedia projects, readings, lectures, and discussion. Students produce music, edit video, increase media literacy, and study theories behind how music communicates meaning.

(IV)

**MUSIC 47. Introductory Topics in Music Technology. 4 Units.**

Introductory topics in electronic music, digital audio, and other aspects of music technology.

Repeatability: Unlimited as topics vary.

(IV)

**MUSIC 48. Introductory Topics in Music and Culture. 4 Units.**

Examines music and musical practices in different historical periods, societies, and cultural settings.

Repeatability: Unlimited as topics vary.

(IV)

**MUSIC 51. Music Technology and Computers. 4 Units.**

A study of the influence of technology on the musical culture and aesthetics from the 20th century to the present, with particular emphasis on the role of the computer. Work includes lectures, readings, listenings, discussions, demonstrations, writing, and experimentation.

(IV)

**MUSIC 65. Piano for Music Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times as topics vary.

Restriction: Music Majors only.

**MUSIC 66. Strings for Music Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times as topics vary.

Restriction: Music Majors only.

**MUSIC 67. Winds for Music Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times as topics vary.

Restriction: Music Majors only.

**MUSIC 68. Voice for Music Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music Majors only.

**MUSIC 69. Percussion for Music Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times as topics vary.

Restriction: Music Majors only.

**MUSIC 70. Guitar, Lute, and Other Plucked Instruments for Music Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music Majors only.

**MUSIC 78. History of Jazz. 4 Units.**

Development of jazz from African and African American folk origins through blues, early jazz, swing, bebop, 'cool' jazz, fusion, free jazz, and contemporary trends.

Restriction: Music Majors have first consideration for enrollment. Music - Performance Majors have first consideration for enrollment.

(IV and VII ).

**MUSIC H80. Experiments in Music. 4 Units.**

Scientists explain the cognition of music using experimental methodology; artists expand the domain of music by trying previously unknown ways of making it. These two types of experiment deepen our understanding of music, from both scientific and artistic vantage points.

Restriction: Campuswide Honors Collegium students only.

(IV)

**MUSIC 82A. MAHUR-Pish Radif: Introduction to Classical Persian Music. 4 Units.**

Survey of art music in Iran and basic structures of classical Persian music, with emphasis on MAHUR modal system and different instruments of classical Persian music. No musical experience required, but interest in vocal music is strongly recommended.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 82B. HOMAYUN-Pish Radif: Introduction to Classical Persian Music. 4 Units.**

Survey of art music in Iran and basic structures of classical Persian music, with emphasis on HOMAYUN modal system and famous musicians and performers of classical Persian music. No musical experience required, but interest in vocal music is strongly recommended.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 82C. SHUR-Pish Radif: Introduction to Classical Persian Music. 4 Units.**

Survey of art music in Iran and basic structures of classical Persian music, with emphasis on the SHUR modal system and different poetic rhythms in classical Persian music. No musical experience required, but interest in vocal music is strongly recommended.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 122A. Piano Literature. 2 Units.**

Survey of stringed keyboard literature from the English Virginalists through twentieth-century composers. Historical, formal, and stylistic considerations of music presented. Performances by class participants and occasional outside guests.

Prerequisite: MUSIC 16A and MUSIC 16B and MUSIC 16C

Restriction: Upper-division students only. Music Majors only. Music - Performance Majors only.

**MUSIC 122B. Piano Literature. 2 Units.**

Survey of stringed keyboard literature from the English Virginalists through twentieth-century composers. Historical, formal, and stylistic considerations of music presented. Performances by class participants and occasional outside guests.

Prerequisite: MUSIC 16A and MUSIC 16B and MUSIC 16C

Restriction: Upper-division students only. Music Majors only. Music - Performance Majors only.

**MUSIC 122C. Piano Literature. 2 Units.**

Survey of stringed keyboard literature from the English Virginalists through twentieth-century composers. Historical, formal, and stylistic considerations of music presented. Performances by class participants and occasional outside guests.

Prerequisite: MUSIC 16A and MUSIC 16B and MUSIC 16C

Restriction: Upper-division students only. Music Majors only. Music - Performance Majors only.

**MUSIC 126. Piano Pedagogy. 2 Units.**

The materials and methods of piano instruction are examined and evaluated.

Restriction: Upper-division students only. Music Majors only. Music - Performance Majors only.

**MUSIC 131. Post-Tonal Theory. 4 Units.**

Significant harmonic, rhythmic, and structural practices since 1900. Analysis and written work exploring free atonality and serialism; neo-tonal practices such as use of extended tertian harmonies, modalism, pandiatonicism, and non-tertian harmonies; structural principles such as aleatory, metric modulation and minimalism.

Prerequisite: MUSIC 16D

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 132. Jazz Theory. 4 Units.**

Study of jazz harmony and melody construction in improvisation. Covered topics include terminology, chord symbols, notation, voicings, and scales as commonly used in jazz and popular music. Issues regarding tonality and ramifications of the blue scale are also examined.

Prerequisite: MUSIC 16D

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 136. Instrumentation. 4 Units.**

Ranges and capabilities of modern orchestral instruments. Exercise in writing for various combinations of wind, string, and percussion instruments and for full orchestra.

Prerequisite: MUSIC 16C

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 140. Topics in Medieval Music. 4 Units.**

Topics in medieval music.

Prerequisite: MUSIC 40B. MUSIC 40B with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 141. Topics in Renaissance Music. 4 Units.**

Topics in renaissance music.

Prerequisite: MUSIC 40B. MUSIC 40B with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 142. Topics in Baroque Music. 4 Units.**

Topics in Baroque music.

Prerequisite: MUSIC 40B. MUSIC 40B with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 142W. Topics in Baroque Music . 4 Units.**

Topics in Baroque music.

Prerequisite: MUSIC 40B. MUSIC 40B with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

(Ib)

**MUSIC 143. Topics in Classical Music. 4 Units.**

Topics in Classical music.

Prerequisite: MUSIC 40C. MUSIC 40C with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 143W. Topics in Classical Music. 4 Units.**

Topics in Classical music.

Prerequisite: MUSIC 40C. MUSIC 40C with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**(Ib)**

**MUSIC 144. Topics in Romantic Music. 4 Units.**

Topics in Romantic music.

Prerequisite: MUSIC 40C. MUSIC 40C with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 144W. Topics in Romantic Music. 4 Units.**

Topics in Romantic music.

Prerequisite: MUSIC 40C. MUSIC 40C with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only.

**(Ib)**

**MUSIC 145. Topics in 20th Century Music. 4 Units.**

Topics in 20th century music.

Prerequisite: MUSIC 40D. MUSIC 40D with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 145W. Topics in 20th Century Music. 4 Units.**

Topics in 20th century music.

Prerequisite: MUSIC 40D. MUSIC 40D with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Upper-division students only. Music Majors only. Music - Performance Majors only.

**(Ib)**

**MUSIC 146. Studies in Jazz Music. 4 Units.**

Topics in Jazz Music.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 147. Studies in Music Technology. 4 Units.**

Specialized topics in electronic music, computer-aided music, and other aspects of music technology.

Repeatability: May be taken for credit 2 times as topics vary.

**MUSIC 148. Studies in Ethnomusicology. 4 Units.**

Topics in Ethnomusicology.

Repeatability: May be taken for credit 2 times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 149. Studies in Music History. 4 Units.**

Specialized topics in musical genres; culture and social issues; performance practices; and interrelated arts.

Prerequisite: MUSIC 40B and MUSIC 40C and MUSIC 40D. Satisfactory completion of the lower-division writing requirement.

Repeatability: May be taken for credit 3 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 150. Composition. 4 Units.**

Exercises and projects for diverse instrumental-vocal combinations; contemporary techniques and problems. Participation in the improvisation ensemble and working with electronic media.

Prerequisite: MUSIC 16C

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 151. Computer Music Composition. 4 Units.**

Exercises in the composition of music uniquely possible by computer, including digital signal processing, computer control of synthesizers and processors, and algorithmic composition. Demonstrations and musical analyses in class; considerable studio work outside class.

Prerequisite: MUSIC 51

**MUSIC 152. Interactive Arts Programming. 4 Units.**

Study of artistic issues and programming techniques involved in the development of interactive computer art and music. Theoretical background, basic tenets of programming, and practical exercises in programming interactive computer multimedia art.

Prerequisite: MUSIC 51 or ART 65A or DANCE 163

**MUSIC 153. Counterpoint. 4 Units.**

Studies in contrapuntal practices of various style periods such as the 16th, 18th, and 20th centuries.

Prerequisite: MUSIC 16B. MUSIC 16B with a grade of C- or better

Restriction: Music Majors only.

**MUSIC 155. Analysis. 4 Units.**

Methods of formal analysis applicable to all Western musical styles: additive, continuous, transformational, and hierarchic forms; rhythm, texture, and sonority as form and process.

Prerequisite: MUSIC 16D

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 156A. Song Literature. 2 Units.**

A survey of song literature. Designed as an overview of the song repertoire, German Lied.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 156B. Song Literature. 2 Units.**

A survey of song literature. Designed as an overview of the song repertoire, French mélodie.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 157. Advanced Study in Composition. 4 Units.**

Individual weekly lessons in composition.

Prerequisite: MUSIC 150. MUSIC 150 with a grade of C- or better

Repeatability: May be taken for credit 6 times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 158A. Diction. 2 Units.**

In-depth study of the International Phonetic Alphabet (IPA), including its transcription and pronunciation, and its application for singers. Introduction to IPA and Italian Diction.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 158B. Diction. 2 Units.**

In-depth study of the International Phonetic Alphabet (IPA), including its transcription and pronunciation, and its application for singers. German Diction.

Prerequisite: MUSIC 158A

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 158C. Diction. 2 Units.**

In-depth study of the International Phonetic Alphabet (IPA), including its transcription and pronunciation, and its application for singers. French Diction.

Prerequisite: MUSIC 158A and MUSIC 158B

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 159. Vocal Pedagogy. 2 Units.**

Survey about the physical structure of the singing mechanism, science, and philosophy of studio instruction.

Restriction: Music - Performance Majors only.

**MUSIC 160. University Orchestra. 2 Units.**

Study and performance of standard orchestral repertory and works by contemporary composers. Membership is open to all qualified students by audition only.

Prerequisite: Audition required.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 161. Wind Ensemble. 2 Units.**

Study and performance of works written for varying combinations of wind and percussion instruments. Membership is open to all qualified students by audition only.

Prerequisite: Audition required.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 162. University Chorus. 2 Units.**

Make-up of the ensembles varies and may include University Chorus, Chamber Choir, Madrigal Singers, Women's Chorus, and Reading Choir. Membership is open to all qualified students by audition only.

Corequisite: MUSIC 162L

Prerequisite: Audition required.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 162P. University Chorus: Accompanying. 2 Units.**

Keyboard accompanying for one of the UCI choral organizations, with individual coaching in sight reading, score reading, and other accompanying skills.

Repeatability: May be taken for credit 12 times.

**MUSIC 164. Opera Workshop. 2-4 Units.**

Preparation and performance of operatic repertoire, including arias, scenes, and fully staged operas, and/or stage training and role analysis.

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 164P. Opera Workshop: Accompanying. 2-4 Units.**

Training in techniques and operatic repertory for keyboard players.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 165. Piano for Music Performance Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music - Performance Majors only.

**MUSIC 166. Strings for Music Performance Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music - Performance Majors only.

**MUSIC 166P. String Accompaniment. 2 Units.**

Chamber ensemble experience with the solo string repertory for keyboard, participation in the weekly string master class, performance in public recitals.

Repeatability: May be taken for credit 3 times.

**MUSIC 167. Winds for Music Performance Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music - Performance Majors only.

**MUSIC 168. Voice for Music Performance Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music - Performance Majors only.

**MUSIC 169. Percussion for Music Performance Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music - Performance Majors only.

**MUSIC 170. Guitar, Lute, and Other Plucked Instruments for Music Performance Majors. 2 Units.**

Private weekly lessons and a weekly master class/workshop for the discussion of solo repertory and performance practice, including special topics such as historical notational systems, traditional American guitar styles, and demonstrations of period plucked instruments. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music - Performance Majors only.

**MUSIC 171. Chamber Singers. 2 Units.**

A select ensemble specializing in vocal chamber music from all periods. Frequent performances on and off campus. Membership is open to all singers by audition.

Repeatability: May be repeated for credit unlimited times.



**MUSIC 176. Chamber Ensembles . 2 Units.**

Make-up of the ensembles varies and may include various Classical ensembles, Latin Jazz Ensemble, Small Jazz Combos, Percussion Ensemble, and Guitar Ensemble. Membership is open to all qualified students by audition only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Majors have first consideration for enrollment. Music - Performance Majors have first consideration for enrollment.

**MUSIC 178. Jazz Orchestra. 2 Units.**

Rehearsal and performance of literature written for large jazz ensemble with emphasis on methods and materials. Laboratory setting for new arrangers and/or composers of modern jazz pieces.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 181. Improvisation. 4 Units.**

Improvisation has been central to all music traditions. Course explores real-time music-making in a variety of non-notated contexts. Different improvisational styles are presented, including jazz, Asian improvisation, and experimental modern music. Emphasis on actual classroom performance.

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 182. Advanced Jazz Combo. 2 Units.**

Small-group jazz ensemble and improvisational workshop. Range of music covered encompasses the full traditional jazz from improvised ragtime up through the most current avant-garde musical techniques.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 183A. Jazz Composition I. 4 Units.**

Performance and lecture course for writing and performing original jazz compositions. Emphasis is placed on composing as a way to create new improvisational frameworks. Cyclical forms, modal compositions, blues-oriented compositions, and ballad writing.

Prerequisite: MUSIC 78 and MUSIC 132

Restriction: Music Majors only.

**MUSIC 183B. Jazz Composition II. 4 Units.**

Performance and lecture course for writing and performing original jazz compositions. Emphasis is placed on composing as a way to create new improvisational frameworks. Non-functional harmony, contemporary forms, free-bop, and current trends.

Prerequisite: MUSIC 78 and MUSIC 132 and MUSIC 183A

Restriction: Music Majors only.

**MUSIC 183C. Jazz Composition III. 4 Units.**

Performance and lecture course for writing and performing original jazz compositions. Emphasis is placed on composing as a way to create new improvisational frameworks. Study of modern tonal-center compositions, intervallic compositions, and alternate rhythms.

Prerequisite: MUSIC 78 and MUSIC 132 and MUSIC 183A and MUSIC 183B

Restriction: Music Majors only.

**MUSIC 189. Accompanying for Plucked Strings: Continuo and Changes. 2 Units.**

Students apply theory to their instruments as they learn the basics of pre-1800 continuo playing and post-1900 jazz charts. Includes discussions of appropriate repertory, treatment of harmonic progressions, and finer points of style and technique.

Prerequisite: MUSIC 16C

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 191. Tutorial in Music. 1-4 Units.**

Supplemental instruction related to student's area of study. Taken only when the materials studied lie outside regular departmental offerings, and when the student has no formal chance to pursue the subject.

Prerequisite: Undergraduate advisor approval required.

Repeatability: May be taken for credit 3 times.

**MUSIC 193. Conducting. 4 Units.**

Introduces students to the basic techniques employed in the practice of conducting and includes score study and development of leadership skills.

Prerequisite: MUSIC 16D and MUSIC 40B and MUSIC 40C

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 195A. Senior Thesis. 2 Units.**

With consultation in regularly scheduled meetings, students identify and study relevant texts and materials and prepare a prospectus for an original thesis.

Prerequisite: Senior standing in the Honors Program in Music and Culture.

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 195B. Senior Thesis. 2 Units.**

Students submit an outline and preliminary drafts of section of their thesis to the instructor, on a schedule supervised by the instructor. The final version will address the instructor's comments and criticisms.

Prerequisite: MUSIC 195A

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 197. Word and Music. 2 Units.**

Performance class for advanced singers and pianists with emphasis on collaborative approach to vocal literature.

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 199. Independent Study. 2-4 Units.**

Student-devised research/composition project, with faculty guidance, resulting in a formal paper/project. Taken only when materials studied lie outside regular departmental offerings or when students have no formal chance to pursue the subject.

Prerequisite: Undergraduate or graduate advisor approval required.

Repeatability: May be taken for credit 3 times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 200. Bibliography and Research. 4 Units.**

Required of all entering students. A systematic introduction to the bibliographical tools both in the general field of music and in the student's areas of specialization.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 201. Topics in Analysis . 4 Units.**

Seminar focusing on different analytical methods, modal, tonal, and post-tonal, and their applications to repertoires drawn from various historical periods through to the present day.

Prerequisite: Placement into MUSIC 201.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 202. Proseminar in Musicology. 4 Units.**

Introduces significant issues and recent developments in musicology and music criticism, including exposure to the controversies that have brought change and reflection to the discipline.

Corequisite: Recommended for musicology students: MUSIC 200

Prerequisite or corequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Restriction: Graduate students only.

**MUSIC 203. Music Thesis . 4 Units.**

Intensive work dedicated to researching and writing a Master's thesis under the supervision of a faculty advisor.

Prerequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 204. Proseminar in Music Theory and Analysis. 4 Units.**

Introduction to music theories, analytic approaches, and methodologies as applied to repertoires drawn from Western art and popular music.

Corequisite: Recommended for musicology students: MUSIC 200

Prerequisite or corequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Restriction: Graduate students only.

**MUSIC 209. Seminar in Creative Practices. 1-4 Units.**

Core first-year seminar required for graduate students in the Integrated Composition, Improvisation, and Technology emphasis of the M.A. and Ph.D. programs. Composition and presentation of original student works, lecture, and discussion.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 210. Choral Conducting . 4 Units.**

Intensive private instruction and study of the various choral literatures.

Repeatability: May be taken for credit 6 times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 211. Performance . 4 Units.**

Contents vary according to the student's major instrument. Intensive private instruction and study of the various literatures.

Repeatability: May be taken for credit 6 times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 212. Composition. 4 Units.**

Intensive work in composition geared to each student's level of competence.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 213. Orchestral Conducting. 4 Units.**

Intensive private instruction in instrumental conducting.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 214. Graduate Recital.**

Performance of public recital.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 215A. Computer Music Composition and Production. 4 Units.**

Study of the composition and production of music made uniquely possible by the computer, including usage of prevalent digital music technology, techniques of digital signal processing, and computer control of synthesizers and audio processors.

Restriction: Graduate students only. Music Majors only.

**MUSIC 215B. Computer Music Programming. 4 Units.**

Study of the artistic issues and programming techniques involved in the development of original applications for computer music composition and interactive performance.

Restriction: Graduate students only. Music Majors only.

**MUSIC 220. Seminar in Music History. 4 Units.**

Topics in music history.

Corequisite: MUSIC 200

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 222. Seminar in Musicology . 4 Units.**

Focuses on current scholarship in musicology and related fields with a strong critical content. Addresses topics relative to their historical and stylistic periods. Recent topics have included Stravinsky, Holy Women, Mahler, Historiography, Issues in Performance Practice, and Brahms's Chamber Music.

Corequisite: Recommended for musicology students: MUSIC 200

Prerequisite or corequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Repeatability: May be taken for credit for 4 units as topics vary.

Restriction: Graduate students only.

**MUSIC 224. Seminar in Music Theory and Analysis. 4 Units.**

Typical topics include Schenkerian theory and analysis, contemporary form theory, and advanced techniques in the analysis of late 19th-century and contemporary music (e.g., transformational theory, Neo-Riemannian, and scale network theory).

Corequisite: Recommended for musicology students: MUSIC 200

Prerequisite or corequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**MUSIC 230. Seminar in Contemporary Music. 4 Units.**

Special seminar projects dealing with contemporary music with emphasis on analytical techniques and style criticism.

Prerequisite or corequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 231. Improvisation. 4 Units.**

Introduces the practice and history of improvisation in diverse fields of Western music since 1950. Performance projects and group critiques, weekly reading and listening assignments, participation in a class concert, and a research paper.

Restriction: Graduate students only. Music Majors only.

**MUSIC 235. Critical Studies in Music. 4 Units.**

A critical examination of music traditions, institutions, and aesthetics, employing new scholarship in music and new critical studies in other disciplines.

Corequisite: Recommended for musicology students: MUSIC 200

Prerequisite or corequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 236. Theoretical ICIT Seminar. 1-4 Units.**

Seminar studying new genres and topics that integrate composition, improvisation, new technologies, and non-classical cultures.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 237. Practical ICIT Seminar. 1-4 Units.**

Study of new practices and techniques that integrate composition, improvisation, new technologies, and non-classical cultures.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 239. Thesis Colloquium. 1-2 Units.**

ICIT students present their thesis work-in-progress for discussion and criticism. Faculty and visiting artists/scholars also present their current work.

Repeatability: May be taken for credit for 8 units.

Restriction: Graduate students only. Music Majors only.

**MUSIC 240. Graduate Projects . 4 Units.**

Substantial projects in performance, conducting, or composition (other than those specifically required for the degree), accompanied by a summary paper.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 242A. First-Year Research and Writing Seminar I. 4 Units.**

Guided reading for one quarter on a broad subject selected by the instructor, followed by one quarter in which the student undertakes independent research on the selected topic, leading to a substantial term paper.

Prerequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Restriction: Graduate students only.

**MUSIC 242B. First-Year Research and Writing Seminar II. 4 Units.**

Guided reading for one quarter on a broad subject selected by the instructor, followed by one quarter in which the student undertakes independent research on the selected topic, leading to a substantial term paper.

Prerequisite: MUSIC 200 and MUSIC 242A. MUSIC 200 with a grade of B or better. MUSIC 242A with a grade of B or better

Restriction: Graduate students only.

**MUSIC 243A. Second-Year Research and Writing Tutorial I. 4 Units.**

In this two-quarter sequence, students gain expertise in a first area of research concentration by undertaking directed reading on a topic of their choice and then writing a paper of near-publishable length and quality on that topic.

Prerequisite: MUSIC 242B. MUSIC 242B with a grade of B or better

Restriction: Graduate students only.

**MUSIC 243B. Second-Year Research and Writing Tutorial II. 4 Units.**

In this two-quarter sequence, students gain expertise in a first area of research concentration by undertaking directed reading on a topic of their choice and then writing a paper of near-publishable length and quality on that topic.

Prerequisite: MUSIC 243A. MUSIC 243A with a grade of B or better

Restriction: Graduate students only.

**MUSIC 244. Readings for the Qualifying Examination. 4-12 Units.**

Directed reading in preparation for the Qualifying Examination.

Prerequisite: MUSIC 243B. MUSIC 243B with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**MUSIC 245. Prospectus Research. 4-12 Units.**

Research and writing of the Dissertation Prospectus.

Prerequisite: MUSIC 244. MUSIC 244 with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**MUSIC 250. Directed Research. 4 Units.**

Preparation for qualifying exams and dissertation, or an individual research project resulting in a substantial paper or comparable documentation of the research results.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 276. Contemporary Ensemble. 2 Units.**

Chamber ensemble for the performance of contemporary music, including newly composed and improvised forms.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 290. Dissertation Research. 4-12 Units.**

Research and writing of the dissertation for the History and Music Theory Ph.D.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**MUSIC 299. Independent Study. 2-4 Units.**

Student-devised research/composition project, with faculty guidance, resulting in a formal paper/project. Taken only when materials studied lie outside regular departmental offerings or when students have no formal chance to pursue the subject.

Prerequisite: Graduate advisor approval required.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 399. University Teaching. 1-4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Department of Art

**Kevin Appel, Department Chair**

3229 Art, Culture and Technology Building

949-824-6648

<http://art.arts.uci.edu/>

The Department of Art houses a multitude of dynamic paths to engage in art making. The faculty is committed to providing students the tools with which they can create work at the highest levels of aesthetic, intellectual, and social/political inquiry. The department's flexible curriculum facilitates serious engagement with painting, drawing, photography, sculpture, digital filmmaking, installation, performance, electronic art and design, art writing, critical theory, and curatorial studies within the context of an interdisciplinary approach to the study of contemporary art.

The Art faculty is comprised of a group of nationally and internationally recognized artists and scholars who are engaged in their fields and dedicated to sharing their expertise in helping students develop informed approaches to media, materials, and techniques while fostering individual approaches in the students' overall art practice. They believe that a vital part of artistic development comes from an accessible faculty and regular contact with active practitioners. To that end, alongside a broad and diverse curriculum, the department also invites visiting artists, curators, and critics to our campus to discuss their work and to get to know students.

The Art department attracts gifted and motivated students who thrive in an environment that encourages autonomy and rigor. Art students are drawn not only to the outstanding creative faculty, the university's resources, and its location in one of the world's leading art centers, but also to a program that encourages their long-term development as artists. The result is a distinguished list of graduates who have made and continue to make significant contributions across the field of art, and who participate in a lasting community of artists from the Art program and beyond.

- Art, B.A.
- Art, M.F.A.
- Digital Arts, Minor
- Digital Filmmaking, Minor

## Faculty

Rhea Anastas, Ph.D. The Graduate Center of The City University of New York, *Associate Professor of Art* (20th century experimentalism in the visual arts, critical theory, cultural theory)

Kevin H. Appel, M.F.A. University of California, Los Angeles, *Department Chair and Executive Director of University Art Galleries and Professor of Art* (painting)

Sarah Awad, M.F.A. University of California, Los Angeles, *Assistant Professor of Teaching of Art* (drawing, painting)

Jennifer Bornstein, M.F.A. University of California, Los Angeles, *Associate Professor of Art* (photography)

Juli C. Carson, Ph.D. Massachusetts Institute of Technology, *Professor of Art* (art history, critical theory, curatorial practice )

Miles C. Coolidge, M.F.A. California Institute of the Arts, *Professor of Art* (photography)

Tony Delap, Claremont Graduate University, *Professor Emeritus of Art*

Martha Gever, Ph.D. City College of the City University of New York, *Professor Emerita of Art* (history and criticism: video, media studies, popular culture)

Bryan Jackson, M.F.A. University of California, Los Angeles, *Continuing Lecturer of Art* (digital filmmaking)

Jesse C. Jackson, M.A. University of Toronto, *Director of the Minor in Digital Arts and Associate Professor of Art; Informatics* (digital art, informatics, design, architecture)

Ulysses S. Jenkins, M.F.A. Otis Art Institute, *Professor of Art; African American Studies* (video, performance art)

Antoinette Lafarge, M.F.A. School of Visual Arts, *Professor of Art* (digital media)

Simon Leung, B.A. University of California, Los Angeles, *Professor of Art; Asian American Studies* (new genres, critical theory, contemporary art history, performance)

Joseph S. Lewis, M.F.A. Maryland Institute College of Art, *Professor of Art* (public art)

Mara Jane Lonner, M.F.A. California Institute of the Arts, *Associate Professor of Teaching Emerita of Art* (drawing, painting, 3D design)

Catherine B. Lord, M.F.A. State University of New York at Buffalo, *Professor Emerita of Art* (queer theory, feminism, photography)

Monica Majoli, M.F.A. University of California, Los Angeles, *Professor of Art* (painting)

Daniel J. Martinez, B.F.A. California Institute of the Arts, *Claire Trevor Professor and Professor of Art* (public art, sculpture, installation, performance)

Yong Soon Min, M.F.A. University of California, Berkeley, *Professor Emerita of Art* (minority, diasporic, and third cinemas; media, nationalism, and globalization; race, sexuality, and popular culture)

Deborah Oliver, M.F.A. California Institute of the Arts, *Lecturer of Art* (performance art, new genres)

Jennifer Pastor, M.F.A. University of California, Los Angeles, *Professor of Art* (sculpture)

Simon G. Penny, M.F.A. Sydney College of the Arts, *Professor of Art; Informatics* (informatics, robotic sculpture, interactive environments, electronic media)

Yvonne Rainer, *Claire Trevor Professor and Professor Emerita of Art* (performance, dance, video)

William S. Roberts, M.F.A. California Institute of the Arts, *Associate Professor of Teaching of Art* (photography)

Amanda Ross-Ho, M.F.A. University of Southern California, *Associate Professor of Art* (sculpture)

Constance J. Samaras, M.F.A. Eastern Michigan University, *Professor Emerita of Art* (photography, intermedia, cultural criticism)

David K. Trend, Ph.D. Miami University, *Professor of Art* (visual culture)

Bruce N. Yonemoto, M.F.A. Otis Art Institute, *Professor of Art; Asian American Studies* (video, experimental media, film theory)

## Courses

### ART 1A. Art in Context: History, Theory, and Practice. 4 Units.

First in a three-quarter foundation sequence introducing students to a broad range of contemporary art, media, and practices in relation to their twentieth-century cultural and historical antecedents. ART 1A deals specifically with contemporary painting and photography.

Restriction: Art Majors have first consideration for enrollment.

(IV)

### ART 1B. Art in Context: History, Theory, and Practice. 4 Units.

Deals with film/video/performance. Concerned with the development of modern/contemporary film, video, and performance, with a focus on experimental and avant-garde production from the early twentieth-century to today.

Restriction: Art Majors have first consideration for enrollment.

(IV)

### ART 1C. Art in Context: History, Theory, and Practice. 4 Units.

Third in a three-quarter foundation sequence introducing students to a broad range of contemporary art, media, and practice in relation to their twentieth-century cultural and historical antecedents. Deals specifically with space and cyberspace.

Restriction: Art Majors have first consideration for enrollment.

(IV)

### ART 8. Changing Creativity. 4 Units.

Explores creativity as a changing concept in historical and contemporary terms from the perspectives of producers, consumers, and institutions. Encompasses international perspectives and the role of new technologies in considering creativity as a resource for innovation and social change.

(IV)

### ART 9A. Visual Culture: Media, Art, and Technology. 4 Units.

Examines creative activities in all spheres of life, including the 'artistic' impulses that dwell in the individual. Culture is addressed in broad terms of the many institutions and cultural forces that shape everyday activities of listening, seeing, doing.

Restriction: Art Majors have first consideration for enrollment.

(IV)



**ART 9B. Visual Culture: A Culture Divided. 4 Units.**

Throughout the 1980s and 1990s, controversies flourished in the mainstream media over purportedly obscene art, anti-American writing, and moral decay, among other issues. Examines these new conflicts as they manifest themselves in public life and everyday experience.

Restriction: Art Majors have first consideration for enrollment.

(IV)

**ART 9C. Visual Culture: Thematic Investigations. 4 Units.**

Considers a broad range of concerns and questions raised by various acts of appropriation in contemporary art and visual culture, such as originality, authenticity, authorship, translation, audience and aesthetics, temporal dimensions of a work, and context.

Restriction: Art Majors have first consideration for enrollment.

(IV)

**ART 11A. Topics in History of Contemporary Art. 4 Units.**

Surveys mid-nineteenth and twentieth-century art production, from modernity through post-modernity, in a historical and cultural context.

Prerequisite: ART 9A

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Art Majors only.

**ART 12A. Art, Design, and Electronic Culture. 4 Units.**

Introduction to historical and theoretical foundations of digital media art, tracing how information technologies seeded growth of new expressive medium. Considers how today's pervasive digital culture evolved through interdisciplinary collaborations between artists, engineers, scientists, scholars.

(IV)

**ART 12B. Technology, Culture, and Society: Steam to Steampunk. 4 Units.**

A survey of the ongoing interactions between technological and social change through the 19th century and 20th century, with special attention to the history of computing, changing arts and cultural practices, and the idea of the Anthropocene.

(IV)

**ART 12C. Intelligences of Arts. 4 Units.**

Introduces contemporary neuroscience and new approaches to cognition – embodied, enactive, extended, situated, distributed. Reviews the history of related ethological, biological, psychological, technological, and philosophical traditions. Considers arts and cultural practices from these and other perspectives, and considers case studies.

(III)

**ART 20A. Basic Drawing I. 4 Units.**

Encourages an investigation of the premises and limits of drawing, primarily, but not inevitably, as a two-dimensional medium. Includes slide presentations and discussions of the historical uses of a wide range of drawing. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 20B. Basic Drawing II. 4 Units.**

Continuation of the investigation initiated in ART 20A, with an emphasis on experimentation, personal investigation, and development of conceptual working premises, as well as the acquisition of necessary skills. Group discussion and critique are emphasized. Materials fee.

Prerequisite: ART 20A

Restriction: Art Majors have first consideration for enrollment.

**ART 30A. Basic Painting I. 4 Units.**

Examination of the fundamental components of painting: color, form, space, surface, scale, and content. Studio work, slide presentations, and critiques of student work. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 30B. Basic Painting II. 4 Units.**

Further examinations of the essential qualities of painting: color, form, space, surface, scale, and content. Studio work, slide presentations, and critiques of student work. Materials fee.

Prerequisite: ART 30A

Restriction: Art Majors have first consideration for enrollment.

**ART 40. Basic Sculpture. 4 Units.**

The practice of sculpture in the contemporary arts; inclusion of spatial interventions, site-specific and environmental design, appropriation of found materials; techniques in cutting joining, and assembly of wood, metals, and plastics. May include casting, welding, and ceramics. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 50A. Matter and Media . 4 Units.**

A project-based introduction to tools and approaches for creating and sharing digital media content within Internet-mediated social environments, with a particular emphasis on art-making and personal expression. Includes an overview of basic user experience and interaction design principles.

**ART 50B. Interaction and Experience. 4 Units.**

An overview of digital video and audio production for the Web, emphasizing art-making and personal expression. Includes digital media aesthetics and conceptual design, basic audio and video recording, and fundamentals of desktop video, audio, and Web authoring software applications.

Prerequisite: ART 50A

**ART 50C. Digital Media: Interaction Design. 4 Units.**

Principles and practices of interaction design for interactive digital media systems that provide for active involvement of the participant. Students gain experience with interaction design issues through a series of media art projects, emphasizing art-making and personal expression.

Prerequisite: ART 12A and ART 12B and ART 50A and ART 50B

**ART 51. Basic Ceramic Sculpture. 4 Units.**

Exploration of use of clay as sculptural basis with an emphasis on development of an idea and its relation to contemporary and experimental art practice. Hand-building, glazing, finishing processes, and use of other structural materials. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 65A. Foundations in Media Design. 4 Units.**

Provides an overview of media design in the digital age, covering principles of design for different media (2D, time-based, interactive); history of relationship between art and design; and practice in working with different design approaches. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 65B. Foundations in Internet Art and Design. 4 Units.**

Introduction to creating art for the Internet, covering history and structure of networks; key types of net-based interactivity; basics of Web design and scripting. Materials fee.

Prerequisite: ART 65A. Recommended: ART 11B.

Restriction: Art Majors have first consideration for enrollment.

**ART 65C. Gizmology and Kinetics. 4 Units.**

Provides students with basic skills in materials, construction and design applicable to making machines, musical instruments and things with moving parts enabling work in kinetic sculpture, custom interactive systems, Mechatronics, Robotics, and Maker/DIY culture. Materials fee.

**ART 71A. Introduction to Photography I. 4 Units.**

Introduction to technical underpinnings emphasizing photography as a contemporary art practice. Topics include 35mm non-automatic camera operation, exposure and lighting, black and white printing, introduction to digital photography, discussion of critical and historical issues. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 71B. Introduction to Photography II. 4 Units.**

Techniques covered include medium and large format cameras, digital photography, studio lighting, digital and analog color printing, mural room. Conceptual direction is developed through critiques, critical readings, discussions, slide lectures. Materials fee.

Prerequisite: ART 71A

Restriction: Art Majors have first consideration for enrollment.

**ART 81A. Digital Filmmaking Production I. 4 Units.**

Introduction to three production stages of video making. Study of the narrative structure of cinema and acquisition of video production skills in camera, lighting, sound, and editing. Production work, readings, and screenings outside of class are assigned. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 81B. Digital Filmmaking Production II. 4 Units.**

Focuses on video stage production, technical skills including camera operation, stage lighting, sound recording, and construction of basic scenic elements. Emphasis is placed on the function and responsibilities of the production crew and proper working and safety procedures. Materials fee.

Prerequisite: ART 81A

Restriction: Art Majors have first consideration for enrollment.

**ART 91. Basic Performance Art. 4 Units.**

Exploration of objects, gesture, action, text, image, and media to create narrative or non-narrative works. Elements of theory and history of performance art are discussed to illustrate techniques and styles to understand, identify, and articulate artistic vision and voice.

Repeatability: May be taken for credit 2 times.

Restriction: Art Majors have first consideration for enrollment.

**ART 95. SPECIAL TOPICS IN BASIC MEDIA. 4 Units.**

Basic instruction in media or disciplines not otherwise represented in the regular curriculum. Topics vary according to the instructor.

Repeatability: Unlimited as topics vary.

Restriction: Art Majors have first consideration for enrollment.

**ART 100. Special Topics in Art. 4 Units.**

Materials fee, topic dependent.

Prerequisite: ART 9A. Lower-division writing strongly recommended.

Repeatability: May be taken for credit 6 times as topics vary.

Restriction: Art Majors only.

**ART 101W. Artists as Writers. 4 Units.**

Contemporary art practice involves text, as final form or an integral element. Many contemporary artists consider writing as essential to their practice. Covers historical and contemporary uses of text and image as well as artists' writing.

Prerequisite: ART 9A and ART 11A. Satisfactory completion of the lower-division writing requirement.

Restriction: Art Majors only.

**(Ib)****ART 106A. Programming for Artists. 4 Units.**

Programming as a means to create interactive artworks with an emphasis on the integration of video, sound, text, and stills. Topics include basic concepts in programming, understanding the limits of code, working with video and audio files, interface design. Materials fee.

Prerequisite: ART 65A. Recommended: ART 11B.

Repeatability: May be taken for credit 2 times.

Restriction: Art Majors only.

**ART 106C. Design for Print. 4 Units.**

Investigates the use of print for communication as an artist. Covers the fundamentals of print design and output using digital media. Materials fee.

Prerequisite: ART 65A. Recommended: ART 11B.

Repeatability: May be taken for credit 2 times.

Restriction: Art Majors only.

**ART 108. Digital Filmmaking Project I. 4 Units.**

Students learn to conceive, develop, and produce original video works building directly upon previously learned skills. Use of video stage and post-production editing facilities. Lectures on video/film subjects, production strategies, readings, screening, field trips, and group critiques. Materials fee.

Prerequisite: ART 81A and ART 81B

Restriction: Art Majors only.

**ART 109. Performance and the Camera. 4 Units.**

Surveys the development of contemporary artists who use performance strategies in the making of videos and films. Students analyze the artist's conceptual approach to performative gestures, actions, and landscapes created for their video or film art.

Prerequisite: ART 1B or ART 81A or ART 91 or ART 128

Restriction: Art Majors only.

**ART 110A. Mechatronic Art I. 4 Units.**

Introduces the practice and theory of analog electronics, emphasizing the design and development of simple interactive systems and the integration of such systems into real-world contexts of performance, installation, sculpture, and automated artifacts. Materials fee.

**ART 110B. Mechatronic Art II. 4 Units.**

Introduces the practice and theory of embedded microcontrollers, digital electronics, coding, sensor interfacing, motor control, and output stages along with mechanical and electromechanical design and construction, emphasizing the integration of such systems into real-world contexts of performance, installation, and art-making. Materials fee.

Prerequisite: ART 110A

**ART 110C. Mechatronic Art III. 4 Units.**

As the capstone to the Mechatronic Art series, students develop major projects utilizing electronics, microcontrollers, sensors, and electromechanical devices, in a methodical and supervised context, with technical, design, and aesthetic advice and critique. Materials fee.

Prerequisite: ART 110A

**ART 113. How to be Clever with Stuff. 4 Units.**

How to Be Clever with Stuff is an introduction to the skilled embodied practices of arts and crafts, working with hand tools, wood, and steel. Class includes technical lecture/demos, short technical assignments, a self-initiated final project, and design drawing. Materials fee.

Restriction: Art Majors have first consideration for enrollment.

**ART 115W. Writing Nearby. 4 Units.**

Art writing is increasingly an area of scholarship unto itself as well as a discursive arm of contemporary art practice. Investigates the politics of art writing as well as training students in its various writing practices.

Prerequisite: ART 9A and ART 11A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only.

**(Ib)****ART 119. Issues in Contemporary Painting. 4 Units.**

Investigation of issues in modern and contemporary art work and criticism, wherein an assessment of Modernist influences is followed by the examination of contemporary painting as a cross-disciplinary practice employing popular culture, 'high art,' theory, and new technology.

Prerequisite: ART 9A. Recommended: Satisfactory completion of the upper-division writing requirement.

Repeatability: May be taken for credit 2 times.

Restriction: Art Majors only.

**ART 119A. Issues in Contemporary Drawing. 4 Units.**

Investigation of drawing as a primary practice rather than a developmental tool. Explores the relationship between Conceptualism, process and content, and considers the historical changes in method, presentation, and theory, from past to present.

Prerequisite: ART 9A

**ART 121A. Afro-Futurism I. 4 Units.**

First of a two-part course on the futuristic artistic vision of Black film, video, and cyberspace. Deals with critical analyses of the Black image in Western Art history, and its association to contemporary Hip Hop culture, art, and music.

Prerequisite: ART 9A. Satisfactory completion of upper-division writing strongly recommended.

Restriction: Art Majors only.

**ART 121B. Afro-Futurism II. 4 Units.**

Second of a two-part course on the futuristic artistic visions of Black film, video, and cyberspace. Deals with modern techno-culture, digital activism, and designing technology based on African aesthetic principles of contemporary Hip Hop International Culture.

Prerequisite: ART 9A. Satisfactory completion of upper-division writing strongly recommended.

Restriction: Art Majors only.

**ART 123B. Issues in Media, Violence, and Fear. 4 Units.**

Violence has been instrumental in story-telling throughout history in art, literature, religion, and entertainment. Continuing presence of media violence provoked debates among parents, politicians, media producers, and academics. Examines history, theory, aesthetics, economics, and politics of violent representation.

Prerequisite: ART 9A. Satisfactory completion of the Upper-Division Writing requirement is recommended.

Restriction: Art Majors only.

**ART 125. Issues in Photography. 4 Units.**

Rigorous investigation of photographic practices and critical writings, the relationship of photography to the construction and maintenance of cultural institutions, the circulation of photographic ideas in society, and photography and technology.

Prerequisite: ART 1A or ART 71A or ART 71B or ART 152A or ART 152B or ART 152C or ART 152D or ART 152E or ART 190B. Recommended: Satisfactory completion of the Upper-Division Writing requirement.

Repeatability: May be taken for credit 2 times.

Restriction: Art Majors only.

**ART 126. Issues in Media and Migration: Asia. 4 Units.**

Media and migration are profound, twinned influences on contemporary globalized experience. A discourse on Asian cultural production and of its transnational dimensions. Students will explore migration in its multiple facets to include migrations of people, ideas, and technologies.

Prerequisite: ART 9A

**ART 126B. Issues in Techno-Arts. 4 Units.**

Addresses issues related to artmaking practices that emerge in tandem with new technologies. Topics include sociopolitical contexts of techno-art; utopic/dystopic framings; key moments in the history of techno-arts.

Prerequisite: ART 9A. Recommended: ART 11B.

Restriction: Art Majors only.

**ART 127B. Issues in Experimental Film History. 4 Units.**

A critical study of experimental film/video art genres and production techniques considering their narrative, structural, iconographic, and cultural aspects. Hollywood narrative, Nouvelle Vague, American Independent, and Video Art compared in terms of production innovation, design, and conceptual content. Materials fee.

Prerequisite: ART 9A

Restriction: Art Majors only.

**ART 128. Issues in New Genres. 4 Units.**

Investigates issues in post-studio practices, including concepts of time, relational aesthetics, site-specificity, institutional critique, and the post-medium condition.

Prerequisite: ART 9A. Recommended: Satisfactory completion of the Upper-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Art Majors only.

**ART 130A. Projects in New Technologies. 4 Units.**

Working with media such as electronic still cameras, desktop publishing, faxes, satellites, virtual reality, digitized imaging. Cultural issues pertinent to the emergence of new technology (e.g., ethical concerns, social impact, copyright laws, nontraditional approaches to distribution, cyberpunk, global markets).

Prerequisite: ART 65A. Recommended: ART 11B and ART 106A.

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 131. Projects in Installation. 4 Units.**

Investigates interior installation in particular spaces. Working in teams, students install, discuss, and remove projects. Technical information and hands-on experience with various media is provided. Materials fee.

Prerequisite: ART 40

Repeatability: May be repeated for credit unlimited times.

**ART 132A. Digital Filmmaking Pre-Production. 4 Units.**

Examines the preparatory and planning stages of video production, including script writing, story boarding, location scouting, script breakdown, and budgeting. Projects may encompass one or more of these stages which will be explored through readings, discussions, and demonstrations. Materials fee.

Prerequisite: ART 81A and ART 81B

Restriction: Art Majors only.

**ART 132B. Digital Filmmaking Post-Production. 4 Units.**

Examines procedures and techniques utilized in video production after principal shooting is completed, including effects processing, composting, sound design, and DVD authoring. Projects focus on these processes, and are explored through readings, discussions, and demonstrations. Materials fee.

Prerequisite: ART 81A and ART 81B

Restriction: Art Majors only.

**ART 133. The Graphic Novel . 4 Units.**

An intensive workshop during which students will create a short graphic novel, taking the process all the way from concept to publication. Course work will focus on understanding how narrative emerges from a combination of visual and textual elements.

Prerequisite: ART 65A. Strongly recommended: ART 106C.

**ART 138. Place Making and Public Art. 4 Units.**

How do art interventions in public spaces inform our definition of 'place' and develop culturally informed audiences? Students will engage in class projects and group investigations that question the traditional and institutional conceptual boundaries of exhibition/distribution.

Prerequisite: ART 40 and ART 9A

Restriction: Art Majors only.

**ART 141. Digital Filmmaking Advanced Project I. 4 Units.**

Incorporating narrative structures in a multi-screen context. Students design and produce an active space in which activities will move from one screen to another. Materials fee.

Prerequisite: ART 81A and ART 81B

Restriction: Art Majors only.

**ART 144. Artist Books as Objects. 4 Units.**

Are artist books still relevant in the contemporary creative community? Focusing on intellectual content and raw physicality, students will explore this question and image/text relationships by creating handmade one-of-a-kind or edition book projects utilizing various mechanical reproduction techniques.

Prerequisite: (ART 20A or ART 30A or ART 40 or ART 51 or ART 65A or ART 71A or ART 81A or ART 91) and ART 9A

**ART 150. Advanced Studio Topics--Painting. 4 Units.**

Provides an intensive and specialized working environment. Thematic issues and material strategies will be explored. Materials fee.

Prerequisite: ART 30B

Repeatability: Unlimited as topics vary.

Restriction: Art Majors only.

**ART 150C. Advanced Drawing . 4 Units.**

Advanced studio problems in visual exploration. Students pursue individual solutions to self-defined and presubscribed projects. Techniques/materials are individual choice. Continual analysis of the personal process.

Prerequisite: ART 20B

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 150F. Advanced Figure Drawing. 4 Units.**

Students develop technical skills in rendering the figure. Live model sessions and an introduction to anatomy. Investigates use of the figure in contemporary art. Materials fee.

Prerequisite: ART 20B

Repeatability: May be taken for credit 2 times.

Restriction: Art Majors only.

**ART 150G. Advanced Figure Painting. 4 Units.**

Students develop technical skills in painting the figure. Live model sessions and projects that investigate the use of the figure in contemporary art.

Prerequisite: ART 150F

**ART 151. Advanced Studio Topics--Sculpture. 4 Units.**

Provides an intensive and specialized working environment. Thematic issues and material strategies will be explored. Materials fee.

Prerequisite: ART 40

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 152A. Advanced Studio Topics: Photography. 4 Units.**

Focused investigation of a range of issues in photographic practice, with an emphasis on developing individual student projects, refining critical thinking, and conceptual framing. Technical topics covered as required. Readings, lectures, critiques, labs. Materials fee.

Prerequisite: ART 71B

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 152B. Documentary Photography. 4 Units.**

Documentary practice is examined through the realization of photo-based projects. Thematic focus of student's choosing will be refined through lectures, discussion, technical demonstrations, field trips, labs, and individual meetings. Materials fee.

Prerequisite: ART 71B

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 152C. The Public Image. 4 Units.**

Strategies for artistic intervention in the public circulation of images are examined alongside the role images play in constructing public identity. Individual or collaborative student projects will be directed around course themes. Materials fee.

Prerequisite: ART 71B

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 152D. The Photographic Tableau. 4 Units.**

Examines and develops photographic projects intended for traditional artistic venues (i.e., galleries and museums). In addition to exploring appropriate techniques and presentation strategies, students consider the interdependency between construction of images and semantic shaping of traditional art venues. Materials fee.

Prerequisite: ART 71B

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 152E. The Constructed Image. 4 Units.**

A studio investigation of theoretical ideas, critical possibilities, historical precedents, and various techniques involving the production of fabricated images. Techniques may include montage, digital, chemical and in-camera manipulations, studio constructions, appropriations, performance, and projected images. Materials fee.

Prerequisite: ART 71B

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 152F. Seminar Production Component. 4 Units.**

Photographic and/or inter-media production course tied to a specific Issues course (for example, Issues in Photography, Issues in Feminism, Issues in New Genres). Critiques, labs, field trips, discussion, demonstrations. Materials fee.

Prerequisite: ART 71B

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 153. Digital Filmmaking Advanced Project II. 4 Units.**

Directed to the production of individual or collaborative videotapes, using studio, portable camera, editing facilities, and sound and computer elements. Emphasis will be on individually initiated projects. Readings and screenings are assigned. Materials fee.

Prerequisite: ART 81A and ART 81B

Restriction: Art Majors only.

**ART 154. Advanced Studio Topics: Performance. 4 Units.**

An intensive investigation of the practice of performance art, with an emphasis on the development of individual projects, and the refinement of various technical skills, as well as audiences, spaces, and cultural connections.

Prerequisite: ART 91 or ART 109 or ART 128

Repeatability: May be taken for credit 3 times.

Restriction: Art Majors only.



**ART 156. Advanced Studio Topics: Ceramic Sculpture. 4 Units.**

Discussion of ideas, techniques, and personal control of form. Clay body, fabrication, glazing, and firing. Emphasis on development of personal direction. Materials fee.

Prerequisite: ART 51

Repeatability: May be repeated for credit unlimited times.

Restriction: Art Majors only.

**ART 166A. Digital Filmmaking Web Series. 4 Units.**

Original video projects produced in collaborative teams combining advanced video students with students from other areas, including Dance, Drama, and Music. Shoots may be carried out on the video stage as well as field locations. Materials fee.

Prerequisite: ART 81A and ART 81B

Restriction: Art Majors only.

**ART 170. Advanced Projects. 4 Units.**

Students working in different mediums will focus on ambitious research, planning, development, and experimentation, leading to a single work or focused series that is large in scope. The project will be exhibited and documented at the end of the quarter. Materials fee.

Prerequisite: ART 150 or ART 150C or ART 151 or ART 152A or ART 152B or ART 152C or ART 152D or ART 152E or ART 152F or ART 153 or ART 166A or ART 190 or ART 190B or ART 190C

Restriction: Art Majors only.

**ART 189. Critical Aesthetics . 4 Units.**

Surveys critical thought that has influenced twentieth-century art production, preparing the student to engage contemporary art with a critical eye, specifically addressing aesthetic and political debates of the historical avant-garde, the neo-avant garde, and postmodern culture.

Prerequisite: ART 1A and ART 1B and ART 1C

Restriction: Upper-division students only. Art Majors only.

**ART 190. Senior Project and Critique. 4 Units.**

Directed-study critique class in preparation for final project and life after graduation; documentation and portfolio preparation for graduate school. Investigation of exhibition spaces and funding opportunities, participation in artists' communities outside the university, and artists' rights issues.

Repeatability: May be repeated for credit unlimited times.

Restriction: Seniors only. Art Majors only.

**ART 190B. Senior Projects and Critique in Photography. 4 Units.**

Directed group study focused on production of photographic projects of significant scope and ambition. Emphasis on preparation for continued study and/or practice in photography in advanced settings beyond the undergraduate university experience. Materials fee.

Prerequisite: ART 1A and ART 1B and ART 1C and ART 71A and ART 71B

Repeatability: May be repeated for credit unlimited times.

Restriction: Seniors only. Art Majors only.

**ART 197. Art Internship. 1-4 Units.**

Under faculty supervision, students participate directly in a variety of art institution settings, including museums, galleries, and nonprofit organizations.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

Restriction: Juniors only.

**ART 198. Honors Exhibition. 4 Units.**

Preparation, installation, and participation in the annual honors exhibition. Materials fee.

Grading Option: Pass/no pass only.

Restriction: Upper-division students only. School of Arts Honors students only.

**ART 199. Independent Study. 1-4 Units.**

Individual study or directed creative projects as arranged with faculty member. Materials fee.

Repeatability: May be repeated for credit unlimited times.

**ART 210. First-Year Graduate Seminar. 4 Units.**

Introductory theory class to contemporary art: intellectual history, theoretical antecedents, and current critical concerns.

Restriction: Graduate students only.

**ART 215. Graduate Seminar Topics. 4 Units.**

In-depth discussion of contemporary art production in relation to a variety of theoretical, cultural, and historical topics. Material is determined by the given instructor's current research interest. Topics vary.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ART 220. Graduate Seminar: Issues in Contemporary Art. 4 Units.**

Classroom interaction with artists, curators, critics, lecturers from fields outside of the arts or from cross-disciplines. Includes recommended readings, discussions, panel participation, writing assignments.

Prerequisite: ART 210

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**ART 230. Graduate Group Critique. 4 Units.**

Focus on studio production. Students are expected to help foster and develop an environment in which serious and sophisticated peer critique can take place.

Repeatability: May be taken for credit 9 times.

Restriction: Graduate students only.

**ART 236. Graduate Topics in Studio Production. 4 Units.**

Graduate group study of a specific medium or art practice (e.g., painting; video, installation, photography, sculpture/3D, performance, digital media, public art, sound art; film). Includes consideration of technical, theoretical, historical, and/or formal issues.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ART 240. Interdisciplinary Projects. 4 Units.**

Intensive faculty-led discussion of in-progress graduate studio projects--can be discipline driven or working across fields in a rigorous interdisciplinary studio environment where students meet with the professor both individually and in small groups.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ART 250. Directed Reading and Research. 4 Units.**

Independent study with a supervising faculty member to direct academic research, develop bibliographies, and discuss assigned readings.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ART 251. Special Topics Seminar. 4 Units.**

Directed reading and/or study group on a given research topic. Agreed-upon meeting structure may be flexible in order to accommodate off-campus field trips and travel.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ART 255. Graduate Interdisciplinary and Collaborative Projects. 4 Units.**

For graduate students working collaboratively across the School of the Arts or cross-university. May be team taught with one of the faculty members based in the Department of Art.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ART 261. Graduate Thesis Writing Seminar. 4 Units.**

Seminar for writing as a component of the thesis. Different models of writing, text, and spoken word will be discussed. Required second year.

Corequisite: ART 262

Prerequisite: ART 210 and ART 215 and ART 220

Restriction: Graduate students only.

**ART 262. Graduate Thesis Independent Study. 1-4 Units.**

Tutorials and directed study in thesis writing, research and/or studio production with thesis committee chair and/or thesis committee members to be taken during final quarters of study.

Corequisite: ART 261

Prerequisite: ART 210 and ART 215 and ART 220

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ART 263. Graduate Thesis, Exhibition Critique. 4 Units.**

Group critique required for matriculating M.F.A. students during the quarter in which their thesis exhibitions are scheduled. Public presentation/lecture on student's work required.

Prerequisite: ART 210 and ART 215 and ART 220 and ART 230 and ART 240 and ART 261 and ART 262

Restriction: Graduate students only.

**ART 264. Critical and Curatorial Thesis Exhibition. 8 Units.**

Intensive tutorial geared toward execution of professional gallery exhibition, which is one half of the degree requirement for the M.F.A. concentration in Critical and Curatorial Studies. Must be taken under direction of Committee Chair.

**ART 280. Contemporary Exhibition Systems. 4 Units.**

Investigates contemporary case studies of curatorial practice. Sometimes taught in collaboration with a host institution. The history, theory and criticism or curatorial practice are tested through the explication of real exhibitions.

Prerequisite: ART 280A

Repeatability: May be taken for credit 4 times.

**ART 280A. Introduction to Exhibition Systems. 4 Units.**

Introduces the basics of curating, covering the fundamentals of collection, research, fundraising, publicity, and installation. Also introduces the related categories of public programming and art criticism.

Restriction: M.F.A. students only.

**ART 399. University Teaching. 4 Units.**

Limited to Teaching Associates working under the active guidance and supervision of a regular rank faculty member responsible for curriculum and instruction at the University.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit for 12 units.

Restriction: Graduate students only.

## Art, B.A.

The Department of Art in the Claire Trevor School of the Arts takes a wide-ranging, interdisciplinary view of contemporary art practice. With an emphasis on experimentation and innovation, the Department of Art is viewed as a leader in genres addressing cultural identity and emerging technologies. The Department provides students a solid theoretical and technical foundation from which to approach art making as both process and product. Each student

is encouraged to develop an individual, disciplined direction approach to media, materials, and techniques. To this end, the curriculum provides studio experiences in drawing, painting, sculpture, photography, digital imaging, video, performance art, and new media. Visiting artists, theorists, curators, and other arts professionals are an integral part of the program.

The Art Culture Technology (ACT) building houses the ROOM Gallery, CATALYST student gallery, undergraduate honors studios, the Digital Filmmaking Studio, department administrative offices, faculty studios, and graduate student studios. The University Art Gallery provides a venue for student shows as well as faculty and guest artist presentations. The original Art buildings have been seismically retro-fitted and extensively remodeled and renovated.

## Requirements for the B.A. in Art

**All students must meet the University Requirements.**

**School Requirements: None.**

Departmental Requirements for the Major in Art

A. Complete the following:

ART 1A	Art in Context: History, Theory, and Practice
ART 1B	Art in Context: History, Theory, and Practice
ART 1C	Art in Context: History, Theory, and Practice (ART 1A, ART 1B, and ART 1C all taken the first year in residence.)
ART 9A	Visual Culture: Media, Art, and Technology
ART 11A	Topics in History of Contemporary Art

B. Select one of the following:

ART HIS 40A	Ancient Greek and Roman Art, and Architecture
ART HIS 40B	Arts of Europe: Medieval and Renaissance
ART HIS 40C	Early Modern and Modern Art in Europe and America
ART HIS 42A	History of Asian Art: Arts of India
ART HIS 42B	History of Asian Art: Arts of China
ART HIS 42C	History of Asian Art: Arts of Japan
ART HIS 42D	History of Asian Art: Arts of Islam

C. Select four of the following:

Lower-division ART 20–99
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D. Select six of the following:

Upper-division ART 100–115 (no more than three in this category),
Upper-division ART 130–195 (minimum of three in this category);

E. Select two of the following:

Issues courses from ART 116–129
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## Honors in Art

The Honors in Art program gives qualifying students a more rigorous course of study in contemporary art practices, thus challenging superior students beyond the scholarly requirements demanded of the Art major. This program is designed to further develop students' critical, analytical, research, and technical skills. It is particularly suited to those wishing to go on to graduate school and/or exhibition careers.

### Eligibility Requirements

1. One year in good standing as an Art major;
2. An overall GPA of 3.2 or higher with a GPA of at least 3.4 in ART courses.
3. Completion of:

ART 1A	Art in Context: History, Theory, and Practice
ART 1B	Art in Context: History, Theory, and Practice
ART 1C	Art in Context: History, Theory, and Practice

Four lower-division courses selected from ART 20–99

One Art History course from either the ART HIS 40 or 42 series.

## Application Deadline

The annual application deadline is May 15. Late applications will not be accepted.

## Application Requirements

All applicants must upload the following at <https://ctsa.slideroom.com>. There is a fee associated with submission of materials via Slideroom.

1. A portfolio of up to 10 images and/or other media samples. Images/media samples must include title of the work, size, year, medium, description, and duration of the work, if time-based.
2. A brief statement (250 words maximum) of research and career goals; and
3. UCI transcript (downloadable from StudentAccess).

The applicant's name, UCI student ID number, and email address must be printed legibly on all submitted materials.

All applicants will be notified of their application status no later than the end of spring quarter finals week.

Students accepted to the program will share the Catherine Lord Undergraduate Honors Studio for the entire academic year. Students accepted to the program must actively participate in programmatic activities. Students must follow the Department's studio occupancy guidelines in order to maintain their studios. GPAs will be reviewed each quarter to ensure programmatic requirements.

Beyond fulfilling regular courses for the Art major, honors students must take the following:

Select two additional courses from the following: ART 100–191, 199;

Select one ART HIST course of the student's choosing; and

Complete ART 198.

Honors Exhibition ART 198 (this course will prepare students for a mandatory, group interdisciplinary honors gallery exhibition to take place during either winter or spring quarter of the student's matriculating year, at which time students will defend their thesis work to faculty on the Undergraduate Committee).

Non-compliance with any of the requirements will result in dismissal from the program.

NOTE: Students may be assessed a course materials fee for certain courses. Consult the online *Schedule of Classes* on the University Registrar's website (<http://www.reg.uci.edu/>) for the most up-to-date information about which courses require a materials fee and the amount of the fee.

## Art Sample Program for Freshman

### Freshman

Fall	Winter	Spring
ART 1A	ART 1B	ART 1C
Art History	Lower-Division Art	Lower-Division Art
WRITING 39B	General Education	General Education
Lower-Division Art	WRITING 39C	General Education

Departmental faculty and the range of artists whose work is represented in the University Art Gallery exhibitions provide diverse career models. Some graduates go on to careers as exhibiting artists or teachers; others work in arts-related activities in museums, galleries, and artists' organizations. A bachelor's degree in Art is usually required as preparation for graduate-level study in Art.

## Art, M.F.A.

The program is designed to provide intensive professional training for independently motivated students wishing to pursue careers in the field of contemporary art. The overall emphasis in the program is on studio production. Experimental and interdisciplinary approaches to art making are emphasized. Students undergo a rigorous course of study combining seminar classes, intensive critique courses, and independent study.

Applicants for admission to the M.F.A. program must meet the general requirements for admission to graduate study, hold a B.A. or B.F.A. in Art, have completed one year of Twentieth-Century Art History (students who have not completed this will be required to do so as part of their graduate studies).

### HOW TO APPLY

1. Complete the Online Application for Graduate Admissions (<http://www.grad.uci.edu/>), which includes submission of a **Statement of Purpose** and three (3) **letters of recommendations** (recommenders must submit letters via online application).

2. Submit a **portfolio** of 20 images and/or other media samples, to be uploaded at <https://ctsa.slideroom.com> (<https://ctsa.slideroom.com/>). Images must include title of the work, size, year, medium, description, and duration of the work, if time-based. Slideroom will ask for a 'student number;' please enter the application number given to you when you apply online,

3. One copy of **transcripts** from the Undergraduate institution(s) attended by the applicant. Undergraduate institutions must send transcripts directly to:  
*University of California, Irvine*  
*Art Department*  
*3229 Art Culture and Technology*  
*Irvine, CA 92697-2775*  
*Attn: Graduate Application*

#### **ALL PARTS OF THE APPLICATION MUST BE SUBMITTED BY JANUARY 15; THERE IS NO GRACE PERIOD.**

Topic-based seminars cover a range of critical issues dealing with the relationship of culture to contemporary art and are designed for students interested in positioning their art practices within an interdisciplinary discursive framework. All incoming students must take the First-Year Graduate Seminar in preparation for further course work. As students progress in the program, they are required to take a series of additional seminars aimed at training them to develop research skills and a written component augmenting their culminating thesis exhibitions. Various approaches to developing text and word are considered, and students are encouraged to approach developing the thesis textual component following a path best suited to their postgraduate interests (e.g., critical writing, spoken word/performance, critical memoir, digital narrative structures).

Throughout a three-year residence, students take a series of critique seminars in which work-in-progress is intensively discussed within a group context. Each quarter, students also meet, on an independent basis, with faculty of their choice. Students are encouraged to work with a range of faculty members. Towards the end of the second year, students select a thesis committee with whom they will work closely on the development of a thesis exhibition in their third year. After selecting a thesis committee, a student may continue to work with a range of faculty, either independently or in a critique seminar, to continue to explore a diversity of ideas and differing approaches to both studio production and art distribution systems.

During the first two years, students are required to take courses from a structured curriculum totaling a minimum of 12 units each quarter. Beyond that, students can select additional course work from any sector of the department or University including approved upper-division undergraduate courses. The third year is structured so that students can individualize their course of study through a wide selection of classes. For example, students wishing to focus primarily on studio production can do so through a combination of independent studies and critique classes, or students can design their third year to focus on both studio production and acquire additional course work in a given research area or graduate emphasis.

In addition to the graduate degree in Art, several emphases offered by the University are available to M.F.A. students. They include, but are not limited to, emphases in Visual Studies, Critical Theory, Feminist Studies, and Asian American Studies (refer to the Visual Studies, Critical Theory Emphasis, Department of Gender and Sexuality Studies, or the Department of Asian American Studies sections of the *Catalogue* for information).

Throughout the first two years, students must also undergo a series of progress checks including open studio reviews and a second-year exhibition where they are evaluated by faculty committees. Satisfactory opinion by these committees, coupled with both satisfactory independent study evaluations and grades of at least a B or above, will allow the student to progress to candidacy for the degree. During the third year, candidates must mount a thesis exhibition. In tandem with the final thesis exhibition, students are required to do a presentation on their work as part of the final defense before their thesis committee. The normal time to degree for students in the M.F.A. program is three years. Residence is required.

Each M.F.A. candidate is provided with an individual or shared studio space. Facilities include photography laboratories (analog and digital), video production studios, data laboratories, and sculpture laboratories for work in wood and metal. There are also facilities to support work in digital media, painting, performance, drawing, and ceramics. Students have regular opportunities to exhibit in three galleries.

Various programs of visiting artists and lecturers are an integral part of the student experience. Visiting artists, curators, critics, and gallerists are invited to give lectures and conduct studio visits with graduate students. Some Art faculty, in addition to their departmental appointment, are affiliated with other UCI and UC programs, e.g., Asian American Studies, African American Studies, Gender and Sexuality Studies, Engineering, Information and Computer Science, Critical Theory Emphasis, Visual Studies, Calit2 Gaming Studies Initiative, Center for Law, Society and Culture, Center for Asian Studies, Center for Global Peace and Conflict Studies, and the UC Institute for Research in the Arts (UCIRA).

## **Admission**

Applicants for admission to the M.F.A. program must meet the general requirements for admission to graduate study, hold a B.A. or B.F.A. in Art, have completed one year of Twentieth-Century Art History (students who have not completed this will be required to do so as part of their graduate studies).

#### **HOW TO APPLY**

1. Complete the Online Application for Graduate Admissions (<http://www.grad.uci.edu/>), which includes submission of a **Statement of Purpose** and three (3) **letters of recommendations** (recommenders must submit letters via online application).
2. Submit a **portfolio** of 20 images and/or other media samples, to be uploaded at <https://ctsa.slideroom.com> (<https://ctsa.slideroom.com/>). Images must include title of the work, size, year, medium, description, and duration of the work, if time-based. Slideroom will ask for a 'student number;' please enter the application number given to you when you apply online,
3. One copy of **transcripts** from the Undergraduate institution(s) attended by the applicant. Undergraduate institutions must send transcripts directly to:

University of California, Irvine  
 Art Department  
 3229 Art Culture and Technology  
 Irvine, CA 92697-2775  
 Attn: Graduate Application

**ALL PARTS OF THE APPLICATION MUST BE SUBMITTED BY JANUARY 15; THERE IS NO GRACE PERIOD.**

## Specific Degree Requirements

107-116 units over a three-year course of study are required. Residency is required. Students must take a minimum of 12 units per quarter.

### First Year:

ART 210	First-Year Graduate Seminar (one in fall)
ART 215 or ART 251	Graduate Seminar Topics (one in any quarter) Special Topics Seminar
ART 220	Graduate Seminar: Issues in Contemporary Art (one in winter)
ART 230	Graduate Group Critique (one in fall, one in winter)
ART 240	Interdisciplinary Projects (one in fall, one in winter, two in spring)

### Second Year:

ART 215 or ART 251	Graduate Seminar Topics (one in any quarter) Special Topics Seminar
ART 220	Graduate Seminar: Issues in Contemporary Art (one in winter)
ART 230	Graduate Group Critique (one in fall, one in winter)
ART 240	Interdisciplinary Projects (two in fall, two in winter, two in spring)

### Third Year:

ART 230	Graduate Group Critique (one in fall)
ART 261	Graduate Thesis Writing Seminar (one in spring)
ART 262	Graduate Thesis Independent Study (one per quarter)
ART 263	Graduate Thesis, Exhibition Critique (one in winter)

### Two courses selected from the following (in any quarter):

ART 215	Graduate Seminar Topics
ART 236	Graduate Topics in Studio Production
ART 250	Directed Reading and Research
ART 251	Special Topics Seminar
ART 255	Graduate Interdisciplinary and Collaborative Projects

Two courses selected from ART 215, ART 240, ART 251, ART 399, or outside 4-unit graduate courses (in any quarter).

## Digital Arts, Minor

### Jesse C. Jackson, Director

The minor in Digital Arts provides opportunities to explore creativity through digital media arts. This program is open to students from all areas of UCI who want to acquire a working knowledge of how digital media content is conceived, constructed, and performed.

In the studio, students receive hands-on experience with current software tools, creating and sharing digital media art projects, developing an appreciation of digital media aesthetics and conceptual design, and learning the fundamentals of desktop video, audio, and Web authoring software applications. Lectures and discussions examine how today's pervasive digital culture evolves through interdisciplinary collaborations among artists, engineers, scientists, and scholars. Course work considers relationships between digital media practices, touching on such areas as social networking, video/audio podcasting, interface design, digital music, telematic performance, intelligent agents, virtual realities, artificial life, and ubiquitous computing. The program investigates critical issues related to emerging technologies and the arts, and surveys recent works by leading digital media artists.

Prospective students should have basic proficiency with Web, email, word processing, and presentation software. It is highly recommended that students have their own computer. Further information is available at the Digital Arts Minor website (<http://sites.uci.edu/elad/minor/>).

### Jesse C. Jackson, Director



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Prospective students should have basic proficiency with Web, email, word processing, and presentation software. It is highly recommended that students have their own computer. Further information is available at the Digital Arts Minor website (<http://sites.uci.edu/elad/minor/>).

The minor in Digital Arts consists of a minimum of eight courses which fall into two categories: A. Required and B. Elective.

A. Complete the following:

ARTS 1	ArtsCore
ART 12A	Art, Design, and Electronic Culture
ART 12B	Technology, Culture, and Society: Steam to Steampunk
ART 50A	Matter and Media
ART 50B	Interaction and Experience
ART 50C	Digital Media: Interaction Design

B. Select two of the following

ART 65A	Foundations in Media Design
ART 65B	Foundations in Internet Art and Design
ART 81A	Digital Filmmaking Production I
ART 81B	Digital Filmmaking Production II
ART 100	Special Topics in Art
ART 106A	Programming for Artists
ART 106C	Design for Print
ART 143	
ARTS 75	Digital Media: Exhibition
DANCE 163	Dance and Video Technology
DANCE 164	Screendance
MUSIC 51	Music Technology and Computers
MUSIC 147	Studies in Music Technology
MUSIC 151	Computer Music Composition
MUSIC 152	Interactive Arts Programming

Each of these courses may be taken one time only for credit toward the minor (with the exception of topics vary courses, e.g., ART 100 ). No course in the requirements for the minor may be taken Pass/Not Pass.

## Digital Filmmaking, Minor

**Bruce Yonemoto, Director**

The minor in Digital Filmmaking in the Claire Trevor School of the Arts provides opportunities to explore creative digital film production techniques and structures basic to the creation of new film works. Undergraduate students from all areas of UCI will have the opportunity to produce digital film works with content that contributes to the future of film as an art form.

Through the minor in Digital Filmmaking students will learn how traditional production techniques create content through form. Theories of studio production and art film history will inform the production of new narrative, documentary, fictional, and experimental film works. Students will learn to produce films which will lend themselves to emerging distribution platforms. The future of film as an art form depends on students to learn traditional as well as experimental components of structure and content. In the studio, students will acquire advanced skills in camera, lighting, sound, re-production, and post-production. Through issues and projects courses the program investigates experimental techniques developed by historical and contemporary film artists.

Application to the Minor in Digital Filmmaking is open to all undergraduate UCI students. There are no restrictions based on major or level. Admission is on a competitive basis and students must submit an online application with a statement of purpose and links to online work samples. A limited number of students are admitted to the minor on a quarterly basis. The quarterly deadline is Friday, Week 3 by 5:00 p.m. Applicants that meet the deadline will



be notified of their admission status via email by Week 7. Interested students are encouraged to obtain further information from the Digital Filmmaking website (<http://digifilmuci.com/>). Course Materials fees are required for all courses in the Minor.

Online Application Form: [digifilm.arts.uci.edu/apply](http://digifilm.arts.uci.edu/apply) (<http://digifilm.arts.uci.edu/apply/>)

### **Bruce Yonemoto, Director**

The minor in Digital Filmmaking in the Claire Trevor School of the Arts provides opportunities to explore creative digital film production techniques and structures basic to the creation of new film works. Undergraduate students from all areas of UCI will have the opportunity to produce digital film works with content that contributes to the future of film as an art form.

Through the minor in Digital Filmmaking students will learn how traditional production techniques create content through form. Theories of studio production and art film history will inform the production of new narrative, documentary, fictional, and experimental film works. Students will learn to produce films which will lend themselves to emerging distribution platforms. The future of film as an art form depends on students to learn traditional as well as experimental components of structure and content. In the studio, students will acquire advanced skills in camera, lighting, sound, re-production, and post-production. Through issues and projects courses the program investigates experimental techniques developed by historical and contemporary film artists.

### **Application**

Application to the Minor in Digital Filmmaking is open to all undergraduate UCI students. There are no restrictions based on major or level. Admission is on a competitive basis and students must submit an online application with a statement of purpose and links to online work samples. A limited number of students are admitted to the minor on a quarterly basis. The quarterly deadline is Friday, Week 3 by 5:00 p.m. Applicants that meet the deadline will be notified of their admission status via email by Week 7. Interested students are encouraged to obtain further information from the Digital Filmmaking website (<http://digifilmuci.com/>). Course Materials fees are required for all courses in the Minor.

Online Application Form: [digifilm.arts.uci.edu/apply](http://digifilm.arts.uci.edu/apply) (<http://digifilm.arts.uci.edu/apply/>)

### **Requirements for the Minor in Digital Filmmaking**

A. Complete the following:

ART 81A	Digital Filmmaking Production I
ART 81B	Digital Filmmaking Production II
ART 108	Digital Filmmaking Project I
ART 127B	Issues in Experimental Film History
ART 132A	Digital Filmmaking Pre-Production
ART 132B	Digital Filmmaking Post-Production
ART 141	Digital Filmmaking Advanced Project I
ART 153	Digital Filmmaking Advanced Project II
or ART 166A	Digital Filmmaking Web Series

This minor requires eight four-unit quarter courses. Two courses in the minor may overlap with the Art major requirements. One course may be taken Pass/No Pass (unless the course overlaps with Art major requirements).

## **Department of Dance**

### **Molly Lynch, Department Chair**

300 Mesa Arts Building  
949-824-7283  
<http://dance.arts.uci.edu/>

The Department of Dance fosters an educational environment in which performance opportunities, creative projects, and theoretical studies complement and reinforce each other, providing a foundation for careers in dance. The program focuses on the dance techniques of ballet, modern, jazz, tap, world dance, and dance and technology. Theoretical studies include dance history and theory; dance writing; Laban studies; dance pedagogy; dance ethnography; dance science; and aesthetics of digital media. Creative opportunities bridge the studio and theoretical work through performance and choreography for multiple contexts; creative applications of animation, motion capture, audio and video technologies; lecture demonstration; and critical, historical, ethnographical, and scientific writing.

The objective of studio work is to develop kinesthetic resources, precision, flexibility, creativity, and freedom in a coordinated and intelligently responsive dancer. The techniques of classical ballet, modern dance, and jazz constitute crafts and styles for the dancer that serve not only as a basis for the training of the body, but also as a basic language of movement for the choreographer.

The theoretical, historical, and scientific courses are designed both to broaden the perspective of those students whose first interest is performance or choreography, and to provide a foundation for those students who plan to pursue careers in the academic, scientific, technological, or administrative fields of dance.

The dance archives in the UCI Langson Library Special Collections offer a rich source of research materials which enhance the Dance program. Among other special holdings, the archives include the extensive Ruth Clark Lert collection of dance books, journals, photographs, original costume sketches, and memorabilia of dance in Europe and the United States from pre-World War I to the present.

- Dance, B.A.
- Dance, B.F.A.
- Dance, M.F.A.

## Faculty

David Allan, Choreographer/Former Soloist, National Ballet of Canada; Choreographer, ballet companies, operas, film, and television, *Professor Emeritus of Dance* (ballet, pas de deux, choreography)

Mary Corey, M.A. University of California, Riverside; Certified Professional Labanotator, *Professor of Dance* (dance history, dance notation and reconstruction)

John L. Crawford, Media Artist and Software Designer, *Professor of Dance; Informatics* (screendance, interactive media, telematic performance, motion capture, digital arts)

Diane L. Diefenderfer, Former Soloist, Los Angeles Ballet, Eglevsky Ballet Company, Frankfurt Ballet Company, Director of Pilates Program for Dance Wellness, Undergraduate Advisor, *Associate Professor of Teaching of Dance* (ballet, pointe, repertory)

Jennifer J. Fisher, Ph.D. University of California, Riverside; founder and editor of Dance Major Journal, *Professor of Dance* (critical dance studies)

Israel Gabriel, Bat-Dor Dance Company; Former Assistant Artistic Director, *Associate Professor of Teaching Emeritus of Dance* (ballet, modern, pas de deux, repertory)

Michel Gervais, *Lecturer of Dance*

Lindsay Gilmour, M.F.A. University of Wisconsin, Milwaukee, *Assistant Professor of Dance* (modern choreography, improvisation)

Charlotte Griffin, M.F.A. University of Texas, Austin, *Assistant Professor of Dance* (choreography, modern, screen dance)

Chad Michael Hall, M.F.A. Ohio State University, *Artistic Director - MULTIPLEX DANCE and Assistant Professor of Dance* (contemporary technique, choreography, improvisation, dance, and video)

Loretta Livingston, Ph.D. Texas Woman's University; Certified Laban Movement Analyst; former principal with Bella Lewitzky Dance Company, Graduate TA Advisor, Co-Advisor for B.F.A. Choreography/Senior Thesis/Honors Thesis concerts, *Professor of Dance* (choreography, Laban movement analysis, body and practice)

Lar Lubovitch, Honorary Doctorate, Juilliard School of the Arts, *Founder and Director of New York-based Lar Lubovitch Dance Company and UCI Distinguished Professor of Dance* (choreography, repertory, technique, and special projects)

Molly L. Lynch, M.F.A. University of California, Irvine; Pilates Certified; Choreographer/Artistic Director of the National Choreographers Initiative, *Department Chair and Professor of Dance* (ballet, repertory, arts management, and senior seminar)

Lisa Marie Naugle, Ph.D. New York University, *Director of International Initiative for CTSA, Artistic Director for DTM2 Performance Ensemble and Professor of Dance* (modern dance, choreography, online/interactive technology, improvisation, teaching of dance)

James W. Penrod, M.F.A. University of California, Irvine; C.M.A. Laban Institute of Movement Studies, *Professor Emeritus of Dance* (ballet, modern, dance notation, choreography, movement analysis)

Janice G. Plastino, Ph.D. University of Southern California, *Professor Emerita of Dance* (kinesiology/anatomy, research methods, choreography, dance science/medicine)

Nancy L. Ruyter, Ph.D. Claremont Graduate University, *Professor Emerita of Dance* (dance history, Spanish dance, bibliography and research)

Kelli Sharp, D.P.T. Chapman University, *Assistant Professor of Dance; Physical Medicine and Rehabilitation* (somatic practices, dance science, kinesiology, physical therapy, motor learning and performance)

Alan Terricciano, M.A. Eastman School of Music, *Associate Dean for Undergraduate Affairs and Professor of Dance; Music* (music for dance, musical resources, critical issues in dance, music theory, keyboard skills, and repertoire)

Tong Wang, M.F.A. University of Utah; Principal dancer with the Shanghai Ballet, Tulsa Ballet Theatre, Dayton Ballet, Ballet West, *Associate Professor of Dance* (ballet, choreography, men's ballet, pas de deux)

S. Ama Wray, Ph.D. University of Surrey, *Associate Professor of Dance; African American Studies* (jazz, choreography, improvisation, teaching of dance, jazz ensemble)

## Courses

### **DANCE 2. Dance Health and Injury Prevention. 4 Units.**

An overview of factors that affect the health of dancers. Includes evaluation of general health measures and prevention and management of common dance injuries.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

### **DANCE 3. Scientific Concepts of Health. 4 Units.**

Introduction to the scientific foundations of health, emphasizing those pertaining to success in college and lifetime wellness. Includes principles of cardiorespiratory, musculoskeletal, flexibility, and nutritional fitness. A variety of learning experiences are offered to apply science to real life.

## (II)

### **DANCE 14. Social Dance. 2 Units.**

Contemporary and historical forms. Current ballroom, disco, and Western square dance forms; Latin ballroom dances; dances from the 20s, 30s, and 40s.

Grading Option: Pass/no pass only.

### **DANCE 21A. Music for Dancers. 4 Units.**

Emphasis on the development of musical skills most pertinent to the dancer: vocabulary, notational literacy, rhythmic and melodic acuity, score reading, and fundamental analysis; working with live accompaniment.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

### **DANCE 30A. Studio Workshop in Ballet I. 2 Units.**

Beginning ballet: fundamentals and principles of classical ballet with an emphasis on technique.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

### **DANCE 30B. Studio Workshop in Ballet I. 2 Units.**

Beginning ballet: fundamentals and principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 30A

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

### **DANCE 30C. Studio Workshop in Ballet I. 2 Units.**

Beginning ballet: fundamentals and principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 30A and DANCE 30B

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

### **DANCE 34. Men's Studio Workshop in Ballet. 2 Units.**

Emphasis on men's traditional ballet, techniques, and movements.

Prerequisite: DANCE 30A and DANCE 30B and DANCE 30C

Repeatability: May be repeated for credit unlimited times.

**DANCE 40A. Studio Workshop in Modern I. 2 Units.**

Fundamentals of modern dance: principles of modern tradition developed from Graham, Humphrey, and Wigman.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**DANCE 40B. Studio Workshop in Modern I. 2 Units.**

Fundamentals of modern dance: principles of modern tradition developed from Graham, Humphrey, and Wigman.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**DANCE 40C. Studio Workshop in Modern I. 2 Units.**

Fundamentals of modern dance: principles of modern tradition developed from Graham, Humphrey, and Wigman.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**DANCE 50A. Studio Workshop on Jazz I. 2 Units.**

Fundamentals of jazz: principles of jazz dance and contemporary forms incorporating the personal point of view of the instructor.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**DANCE 50B. Studio Workshop on Jazz I. 2 Units.**

Fundamentals of jazz: principles of jazz dance and contemporary forms incorporating the personal point of view of the instructor.

Prerequisite: DANCE 50A

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**DANCE 50C. Studio Workshop on Jazz I. 2 Units.**

Fundamentals of jazz: principles of jazz dance and contemporary forms incorporating the personal point of view of the instructor.

Prerequisite: DANCE 50B

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**DANCE 52A. Workshop in Tap I. 2 Units.**

Beginning tap: principles of rhythm and basic tap steps.

Repeatability: May be taken for credit 2 times.

**DANCE 52B. Workshop in Tap I. 2 Units.**

Beginning tap: principles of rhythm and basic tap steps.

Prerequisite: DANCE 52A

Repeatability: May be taken for credit 2 times.

**DANCE 52C. Workshop in Tap I. 2 Units.**

Beginning tap: principles of rhythm and basic tap steps.

Prerequisite: DANCE 52B

Repeatability: May be taken for credit 2 times.

**DANCE 60A. Choreography. 4 Units.**

Beginning-to-intermediate study of principles of dance composition. May include composition assignments for stage and video. By audition, works may be shown quarterly in public studio performances.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 60B. Choreography. 4 Units.**

Beginning-to-intermediate study of principles of dance composition. May include composition assignments for stage and video. By audition, works may be shown quarterly in public studio performances.

Prerequisite: DANCE 60A

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 60C. Choreography. 4 Units.**

Beginning-to-intermediate study of principles of dance composition. May include composition assignments for stage and video. By audition, works may be shown quarterly in public studio performances.

Prerequisite: DANCE 60A and DANCE 60B

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 80. Introduction to Ballet and Modern Dance. 4 Units.**

Survey of nineteenth and twentieth-century ballet, modern dance, and theatre dance.

Overlaps with DANCE 90B, DANCE 90C, DANCE 90A.

Restriction: Non-major only.

(IV, VIII)

**DANCE 81. American Ballet and Modern Dance since 1900. 4 Units.**

A survey of American ballet and modern dance in the twentieth and twenty-first centuries. Lectures are supplemented by video.

Overlaps with DANCE 90C.

Restriction: Non-major only. Dance 81 and Dance 90C may not both be taken for credit.

(IV)

**DANCE 82. Topics in World Dance. 4 Units.**

Various topics in world dance studies focusing on historical, social, and cultural contexts.

Repeatability: May be repeated for credit unlimited times.

(VIII)

**DANCE 83. Dance in Feature Film. 4 Units.**

Dance in film musicals and commercial dance films, concentrating especially on films from the 1930s through the 1970s.

(IV)

**DANCE 85. What Dance Does: From Ballet to Hip-Hop. 4 Units.**

Explores the way dance reflects culture and embodies new ideas. Examples for viewing and analysis come from ballet (with roots in Europe) and hip-hop (with roots in the African diaspora). Themes include gender, perceived racial difference, identity.

(IV)

**DANCE 90A. Dance History I. 4 Units.**

Global perspectives. Topics and histories of dance and movement practices from various parts of the world.

Overlaps with DANCE 80.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

(IV and VIII ).

**DANCE 90B. Dance History II. 4 Units.**

The history of dance in the western tradition from the Renaissance through the 19th century.

Prerequisite: DANCE 90A

Overlaps with DANCE 80.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

(IV and VIII ).

**DANCE 90C. Dance History III. 4 Units.**

The history of dance in the western tradition in the the 20th and 21st centuries.

Prerequisite: DANCE 90B

Overlaps with DANCE 80, DANCE 81.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

(IV ).

**DANCE 100. Kinesiology for Dance. 4 Units.**

The study of the production of dance movement by the musculoskeletal system. Anatomical and dynamic analysis of dance movement.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 103. Pilates. 2 Units.**

Basics of technique emphasizing alignment, breath control, correction of muscular imbalances.

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 104. Pilates Reformer. 2 Units.**

Utilizes the Universal Reformer apparatus, aiding the student in core stabilization, correcting muscular imbalances, increasing flexibility, and improving strength.

Prerequisite: DANCE 103

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 110. World Dance . 2 Units.**

Studio workshop of dances and movement sources of specified countries or areas.

Repeatability: May be taken for credit 6 times as topics vary.

**DANCE 125A. Teaching of Dance. 4 Units.**

Pedagogy. The methods and theory of teaching dance forms.

Prerequisite: DANCE 133A and DANCE 133B and DANCE 133C and DANCE 143A and DANCE 143B and DANCE 143C

Restriction: Upper-division students only. Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 127A. Costume Design for Dance. 4 Units.**

Costume design and construction specific to the body in motion. Theoretical study and practical execution.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 130A. Pointe Class. 2 Units.**

Beginning and intermediate pointe work; principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 132A and DANCE 132B and DANCE 132C

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 132A. Studio Workshop in Ballet II. 2 Units.**

Intermediate ballet and beginning pointe work; principles of classical ballet with an emphasis on technique.

Prerequisite: (DANCE 30A and DANCE 30B and DANCE 30C) or audition. Prerequisites are for non-Dance majors only.

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 132B. Studio Workshop in Ballet II. 2 Units.**

Intermediate ballet and beginning pointe work; principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 132A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 132C. Studio Workshop in Ballet II. 2 Units.**

Intermediate ballet and beginning pointe work; principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 132A and DANCE 132B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 133A. Advanced Studio Workshop in Ballet III. 2 Units.**

Advanced intermediate ballet and pointe work; principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 132C. DANCE 132C with a grade of B+ or better. Placement by audition is also accepted.

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 133B. Advanced Studio Workshop in Ballet III. 2 Units.**

Advanced intermediate ballet and pointe work; principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 133A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 133C. Advanced Studio Workshop in Ballet III. 2 Units.**

Advanced intermediate ballet and pointe work; principles of classical ballet with an emphasis on technique.

Prerequisite: DANCE 133A and DANCE 133B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 134A. Advanced Studio Workshop in Ballet IV. 4 Units.**

Advanced ballet, pointe work, and performance styles: principles of classical ballet.

Prerequisite: DANCE 133A and DANCE 133B and DANCE 133C. DANCE 133C with a grade of B+ or better. Placement by audition is also accepted.

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 134B. Advanced Studio Workshop in Ballet IV. 4 Units.**

Advanced ballet, pointe work, and performance styles: principles of classical ballet.

Prerequisite: DANCE 134A

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 134C. Advanced Studio Workshop in Ballet IV. 4 Units.**

Advanced ballet, pointe work, and performance styles: principles of classical ballet.

Prerequisite: DANCE 134A and DANCE 134B

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 135A. Advanced Studio Workshop in Ballet V. 4 Units.**

Advanced ballet, pointe work, and performance styles: principles of classical ballet.

Prerequisite: DANCE 134A and DANCE 134B and DANCE 134C. DANCE 134C with a grade of B+ or better. Placement by audition is also accepted.

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 135B. Advanced Studio Workshop in Ballet V. 4 Units.**

Advanced ballet, pointe work, and performance styles: principles of classical ballet.

Prerequisite: DANCE 135A

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 135C. Advanced Studio Workshop in Ballet V. 4 Units.**

Advanced ballet, pointe work, and performance styles: principles of classical ballet.

Prerequisite: DANCE 135A and DANCE 135B

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 137. Repertory . 2 Units.**

Rehearsal and performance of repertoire from established ballet, modern, or jazz choreographers.

Prerequisite: (DANCE 133A and DANCE 133B and DANCE 133C) or (DANCE 143A and DANCE 143B and DANCE 143C)

Repeatability: May be taken for credit 3 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 139. Partnering. 2 Units.**

Principles of partnering techniques in various dance performance styles.

Prerequisite: DANCE 133A and DANCE 133B and DANCE 133C and DANCE 143A and DANCE 143B and DANCE 143C

Repeatability: May be taken for credit 4 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.



**DANCE 142A. Studio Workshop in Modern II. 2 Units.**

Introduction to the principles of motion, including the use of breath, gravity, spatial awareness, and time values.

Prerequisite: DANCE 40A and DANCE 40B and DANCE 40C. Prerequisites are for non-Dance majors only.

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 142B. Studio Workshop in Modern II. 2 Units.**

Introduction to the principles of motion, including the use of breath, gravity, spatial awareness, and time values.

Prerequisite: DANCE 142A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 142C. Studio Workshop in Modern II. 2 Units.**

Introduction to the principles of motion, including the use of breath, gravity, spatial awareness, and time values.

Prerequisite: DANCE 142A and DANCE 142B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 143A. Advanced Studio Workshop in Modern III. 2 Units.**

Builds on fundamentals of Dance 142A-B-C and introduces performance techniques.

Prerequisite: DANCE 142C. DANCE 142C with a grade of B+ or better

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 143B. Advanced Studio Workshop in Modern III. 2 Units.**

Builds on the fundamentals of DANCE 142A-DANCE 142B-DANCE 142C and introduces performance techniques.

Prerequisite: DANCE 143A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 143C. Advanced Studio Workshop in Modern III. 2 Units.**

Builds on fundamentals of DANCE 142A-DANCE 142B-DANCE 142C and introduces performance techniques.

Prerequisite: DANCE 143A and DANCE 143B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 144A. Advanced Studio Workshop in Modern IV. 2 Units.**

Synthesis of fundamentals and performance technique. Aims to bring students to the preprofessional level.

Prerequisite: DANCE 143C. DANCE 143C with a grade of B+ or better

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 144B. Advanced Studio Workshop in Modern IV. 2 Units.**

Synthesis of fundamentals and performance technique. Aims to bring students to the preprofessional level.

Prerequisite: DANCE 144A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 144C. Advanced Studio Workshop in Modern IV. 2 Units.**

Synthesis of fundamentals and performance technique. Aims to bring students to the preprofessional level.

Prerequisite: DANCE 144A and DANCE 144B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 152A. Intermediate Studio Workshop in Jazz II. 2 Units.**

Intermediate jazz: principles of jazz dance and contemporary forms incorporating the personal views of the instructor.

Prerequisite: Prerequisites for non-Dance majors: DANCE 50A and DANCE 50B and DANCE 50C.

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 152B. Intermediate Studio Workshop in Jazz II. 2 Units.**

Intermediate jazz: principles of jazz dance and contemporary forms incorporating the personal views of the instructor.

Prerequisite: DANCE 152A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 152C. Intermediate Studio Workshop in Jazz II. 2 Units.**

Intermediate jazz: principles of jazz dance and contemporary forms incorporating the personal views of the instructor.

Prerequisite: DANCE 152A and DANCE 152B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors have first consideration for enrollment. Dance - Choreography Majors have first consideration for enrollment. Dance - Performance Majors have first consideration for enrollment.

**DANCE 153A. Advanced Studio Workshop in Jazz III. 2 Units.**

Advanced jazz: principles of jazz dance and contemporary forms incorporating the personal views of the instructor.

Prerequisite: DANCE 152C. DANCE 152C with a grade of B+ or better

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 153B. Advanced Studio Workshop in Jazz III. 2 Units.**

Advanced jazz: principles of jazz dance and contemporary forms incorporating the personal views of the instructor.

Prerequisite: DANCE 153A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 153C. Advanced Studio Workshop in Jazz III. 2 Units.**

Advanced jazz: principles of jazz dance and contemporary forms incorporating the personal views of the instructor.

Prerequisite: DANCE 153A and DANCE 153B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 154A. Advanced Jazz: Performance Techniques IV. 2 Units.**

Advanced jazz emphasizing performance techniques.

Prerequisite: DANCE 153C. DANCE 153C with a grade of B+ or better

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 154B. Advanced Jazz: Performance Techniques IV. 2 Units.**

Advanced jazz emphasizing performance techniques.

Prerequisite: DANCE 154A

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 154C. Advanced Jazz: Performance Techniques IV. 2 Units.**

Advanced jazz emphasizing performance techniques.

Prerequisite: DANCE 154A and DANCE 154B

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only.

**DANCE 160. Improvisation. 2 Units.**

Structured and experiential improvisation to heighten the personal intuitive processes, the kinesthetic sense, spatial and temporal awareness, and to encourage insights into the potential movement resources of the individual for performance and choreography. Course encourages freedom of exploration.

Repeatability: May be taken for credit 2 times.

**DANCE 162A. Choreography II. 4 Units.**

Directed choreographic projects for stage or video integrating the elements of stagecraft. In process or completed works may be shown quarterly in public studio or stage performances.

Prerequisite: DANCE 60A and DANCE 60B and DANCE 60C. Audition required.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 162B. Choreography II. 4 Units.**

Directed choreographic projects for stage or video integrating the elements of stagecraft. In process or completed works may be shown quarterly in public studio or stage performances.

Prerequisite: DANCE 162A. Audition required.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 162C. Choreography II. 4 Units.**

Directed choreographic projects for stage or video integrating the elements of stagecraft. In process or completed works may be shown quarterly in public studio or stage performances.

Prerequisite: DANCE 162A and DANCE 162B. Audition required.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 163. Dance and Video Technology. 4 Units.**

Introduction to video and audio documentation of dance performance. Integrating dance performance within the film aesthetic. Techniques and technologies of video cameras, formats, editing, and projection. Overview of video compression and DVD authoring.

Prerequisite: DANCE 60A

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 164. Screendance. 4 Units.**

Overview of dance for film and choreography for the camera. Aesthetics of creating dance for the screen. Approaches for delivery of dance films to an audience, including projection, DVD, Web, and mobile devices. A final dance film project is required.

Prerequisite: DANCE 163

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 165. Choreographic Projects. 1-4 Units.**

Supervised choreographic projects for workshop productions.

Prerequisite: Audition required.

Repeatability: May be taken for credit 2 times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 170. Dance Performance. 1-4 Units.**

Rehearsal and performance in a faculty-choreographed production.

Prerequisite: Audition required.

Repeatability: May be repeated for credit unlimited times.

**DANCE 171. Dance Workshop. 1-4 Units.**

Rehearsal and performance in a student-choreographed production.

Prerequisite: Audition required.

Repeatability: May be repeated for credit unlimited times.

**DANCE 172. Master of Fine Arts Concert. 1-4 Units.**

Rehearsal and performance in a graduate student-choreographed production.

Prerequisite: Audition required.

Repeatability: May be repeated for credit unlimited times.

**DANCE 174. UCI Dance Ensemble Performance. 1-4 Units.**

Performance with the UCI Dance Ensemble.

Repeatability: May be taken for credit 6 times.

Restriction: Sophomores only. Upper-division students only.

**DANCE 176. UCI Jazz Dance Ensemble. 2-4 Units.**

Rehearsal and performance in theatrical jazz dance, designed to provide an experience in assimilating various styles of jazz dance and in refining dance performance techniques. Students will master aspects of dance company promotion.

Prerequisite: DANCE 152A and DANCE 152B and DANCE 152C

Repeatability: May be taken for credit 6 times.

Restriction: Sophomores only. Upper-division students only.

**DANCE 178. Performance Laboratory. 2 Units.**

Rehearsal and performance of graduate student-choreographed dance works for the M.F.A. thesis.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**DANCE 179. UCI Etude Ensemble. 4 Units.**

Repertory and performances by undergraduate Dance majors. Concert presentations on and off campus. Faculty directed, student/faculty choreographed.

Prerequisite: Audition required.

Repeatability: May be taken for credit 9 times.

Restriction: Sophomores only. Upper-division students only.

**DANCE 180C. Laban Studies. 4 Units.**

Laban movement analysis.

Prerequisite: DANCE 21A

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 185W. Critical Issues in Dance. 4 Units.**

Critical thinking and writing about dance, with a section on dance criticism and a major emphasis on persuasive writing about significant issues in the dance world.

Prerequisite: DANCE 90A and DANCE 90B and DANCE 90C. Satisfactory completion of the lower-division writing requirement.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**(Ib)**

**DANCE 193. Selected Topics in Dance. 1-4 Units.**

Directed group studies of topics in dance.

Repeatability: May be taken for credit 3 times as topics vary.

**DANCE 194. Topics Vary. 4 Units.**

Seminar in Dance Studies. Variable topics related to gender, race, politics, and dance writing, and criticism, with attention to linking dance practices to the wider world.

Prerequisite: DANCE 90A and DANCE 90B and DANCE 90C

Repeatability: Unlimited as topics vary.

**DANCE 195. Arts Management. 4 Units.**

Designed for students interested in the developmental and management of nonprofit arts organizations. Examines the organizational structure and areas of operation such as marketing, fundraising, budgeting, production, and administration.

Repeatability: May be taken for credit 2 times.

**DANCE 197. Independent Study. 1-4 Units.**

Individual independent projects in experimental laboratory, library, field, performance, under instructor's direction. Students can receive conceptual, creative, and theoretical instruction in the successful completion of a written report or performance.

Repeatability: May be repeated for credit unlimited times.

**DANCE 199. Senior Thesis. 4 Units.**

Directed research or creative activity for senior Dance majors. Research consists of a substantial essay on dance history, research in dance science, or the creation of original or reconstructed choreography.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Dance Majors only. Dance - Choreography Majors only. Dance - Performance Majors only.

**DANCE 201. Seminar in Kinesiology for Dance. 4 Units.**

Introduction to the anatomical, biomechanical, and physiological principles of dance movement.

Prerequisite: DANCE 100

**DANCE 222. Musical Resources. 4 Units.**

Detailed study of music as it relates to dance. Historical overview of musical form, style, and other elements. Analysis of various affinities between music and dance. Practical applications.

**DANCE 225. Seminar in the Teaching of Dance Techniques. 4 Units.**

Principles and theories of teaching dance techniques. Supervised presentation and teaching of technique class.

**DANCE 231A. Graduate Studio: Ballet. 2 Units.**

Advanced ballet, pointe work, and performance style: principles of the classical ballet with an emphasis on technique.

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 231B. Graduate Studio: Ballet. 2 Units.**

Advanced ballet, pointe work, and performance style: principles of the classical ballet with an emphasis on technique.

Prerequisite: DANCE 231A

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 231C. Graduate Studio: Ballet. 2 Units.**

Advanced ballet, pointe work, and performance style: principles of the classical ballet with an emphasis on technique.

Prerequisite: DANCE 231B

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 241A. Graduate Studio: Modern. 2 Units.**

Advanced modern dance: synthesis of fundamentals and performance technique. Aims to bring students to the preprofessional level.

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 241B. Graduate Studio: Modern. 2 Units.**

Advanced modern dance: synthesis of fundamentals and performance technique. Aims to bring students to the preprofessional level.

Prerequisite: DANCE 241A

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 241C. Graduate Studio: Modern. 2 Units.**

Advanced modern dance: synthesis of fundamentals and performance technique. Aims to bring students to the preprofessional level.

Prerequisite: DANCE 241B

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 251A. Graduate Studio: Jazz. 2 Units.**

Principles of jazz dance and contemporary forms, incorporating the personal views of the instructor.

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 251B. Graduate Studio: Jazz. 2 Units.**

Principles of jazz dance and contemporary forms, incorporating the personal views of the instructor.

Prerequisite: DANCE 251A

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 251C. Graduate Studio: Jazz. 2 Units.**

Principles of jazz dance and contemporary forms, incorporating the personal views of the instructor.

Prerequisite: DANCE 251B

Repeatability: May be repeated for credit unlimited times.

Restriction: Audition required.

**DANCE 252A. Graduate Studio: Tap. 2 Units.**

An overview of tap concentrating on the development of various technique forms using basic and intermediate principles.

Repeatability: May be taken for credit 4 times.

**DANCE 252B. Graduate Studio: Tap. 2 Units.**

An overview of tap concentrating on the development of various technique forms using basic and intermediate principles.

Prerequisite: DANCE 252A

Repeatability: May be taken for credit 4 times.

**DANCE 252C. Graduate Studio: Tap. 2 Units.**

An overview of tap concentrating on the development of various technique forms using basic and intermediate principles.

Prerequisite: DANCE 252B

Repeatability: May be taken for credit 4 times.

**DANCE 261A. Graduate Studio in Choreography. 4 Units.**

Graduate work in dance composition emphasizing the individual aesthetic. Assignments in movement discovery, solo and group forms, with the main emphasis on independent work.

Repeatability: May be repeated for credit unlimited times.

**DANCE 261B. Graduate Studio in Choreography. 4 Units.**

Graduate work in dance composition emphasizing the individual aesthetic. Assignments in movement discovery, solo and group forms, with the main emphasis on independent work.

Prerequisite: DANCE 261A

Repeatability: May be repeated for credit unlimited times.

**DANCE 264. Screendance. 4 Units.**

Overview of dance for film and choreography for the camera. Aesthetics of creating dance for the screen. Approaches for delivery of dance films to an audience, including projection, DVD, Web, and mobile devices. A final dance film project is required.

Prerequisite: DANCE 281

**DANCE 281. Dance and Video Technology. 4 Units.**

Introduction to video and audio documentation of dance performance. Integrating dance performance within the film aesthetic. Techniques and technologies of video cameras, formats, editing, and projection. Overview of video compression and DVD authoring.

**DANCE 282. Seminar in Movement Analysis. 4 Units.**

Theories of movement analysis and nonverbal communication applied to dance.

**DANCE 283. Critical Issues in Dance. 4 Units.**

Reading, writing, discussing, and presenting key issues that relate to dance studies. Basics of dance analysis and criticism. Special emphasis on effective ways of defining, clarifying, and arguing for points of view.

Prerequisite: DANCE 284

**DANCE 284. Bibliography and Research. 4 Units.**

Understanding the field of dance studies, available resources, research methods, and academic formats in preparation for thesis writing.

**DANCE 285. Graduate Projects. 4 Units.**

Projects may be educational, choreographic, scientific, historical, or philosophical in scope and must have faculty advisor approval.

Repeatability: May be taken for credit 6 times.

**DANCE 286. Thesis. 4 Units.**

Substantial research in a topic approved by the student's graduate committee. Results of the research must be written in approved thesis style.

Repeatability: May be taken for credit 6 times.

**DANCE 287. Graduate Lectures in Dance. 1-4 Units.**

A series of lectures and discussions of announced topics in dance. Content may be from history, ethnology, notation, medicine, music, or other areas in the field.

Repeatability: Unlimited as topics vary.

**DANCE 296. Proseminar in Dance History. 4 Units.**

Discussion seminar with emphasis on reading and thinking about problems in dance history; presentation of oral and written reports.

Repeatability: May be taken for credit 2 times as topics vary.

**DANCE 297. Directed Reading. 1-4 Units.**

Topic to be approved by instructor. Paper required.

Repeatability: May be repeated for credit unlimited times.

**DANCE 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Dance Majors only.

## Dance, B.A.

The Bachelor of Arts (B.A.) is designed for those who wish to obtain a broad undergraduate background as preparation for careers or graduate work and related fields. It offers students a dance education that stresses performance and choreography, and, at the same time, intellectual depth and scope. In addition to the core, 12 units of elective Dance courses are required. The remaining elective units required for graduation may be chosen from Dance or other disciplines in relation to a student's individual interest. While the program of study in Dance stresses technical proficiency and academic understanding in dance, the B.A. degree program also enables students to pursue elective subjects in their special areas of interest in other academic disciplines.

### Proficiency Levels

In addition to meeting the general requirements for admission to UCI, applicants must demonstrate technical and creative promise. The Department holds annual entrance auditions for potential freshmen and transfer students during the winter quarter prior to the fall quarter when entrance is anticipated. First-year students wishing to major in Dance must be at technique level II in at least one of the three major genres (ballet, modern, jazz).

Placement auditions for admitted students are held during Welcome Week to determine levels of technical ability for placement in courses. It is suggested that transfer students wishing to pursue a B.A. in Dance complete, in addition to their general education requirements, one course in choreography, two courses in dance technique, and one course in music for dancers prior to transfer to UCI.

Transfer students wishing to pursue the B.F.A. must declare their intention in writing at the time of their entrance audition and demonstrate technique and/or choreography levels appropriate to their year. It is suggested that transfer students complete, in addition to their general education requirements, one course in choreography, two courses in dance technique, one course in music for dancers, and one course in dance performance prior to transfer to UCI.



Students deficient in level of performance or academic preparation should be prepared to extend their studies beyond the normal four-year program in order to meet the requirements for graduation.

**All students must meet the University Requirements.**

**School Requirements: None.**

**Departmental Requirements for the Major**

A. Complete the following:

DANCE 2	Dance Health and Injury Prevention
DANCE 21A	Music for Dancers
DANCE 60A	Choreography
DANCE 90A	Dance History I
DANCE 90B	Dance History II
DANCE 90C	Dance History III
DANCE 100	Kinesiology for Dance
DANCE 180C	Laban Studies
DANCE 185	

B. Complete one four-unit course from the following:

DANCE 125A	Teaching of Dance
DANCE 127A	Costume Design for Dance
DANCE 162A	Choreography II
DANCE 163	Dance and Video Technology
DANCE 164	Screendance
DANCE 180A	
DANCE 194	Topics Vary
DANCE 195	Arts Management

C. Technique: Students must complete at least one Dance technique course (ballet, modern dance, jazz, Spanish, world dance, pointe, social dance, tap, or repertory) each quarter in residence. At a minimum, students must complete level II in Ballet, Modern, and Jazz (DANCE 132A-DANCE 132B-DANCE 132C, DANCE 142A-DANCE 142B-DANCE 142C, and DANCE 152A-DANCE 152B-DANCE 152C) and level III in either Ballet or Modern (DANCE 133A-DANCE 133B-DANCE 133C or DANCE 143A-DANCE 143B-DANCE 143C). Students who place above level II in any technique must take a year of that technique at the level in which they are placed. All students must also complete one course chosen from DANCE 14 (Social Dance), DANCE 52A, DANCE 52B, DANCE 52C (Tap I) or DANCE 110 (World Dance). NOTE: Units earned in ballet, jazz, and modern technique courses beyond the required amount do not count toward departmental elective requirements but may count toward University requirements.

D. Performance:

Select two of the following:

DANCE 170	Dance Performance
DANCE 171	Dance Workshop
DANCE 172	Master of Fine Arts Concert

E. Four units of DRAMA 101 (Theater Production) must be taken during the first year in residence.

F. Electives: 12 units of electives must be completed within the major.

## Sample Program for Freshmen

Fall	Winter	Spring
WRITING 39B	WRITING 39C	DANCE 2
DANCE 21A	General Education	General Education
Technique	General Education	General Education
General Education	Technique	Technique
	Drama 101 (2 units)	Drama 101 (2 units)

Careers in dance require excellent training and extraordinary discipline, tenacity, and dedication. Graduates of the Department have an excellent record of placement in the many fields of dance. Some have become professional dancers in ballet companies (including the Metropolitan Opera Ballet, San Francisco Ballet, Nashville Ballet, Complexions Contemporary Ballet, and Joffrey Ballet); in modern dance companies (including Hubbard Street Dance Company, MOMIX, and Martha Graham Dance Ensemble); in touring companies (including Wicked, Newsies, Dirty Dancing, The Lion King, Fame: The Musical, Carousel, and Cirque du Soleil); and in films, television, and theatre.

In addition to training for professional dance performance and choreography, the major in dance serves as a basis for graduate study or job opportunities in fields such as dance history, dance science, dance pedagogy, dance reconstruction, dance criticism, dance video, and technology. Related fields, such as arts administration, law in relation to the arts, arts therapies, design and production, and music also offer positions for graduates. Students who are interested in a career in athletic training, physical therapy, or dance science will find a major in Dance, with related course work in chemistry, physics, biology, and mathematics, to be excellent preparation for further study.

## Dance, B.F.A.

The Bachelor of Fine Arts (B.F.A.) program with specializations in Performance and Choreography, is designed for students who wish to prepare intensively for careers in those areas. The courses required in addition to the core are primarily in Dance. The B.F.A. program allows for a few free electives in other areas. Admission to the B.F.A. program with a specialization in Choreography is by faculty approval only.

The B.F.A. program with a specialization in Performance does not require additional faculty approval beyond the required audition for admission to the Dance major; students should declare their intention to pursue this specialization during spring quarter of their sophomore year.

### Proficiency Levels

In addition to meeting the general requirements for admission to UCI, applicants must demonstrate technical and creative promise. The Department holds annual entrance auditions for potential freshmen and transfer students during the winter quarter prior to the fall quarter when entrance is anticipated. First-year students wishing to major in Dance must be at technique level II in at least one of the three major genres (ballet, modern, jazz).

Placement auditions for admitted students are held during Welcome Week to determine levels of technical ability for placement in courses. It is suggested that transfer students wishing to pursue a B.A. in Dance complete, in addition to their general education requirements, one course in choreography, two courses in dance technique, and one course in music for dancers prior to transfer to UCI.

Transfer students wishing to pursue the B.F.A. must declare their intention in writing at the time of their entrance audition and demonstrate technique and/or choreography levels appropriate to their year. It is suggested that transfer students complete, in addition to their general education requirements, one course in choreography, two courses in dance technique, one course in music for dancers, and one course in dance performance prior to transfer to UCI.

Students deficient in level of performance or academic preparation should be prepared to extend their studies beyond the normal four-year program in order to meet the requirements for graduation.

**All students must meet the University Requirements.**

**School Requirements: None.**

### Departmental Requirements for the Major

Students must complete the departmental requirements as listed for the B.A. degree in Dance. In addition, B.F.A. students must complete the requirements for either the specialization in Choreography or Performance.

#### Choreography Specialization:

DANCE 60B	Choreography
DANCE 60C	Choreography
DRAMA 30A	Acting
DRAMA 50C	Introduction to Lighting Design

One course selected from the following:

DRAMA 50A	Introduction to Costume Design
DRAMA 50B	Introduction to Scenic Design
DRAMA 50D	Introduction to Sound Design
DRAMA 50E	Introduction to Stage Management
DANCE 127A	Costume Design for Dance

Any three quarters of courses chosen from the following:

DANCE 162A- 162B- 162C	Choreography II and Choreography II and Choreography II
DANCE 164	Screendance

Select two courses in DANCE 165 <sup>1</sup>

Four units (one or two courses) in Art History, Music, Studio Art, or Drama (in addition to DRAMA 30A, DRAMA 50C, and DRAMA 101 requirements).

#### Performance Specialization:

Technique: At a minimum, students must complete level III in Ballet, Modern, and Jazz (DANCE 133A, DANCE 133B, DANCE 133C, DANCE 143A, DANCE 143B, DANCE 143C, and DANCE 153A, DANCE 153B, DANCE 153C) and level IV in either Ballet or Modern (DANCE 134A-DANCE 134B-DANCE 134C or DANCE 144A-DANCE 144B-DANCE 144C). Students who place above level III in any technique must take a year of that technique at the level in which they are placed.

DANCE 139 Partnering

Performance:

DANCE 137 Repertory  
or DANCE 179 UCI Etude Ensemble

DANCE 170 Dance Performance (series) <sup>2</sup>

Select one of the following:

DRAMA 30A Acting

or a fourth additional performance in the DANCE 170 series.

- <sup>1</sup> Choreographic Projects—one original choreographic work, approved by the faculty, must be presented in both the junior and senior years.
- <sup>2</sup> DANCE 170 series: must be in three additional performances beyond the B.A. requirements, one of which must be DANCE 170, DANCE 171, DANCE 172, or DANCE 174. DANCE 171 and DANCE 172 may be repeated for credit. Students must demonstrate proficiency in at least two dance genres in these performances.

## Sample Program for Freshmen

Fall	Winter	Spring
WRITING 39B	WRITING 39C	DANCE 2
DANCE 21A	General Education	General Education
Technique	General Education	General Education
General Education	Technique	Technique
	Drama 101 (2 units)	Drama 101 (2 units)

Careers in dance require excellent training and extraordinary discipline, tenacity, and dedication. Graduates of the Department have an excellent record of placement in the many fields of dance. Some have become professional dancers in ballet companies (including the Metropolitan Opera Ballet, San Francisco Ballet, Nashville Ballet, Complexions Contemporary Ballet, and Joffrey Ballet); in modern dance companies (including Hubbard Street Dance Company, MOMIX, and Martha Graham Dance Ensemble); in touring companies (including Wicked, Newsies, Dirty Dancing, The Lion King, Fame: The Musical, Carousel, and Cirque du Soleil); and in films, television, and theatre.

In addition to training for professional dance performance and choreography, the major in dance serves as a basis for graduate study or job opportunities in fields such as dance history, dance science, dance pedagogy, dance reconstruction, dance criticism, dance video, and technology. Related fields, such as arts administration, law in relation to the arts, arts therapies, design and production, and music also offer positions for graduates. Students who are interested in a career in athletic training, physical therapy, or dance science will find a major in Dance, with related course work in chemistry, physics, biology, and mathematics, to be excellent preparation for further study.

## Dance, M.F.A.

The M.F.A. program is an intensive program requiring a core of courses in studio and academic areas. The student's individual area of interest is explored through the thesis project in the second year. Projects or written theses may be pursued in choreography, video choreography, dance training, dance history and theory, ethnography, dance science, dance reconstruction, and dance and digital technology.

Applicants for admission to the degree program must meet the general requirements for admission to graduate study and hold a B.A. or B.F.A. in Dance or the equivalent. Candidates must meet the minimum requirements for the B.A. in Dance at UCI. Proposals for three choreographic works that could be completed in the graduate program must be submitted. An audition in ballet and modern technique is required for admission and is held in winter quarter. At this audition, applicants must also present a prepared five-minute choreographed piece, which may be a solo performed by the applicant, or a videotape of the applicant's choreography. Interviews with faculty are conducted following the audition, and applicants are given a short writing exercise.

## General Degree Requirements

Normally two years of residence are required. Each candidate must enroll for three courses each quarter for six quarters, exclusive of summer sessions.

In the second year, satisfactory attainment must be demonstrated by a major thesis; in choreography this consists of the composition and production of a choreographic work; in other areas, such as dance history, dance training, or dance science, this consists of a written thesis or a comprehensive project in a chosen area of study. All theses must be defended in a one-hour oral examination which may also test the candidate's general knowledge in the area.

The normative time to degree for students in the M.F.A. program is two years. Residence is required. The normative time to degree can be extended to three years only when a student requests extra time for more involved thesis research through a petition to the Chair of the Department. The maximum time to degree is three years. Students who do not complete the degree in three years will be dropped from the program.

## Specific Degree Requirements

Seventy-two quarter units in graduate or approved upper-division undergraduate courses must be completed with a grade of at least B in each course. No more than 20 units in upper-division courses may count toward the degree. Fulfillment of the technique course requirements must be approved by the faculty advisor.

A. Complete the following:

DANCE 201	Seminar in Kinesiology for Dance
DANCE 222	Musical Resources
DANCE 225	Seminar in the Teaching of Dance Techniques
DANCE 261A- 261B	Graduate Studio in Choreography and Graduate Studio in Choreography
DANCE 281	Dance and Video Technology
DANCE 282	Seminar in Movement Analysis
DANCE 283	Critical Issues in Dance
DANCE 284	Bibliography and Research
DANCE 286	Thesis
DANCE 296	Proseminar in Dance History

Also required: Six courses chosen from any graduate or upper-division dance technique course.

By the end of their first year, students will choose their area of study for their thesis. Students who wish to produce a choreographic thesis must apply to the graduate choreography advisor during winter of their first year. The faculty will review the applications and will consider the quality of the student's work in DANCE 261, as well as the choreographic proposal, in making their selection.

Graduate students are encouraged to apply for teaching assistantships in areas such as notation, dance science, history, music for dancers, choreography, world dance, dance video, critical issues, and all technique classes. Students with expertise in any of these areas are given special consideration.

## Department of Drama

### Donald D. Hill, Department Chair

249 Drama Building

949-824-6614

<http://drama.arts.uci.edu/>

The Department of Drama, widely recognized and ranked as one of the top ten training programs in the country, combines broad liberal study and comprehensive training in several sub-disciplines of drama. The Department of Drama produces a full season of plays, musicals, and world premieres with varying dimensions and audience/actor relationships.

The vision of the Department of Drama's founding faculty was "to produce students who combine a critical intelligence with disciplined theatrical experience." To this end, the Department fosters an environment of creativity, in-depth learning of design, performance, and scholarly activity. The Department's rare combination of distinguished permanent faculty, high profile guest master class teachers, an interactive student population, and excellent facilities allows it to offer a program that is creatively robust and intellectually rigorous. The current faculty includes active and highly regarded individuals in their fields of practice, and so remains able to impart current, relevant knowledge to drama students.

## Department Facilities

The Department's facilities include the following theatre spaces:

Irvine Barclay Theatre - 760-seat proscenium stage

Claire Trevor Theatre - 290-seat proscenium stage

Winifred Smith Hall - 230-seat thrust platform stage

Robert Cohen Theatre - 80-seat 'black box' stage

Little Theatre - 165-seat proscenium stage

Nixon Theatre - 60-seat laboratory and cabaret stage

Productions have been mounted in the school's six theatre spaces, University Art Gallery, Motion Capture Studio, Beall Center for Art and Technology, Experimental Media Performance Lab (xMPL), Maya Lin designed Arts Plaza, Jerzy Grotowski-inspired UCI Barn and Yurt, and the New Swan Theater (featuring a buildable Elizabethan theatre).

- Drama and Theatre, Ph.D.
- Drama, B.A.
- Drama, M.F.A.
- Drama, Minor
- Music Theatre, B.F.A.

## Faculty

Lonnie R. Alcaraz, M.F.A. University of California, Irvine, *Professor of Drama* (lighting design, digital imaging)

Stephen F. Barker, Ph.D. University of Arizona, *Dean of the Claire Trevor School of the Arts and Professor of Drama* (post-modern theatre, Beckett, critical theory)

Cynthia M. Bassham, M.F.A. American Conservatory Theatre, *Associate Professor of Teaching of Drama* (voice, speech for actors, acting)

Andrew L. Borba, M.F.A. New York University, *Co-Head of Acting and Assistant Professor of Drama* (acting)

Richard A. Brestoff, M.F.A. New York University, *Professor of Drama* (film and television acting)

Juliette A. Carrillo, M.F.A. Yale University, *Assistant Professor of Drama* (directing)

Dennis R. Castellano, M.F.A. University of California, Irvine, *Professor of Teaching Emeritus of Drama* (music theatre)

Robert S. Cohen, D.F.A. Yale University, *Professor Emeritus of Drama* (acting theory, acting, directing)

Myrona L. DeLaney, Ed.D. University of California, Irvine, *Head of Music Theatre and Associate Professor of Teaching of Drama* (music theatre, singing, acting)

Holly Durbin, M.F.A. University of California, Los Angeles, *Professor of Drama* (costume design)

Clifford L. Faulkner, M.A. California State University, Long Beach, *Professor of Teaching Emeritus of Drama* (scenery design, history of design, gay theatre)

Keith Fowler, D.F.A. Yale University, *Professor Emeritus of Drama* (directing, acting)

Marcia G. Froehlich, M.F.A. University of Michigan, *Assistant Professor of Drama* (costume design)

Douglas S. Goheen, Ph.D. University of Denver, *Professor Emeritus of Drama* (scenery design, digital imaging)

George C. Harvey, M.F.A. University of California, Irvine, *Professor Emeritus of Drama* (artistic direction, producing, lighting design)

Donald D. Hill, M.F.A. University of Southern California, *Department Chair and Co-Head of Stage Management, Associate Producer and Professor of Teaching of Drama* (stage management, directing, acting)

Michael K. Hooker, M.F.A. California Institute of the Arts, *Head of Design and Professor of Drama* (sound design)

Ketu H. Katrak, Ph.D. Bryn Mawr College, *Professor of Drama; Comparative Literature; English* (drama and performance, African drama and Ancient Sanskrit drama [from India], postcolonial literature and theory, women writers and feminist theory)

Madeline Kozlowski, M.F.A. Brandeis University, *Professor Emerita of Drama* (costume design)

Anthony James Kubiak, Ph.D. University of Wisconsin-Madison, *Professor of Drama* (American and modern drama, modern poetry, critical theory, philosophy)

Daphne Pi-Wei Lei, Ph.D. Tufts University, *Head of Doctoral Studies and Professor of Drama; Asian American Studies* (Asian theatre, Asian American theatre, intercultural theatre, gender theory, performance theory)

Annie M. Loui, *Co-Head of Acting and Professor of Drama* (movement, directing, acting)

Mihai Maniutiu, Ph.D. Caragiale Academy of Theatrical Arts and Cinematography, *UCI Distinguished Professor of Drama* (directing)

Ian Andrew Munro, Ph.D. Harvard University, *Associate Professor of Drama; English* (European drama and performance, early modern popular culture, theatrical performance of wit)

Vincent Olivieri, M.F.A. Yale University, *Associate Dean of Graduate Affairs and Professor of Drama* (sound design)

Jane M. Page, M.F.A. Indiana University, *Head of Directing and Professor of Drama* (directing, acting)

Andrew A. Palermo, B.F.A. University of Cincinnati, College-Conservatory of Music, *Associate Professor of Drama* (music theatre choreography)

Janelle Reinelt, Ph.D. Stanford University, *Professor Emerita of Drama* (British theatre, political theory, performance)

Bryan R. Reynolds, Ph.D. Harvard University, *UCI Chancellor's Professor and Claire Trevor and Professor of Drama* (Shakespeare, Renaissance drama, critical theory, feminist theory, performance theory, cultural studies)

Tara Rodman, Ph.D. Northwestern University, *Assistant Professor of Drama; Asian American Studies* (modernist performance, Japanese theatre and dance, transnationalism, racial formation, global Asias)

Eli Simon, M.F.A. Brandeis University, *UCI Chancellor's Professor and Professor of Drama* (acting, directing)

Jaymi Smith, B.F.A. DePaul University, *Professor of Drama* (lighting design)

Philip D. Thompson, M.F.A. University of California, Irvine, *Professor of Drama* (voice, speech for actors, acting)

Richard J. Triplett, M.A. Otis Art Institute, *Professor Emeritus of Drama* (scenery and costume design, history of design)

Joel R. Veenstra, M.F.A. University of California, Irvine, *Co-Head of Stage Management and Associate Professor of Teaching of Drama* (stage management, acting)

## Courses

### **DRAMA 10. Introduction to Theatre. 4 Units.**

An interactive introduction to the world of theatre that serves to develop an appreciation of theatrical arts, to establish an awareness of landmarks within the performance history, and to create an understanding of the collaborative roles and departments that exist.

(IV)

### **DRAMA 11. The Rock and Roll Spectacle Show. 4 Units.**

A thorough overview to the development and cultural significance of the Rock 'n' Roll Spectacle show. Focus on historical and recent developments of the spectacle show, trends in the aesthetics of the field, and various sub-genres.

(IV)

### **DRAMA 14. Performing Rock 'N' Roll. 4 Units.**

Explores major movements in the history of rock 'n' roll in terms of performance, not virtuosity necessarily of the performers as musicians, rather as performances of aesthetics in modes of embodied ideology, iconoclastic spectacle, mixed media fashion, and subcultural formation.

### **DRAMA 15. Performance Now. 4 Units.**

Exposes students to what is most current in the world of performance and theatre. Begins with a series of lectures on the idea of performance, and the various theories that frame it.

Restriction: Music Theatre Majors have first consideration for enrollment. Drama Majors have first consideration for enrollment.

(IV)

### **DRAMA 16. Performing Culture. 4 Units.**

Culture, aesthetics, and ideology (combined in the concept 'subculture') work to fashion social identities. Using theories and methodologies of performance studies, with an emphasis on American culture, this course explores why and how culture is reinforced through performance.

(IV)

### **DRAMA 20A. Culture in Performance. 4 Units.**

A three-quarter foundation series exploring the rich depth of theatre, drama, and other genres of performance across a wide variety of worldwide forms, for performer and audience.

(IV)

**DRAMA 20B. Culture in Performance. 4 Units.**

A three-quarter foundation series exploring the rich depth of theatre, drama, and other genres of performance across a wide variety of worldwide forms, for performer and audience.

(IV)

**DRAMA 20C. Culture in Performance. 4 Units.**

A three-quarter foundation series exploring the rich depth of theatre, drama, and other genres of performance across a wide variety of worldwide forms, for performer and audience.

(IV)

**DRAMA 30A. Acting. 4 Units.**

Focuses on Stanislavski-based terminology and technique through theatre exercises and improvisation. The first part of a one-year series in basic acting technique and discipline.

Repeatability: May be taken for credit 2 times.

Restriction: Music Theatre Majors have first consideration for enrollment. Drama Majors have first consideration for enrollment.

**DRAMA 30B. Acting. 4 Units.**

Focuses on scene work and character development. The second part of a one-year series in basic acting technique and discipline.

Prerequisite: DRAMA 30A

Repeatability: May be taken for credit 2 times.

Restriction: Music Theatre Majors have first consideration for enrollment. Drama Majors have first consideration for enrollment.

**DRAMA 30C. Acting. 4 Units.**

Focuses on monologues, auditions, callbacks, and the profession of acting. The third part of a one-year series in basic acting technique and discipline.

Prerequisite: DRAMA 30A and DRAMA 30B

Repeatability: May be taken for credit 2 times.

Restriction: Music Theatre Majors have first consideration for enrollment. Drama Majors have first consideration for enrollment.

**DRAMA 34. Movement for Actors. 4 Units.**

A studio course in fundamentals of stretch, strength, and alignment; exploring spatial awareness and physical control through mime isolations, techniques, and related improvisation.

Repeatability: May be taken for credit 3 times.

**DRAMA 35. Speech for the Theatre. 4 Units.**

An introductory course in voice and speech for actors, combining the body-based approach to voice developed by Fitzmaurice, and speech work of Knight and Thompson. Designed for the needs of actors and is not a public speaking course.

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 40A. Development of Drama. 4 Units.**

The development of Western Drama, concentrating on the drama's intellectual, social, and artistic foundations. About 10 plays and supplementary critical material are read each quarter. Greek Drama through Shakespeare.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors have first consideration for enrollment. Drama Majors have first consideration for enrollment.

(IV and VIII ).



**DRAMA 40B. Development of Drama. 4 Units.**

The development of Western Drama, concentrating on the drama's intellectual, social, and artistic foundations. About 10 plays and supplementary critical material are read each quarter. Restoration Drama through Ibsen.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors have first consideration for enrollment. Drama Majors have first consideration for enrollment.

(IV and VIII ).

**DRAMA 40C. Development of Drama. 4 Units.**

The development of Western Drama, concentrating on the drama's intellectual, social, and artistic foundations. About 10 plays and supplementary material are read each quarter. Contemporary Drama. Post Naturalistic theatre.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors have first consideration for enrollment. Drama Majors have first consideration for enrollment.

(IV and VIII ).

**DRAMA 50A. Introduction to Costume Design. 4 Units.**

Introduction to the process and procedures employed by the costume designer for the theatre. The elements of design are discussed in the context of character development, historical period, and style. Exercises extend to drawing, rendering, and investigation of human proportions.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 50B. Introduction to Scenic Design. 4 Units.**

Introduction to the principles and practice of scenic design. Weekly problems include research into various periods and styles of production with an emphasis on the conceptual idea. Perspective drawing, rendering, and model building are covered in studio exercises and assignments.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 50C. Introduction to Lighting Design. 4 Units.**

Introduction to the principles, theories, and equipment employed by the lighting designer for the stage. Areas of investigation include history, technology, and script analysis. Detailed studio attention is given to the theory and practice of design.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 50D. Introduction to Sound Design. 4 Units.**

Principles, theories, equipment use, and terminology employed by the sound designer for the stage. Areas of study include history, technology, and script analysis. Focuses on the theory and practice of design.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 50E. Introduction to Stage Management. 4 Units.**

A basic study of theatrical, dance, and opera stage management practices, forms, and methods, from first script reading to closing night. Opportunity to observe professionals at work in regional and touring situations as available.

Prerequisite or corequisite: DRAMA 10

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 60. Topics in Advanced Stage Management. 4 Units.**

Nurtures a greater appreciation for the stage manager and his or her process, and supports students who are interested in pursuing a career in professional stage management.

Repeatability: May be taken for credit 3 times as topics vary.



**DRAMA 65. Music Theatre Workshop I. 2 Units.**

Basic vocal technique and characterization of musical theatre repertoire explored.

Prerequisite: Audition required.

Repeatability: May be taken for credit 2 times.

**DRAMA 80. Directing I . 4 Units.**

Introduction to comprehensive directing process from pre-production to opening. Focus on fundamental skills: analysis, staging, action, actor coaching, and elements of design. Skills applied to scripted theatrical material. Develop a language for commenting on theatrical production. Attending and critiquing productions.

Prerequisite: DRAMA 30A and DRAMA 30B

**DRAMA 100. University Theatre . 4 Units.**

Rehearsal and performance in a faculty-directed.

Prerequisite: Audition required.

Repeatability: May be repeated for credit unlimited times.

**DRAMA 101A. Theatre Production: Costume. 1-6 Units.**

The production courses are offered to give students the opportunity to participate in departmental productions. Students engage in the production and construction of designed work as well as its applied execution during performance.

Repeatability: May be taken for credit for 24 units.

Restriction: May be taken for credit for a maximum of 24 units provided productions change.

**DRAMA 101B. Theatre Production: Scenic. 1-6 Units.**

The production courses are offered to give students the opportunity to participate in departmental productions. Students engage in the production and construction of designed work as well as its applied execution during performance.

Repeatability: May be taken for credit for 24 units.

Restriction: May be taken for credit for a maximum of 24 units provided productions change.

**DRAMA 101C. Theatre Production: Lighting. 1-6 Units.**

The production courses are offered to give students the opportunity to participate in departmental productions. Students engage in the production and construction of designed work as well as its applied execution during performance.

Repeatability: May be taken for credit for 24 units.

Restriction: May be taken for credit for a maximum of 24 units provided productions change.

**DRAMA 101D. Theatre Production: Stage Management. 1-8 Units.**

The production courses are offered to give students the opportunity to participate in departmental productions. Students engage in the production and construction of designed work as well as its applied execution during performance.

Repeatability: May be taken for credit 24 times.

Restriction: May be taken for credit for a maximum of 24 units provided productions change.

**DRAMA 101E. Theatre Production: Audio. 1-6 Units.**

The production courses are offered to give students the opportunity to participate in departmental productions. Students engage in the production and construction of designed work as well as its applied execution during performance.

Repeatability: May be taken for credit for 24 units.

Restriction: May be taken for credit for a maximum of 24 units provided productions change.

**DRAMA 101S. Theatre Production: Theatre Management. 1-6 Units.**

The production courses are offered to give students the opportunity to participate in departmental productions. Students engage in the production and construction of designed work as well as its applied execution during performance.

Repeatability: May be taken for credit for 24 units.

Restriction: May be taken for credit for a maximum of 24 units provided productions change.

**DRAMA 103. Lectures in Dramatic Literature. 4 Units.**

Courses include Medieval and Tudor Drama, Elizabethan and Jacobean Drama, Shakespeare, Restoration and Eighteenth Century Drama, Modern British Drama, Modern American Drama, Tragedy, and Comedy.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 103W. Lectures in Dramatic Literature. 4 Units.**

Courses include Medieval and Tudor Drama, Elizabethan and Jacobean Drama, Shakespeare, Restoration and Eighteenth-Century Drama, Modern British Drama, Modern American Drama, Tragedy, and Comedy.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 109. Special Topics in Theory and Criticism. 4 Units.**

Discussion of recent major trends and ideas in critical theory, concentrating on in-depth readings and lectures in particular facets of theory and criticism: Derrida, Butler, Lacan, Deleuze, and others.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 109W. Special Topics in Theory and Criticism. 4 Units.**

Discussion of recent major trends and ideas in critical theory, concentrating on in-depth readings and lectures in particular facets of theory and criticism: Derrida, Butler, Lacan, Deleuze, and others.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**(Ib)****DRAMA 110. Special Topics in Classical Dramas . 4 Units.**

Designed to introduce students to various classical traditions-early Greek and Roman theatres, to be sure, but also, by way of comparison, the classical traditions of non-European cultures.

Prerequisite: DRAMA 40A and DRAMA 40B and DRAMA 40C. Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 110W. Special Topics in Classical Dramas. 4 Units.**

Designed to introduce students to various classical traditions-early Greek and Roman theatres, to be sure, but also, by way of comparison, the classical traditions of non-European cultures.

Prerequisite: DRAMA 40A or DRAMA 40B or DRAMA 40C. Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**(Ib)**

**DRAMA 112. Special Topics in Early Modern and Neoclassical Theatre. 4 Units.**

Investigates aspects of European theatre and culture in the sixteenth, seventeenth, and eighteenth centuries; individual courses may focus on specific topics within this broad expanse.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 112W. Special Topics in Early Modern and Neoclassical Theatre. 4 Units.**

Investigates aspects of European theatre and culture in the sixteenth, seventeenth, and eighteenth centuries; individual courses may focus on specific topics within this broad expanse.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**(Ib)****DRAMA 116. Special Topics in Nineteenth-Century Dramas. 4 Units.**

Looks at the various trends and conventions of theatres in the nineteenth century, both Euro-American and beyond, paying special attention to the culture and political milieu within which these various traditions appeared.

Prerequisite: DRAMA 40A and DRAMA 40B and DRAMA 40C. Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 116W. Special Topics in Nineteenth-Century Dramas. 4 Units.**

Looks at the various trends and conventions of theatres in the nineteenth century, both Euro-American and beyond, paying special attention to the culture and political milieu within which these various traditions appeared.

Prerequisite: DRAMA 40A and DRAMA 40B and DRAMA 40C. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**(Ib)****DRAMA 118. Special Topics in Modern and Contemporary Drama. 4 Units.**

An investigation into the many forms and permutations of modern (1880-1945), and contemporary (since 1945) drama, paying special attention to the historical and philosophical interpretations of text and performance.

Prerequisite: DRAMA 40A and DRAMA 40B and DRAMA 40C. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 118W. Special Topics in Modern and Contemporary Drama . 4 Units.**

An investigation into the many forms and permutations of modern (1880-1945), and contemporary (since 1945) drama, paying special attention to the historical and philosophical interpretations of text and performance.

Prerequisite: DRAMA 40A and DRAMA 40B and DRAMA 40C. Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**(Ib)**

**DRAMA 121. Introduction to Asian Theatre. 4 Units.**

An introduction to some of the major traditional theatrical forms and dramatic texts from India, China, and Japan. Other than dramatic texts (in English translation), attention is also paid to theory, history, and performance styles of traditional Asian theatre.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 122. Asian American Theatre. 4 Units.**

An introduction to the history and development of Asian American theatre and drama. Besides play analysis, special attention is also paid to the history and politics of Asian American identity and experience, as well as to aspects of theatrical performance.

Prerequisite: DRAMA 40A and DRAMA 40B and DRAMA 40C

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 123. Multicultural Theatres. 4 Units.**

A study of the history, culture, aesthetics, and literature of various traditional performing arts and their connections to the contemporary multicultural society.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 126. African American Film and Drama. 4 Units.**

A critical investigation of films and plays written by African Americans, with emphasis on dramaturgical and cinematic strategies, individual and collective representation, and the legacy of African American political struggle.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 126W. African American Film and Drama. 4 Units.**

A critical investigation of films and plays written by African Americans, with emphasis on dramaturgical and cinematic strategies, individual and collective representation, and the legacy of African American political struggle.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Restriction: Music Theatre Majors only. Drama Majors only.

**(Ib)****DRAMA 129. Advanced Topics in Performance. 4 Units.**

Addresses particular issues in theatre and performance that typically lie outside of regular course offerings. May address such issues as the theatre of the Avant Garde, performing gender, transversality and performance, body art, installation and performance art, among other topics.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 129W. Advanced Topics in Performance. 4 Units.**

Addresses particular issues in theatre and performance that typically lie outside of regular course offerings. May address such issues as the theatre of the Avant Garde, performing gender, transversality and performance, body art, installation and performance art, among other topics.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**(Ib)****DRAMA 130. Intermediate Acting. 4 Units.**

Rehearsal and presentation of scenes from contemporary material. Focus on connection with scene partner, playing actions, and text analysis. Introduction to the credibility and theatricality of characterization and style.

Prerequisite: DRAMA 30A and DRAMA 30B and DRAMA 30C with an average grade of B or better. For transfer students: one year of beginning acting with an average grade of B or better.

Repeatability: May be taken for credit 2 times.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 132A. Writing for Performance. 4 Units.**

Completion of a full-length play or its equivalent; discussion of student writing and of relevant literary texts.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 134. Studio for Advanced Movement for Actors. 4 Units.**

Studio course in conditioning and partnering techniques to the practice of contact improvisation. Contact improvisation is explored and applied in scene study.

Prerequisite: DRAMA 34. DRAMA 34 with a grade of B or better

Repeatability: May be taken for credit 3 times.

**DRAMA 135. Master Classes in Acting. 1-4 Units.**

Advanced acting in specialized areas including acting for the camera: situation comedy, commercials; auditioning and industry preparation; Shakespeare; Molière; Chekov; improvisation; advanced movement and voice and speech for the actor; self-starting; stage combat; repertory acting, singing; comedy; clowning; and masks.

Prerequisite: DRAMA 130. DRAMA 130 with a grade of B or better

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 136. Music Theatre Acting. 4 Units.**

An acting class exclusive to the students in the B.F.A. in Music Theatre program.

Prerequisite: DRAMA 30A and DRAMA 30B and DRAMA 30C

Repeatability: May be taken for credit 4 times.

Restriction: Music Theatre Majors only.

**DRAMA 142. Music Theatre Workshop II. 4 Units.**

A workshop in audition technique and song interpretation.

Prerequisite: Audition required.

Repeatability: May be taken for credit 4 times.

**DRAMA 143A. Music Theatre Workshop III. 4 Units.**

Scene study and song repertoire examined by era for the advanced Music Theatre student. 1800s-1940.

Prerequisite: DRAMA 142. Audition required.

**DRAMA 143B. Music Theatre Workshop III. 4 Units.**

Scene study and song repertoire examined by era for the advanced Music Theatre student. 1940s-1970s.

Prerequisite: DRAMA 142. Audition required.

**DRAMA 143C. Music Theatre Workshop III. 4 Units.**

Scene study and song repertoire examined by era for the advanced Music Theatre student. 1970's-present.

Prerequisite: DRAMA 142. Audition required.

**DRAMA 144. Music Theatre Workshop IV. 4 Units.**

A performance class concentrating on role building. Work culminates with in-class performances of abbreviated versions of musicals.

Prerequisite: For B.F.A. students: DRAMA 143A, DRAMA 143B, DRAMA 143C, and audition. For Drama graduate students: audition required.

Repeatability: May be taken for credit 4 times.

Restriction: Graduate students only. Music Theatre Majors only. Drama Majors only.

**DRAMA 145. Music Theatre Singing. 1 Unit.**

Private weekly voice lessons for the advanced Music Theatre student.

Corequisite: DRAMA 143A

Repeatability: May be taken for credit 9 times.

Restriction: Music Theatre Majors only.

**DRAMA 146. NYSP-Preparation. 4 Units.**

Class preparation for the New York Satellite Program (NYSP) - an immersion experience in New York City for the musical theatre performer.

Prerequisite: Admission is by audition and the following prerequisites: DRAMA 30C and two quarters of DRAMA 148A, DRAMA 148B, or DRAMA 148C (if the 148 prerequisite is not complete at the time of auditions, student must enroll during the fall and winter quarters in the same year as the trip to New York); senior Drama majors must have successfully completed DRAMA 40C and DRAMA 120C; non-Drama majors must have sophomore standing or higher and must carefully plan their course schedule as many spring quarter classes cannot be taken while part of the NYSP.

Repeatability: May be taken for credit 2 times.

**DRAMA 148A. History of American Musical Theatre. 4 Units.**

A survey of the influential artists who produce, write, direct, and perform on America's musical stages. Surveys 1700s-1940s.

Restriction: Drama Majors only. Music Theatre Majors only.

Concurrent with DRAMA 248A.

**DRAMA 148B. History of American Musical Theatre. 4 Units.**

A survey of the influential artists who produce, write, direct, and perform on America's musical stages. Surveys 1940s-1970s.

Restriction: Drama Majors only. Music Theatre Majors only.

Concurrent with DRAMA 248B.

**DRAMA 148C. History of American Musical Theatre. 4 Units.**

A survey of the influential artists who produce, write, direct, and perform on America's musical stages. Surveys 1970s to present day.

Restriction: Drama Majors only. Music Theatre Majors only.

Concurrent with DRAMA 248C.

**DRAMA 149. Music Proficiency for Actors. 2 Units.**

A musicianship class introducing basic musical terminology, theory, and sight singing skills.

Repeatability: May be taken for credit 2 times.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 150. Costume Production Techniques. 4 Units.**

Studio instruction in pattern making, draping, millinery, and construction techniques.

Prerequisite: DRAMA 50A

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 157. Lighting Composition. 4 Units.**

Provides an opportunity for students to pursue stage lighting composition in a studio atmosphere. Laboratory practice includes weekly exercises in style and genre. Emphasis is placed on the realization of conceptual ideas.

Prerequisite: DRAMA 50C

Repeatability: May be repeated for credit unlimited times.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 158. Topics in Theatre Design. 4 Units.**

Examines the various functions of scenery and costume: locale, historical period, mood, and atmosphere, with special assignments in each area. Discussion of problems in scenic metaphors and visualization, emphasizing techniques of planning and presentation (e.g., floor plans, models, and rendering).

Prerequisite: DRAMA 50A or DRAMA 50B

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 159. Proseminar in Theatre Design. 4 Units.**

Topics in theatre design.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 164A. History of Costume. 4 Units.**

A study of the development of dress and the influence of cultural factors on clothing from the time of Egyptians to Early Baroque.

Prerequisite: DRAMA 50A

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 164B. History of Costume. 4 Units.**

A study of the development of dress and the influence of cultural factors on clothing from late Baroque to World War I.

Prerequisite: DRAMA 50A

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 176. Script and Score. 4 Units.**

A form and analysis seminar discussing the libretto and score of landmark musicals.

Prerequisite: Two courses from DRAMA 148A or DRAMA 148B or DRAMA 148C.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 177. Song Repertoire. 2 Units.**

A song coaching class culminating in a song recital or showcase. Each quarter will feature a different composer, lyricist, or musical style.

Repeatability: May be taken for credit 6 times.

Restriction: Music Theatre Majors only.

**DRAMA 180. Contemporary Dramatic Criticism and Theory. 4 Units.**

Reading and analysis of theories and critical approaches to contemporary theatre: Brecht, Artaud, and others who have contributed to the form and idea of the modern theatre. Writing of assigned exercises in dramatic criticism.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 180W. Contemporary Dramatic Criticism and Theory. 4 Units.**

Reading and analysis of theories and critical approaches to contemporary theatre: Brecht, Artaud, and others who have contributed to the form and idea of the modern theatre. Writing of assigned exercises in dramatic criticism.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only. Music Theatre Majors only.

(Ib)

**DRAMA 182A. Dance Technique, Level I. 4 Units.**

Advanced beginner and intermediate dance training including musical theatre, ballet, jazz and contemporary modern techniques and repertoire. Body conditioning is also a major component of the course.

Prerequisite: DRAMA 65 or DRAMA 142. Audition required.

Repeatability: May be taken for credit 4 times.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 182B. Dance Technique, Level I. 4 Units.**

Advanced beginner and intermediate dance training including musical theatre, ballet, jazz and contemporary modern techniques and repertoire. Body conditioning is also a major component of the course.

Prerequisite: (DRAMA 65 or DRAMA 142) and DRAMA 182A. Audition required.

Repeatability: May be taken for credit 4 times.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 183A. Dance Technique, Level II. 4 Units.**

Intermediate and advanced dance training including musical theatre, ballet, jazz and contemporary modern techniques and repertoire. Body conditioning is also a major component of the course.

Prerequisite: DRAMA 65 or DRAMA 142. Audition required.

Repeatability: May be taken for credit 4 times.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 183B. Dance Technique, Level II. 4 Units.**

Intermediate and advanced dance training including musical theatre, ballet, jazz and contemporary modern techniques and repertoire. Body conditioning is also a major component of the course.

Prerequisite: (DRAMA 65 or DRAMA 142) and DRAMA 183A. Audition required.

Repeatability: May be taken for credit 4 times.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 184. Directing II. 4 Units.**

The principles of stage directing, covering the director's functions in the areas of interpretation, composition, coaching, and styling a theatrical production. Directing exercises and projects; the final project is the preparation of a hypothetical proposal for a play production.

Prerequisite: DRAMA 30A and DRAMA 30B and DRAMA 40A and DRAMA 40B and DRAMA 40C and DRAMA 80

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 185. Advanced Directing. 4 Units.**

A seminar in directorial organization and research. Student prepares a textual and dramaturgical analysis, a production timetable, and a hypothetical production book of an assigned play.

Prerequisite: DRAMA 184

Repeatability: May be repeated for credit unlimited times.

Restriction: Drama Majors only. Music Theatre Majors only.

**DRAMA 190. NYSP-Acting. 1-4 Units.**

New York Satellite Program acting classes taught by guest faculty in New York.

Prerequisite: DRAMA 146

Repeatability: May be taken for credit 2 times.



**DRAMA 191. NYSP - Dance. 4 Units.**

New York Satellite Program dance classes in ballet, tap, jazz, and musical theatre styles taught by guest faculty in New York.

Prerequisite: DRAMA 146

Repeatability: May be taken for credit 2 times.

**DRAMA 192. NYSP - Singing. 4 Units.**

New York Satellite Program private and group lessons in musical theatre singing taught by guest faculty in New York.

Prerequisite: DRAMA 146

Repeatability: May be taken for credit 2 times.

**DRAMA 193. NYSP - Performance. 4 Units.**

New York Satellite Program rehearsals and public, staged readings of original musicals in New York.

Prerequisite: DRAMA 146

Repeatability: May be taken for credit 2 times.

**DRAMA 194. NYSP-UCI Residency. 4 Units.**

New York Satellite Program follow-up classes and performances back on Irvine campus upon the return from New York.

Prerequisite: DRAMA 146

Repeatability: May be taken for credit 2 times.

**DRAMA 195. Music Theatre Dance - Special Topics. 1-4 Units.**

Advanced dance classes in specialized areas including the dance styles of a choreographer (de Mille, Fosse, Robbins, Tune, Stroman), genre (tap, ballroom, jazz, swing, hip-hop), or in musical theatre choreography.

Prerequisite: DRAMA 182A or DRAMA 182B or DRAMA 183A or DRAMA 183B. Audition required.

Repeatability: Unlimited as topics vary.

Restriction: Music Theatre Majors only. Drama Majors only.

**DRAMA 198. Director Class Project. 1-8 Units.**

For students who are involved in the Director Class Projects at UCI as actors, directors, designers, stage managers and their assistants. M.F.A. Directors and the Head of Directing (HoD) supervise the projects.

Grading Option: Pass/no pass only.

Repeatability: Unlimited as topics vary.

**DRAMA H198. Honors Director Class Project. 1-4 Units.**

For graduate student actors and undergraduate directors who are candidates for Honors in Directing and involved in the Director Class Projects. The Head of Directing (HoD) supervises these students.

Repeatability: Unlimited as topics vary.

**DRAMA 199. Project in Theatre . 1-4 Units.**

Independent theatre projects with Drama faculty.

Repeatability: Unlimited as topics vary.

**DRAMA 200. Graduate Studio: Acting. 4 Units.**

Work in graduate studio taken in tandem with graduate studios in stage voice (DRAMA 201), stage speech (DRAMA 202), and stage movement (DRAMA 203).

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 201. Graduate Studio: Voice. 1 Unit.**

Graduate studio in vocal production for actors.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 202. Graduate Studio: Speech. 1 Unit.**

Graduate studio in speech for actors.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 203. Graduate Studio: Movement. 2 Units.**

Work in graduate studio: stage movement taken in tandem with nine graduate studios in acting (DRAMA 200), voice (DRAMA 201), speech (DRAMA 202), and voice/movement dynamics (DRAMA 206).

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 206. Graduate Studio: Voice/Movement Dynamics. 2 Units.**

Daily conditioning exercises.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 211. Graduate Studio: Directing. 4 Units.**

Graduate studio in directing.

Repeatability: Unlimited as topics vary.

Restriction: Drama graduate students only.

**DRAMA 219. Graduate Master Class. 1-4 Units.**

Various topics such as Shakespeare, comedy, Molière, improvisation, Kabuki, television acting.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 220. Seminar in Dramatic Literature. 4 Units.**

Topics in Dramatic Literature.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 225. Seminar on Theatre Pedagogy. 4 Units.**

A seminar on the major teaching systems in the dramatic arts with particular attention to professional arts training. Required prior to applying for Teaching Assistantships in studio areas.

Restriction: Drama graduate students only.

**DRAMA 240. Graduate Projects . 1-4 Units.**

Various projects depending on student's concentration (acting, design, musical theatre, directing).

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Drama and Theatre Majors only. Drama Majors only.

**DRAMA 241. Singing Pedagogy . 2 Units.**

Learning how to teach voice lessons and coach musical theatre singing. Experiences include both private voice lessons and observing the lessons given to the B.F.A./Music Theatre students.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate Music Direction students only.

**DRAMA 242. Conducting . 2 Units.**

Private conducting instruction to develop freedom of movement/expression, baton technique, ear training, and tempo memory for both rehearsal and performance situations in musical theatre.

Repeatability: May be taken for credit 9 times.

Restriction: Graduate Music Directors only.

**DRAMA 243. Script and Score . 4 Units.**

A form and analysis seminar discussing the libretto and score of landmark musicals.

Restriction: Graduate students only. Music Majors only.

Concurrent with DRAMA 176.

**DRAMA 244. Dramaturgy: Theory and Methods. 4 Units.**

Examines the practice, place, and theory of dramaturgy. Explores plays in terms of how they work: dramatic form and structure, historical context, and more. Study includes dramaturgy as a theatrical practice.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 246A. Musical Scene Study I. 4 Units.**

Musically directing scenes from musicals of various time periods. Features works from the late 19th and early 20th centuries, including songwriters Gilbert and Sullivan, Irving Berlin, George Gershwin, Rodgers and Hart, and Cole Porter.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate Music Director students only.

**DRAMA 246B. Musical Scene Study II. 4 Units.**

Musically directing scenes from musicals of various time periods. Features works from the middle of the 20th century including songwriters Rodgers and Hammerstein, Lerner and Loewe, Julie Styne, Kander and Ebb, and Jerry Herman.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate Music Directors only.

**DRAMA 246C. Musical Scene Study III. 4 Units.**

Musically directing scenes from musicals of various time periods. Features works from the late 20th and early 21st centuries including songwriters Stephen Sondheim, Andrew Lloyd Webber, Stephen Schwartz, Flaherty and Ahrens, and Jeanine Tesori.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate Music Directors only.

**DRAMA 247. Musicals Abridged . 4 Units.**

Musically directing abridged versions of musicals from various time periods and genres.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate Music Directors only.

**DRAMA 248A. History of American Music Theatre. 4 Units.**

A survey of the influential artists who produce, write, direct, and perform on America's musical stages. Surveys 1700s-1940s.

Restriction: Graduate students only.

Concurrent with DRAMA 148A.

**DRAMA 248B. History of American Musical Theatre. 4 Units.**

A survey of the influential artists who produce, write, direct and perform on America's musical stages. Surveys 1940s-1970s.

Restriction: Graduate students only.

Concurrent with DRAMA 148B.

**DRAMA 248C. History of American Musical Theatre. 4 Units.**

A survey of the influential artists who produce, write, direct and perform on America's musical stages. Surveys 1970s to present day.

Concurrent with DRAMA 148C.

**DRAMA 249. Graduate Music Direction. 4 Units.**

Various musical direction activities including the vocal direction, accompanying, and conducting of musical theatre performances.

Repeatability: May be taken for credit 9 times.

Restriction: Graduate students only. Music Majors only.

**DRAMA 251A. Foundations of Theatre. 4 Units.**

Seeks to create greater understanding in the roots and theories of theatrical models, aesthetics, action vs. reaction of differing thoughts in theatrical doctrine, and art, architecture, music, and fashion that contributed to the style and practice of theatre.

Restriction: Drama graduate students only.

**DRAMA 251B. Foundations of Theatre. 4 Units.**

Seeks to create greater understanding in the roots and theories of theatrical models, aesthetics, action vs. reaction of differing thoughts in theatrical doctrine, and art, architecture, music, and fashion that contributed to the style and practice of theatre.

Restriction: Drama graduate students only.

**DRAMA 251C. Foundations of Theatre. 4 Units.**

Seeks to create greater understanding in the roots and theories of theatrical models, aesthetics, action vs. reaction of differing thoughts in theatrical doctrine, and art, architecture, music, and fashion that contributed to the style and practice of theatre.

Restriction: Drama graduate students only.

**DRAMA 254. Graduate Stage Management. 4 Units.**

Studio exercises and projects in stage management.

Repeatability: May be repeated for credit unlimited times.

Restriction: Drama Majors only.

**DRAMA 255. Graduate Design Seminar. 4 Units.**

Projects, lectures, and critical discussion in costume, scenery, lighting, and sound design.

Restriction: Drama Majors only.

**DRAMA 256. Survival and Professional Practice in Design. 4 Units.**

Provides an in-depth examination of business skills needed to survive as a theatrical designer. Required 'Bridge' course in the Design MFA programs, relevant to all disciplines.

Restriction: Drama graduate students only.

**DRAMA 257A. Costume Thesis Project. 4 Units.**

Development of thesis project with focus on organization, research, timeline, and execution.

Prerequisite: DRAMA 240

Restriction: Drama graduate students only.

**DRAMA 257B. Scenic Thesis Project. 4 Units.**

Development of thesis project with focus on organization, research, timeline, and execution.

**DRAMA 257E. Thesis Writing Project-Stage Management. 4 Units.**

Development of thesis topic with focus on organization, research, timeline, and execution.

Prerequisite: 12 units of DRAMA 254.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Drama graduate students only.

**DRAMA 258. Drawing for Designers. 2 Units.**

A multi-skill level course in drawing technique focusing on skills essential to stage designers including line, proportion, perspective and creating dynamic compositions. Focus will primarily be in figure drawing but may include still-life, landscape, and architectural drawings. Materials fee.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 9 times.

**DRAMA 259. Theatre Colloquium. 1 Unit.**

Exposes students to a wider range of theatrical practitioners, theories, and topics through guest lecturers, special projects, and cross-disciplinary dialogue.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 260A. Digital Costume Rendering. 4 Units.**

A studio course in costume rendering for the theatre using computer image manipulation. Instruction in compositing and painting techniques and performance design conventions.

**DRAMA 260B. Digital Textile Design and Printing. 4 Units.**

A studio course in textile design using digital printing and embossing techniques. Instruction in state-of-the-art software and output manipulation for artistic expression.

**DRAMA 261. Digital Design: Drawing/Painting/Rendering. 4 Units.**

A studio course in scenic or costume rendering for the theatre using the computer for drawing/painting through the use of the digital pen/tablet.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 262. Digital Design: 2D/3D Modeling. 4 Units.**

A studio course in CAD's 2D drafting and 3D modeling capabilities for theatrical design. Instruction in state-of-the-art software for 2D and 3D object creation and theatrical presentation conventions.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 263. Digital Design: 3D Rendering. 4 Units.**

A studio course in theatrical design through 3d modeling on computer and use of state-of-the-art rendering software. Instruction emphasizes collaborative design process through the use of scenic designer/lighting designer teams for all projects.

Prerequisite: DRAMA 262

Restriction: Graduate students only. Drama and Theatre Majors only. Drama Majors only.

**DRAMA 264. Lighting Graphics. 4 Units.**

A studio course in the various graphic methods employed by lighting designers in the theatre. Projects include manual and CAD techniques for Light Plot and Paperwork creation.

Prerequisite: DRAMA 262

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 265. Digital Design: 2D CAD. 4 Units.**

A studio course in theatrical design and architectural lighting design on the computer. Instruction in state-of-the-art software for 2D object creation. Theatrical and architectural standards implemented in performance design.

Prerequisite: DRAMA 262

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 266. Digital Design: Digital Audio Systems. 4 Units.**

Comprehensive tutorial on digital audio including hard disk recording, editing, data compression, and ethernet audio distribution. Focus is on recording, editing, and delivery of audio as used by the sound designer in the digital domain.

Restriction: Drama graduate students only.

**DRAMA 267. Digital Design: Creating Sounds from Scratch. 4 Units.**

The process of analyzing sounds for their core timbral components and using that data to create new sounds - from realistic to fantastic - by means of digital manipulation.

Prerequisite: DRAMA 266

Restriction: Drama Majors only.

**DRAMA 271. Conceptual Sound Design. 4 Units.**

An intensive, project-based seminar for exploring relationships between sound and sight. Synesthesia, creative intent vs. audience perception, and sound/movement are typical of the many topics to be explored. A series of creative projects are assigned and critiqued in peer review.

Prerequisite: DRAMA 266

Restriction: Drama Majors only.

**DRAMA 272. Musical Theatre Sound/Concert Sound. 4 Units.**

A concept-to-opening study of the process of designing sound systems for musicals and live/touring sound. Special attention given to the paperwork and documentation required to package, build, and mix these shows.

Restriction: Drama Majors only.

**DRAMA 277. Critical Listening. 4 Units.**

Exploration of the many variables that affect (and effect) the audio chain. Perceiving and understanding these parameters unlocks the art of controlling sound and stylizing cues. Also includes the process of equalizing/aligning sound systems and the art of audio mastering.

Prerequisite: DRAMA 266

Restriction: Drama Majors only.

**DRAMA 279. Advanced Sound Design. 4 Units.**

An in-depth investigation into sound design for the theatre. Special emphasis is placed on text analysis, design conception, content creation, content delivery, and design organization. Class projects include creating paper designs and paperwork for different texts.

**DRAMA 280A. Techniques in Costume Design. 4 Units.**

Student exercises in the techniques and implementation of costume design.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only.

**DRAMA 280B. Techniques in Scenery Design. 4 Units.**

Student exercises in the techniques and implementation of scenic design.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only.

**DRAMA 280C. Techniques in Lighting Design. 4 Units.**

Student exercises in the techniques and implementation of lighting design.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only.

**DRAMA 280D. Techniques in Sound Design. 4 Units.**

Student exercises in the techniques and implementation of sound design.

Repeatability: Unlimited as topics vary.

Restriction: Drama Majors only.

**DRAMA 282. Stage Electronics/Introduction to Show Control. 4 Units.**

Using computers and dedicated hardware to cue, control or automate sound, scenery, and lighting for live performance and themed entertainment applications.

Restriction: Graduate students only. Drama Majors only. Drama and Theatre Majors only.

**DRAMA 290. Dramatic Literature and Theatre History Prior to 1900. 4 Units.**

Studies in selected areas of dramatic literature and theatre history prior to 1900. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**DRAMA 291. Dramatic Literature and Theatre History, 1900 to Present. 4 Units.**

Studies in selected areas of dramatic literature and theatre history, 1900 to present. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**DRAMA 292. Cultural and Critical Theory. 4 Units.**

Studies in selected areas of cultural and critical theory. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**DRAMA 293. Directed Studies. 4-12 Units.**

Directed study with Drama faculty.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

**DRAMA 294. Dissertation Research. 4-12 Units.**

Dissertation research with Drama faculty.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**DRAMA 295. Professional Internship. 1-12 Units.**

An arranged internship at the South Coast Repertory Theatre, or other equity theatre company, for qualifying M.F.A. students. A stipend and equity points are provided by the theatre company.

Repeatability: May be repeated for credit unlimited times.

Restriction: Drama graduate students only.

**DRAMA 297. Dramaturgy Practicum. 4 Units.**

Requires doctoral students to identify two plays from the Drama Department's season to work as dramaturges. Students write a Dramaturgy Booklet recording their research and interactions with director, actors, and the design team. Students will work with doctoral faculty.

Restriction: Graduate students only. Drama and Theatre Majors only.

**DRAMA 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

## Drama and Theatre, Ph.D.

This is a joint program offered by the UCI Department of Drama and the UCSD Department of Theatre and Dance.

This program has the largest dedicated doctoral faculty of any Drama program in the nation and one of the lowest teacher-student ratios. The program is designed to encourage students to develop a unique body of research working closely with a small group of faculty at both UCI and UCSD. This 'boutique' approach calls on each student to explore avenues of research and scholarship that will maximize opportunities for entrance into the highest levels of academia.

The program's goal is to prepare students for a successful career at either a research university or a major liberal arts institution, in a variety of possible disciplines ranging from Drama and Theatre, English, and Performance Studies, to Cultural, Gender, and Ethnic Studies. The Drama Department places a high value on collegiality and professionalism, and nurtures these qualities through cooperative work within seminars, independent studies, organized events, teaching opportunities and professional trainings.

Students with a B.A. (minimum GPA of 3.5), M.A., or M.F.A. in Drama and Theatre are eligible for admission to the doctoral program. Students with training in literature (or another area in the humanities) will also be considered, provided they can demonstrate a background in drama or theatre. Experience in one of the creative activities of theatre (acting, directing, playwriting, design, dramaturgy) enhances a student's chances of admission.

All applicants are required to take the Graduate Record Examination and to submit samples of their critical writing.

While not required for admission, a working knowledge of a second language is highly desirable (see Language Requirement).

## Course of Study

Students are required to take a minimum of 144 units, which is equivalent to four years of full-time study (full-time students must enroll for a minimum of 12 units each quarter). Forty of these units are taken in required seminars; the balance is made up of elective seminars, independent study and research projects (including preparing the three qualifying papers), and dissertation research. Students must take a minimum of one seminar per year in the UCSD Department of Theatre and Dance. The program of study makes it possible for students to take a significant number of elective courses and independent studies both with faculty in Drama and Theatre and in other departments.

## Required Courses

A. Complete:

DRAMA 290	Dramatic Literature and Theatre History Prior to 1900 (three seminars/12 units)
DRAMA 291	Dramatic Literature and Theatre History, 1900 to Present (three seminars/12 units)
DRAMA 292	Cultural and Critical Theory (four seminars/16 units)

All graduate courses may be repeated when the topic varies. Descriptions of the topics to be treated in a given academic year are published by the Department in the fall. Enrollment in each course requires the consent of the instructor. The courses are limited to registered doctoral students.

These 10 required seminars must be completed by all students, including those who have an M.A. or an M.F.A., before the end of the third year. In addition, students must pass comprehensive examinations at the end of their first and second years.

DRAMA 293 Directed Studies and DRAMA 294 Dissertation Research are also required.

## Graduate Emphasis in Dramaturgy (Elective):

This Emphasis may be taken at any time during a graduate student's doctoral work, preferably during the first 4 years of graduate study, prior to the dissertation. The Emphasis includes 3 courses:

A. Complete:

DRAMA 244	Dramaturgy: Theory and Methods
DRAMA 297	Dramaturgy Practicum
DRAMA 290 or DRAMA 291	Dramatic Literature and Theatre History Prior to 1900 Dramatic Literature and Theatre History, 1900 to Present

The emphasis also includes a research component on dramaturgy in consultation with the Instructor .

## Comprehensive Examinations

In the first year, students prepare for the Written Comprehensive Examination, which is based on a reading list of approximately 150 titles ranging from the Ancient Greeks to the present. Students take this examination at the beginning of the fall quarter of their second year. (Comprehensive examinations are scheduled at the beginning of fall quarter in order to allow students the summer to prepare.) Students who fail the Written Comprehensive may retake it no later than the first week of winter quarter of their second year. Students who fail the Written Comprehensive for a second time are dismissed from the program.

In their second year, students prepare for the Oral Comprehensive Examination. The reading list for this examination is designed to permit students to acquire a knowledge of their dissertation subject area, broadly conceived. The reading list is compiled by the student and the dissertation advisor,



in consultation with other members of the faculty, as appropriate; the reading list must be established by the end of winter quarter of the second year. Students take the Oral Comprehensive at the beginning of the fall quarter of their third year. Students also submit a dissertation prospectus (approximately five pages) when they take this examination. Students who fail the Oral Comprehensive may retake it no later than the first week of winter quarter of their third year. Students who fail the Oral Comprehensive for a second time are dismissed from the program.

### **Advancement to Candidacy: Three Qualifying Papers**

Students normally select a dissertation advisor during their second year and must do so before the end of spring quarter of that year. In consultation with the dissertation advisor and other faculty members, students develop topics for three qualifying papers, which are written during their third year. The three qualifying papers—one long (approximately 50 pages) and two short (approximately 30 pages each)—must be completed by the end of the third year; these completed papers provide the basis for the Oral Qualifying Examination. Students write the long paper under the direction of their dissertation advisor; it is understood that the long paper is preparatory to the dissertation. The short papers deal with other related topics, subject to the approval of the student's advisors; the two short papers are understood as engaging in exploring the larger contexts of the dissertation. The normative time for students to pass the Qualifying Examination and advance to candidacy is at the end of their third year; students must advance to candidacy no later than the end of fall quarter of their fourth year. Once advanced to candidacy, students write their dissertation which, upon completion, is defended in a final oral examination.

Students may select a dissertation advisor from either the UCI Department of Drama or the UCSD Department of Theatre and Dance. All UCI doctoral dissertation committees must include at least one faculty member from UCSD.

### **Language Requirement**

Students are required to complete an advanced research project using primary and secondary material in a second language (materials may include live and/or recorded performance; interviews with artists, critics, and scholars; and other non-documentary sources, as well as more conventional textual sources). This requirement may be satisfied by writing a seminar paper or a qualifying paper (see Advancement to Candidacy above) that makes extensive use of materials in a second language. The second-language requirement must be satisfied before the end of the third year. This requirement will not be waived for students who are bi- or multilingual; all students are required to do research-level work in more than one language.

It is assumed that students will have acquired a second language before entering the doctoral program, although second-language proficiency is not a requirement for admission. While students may study one or more second languages while at UCI or UCSD, language courses may not be counted toward doctoral program requirements.

### **Teaching**

Students are required to teach a minimum of four quarters, via DRAMA 399. No more than eight units of apprentice teaching may be counted toward the required 144 units.

### **Departmental Ph.D. Time-Limit Policies**

Students must advance to candidacy by the end of the fall quarter of their fourth year. Departmental normative time for completion of the degree is five years; total registered time in the Ph.D. program at UCI or UCSD cannot exceed seven years.

### **Financial Support**

Ph.D. students entering the program with a B.A. may be supported (either by teaching assignments or fellowships) for five years. Students who have an M.A. and have been given transfer credit may be supported for four years. Such support depends upon the funds available, the number of students eligible, and the student's rate of progress.

Graduates from the Department of Drama perform, stage manage, or design on Broadway, in national tours, regional and summer theatres, in films and on television. UC Irvine's Drama alumni serve as artistic directors, business managers, designers, art directors, and performers at more than 100 theatre companies, and are faculty at more than 75 institutions of higher learning.

A degree in Drama may or may not lead to professional employment in theatre or film. While some alumni may pursue careers as professional theatre artists, many may use the skills learned from their degree and embark upon careers in law, business, arts management, advertising, and teaching. Others may pursue further study at UC Irvine or other notable institutions.

## **Drama, B.A.**

The B.A. program consists of a comprehensive study of acting, directing, design, music theatre, playwriting, stage management, theatre production, and dramatic theory, criticism, literature, and history. It involves hands-on participation in productions as an actor, designer, writer, technician, or stage manager. Auditions for all productions at UCI are open to undergraduates, and some productions are open exclusively to undergraduates. The B.A. program does not require an entrance audition.

There can be few subjects as broad or as fundamental to human civilization as those of Drama and Theatre. The B.A. in Drama is part of a larger education which includes close consideration of world history and politics; human psychology and desire; music, dance, literature and art; visual and aural aesthetics, and both ancient and contemporary technologies of communication. While Drama is rightfully considered an entertainment, it is an entertainment that begins with the greatest literature ever written – from the classics of Euripides, Shakespeare and Molière to modern Americans

like Tennessee Williams, August Wilson and David Henry Hwang – as presented in the most sophisticated performance techniques from Europe, Asia, Africa, and the Americas developed over 3,000 years. And Theatre – the practice of Drama – is a hands-on collaboration that involves real-time interactions with other artists, and displaying the results to real-life audiences.

**All students must meet the University Requirements.**

**School Requirements: None.**

**Departmental Requirements for the Major in Drama**

A. Complete the following:

DRAMA 10	Introduction to Theatre
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B. Select one of the following:

DRAMA 15	Performance Now
DRAMA 20A	Culture in Performance
DRAMA 20B	Culture in Performance
DRAMA 20C	Culture in Performance

C. Complete the following:

DRAMA 30A	Acting
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D. Complete one year survey in the development of drama: <sup>1</sup>

DRAMA 40A- 40B- 40C	Development of Drama and Development of Drama and Development of Drama
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E. Select five of the following, of which at least one must be DRAMA 50C, DRAMA 50D, or DRAMA 50E: <sup>2</sup>

DRAMA 30B	Acting
DRAMA 30C	Acting
DRAMA 50A	Introduction to Costume Design
DRAMA 50B	Introduction to Scenic Design
DRAMA 50C	Introduction to Lighting Design
DRAMA 50D	Introduction to Sound Design
DRAMA 50E	Introduction to Stage Management

F. Select seven of the following:

DRAMA 80	Directing I
Upper-division Drama courses, which must include three dramatic literature courses from DRAMA 103-129, or 180 (excluding DRAMA 101, 198, and 199).	

**Theatre Production (DRAMA 101) requirements:**

Freshmen—eight units, of which four units must be completed during the first year of residency at UCI;

Transfer Students: Sophomores—six units, of which four units must be completed during the first year of residency at UCI; Juniors and Seniors—four units, which must be completed during the first year of residency at UCI.

- <sup>1</sup> Students are required to take DRAMA 40A, DRAMA 40B, DRAMA 40C in their sophomore year, after completion of the lower-division writing requirement.
- <sup>2</sup> Students entering the Department as freshman must complete the requirement of three courses chosen from DRAMA 50A, DRAMA 50B, DRAMA 50C, DRAMA 50D, DRAMA 50E by the end of their junior year. All other students must complete these courses within one year of entering the major.

## Sample Program for Freshmen

Fall	Winter	Spring
DRAMA 30A	DRAMA 30B	DRAMA 30C
DRAMA 10	DRAMA 15	DRAMA 50
DRAMA 101 (2 units)	DRAMA 101 (2 units)	General Education
WRITING 39B	WRITING 39C	General Education

## Honors in Drama Program

The Honors in Drama is a designation designed to recognize the generalist undergraduate Drama student, one who has chosen to focus on breadth in their education, as opposed to depth in one area. Such students are often ineligible to be considered for Honors in a specific area (Acting, Design, etc.), and the Honors in Drama designation is a recognition of the high quality of scholarship and work that the student has accomplished within the Department.

Eligibility requirements include: 1) at least one year in good standing as a Drama major; 2) anticipated graduation date within one year of application; 3) not currently receiving any other honors through the Drama Department; 4) completion of at least three upper-division courses, spanning at least three areas (acting, directing, design, stage management, music direction, dramaturgy, or literature/theory/criticism); 5) minimum overall GPA of at least 3.2, with a minimum GPA of 3.4 in all UCI Drama courses; 6) completed participation in at least five UCI Drama mainstage, director class projects, or faculty mentored productions as cast, designer, stage manager, dramaturg, crew chief, assistant director, assistant designer, or assistant stage manager (DRAMA 100, DRAMA 198, or DRAMA 199); 7) completion of four DRAMA 101 units.

Admission to the Honors in Drama program is competitive; only truly exceptional students (no more than 10 to 20 percent of those eligible) will be admitted to the program. To apply, a student must have a faculty recommender. Students may apply directly to the program, or faculty members may submit nominations. Completed applications and a resume, CV, dossier, or portfolio are due on the first day of spring quarter. After reviewing the application and resume, etc., faculty will vote on admissions to the honors program. A simple majority is required to make the award. In the event of a tie, the Drama Chair casts the deciding vote.

Criteria for admission include a demonstrated commitment and contributions to UCI Drama productions and scholarship that spans multiple areas of the Department, including acting, directing, design, stage management, music direction, dramaturgy, literature/theory/criticism, producing, technical production, and/or playwrighting. Students should have also demonstrated commitment and contributions to UCI Drama's culture, including issues of leadership, diversity and mentorship.

## Honors in Acting Program

Admission to the Honors in Acting Program requires both eligibility and a special audition. The eligibility requirements for sophomore-level transfer students and native UCI students are (1) at least one year in good standing as a UCI Drama major; (2) completion of DRAMA 130 or DRAMA 136 and at least one section of either DRAMA 135 or DRAMA 142, all at UCI; (3) honors students must possess and maintain an overall GPA of at least 3.2, with a GPA of 3.4 or higher in all acting courses; (4) performance in at least three official UCI Drama productions; (5) completion of six units of DRAMA 101 (Production/Crew); and (6) completion of the eligibility form.

The eligibility requirements for junior-level transfer students are (1) one year in good standing as a UCI Drama major; (2) completion of DRAMA 130 or DRAMA 136 at UCI; (3) honors students must possess and maintain an overall GPA of at least 3.2, with a GPA of 3.4 or higher in all acting courses; (4) completed performance in at least one official UCI Drama production; (5) completion of four units of DRAMA 101; and (6) completion of eligibility form.

A student's audition will determine final admission to the Honors in Acting program. Only truly exceptional students, no more than 10 to 20 percent of those eligible, will be admitted. The Honors auditions, for eligible candidates only, are held at the end of fall quarter and by special arrangement. Auditions will consist of a standard presentation: one classical and one modern monologue, totaling no more than three minutes.

Honors in Acting Program students receive (1) the "Honors in Acting" notation on their official transcript at graduation; and (2) nomination and recommendation for national University/Resident Theatre Association (U/RTA) auditions. Honors in Acting students may also be eligible to join M.F.A. Acting students in on-campus auditions for professional theatres and attend M.F.A. Actors' "Dynamics" classes.

## Honors in Design/Technology Program

The Honors in Design/Technology Program provides the opportunity for Drama majors to concentrate on the study and practice of scenery, costume, lighting, sound design, or technology. Honors in Design/Technology students study basic and advanced design and production techniques, participate in classes with graduate design students, and may serve as an assistant to a graduate student or faculty designer, or design a production at UCI.

Eligibility requirements are (1) at least one year in good standing at UCI as a Drama major; (2) completion of DRAMA 50A, DRAMA 50B, DRAMA 50C, DRAMA 50D for Scenic or Costume designers; or completion of DRAMA 50C, DRAMA 50D and two of DRAMA 50A or DRAMA 50B for Sound or Lighting designers (3) completion of at least two courses selected from DRAMA 50E, upper-division studio courses (DRAMA 150–162, 167–169, 171, or 179), or graduate-level design courses, including at least one from the design area in which the student is applying for honors; (4) possess and maintain an overall GPA of at least 3.2, with a GPA of 3.4 or higher in all design and production technique courses; (5) completion of four out of eight units of DRAMA 101 (Theatre Production); and (6) completion of the eligibility form.

Admission to the Honors in Design/Technology Program is competitive. Students may be admitted as early as the winter quarter of their sophomore year. Upon completion of eligibility requirements, the student will schedule an informal portfolio review with a member of the design faculty appropriate to the student's specialty area(s).

Only truly exceptional students will be admitted to Honors in Design/Technology as determined by the Design faculty.

If the faculty mentor determines that the student is a good candidate for the Honors in Design/Technology Program, the mentor will present the student's portfolio to the Design Faculty. The Design Faculty, led by the Head of Design, will then decide if the student shall be admitted to the Honors in Design Program.

Honors in Design/Technology students receive (1) the "Honors in Design/Technology" notation on their official transcript at graduation; (2) an assistant designer assignment with a graduate student or faculty designer; (3) special consideration to design a budgeted and technically supported production; and (4) Honors in Design students may also receive nomination and recommendation for national University/Resident Theatre Association (U/RTA) interviews.

Honors in Design/Technology students are expected to maintain a high level of performance and commitment to their work and the Drama Department. Honors students meet with their faculty mentor at the beginning of every quarter to evaluate their progress and check that all grade, course, and production requirements are being satisfied.

Once admitted into the Honors in Design/Technology Program, students are expected to:

1. Maintain an overall GPA of at least 3.2, with a GPA of at least 3.4 in all design and production technique courses.
2. Remain in good standing as a Drama major.
3. Satisfy any provisional conditions for acceptance into the Honors in Design/Technology program.
4. Complete production assignments as assigned by the faculty mentor.
5. Continue to take at least two courses (as enumerated in the eligibility section) or independent studies per year, at least half of which must come from the area of design in which the student is applying for honors.
6. Complete any safety and auxiliary training commensurate with M.F.A. students in a particular discipline.
7. Maintain the Drama Department's CORE values (<http://drama.arts.uci.edu/graduate-programs/directing/mfa-directing/>).

Should a student, having been previously admitted to the Honors in Design Program, fail to meet expectations, the Design Faculty will meet to evaluate the situation; the student may lose their Honors in Design status and have to re-apply to the Program.

For more information contact the Head of Design in Drama or Area Head of design discipline.

## Honors in Directing Program

The Honors in Directing Program provides the opportunity for Drama majors to concentrate on the study and practice of stage direction. Honors in Directing students study basic and advanced directing techniques, participate in the directing studio classes with graduate Directing students, and direct two full plays in the Director Class Projects series. Honors students also have the opportunity to receive credit as the assistant director to a Drama Department main season show, or as a production internship with a professional theatre company.

Admission to the Honors in Directing Program is competitive. Candidates must first complete DRAMA 184 (Directing) and receive instructor approval to enroll in DRAMA 185 (Advanced Directing). Candidates must apply, as a director, for DRAMA 198 (Director Class Project) by submitting a proposal to direct a play in the Director Class Project. If the proposal is accepted, the candidate must declare to the Head of Directing that the production is to be counted as an audition for admission to the Honors in Directing Program. A committee of three Drama faculty members, including the Head of Directing, will then see and evaluate the production for clarity of interpretation, unity of style, strength of acting, and ensemble performance, and will examine the candidate's self-evaluation and the evaluations of the director by members of the cast. The Head of Directing will inform the candidate of the committee's decision as to whether or not the candidate is admitted to the Honors Program.

Undergraduate Drama majors can be admitted into the program as early as the winter quarter of their freshman year but no later than the spring quarter of their junior year. Students may be admitted to the program retroactively if all the requirements for Directing Honors have been met by their final year, but only if a faculty committee of three has seen their workshops and agrees to admit the candidate.

To achieve the Honors in Directing distinction, students must fulfill all the courses required of the regular Drama major, with an overall GPA of 3.2 or higher. In addition, students must complete the following courses with a GPA of 3.4 or higher:

1. DRAMA 184 (Directing).
2. Two courses in DRAMA 185 (Advanced Directing). In this course, undergraduate Directing students present work in the Directing Laboratory along with graduate Directing students.
3. Two Director Class projects, one of which must be taken as DRAMA 198 (Director Class Project) with the candidate serving as director. The candidate must stage a second Director Class Project as DRAMA H198 (Honors Director Class Project), for which a letter grade is earned.
4. Four additional units to be satisfied by any of the following: DRAMA 199 (as a summer internship, approved by the Head of Directing, with the candidate serving a professional theatre company as director, assistant director, or production assistant); DRAMA 199 (as a production/directing project for Playwright's Workshop); DRAMA 100 (as assistant director to a faculty director); or DRAMA 199 (as assistant director to a graduate director's thesis production).

Honors candidates meet with the Head of Directing at the beginning of every quarter to evaluate their progress and to check that all grade and course requirements are being satisfied. Successful graduating seniors will receive the "Honors in Directing" notation on their official transcript and will receive a nomination and recommendation for national University/Resident Theatre Association (U/RTA) interviews.

NOTE: All of the above courses are open to all students even though they may not qualify for the Honors Program.

## Honors in Dramatic Literature, History, and Theory Program

The Honors in Dramatic Literature, History, and Theory Program is designed to challenge superior students beyond the scholarly requirements of the Drama major. It provides them with the opportunity to advance their knowledge of dramatic literature, history, and theory and to further develop their writing, analytical, and research skills. An additional purpose of the program is to better prepare students for graduate study in not only dramatic literature, history, and theory, but in all fields in the humanities and social sciences, as well as in law.

Eligibility requirements are (1) completion of DRAMA 40A, DRAMA 40B, DRAMA 40C and two courses selected from DRAMA 103–129 (for upper-division writing credit), or equivalents to these courses from other institutions; (2) possess and maintain an overall GPA of at least 3.2, with a GPA of 3.4 or higher in all dramatic literature, history, and theory courses; and (3) completion of the eligibility form.

Admission to the Honors in Dramatic Literature, History, and Theory Program is competitive. Students must apply to the program prior to the spring quarter of their junior year. Upon completion of eligibility requirements, applicants must submit at least two critical essays, most likely written previously for courses, totaling no more than 30 pages. These essays will be used by the Honors Committee (comprised of the Head of Dramatic Literature, History, and Theory and two additional members of the Drama faculty) to determine admission. Only truly exceptional students (no more than 10 to 20 percent of those eligible) will be admitted.

Beyond fulfilling the regular requirements of the Drama major, honors students must take three additional upper-division courses in dramatic literature, history, and/or theory, one of which must be focused on theory. Upper-division courses in other departments may be used to fulfill these requirements, as long as the Honors Committee approves them.

Honors students must also write an honors thesis, a 30–40 page research paper written under the supervision of a faculty member on a topic chosen by the student. In consultation with the student, the adviser for this project is selected before the end of the fall quarter of the student's senior year. Students develop their projects until the spring quarter when they enter the writing phase. It is only during the spring quarter that students achieve full course credit for their work on the thesis, in the form of an independent study course with their advisor. This independent study is the final course of the program.

Successful graduating seniors will receive the "Honors in Dramatic Literature, History, and Theory" notation on their official transcript.

## Honors in Music Theatre

Successful graduating seniors in both the B.A. in Drama and the B.F.A. in Music Theatre can achieve Honors in Music Theatre. An overall GPA of 3.2 or higher is required along with an overall GPA of 3.4 in all music theatre courses. B.F.A. students need to complete all course work listed under "Departmental Requirements for the B.F.A. Major" while B.A. students need to complete the following additional music theatre courses:

A. Complete the following:

DRAMA 142	Music Theatre Workshop II
DRAMA 143A- 143B- 143C	Music Theatre Workshop III and Music Theatre Workshop III and Music Theatre Workshop III
DRAMA 145	Music Theatre Singing (taken three times)
DRAMA 146	NYSP-Preparation
DRAMA 148A- 148B- 148C	History of American Musical Theatre and History of American Musical Theatre and History of American Musical Theatre
DRAMA 149	Music Proficiency for Actors
DRAMA 176	Script and Score
DRAMA 190	NYSP-Acting
DRAMA 191	NYSP - Dance
DRAMA 192	NYSP - Singing
DRAMA 193	NYSP - Performance
DRAMA 194	NYSP-UCI Residency
Two ballet classes in Dance.	
One tap class in Dance.	
One jazz class in Dance.	

B. Select one of the following in any combination:

DRAMA 182A- 182B	Dance Technique, Level I and Dance Technique, Level I
DRAMA 183A- 183B	Dance Technique, Level II and Dance Technique, Level II

At graduation, successful Honors students receive the "Honors in Music Theatre" notation on their transcripts.

## Honors in Stage Management Program

The Honors in Stage Management Program provides the opportunity for Drama majors to concentrate on the study and practice of stage management. Honors students study basic and advanced stage management techniques, participate in classes with graduate stage managers, work as assistant

stage managers with the graduate stage managers on graduate student-directed and faculty-directed productions, and stage manage a graduate student-directed or faculty-directed production at UCI.

Eligibility requirements are (1) minimum one year in good standing at UCI as a Drama major; (2) completion of three of the following: DRAMA 50A, DRAMA 50B, DRAMA 50C, DRAMA 50D or equivalent courses; (3) completion of DRAMA 50E; (4) possess and maintain an overall GPA of at least 3.2, with a GPA of 3.4 or higher in all stage management and production courses; (5) completion of eight units of Drama 101 (Theatre Production); and (6) completion of the eligibility form.

Admission to the Honors in Stage Management Program is competitive. Students may be admitted as early as the winter quarter of their sophomore year but no later than the spring quarter of their junior year. Only truly exceptional students (no more than 10 to 20 percent of those eligible) will be admitted to the program as determined by the Honors Committee. Upon completion of eligibility requirements, the student will submit to the Honors Committee: (1) two prompt books; (2) a resume including all stage management and production experience; (3) letters of reference from two directors with whom the student has worked; and (4) a written paper on the subject of stage management.

Students receive the "Honors in Stage Management" notation on their final transcript; nomination and recommendation for national University/Resident Theatre Association (U/RTA) interviews; assistant stage manager assignments working with graduate stage managers; and a stage management assignment on a graduate student-directed or faculty-directed production.

Honors candidates meet with the Head of Stage Management at the beginning of every quarter to evaluate their progress.

Graduates from the Department of Drama perform, stage manage, or design on Broadway, in national tours, regional and summer theatres, in films and on television. UC Irvine's Drama alumni serve as artistic directors, business managers, designers, art directors, and performers at more than 100 theatre companies, and are faculty at more than 75 institutions of higher learning.

A degree in Drama may or may not lead to professional employment in theatre or film. While some alumni may pursue careers as professional theatre artists, many may use the skills learned from their degree and embark upon careers in law, business, arts management, advertising, and teaching. Others may pursue further study at UC Irvine or other notable institutions.

## **Drama, M.F.A.**

The Department of Drama offers an M.F.A. in Drama, with emphases in Acting, Directing, Design, Music Direction, or Stage Management.

The Acting faculty is devoted to the development of working professional actors who possess the skills, insight, intelligence, creativity, and vision to create the theatre of the future. UCI has proven itself notably successful in training working professionals with alumni who perform on stages around the country, on and off Broadway, in regional theatres, or in feature films and television series. Many graduates of the program hold faculty positions in university theatre.

The Directing program is dedicated to the idea that theatre should challenge and expand the mind, move the soul, and delight the spirit. The Directing program is a three-year course of study. The program's first year focuses on directing realistic "character driven" work, along with script analysis and collaboration skills. In the second year, the student director focuses on "language driven" plays, the components of production, and communication in collaboration. The third year centers on original and devised work as well as self-produced projects. Each student is expected to direct every quarter – in the classroom, with student directed projects, and/or in production. In addition, each student will be engaged in full-length plays in the second year. During their course of study, each student will receive, at a minimum, one fully produced show in the main season. One of these will be the student's thesis production in their third year.

The Design program provides a challenging and creative environment for the curious and resourceful design student. Students in this program will be exceptionally well-suited to a career in the theatre and related entertainment arts. Incoming students specialize in a specific discipline: sound design, lighting design, costume design, or scenic design. Study of that specific discipline is at the heart of the student's education. Students will also develop a solid working knowledge of the basic principles and procedures of the other disciplines in order to foster more productive collaboration. In addition, the design curriculum includes the study of theatre history, art history, and dramatic literature. Instruction is focused on the growth of each student's individual design abilities. Students will work in a shared studio space, creating an atmosphere of constructive critique and support. Beyond the regular course load, additional learning opportunities can occur during weekly round tables, design tutorials, masterclasses, and post-performance critiques. The Design program provides professional training that respects our theatrical heritage and the traditional skills of a designer. In addition, a strong emphasis is placed on new technologies and how they affect and enhance contemporary design practices. Training on high-end computers and equipment using the latest software is required in all design disciplines, preparing students for a seamless transition to the professional world.

The Music Direction program prepares artists for a professional life in the theatre as musical directors. Students work with faculty members and other professionals in the Musical Theatre field, receiving instruction and mentoring in conducting, vocal coaching for the actor, musical preparation, script and score analysis, composing and arranging music for the stage, sound design, and singing pedagogy. Students also gain valuable first-hand experience through internships. The program is designed to help students refine/ improve their knowledge base and experience in vocal coaching, conducting, musical preparation of singers, rehearsal techniques, composing, arranging, and producing. Applicants are required to have excellent keyboard skills (including sight-reading, transposition), basic orchestra score-reading and conducting skills, and an understanding and appreciation of musical theatre as a genre. Students have the opportunity to work on musical productions each quarter while being closely mentored by the department's Musical Theatre and associated faculty.



The Stage Management program is dedicated to the professional training of advanced students interested in developing their skills, knowledge, and abilities in stage management. Graduate stage managers work with directors, choreographers, musical directors, and designers in various genres including drama, musical theatre, dance, opera, concerts and special events. Through the course of the program, production assignments grow in complexity. Each graduate student will stage manage or assistant stage manage seven productions. The faculty provides training not only in the area of stage management but also in dramatic literature, the development of theatre, concepts and collaboration, and script analysis which helps stage managers understand how to communicate effectively with all members of the production team on a professional level. In addition, instruction supplemented with visiting professionals from all areas of the live entertainment industry, television, and film.

Applicants for admission to the degree program must meet the general requirements for admission to graduate study and hold a B.A., B.F.A., or higher degree.

Applicants must submit dossiers of biographical information and theatrical experience, together with photographs, essays, reviews, production books, and portfolios, as appropriate.

An audition is typically required for all applicants who intend to enter the Acting program. UCI coordinates its auditions with the University/Resident Theatre Association (U/RTA), and conducts auditions, both for U/RTA finalists and UCI applicants, in New York, Chicago, Los Angeles, and Irvine during January and February. Other U/RTA audition sites may be considered. Interviews for applicants in Directing, in Design, in Music Direction, and in Stage Management are also required.

Normally three years of residence is required. Each candidate must enroll for three courses each quarter for nine quarters, exclusive of summer sessions.

The normative time to degree for students in the M.F.A. program is three years. Residence is required. The maximum time to degree can be extended to four years only through petition to the Head of the Program for extenuating circumstances. Students who do not complete the degree in four years will be recommended for academic disqualification.

During the first year of residence each candidate will prepare, for credit, two graduate projects, in acting, directing, design, music direction, stage management, theatrical research, or a combination of two of these. Satisfactory completion of these projects, as determined by the faculty, is prerequisite to entering the second year of the program.

The required thesis normally consists of directing, designing, musically directing, stage managing, or playing a principal role in a major production, and collecting in essay form the evidences of research, analysis, and judgments which formed a part of the production experience.

Each graduate student is expected to participate in productions throughout residence at UCI.

Specific course requirements must be satisfied in one of the following five areas:

### Acting Requirements

A. Select nine graduate studios in acting:

DRAMA 200	Graduate Studio: Acting
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B. Students must enroll in each of the following studios every quarter for a total of nine quarters:

DRAMA 201	Graduate Studio: Voice
DRAMA 202	Graduate Studio: Speech
DRAMA 203	Graduate Studio: Movement
DRAMA 206	Graduate Studio: Voice/Movement Dynamics

C. Select three master classes in acting from various topics offered in DRAMA 219.

D. Complete the following:

DRAMA 251A	Foundations of Theatre
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E. Select one seminar in dramatic literature, performance theory, criticism, history of theatre, or contemporary theatre from the following:

DRAMA 220–225
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F. Select six graduate projects, of which two may be the following professional internships:

DRAMA 240	Graduate Projects
or DRAMA 295	Professional Internship

A total of 110 quarter units in graduate or approved upper-division undergraduate courses must be completed with a grade of at least B in each course.

### Design Requirements

A. Select seven graduate studios in design seminars:

DRAMA 255	Graduate Design Seminar
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B. Select six courses in graduate projects (one of which may be a professional internship: DRAMA 295):

DRAMA 240	Graduate Projects
C. Select two elective courses from courses numbered 100 and above.	
D. Select four courses in dramatic literature, performance theory, criticism, or history of theater from the following:	
DRAMA 220	Seminar in Dramatic Literature
DRAMA 221	
DRAMA 248A- 248B- 248C	History of American Music Theatre and History of American Musical Theatre and History of American Musical Theatre
DRAMA 164A	History of Costume
DRAMA 164B	History of Costume
or other substitutions as approved by mentor.	
E. Select three courses in design techniques from the following:	
DRAMA 258–282	
F. Complete three foundation courses taken during the first year of study:	
DRAMA 251A- 251B- 251C	Foundations of Theatre and Foundations of Theatre and Foundations of Theatre
G. Select eight Colloquium courses:	
DRAMA 259	Theatre Colloquium
H. Complete the following:	
DRAMA 256	Survival and Professional Practice in Design

A total of 112 quarter units in graduate or approved upper-division undergraduate courses must be completed with a grade of at least B in each course.

### Directing Requirements

A. Select nine graduate studios in directing:	
DRAMA 211	Graduate Studio: Directing (one of which is the creation of a thesis portfolio and resume)
B. Complete two courses in Foundations:	
DRAMA 251A- 251C	Foundations of Theatre and Foundations of Theatre
C. Select one course in Multiculturalism:	
DRAMA 220	Seminar in Dramatic Literature
D. Select two courses as professional internships:	
DRAMA 295	Professional Internship
E. Select two courses in acting:	
DRAMA 200	Graduate Studio: Acting (may include movement, voice classes approved by the Head of Directing)
F. Select two seminars in dramatic literature, performance theory, criticism, theatre history (approved by the Head of Directing)	
DRAMA 199	Project in Theatre
DRAMA 221	
DRAMA 248A- 248B- 248C	History of American Music Theatre and History of American Musical Theatre and History of American Musical Theatre
G. Select six projects:	
DRAMA 240	Graduate Projects (of which one is the thesis and one is an off-site production)
H. Select two design or stage management courses (approved by the Head of Directing)	
DRAMA 157	Lighting Composition
DRAMA 159	Proseminar in Theatre Design
DRAMA 199	Project in Theatre
DRAMA 254	Graduate Stage Management
DRAMA 255	Graduate Design Seminar
I. And a minimum of three electives.	



A total of 116 quarter units in graduate or approved upper-division undergraduate courses must be completed with a grade of at least B in each course.

### Music Direction Requirements

A. Select three projects in theatre:

DRAMA 199	Project in Theatre
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B. Complete three courses in singing:

DRAMA 241	Singing Pedagogy
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C. Complete nine courses in conducting:

DRAMA 242	Conducting
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D. Complete one course in form and analysis:

DRAMA 243	Script and Score
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E. Complete three courses in scene study:

DRAMA 246A	Musical Scene Study I
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DRAMA 246B	Musical Scene Study II
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DRAMA 246C	Musical Scene Study III
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F. Complete three quarters in abbreviated musicals:

DRAMA 247	Musicals Abridged
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G. Complete three courses in American Musical Theatre History:

DRAMA 248A	History of American Music Theatre
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DRAMA 248B	History of American Musical Theatre
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DRAMA 248C	History of American Musical Theatre
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H. Complete nine quarters in musical direction projects:

DRAMA 249	Graduate Music Direction
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I. Complete two courses in foundations of theatre:

DRAMA 251A	Foundations of Theatre
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DRAMA 251C	Foundations of Theatre
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J. Complete one course in orchestration:

MUSIC 136	Instrumentation
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K. Complete one elective

A total of 128 quarter units in graduate or approved upper-division undergraduate courses must be completed with a grade of at least B in each course.

### Stage Management Requirements

A. Select seven graduate studios in stage management:

DRAMA 254	Graduate Stage Management
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B. Complete one thesis project course:

DRAMA 257E	Thesis Writing Project-Stage Management
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C. Select seven courses in graduate projects:

DRAMA 240	Graduate Projects
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D. Complete one professional internship course:

DRAMA 295	Professional Internship
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E. Select three electives as approved by the faculty advisor from the following:

graduate-level (DRAMA 200+)
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upper-division (DRAMA 100–199)
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F. Complete three courses in foundations in theatre:

DRAMA 251A- 251B- 251C	Foundations of Theatre and Foundations of Theatre and Foundations of Theatre
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G. Select two courses in production techniques from the following:

DRAMA 150–159, 162–164, 167–168, 170–171, 260A, B–262, 265–266
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H. Select one course in dramatic literature, criticism, contemporary theatre, or history of music theatre from the following:

DRAMA 220	Seminar in Dramatic Literature
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DRAMA 221
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## DRAMA 248A- 248B- 248C

History of American Music Theatre  
and History of American Musical Theatre  
and History of American Musical Theatre

A total of 112 quarter units in graduate or approved upper-division undergraduate courses must be completed with a grade of at least B in each course.

Graduates from the Department of Drama perform, stage manage, or design on Broadway, in national tours, regional and summer theatres, in films and on television. UC Irvine's Drama alumni serve as artistic directors, business managers, designers, art directors, and performers at more than 100 theatre companies, and are faculty at more than 75 institutions of higher learning.

A degree in Drama may or may not lead to professional employment in theatre or film. While some alumni may pursue careers as professional theatre artists, many may use the skills learned from their degree and embark upon careers in law, business, arts management, advertising, and teaching. Others may pursue further study at UC Irvine or other notable institutions.

## Drama, Minor

The Drama minor provides opportunities for students to engage in research and creative work throughout the Drama department. The program is open to all undergraduate students. Coursework includes history, theory, culture, and practice topics. Students will also participate in drama productions of both large and small scales.

The minor provides the flexibility to allow students to explore areas of particular interest to them, including performance, design, scholarship, stage management, directing, and more.

The minor in Drama consists of eight courses (32 units) as specified below:

A. Complete the following:

DRAMA 10	Introduction to Theatre
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B. Select one of the following:

DRAMA 15	Performance Now
DRAMA 20A	Culture in Performance
DRAMA 20B	Culture in Performance
DRAMA 20C	Culture in Performance

C. Select one of the following:

DRAMA 30A	Acting
DRAMA 65	Music Theatre Workshop I
DRAMA 142	Music Theatre Workshop II
DRAMA 146	NYSP-Preparation
DRAMA 50A	Introduction to Costume Design
DRAMA 50B	Introduction to Scenic Design
DRAMA 50C	Introduction to Lighting Design
DRAMA 50D	Introduction to Sound Design
DRAMA 50E	Introduction to Stage Management

D. Select one of the following:

DRAMA 40A	Development of Drama
DRAMA 40B	Development of Drama
DRAMA 40C	Development of Drama

E. Complete four units of DRAMA 101, selected from the following: <sup>1</sup>

DRAMA 101A	Theatre Production: Costume
DRAMA 101B	Theatre Production: Scenic
DRAMA 101C	Theatre Production: Lighting
DRAMA 101D	Theatre Production: Stage Management
DRAMA 101E	Theatre Production: Audio

F. Select one of the following:

DRAMA 100	University Theatre
DRAMA 198	Director Class Project

# DRAMA 199

## Project in Theatre

G. Select two Drama electives, one of which must be upper division (100-199)

<sup>1</sup> DRAMA 101 units may not overlap with any other major or minor requirements.

Students may elect to take a maximum of two courses in the minor Pass/Not Pass. Students in the Music Theatre and Drama majors may not declare a minor in Drama.

## Music Theatre, B.F.A.

The B.F.A. in Music Theatre includes high-level training curriculum including song repertoire building, audition technique, dance technique and repertoire, singing for the stage, and study in the history of the American musical. Each quarter, those students that have completed one quarter of Music Theatre Workshop, Level III (DRAMA 143A , DRAMA 143B , or DRAMA 143C ) can audition for entry into the B.F.A. track.

A. Complete the following:

DRAMA 10	Introduction to Theatre
DRAMA 30A- 30B- 30C	Acting and Acting and Acting
DRAMA 40A- 40B- 40C	Development of Drama and Development of Drama and Development of Drama

B. Select one of the following:

DRAMA 15	Performance Now
DRAMA 20A	Culture in Performance
DRAMA 20B	Culture in Performance
DRAMA 20C	Culture in Performance

C. Select one of the following design courses:

DRAMA 50A	Introduction to Costume Design
DRAMA 50B	Introduction to Scenic Design
DRAMA 50C	Introduction to Lighting Design
DRAMA 50D	Introduction to Sound Design
DRAMA 50E	Introduction to Stage Management

D. Complete:

DRAMA 100	University Theatre
DRAMA 136	Music Theatre Acting
DRAMA 142	Music Theatre Workshop II
DRAMA 143A- 143B- 143C	Music Theatre Workshop III and Music Theatre Workshop III and Music Theatre Workshop III
DRAMA 144	Music Theatre Workshop IV
DRAMA 145	Music Theatre Singing (taken three times)
DRAMA 146	NYSP-Preparation
DRAMA 148A- 148B- 148C	History of American Musical Theatre and History of American Musical Theatre and History of American Musical Theatre
DRAMA 149	Music Proficiency for Actors
DRAMA 176	Script and Score
DRAMA 177	Song Repertoire

E. Complete:

DRAMA 182A- 182B	Dance Technique, Level I and Dance Technique, Level I
or	
DRAMA 183A- 183B	Dance Technique, Level II and Dance Technique, Level II

F. Select one Dramatic Literature course from DRAMA 103-129 or 180.

**Theatre Production (DRAMA 101) requirements:**

Freshmen—eight units, of which four units must be completed during the first year of residency at UCI.

Transfer Students: Sophomores—six units, of which four units must be completed during the first year of residency at UCI; Juniors and Seniors—four units, which must be completed during the first year of residency at UCI.

Plus each of the following courses when in residence in the New York Satellite Program:

DRAMA 190	NYSP-Acting
DRAMA 191	NYSP - Dance
DRAMA 192	NYSP - Singing
DRAMA 193	NYSP - Performance
DRAMA 194	NYSP-UCI Residency

Also complete two ballet classes, one tap class, and one jazz class in Dance.

**Application Process to Declare the Major**

Drama majors may audition for the program upon acceptance into the Music Theatre Workshop, Level III (DRAMA 143A, DRAMA 143B, or DRAMA 143C). B.F.A. auditions are held three times per year: during Welcome Week and finals week of the fall and winter quarters. A grade point average of 3.0 in music theatre courses completed prior to the B.F.A. audition is required.

**Honors in Drama Program**

The Honors in Drama is a designation designed to recognize the generalist undergraduate Drama student, one who has chosen to focus on breadth in their education, as opposed to depth in one area. Such students are often ineligible to be considered for Honors in a specific area (Acting, Design, etc.), and the Honors in Drama designation is a recognition of the high quality of scholarship and work that the student has accomplished within the Department.

Eligibility requirements include: 1) at least one year in good standing as a Drama major; 2) anticipated graduation date within one year of application; 3) not currently receiving any other honors through the Drama Department; 4) completion of at least three upper-division courses, spanning at least three areas (acting, directing, design, stage management, music direction, dramaturgy, or literature/theory/criticism); 5) minimum overall GPA of at least 3.2, with a minimum GPA of 3.4 in all UCI Drama courses; 6) completed participation in at least five UCI Drama mainstage, director class projects, or faculty mentored productions as cast, designer, stage manager, dramaturg, crew chief, assistant director, assistant designer, or assistant stage manager (DRAMA 100, DRAMA 198, or DRAMA 199); 7) completion of four DRAMA 101 units.

Admission to the Honors in Drama program is competitive; only truly exceptional students (no more than 10 to 20 percent of those eligible) will be admitted to the program. To apply, a student must have a faculty recommender. Students may apply directly to the program, or faculty members may submit nominations. Completed applications and a resume, CV, dossier, or portfolio are due on the first day of spring quarter. After reviewing the application and resume, etc., faculty will vote on admissions to the honors program. A simple majority is required to make the award. In the event of a tie, the Drama Chair casts the deciding vote.

Criteria for admission include a demonstrated commitment and contributions to UCI Drama productions and scholarship that spans multiple areas of the Department, including acting, directing, design, stage management, music direction, dramaturgy, literature/theory/criticism, producing, technical production, and/or playwrighting. Students should have also demonstrated commitment and contributions to UCI Drama's culture, including issues of leadership, diversity and mentorship.

**Honors in Acting Program**

Admission to the Honors in Acting Program requires both eligibility and a special audition. The eligibility requirements for sophomore-level transfer students and native UCI students are (1) at least one year in good standing as a UCI Drama major; (2) completion of DRAMA 130 or DRAMA 136 and at least one section of either DRAMA 135 or DRAMA 142, all at UCI; (3) honors students must possess and maintain an overall GPA of at least 3.2, with a GPA of 3.4 or higher in all acting courses; (4) performance in at least three official UCI Drama productions; (5) completion of six units of DRAMA 101 (Production/Crew); and (6) completion of the eligibility form.

The eligibility requirements for junior-level transfer students are (1) one year in good standing as a UCI Drama major; (2) completion of DRAMA 130 or DRAMA 136 at UCI; (3) honors students must possess and maintain an overall GPA of at least 3.2, with a GPA of 3.4 or higher in all acting courses; (4) completed performance in at least one official UCI Drama production; (5) completion of four units of DRAMA 101; and (6) completion of eligibility form.

A student's audition will determine final admission to the Honors in Acting program. Only truly exceptional students, no more than 10 to 20 percent of those eligible, will be admitted. The Honors auditions, for eligible candidates only, are held at the end of fall quarter and by special arrangement. Auditions will consist of a standard presentation: one classical and one modern monologue, totaling no more than three minutes.

Honors in Acting Program students receive (1) the "Honors in Acting" notation on their official transcript at graduation; and (2) nomination and recommendation for national University/Resident Theatre Association (U/RTA) auditions. Honors in Acting students may also be eligible to join M.F.A. Acting students in on-campus auditions for professional theatres and attend M.F.A. Actors' "Dynamics" classes.

## Honors in Design/Technology Program

The Honors in Design/Technology Program provides the opportunity for Drama majors to concentrate on the study and practice of scenery, costume, lighting, sound design, or technology. Honors in Design/Technology students study basic and advanced design and production techniques, participate in classes with graduate design students, and may serve as an assistant to a graduate student or faculty designer, or design a production at UCI.

Eligibility requirements are (1) at least one year in good standing at UCI as a Drama major; (2) completion of DRAMA 50A, DRAMA 50B, DRAMA 50C, DRAMA 50D for Scenic or Costume designers; or completion of DRAMA 50C, DRAMA 50D and two of DRAMA 50A or DRAMA 50B for Sound or Lighting designers (3) completion of at least two courses selected from DRAMA 50E, upper-division studio courses (DRAMA 150–162, 167–169, 171, or 179), or graduate-level design courses, including at least one from the design area in which the student is applying for honors; (4) possess and maintain an overall GPA of at least 3.2, with a GPA of 3.4 or higher in all design and production technique courses; (5) completion of four out of eight units of DRAMA 101 (Theatre Production); and (6) completion of the eligibility form.

Admission to the Honors in Design/Technology Program is competitive. Students may be admitted as early as the winter quarter of their sophomore year. Upon completion of eligibility requirements, the student will schedule an informal portfolio review with a member of the design faculty appropriate to the student's specialty area(s).

Only truly exceptional students will be admitted to Honors in Design/Technology as determined by the Design faculty.

If the faculty mentor determines that the student is a good candidate for the Honors in Design/Technology Program, the mentor will present the student's portfolio to the Design Faculty. The Design Faculty, led by the Head of Design, will then decide if the student shall be admitted to the Honors in Design Program.

Honors in Design/Technology students receive (1) the "Honors in Design/Technology" notation on their official transcript at graduation; (2) an assistant designer assignment with a graduate student or faculty designer; (3) special consideration to design a budgeted and technically supported production; and (4) Honors in Design students may also receive nomination and recommendation for national University/Resident Theatre Association (U/RTA) interviews.

Honors in Design/Technology students are expected to maintain a high level of performance and commitment to their work and the Drama Department. Honors students meet with their faculty mentor at the beginning of every quarter to evaluate their progress and check that all grade, course, and production requirements are being satisfied.

Once admitted into the Honors in Design/Technology Program, students are expected to:

1. Maintain an overall GPA of at least 3.2, with a GPA of at least 3.4 in all design and production technique courses.
2. Remain in good standing as a Drama major.
3. Satisfy any provisional conditions for acceptance into the Honors in Design/Technology program.
4. Complete production assignments as assigned by the faculty mentor.
5. Continue to take at least two courses (as enumerated in the eligibility section) or independent studies per year, at least half of which must come from the area of design in which the student is applying for honors.
6. Complete any safety and auxiliary training commensurate with M.F.A. students in a particular discipline.
7. Maintain the Drama Department's CORE values (<http://drama.arts.uci.edu/graduate-programs/directing/mfa-directing/>).

Should a student, having been previously admitted to the Honors in Design Program, fail to meet expectations, the Design Faculty will meet to evaluate the situation; the student may lose their Honors in Design status and have to re-apply to the Program.

For more information contact the Head of Design in Drama or Area Head of design discipline.

## Honors in Directing Program

The Honors in Directing Program provides the opportunity for Drama majors to concentrate on the study and practice of stage direction. Honors in Directing students study basic and advanced directing techniques, participate in the directing studio classes with graduate Directing students, and direct two full plays in the Director Class Projects series. Honors students also have the opportunity to receive credit as the assistant director to a Drama Department main season show, or as a production internship with a professional theatre company.

Admission to the Honors in Directing Program is competitive. Candidates must first complete DRAMA 184 (Directing) and receive instructor approval to enroll in DRAMA 185 (Advanced Directing). Candidates must apply, as a director, for DRAMA 198 (Director Class Project) by submitting a proposal to direct a play in the Director Class Project. If the proposal is accepted, the candidate must declare to the Head of Directing that the production is to be counted as an audition for admission to the Honors in Directing Program. A committee of three Drama faculty members, including the Head of Directing, will then see and evaluate the production for clarity of interpretation, unity of style, strength of acting, and ensemble performance, and will examine the candidate's self-evaluation and the evaluations of the director by members of the cast. The Head of Directing will inform the candidate of the committee's decision as to whether or not the candidate is admitted to the Honors Program.

Undergraduate Drama majors can be admitted into the program as early as the winter quarter of their freshman year but no later than the spring quarter of their junior year. Students may be admitted to the program retroactively if all the requirements for Directing Honors have been met by their final year, but only if a faculty committee of three has seen their workshops and agrees to admit the candidate.

To achieve the Honors in Directing distinction, students must fulfill all the courses required of the regular Drama major, with an overall GPA of 3.2 or higher. In addition, students must complete the following courses with a GPA of 3.4 or higher:

1. DRAMA 184 (Directing).
2. Two courses in DRAMA 185 (Advanced Directing). In this course, undergraduate Directing students present work in the Directing Laboratory along with graduate Directing students.
3. Two Director Class projects, one of which must be taken as DRAMA 198 (Director Class Project) with the candidate serving as director. The candidate must stage a second Director Class Project as DRAMA H198 (Honors Director Class Project), for which a letter grade is earned.
4. Four additional units to be satisfied by any of the following: DRAMA 199 (as a summer internship, approved by the Head of Directing, with the candidate serving a professional theatre company as director, assistant director, or production assistant); DRAMA 199 (as a production/directing project for Playwright's Workshop); DRAMA 100 (as assistant director to a faculty director); or DRAMA 199 (as assistant director to a graduate director's thesis production).

Honors candidates meet with the Head of Directing at the beginning of every quarter to evaluate their progress and to check that all grade and course requirements are being satisfied. Successful graduating seniors will receive the "Honors in Directing" notation on their official transcript and will receive a nomination and recommendation for national University/Resident Theatre Association (U/RTA) interviews.

NOTE: All of the above courses are open to all students even though they may not qualify for the Honors Program.

## Honors in Dramatic Literature, History, and Theory Program

The Honors in Dramatic Literature, History, and Theory Program is designed to challenge superior students beyond the scholarly requirements of the Drama major. It provides them with the opportunity to advance their knowledge of dramatic literature, history, and theory and to further develop their writing, analytical, and research skills. An additional purpose of the program is to better prepare students for graduate study in not only dramatic literature, history, and theory, but in all fields in the humanities and social sciences, as well as in law.

Eligibility requirements are (1) completion of DRAMA 40A, DRAMA 40B, DRAMA 40C and two courses selected from DRAMA 103–129 (for upper-division writing credit), or equivalents to these courses from other institutions; (2) possess and maintain an overall GPA of at least 3.2, with a GPA of 3.4 or higher in all dramatic literature, history, and theory courses; and (3) completion of the eligibility form.

Admission to the Honors in Dramatic Literature, History, and Theory Program is competitive. Students must apply to the program prior to the spring quarter of their junior year. Upon completion of eligibility requirements, applicants must submit at least two critical essays, most likely written previously for courses, totaling no more than 30 pages. These essays will be used by the Honors Committee (comprised of the Head of Dramatic Literature, History, and Theory and two additional members of the Drama faculty) to determine admission. Only truly exceptional students (no more than 10 to 20 percent of those eligible) will be admitted.

Beyond fulfilling the regular requirements of the Drama major, honors students must take three additional upper-division courses in dramatic literature, history, and/or theory, one of which must be focused on theory. Upper-division courses in other departments may be used to fulfill these requirements, as long as the Honors Committee approves them.

Honors students must also write an honors thesis, a 30–40 page research paper written under the supervision of a faculty member on a topic chosen by the student. In consultation with the student, the adviser for this project is selected before the end of the fall quarter of the student's senior year. Students develop their projects until the spring quarter when they enter the writing phase. It is only during the spring quarter that students achieve full course credit for their work on the thesis, in the form of an independent study course with their advisor. This independent study is the final course of the program.

Successful graduating seniors will receive the "Honors in Dramatic Literature, History, and Theory" notation on their official transcript.

## Honors in Music Theatre

Successful graduating seniors in both the B.A. in Drama and the B.F.A. in Music Theatre can achieve Honors in Music Theatre. An overall GPA of 3.2 or higher is required along with an overall GPA of 3.4 in all music theatre courses. B.F.A. students need to complete all course work listed under "Departmental Requirements for the B.F.A. Major" while B.A. students need to complete the following additional music theatre courses:

A. Complete the following:

DRAMA 142	Music Theatre Workshop II
DRAMA 143A- 143B- 143C	Music Theatre Workshop III and Music Theatre Workshop III and Music Theatre Workshop III
DRAMA 145	Music Theatre Singing (taken three times)
DRAMA 146	NYSP-Preparation

DRAMA 148A- 148B- 148C	History of American Musical Theatre and History of American Musical Theatre and History of American Musical Theatre
DRAMA 149	Music Proficiency for Actors
DRAMA 176	Script and Score
DRAMA 190	NYSP-Acting
DRAMA 191	NYSP - Dance
DRAMA 192	NYSP - Singing
DRAMA 193	NYSP - Performance
DRAMA 194	NYSP-UCI Residency
Two ballet classes in Dance.	
One tap class in Dance.	
One jazz class in Dance.	
B. Select one of the following in any combination:	
DRAMA 182A- 182B	Dance Technique, Level I and Dance Technique, Level I
DRAMA 183A- 183B	Dance Technique, Level II and Dance Technique, Level II

At graduation, successful Honors students receive the "Honors in Music Theatre" notation on their transcripts.

## Honors in Stage Management Program

The Honors in Stage Management Program provides the opportunity for Drama majors to concentrate on the study and practice of stage management. Honors students study basic and advanced stage management techniques, participate in classes with graduate stage managers, work as assistant stage managers with the graduate stage managers on graduate student-directed and faculty-directed productions, and stage manage a graduate student-directed or faculty-directed production at UCI.

Eligibility requirements are (1) minimum one year in good standing at UCI as a Drama major; (2) completion of three of the following: DRAMA 50A, DRAMA 50B, DRAMA 50C, DRAMA 50D or equivalent courses; (3) completion of DRAMA 50E; (4) possess and maintain an overall GPA of at least 3.2, with a GPA of 3.4 or higher in all stage management and production courses; (5) completion of eight units of Drama 101 (Theatre Production); and (6) completion of the eligibility form.

Admission to the Honors in Stage Management Program is competitive. Students may be admitted as early as the winter quarter of their sophomore year but no later than the spring quarter of their junior year. Only truly exceptional students (no more than 10 to 20 percent of those eligible) will be admitted to the program as determined by the Honors Committee. Upon completion of eligibility requirements, the student will submit to the Honors Committee: (1) two prompt books; (2) a resume including all stage management and production experience; (3) letters of reference from two directors with whom the student has worked; and (4) a written paper on the subject of stage management.

Students receive the "Honors in Stage Management" notation on their final transcript; nomination and recommendation for national University/Resident Theatre Association (U/RTA) interviews; assistant stage manager assignments working with graduate stage managers; and a stage management assignment on a graduate student-directed or faculty-directed production.

Honors candidates meet with the Head of Stage Management at the beginning of every quarter to evaluate their progress.

Graduates from the Department of Drama perform, stage manage, or design on Broadway, in national tours, regional and summer theatres, in films and on television. UC Irvine's Drama alumni serve as artistic directors, business managers, designers, art directors, and performers at more than 100 theatre companies, and are faculty at more than 75 institutions of higher learning.

A degree in Drama may or may not lead to professional employment in theatre or film. While some alumni may pursue careers as professional theatre artists, many may use the skills learned from their degree and embark upon careers in law, business, arts management, advertising, and teaching. Others may pursue further study at UC Irvine or other notable institutions.

## Department of Music

**Stephen Tucker, Department Chair**

303 Music and Media Building

949-824-6615

<http://music.arts.uci.edu/>



The curricular philosophy of the Department of Music is based on the ideals of the conservatory within the academy. The faculty are concerned with the performance and creation of music within the context of the highest standards of historical, aesthetic, and theoretical inquiry.

The faculty includes composers, musicologists and music theorists, conductors, and performers. All members of the faculty are highly active in their fields as publishing scholars, concert and recording artists, and well-known composers. Many of the instrumental instructors are drawn from the ranks of the Los Angeles Philharmonic, the Los Angeles Chamber Orchestra, the Pacific Symphony, and other orchestras in Southern California. The department also presents frequent performances and master classes by renowned guest artists, and houses several state of the art music technology facilities.

## Career Opportunities

Musicians develop a wide range of transferable skills during their undergraduate career. Musicians learn how to think, to write, to present themselves in public, and to work collaboratively in different kinds of teams. They also demonstrate over the long term a determination and commitment, and a desire to succeed. With a degree in Music, students will find that many career paths lie before them, both within and beyond the diverse field of music.

- History and Theory of Music, Ph.D.
- Integrated Composition, Improvisation, and Technology, Ph.D.
- Music, B.A.
- Music, B.Mus.
- Music, M.F.A.

## Faculty

Kei Akagi, B.A. International Christian University, *Professor of Music; Asian American Studies*

Amy Bauer, Ph.D. Yale University, *Associate Professor of Music*

Haroutune Bedelian, M.A. Royal Academy of Arts, *Professor of Music*

Lorna Griffitt Bedelian, D.M.A. Indiana University, *Professor of Teaching of Music*

Frances Bennett, B.F.A. University of California, Irvine, *Lecturer of Music*

David Brodbeck, Ph.D. University of Pennsylvania, *Professor of Music; European Languages and Studies*

Eleanore Choate, M.A. California State University, Long Beach, *Lecturer of Music*

Patricia Cloud, M.M. University of Southern California, *Lecturer of Music*

Jonathan Davis, D.M.A. Juilliard School, *Lecturer of Music*

Michael Dessen, Ph.D. University of California, San Diego, *Professor of Music*

John Christopher Dobrian, Ph.D. University of California, San Diego, *Professor of Music; Informatics*

Nohema Fernandez, D.M.A. Stanford University, *Professor Emerita of Music*

Frederick Greene, B.M. University of Southern California, *Lecturer of Music*

Nicole Grimes, Ph.D. University of Dublin, *Associate Professor of Music*

Stephan Hammel, Ph.D. University of Pennsylvania, *Assistant Professor of Music*

Matthew Hare, D.M.A. University of Iowa, *Lecturer of Music*

Jason Harnell, *Lecturer of Music*

Gary Heaton-Smith, D.M.A. University of California, Los Angeles, *Lecturer of Music*

Joseph Huszti, MM Northwestern University, *Professor Emeritus of Music*

Mari Kimura, D.M.A. Juilliard School, *Professor of Music*

Sarah Koo, M.M. The Juilliard School, *Lecturer of Music*

Jerzy Kosmala, D.M. Indiana University, *Lecturer of Music*

Peter O. Krapp, Ph.D. University of California, Santa Barbara, *Professor of Film and Media Studies; English; European Languages and Studies; Informatics; Music; Visual Studies* (digital culture, media history, cultural memory)



Lukas Ligeti, *Assistant Professor of Music*

Eric Lindsay, D.M. Indiana University, *Lecturer of Music*

Kevin McKeown, M.A. University of California, Los Angeles, *Lecturer of Music*

Irene Messoloras, D.M.A. University of California, Los Angeles, *Lecturer of Music*

Elliott Moreau, M.M. University of Southern California, *Lecturer of Music*

Margaret Murata, Ph.D. University of Chicago, *Professor Emerita of Music*

Adedeji Ogunfolu, M.M. University of Michigan, Ann Arbor, *Lecturer of Music*

Dariusz Oleszkiewicz, B.A. California Institute of the Arts, *Lecturer of Music*

Hossein Omoumi, Ph.D. University of Florence, *Maseeh Professor in Persian Performing Arts and Professor of Music*

Barry Perkins, M.A. New England Conservatory of Music, *Lecturer of Music*

Gerald Pinter, B.A. University of North Texas, *Lecturer of Music*

Colleen Reardon, Ph.D. University of California, Los Angeles, *Professor of Music*

Bobby Rodriguez, D.M.A. University of California, Los Angeles, *Lecturer of Music*

John Schneiderman, M.F.A. University of California, Irvine, *Professor of Teaching of Music*

Nina Scolnik, B.M. Oberlin College, *Professor of Teaching of Music*

David Stetson, B.M. University of Southern California, *Lecturer of Music*

Darryl Taylor, D.M.A. University of Michigan, *Professor of Music; African American Studies*

Alan Terricciano, M.A. Eastman School of Music, *Associate Dean for Undergraduate Affairs and Professor of Dance; Music* (music for dance, musical resources, critical issues in dance, music theory, keyboard skills, and repertoire)

Stephen Tucker, D.M.A. University of California, Los Angeles, *Robert and Marjorie Rawlins Chair in Music and Associate Professor of Music*

Kojiro Umezaki, M.A. Dartmouth College, *Professor of Music; Computer Science*

Sunil P. Verma, M.D. University of Southern California, *Assistant Dean of Workforce Development and Health Sciences Associate Clinical Professor of Otolaryngology; Music*

Amanda Jane Walker, M.F.A. University of California, Los Angeles, *Lecturer of Music*

## Courses

### **MUSIC 3. Introduction to Music. 4 Units.**

Introduction to musical concepts and active listening skills. Students develop musical understanding through critical readings, selected repertoire, fundamental concepts related to rhythm, pitch, and genre. Students apply those concepts to music from a wide range of historical and cultural origins.

(IV)

### **MUSIC 4. Introduction to Opera. 4 Units.**

Introduces students with no musical background to the dramatic and performance conventions of opera, and suggests ways of developing a critical stance vis-a-vis the social, political, gender-related and moral conflicts that are presented by composers and librettists.

(IV)

### **MUSIC 5. Popular Music in the United States. 4 Units.**

Examines the cultural, social, political, and economic dimensions of popular music in the United States over the last century and a half, with an emphasis on matters related to class, race, ethnicity, and gender.

(IV)

**MUSIC 8. The Beatles and the Sixties. 4 Units.**

Through a study of the music of the Beatles, students are introduced to selected broader historical and cultural themes (e.g., race and music, gender and music, music and the counterculture) while developing an understanding of the basic elements of music.

(IV)

**MUSIC 9. Rock: The Early Years. 4 Units.**

Surveys the social and cultural fabric of the post-World War II United States (from the late 1940s through the early 1970s) as seen through the prism of music - rock and roll music.

(IV)

**MUSIC 10. Piano for Majors. 1 Unit.**

For Music majors with little or no piano experience. Provides the necessary background for realizing keyboard exercises required in the theory and harmony courses, and develops skills to play and sight-read simple music from different periods.

Repeatability: May be taken for credit 3 times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 15A. Musicianship I. 2 Units.**

Interval and chord quality identification, melodic and harmonic dictation, tonal and chromatic sight-singing, and rhythmic reading and dictation.

Corequisite: MUSIC 16A

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 15B. Musicianship II. 2 Units.**

Interval and chord quality identification, melodic and harmonic dictation, tonal and chromatic sight-singing, and rhythmic reading and dictation.

Corequisite: MUSIC 16B

Prerequisite: MUSIC 15A and MUSIC 16A. MUSIC 15A with a grade of C- or better. MUSIC 16A with a grade of C- or better

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 15C. Musicianship III. 2 Units.**

Interval and chord quality identification, melodic and harmonic dictation, tonal and chromatic sight-singing, and rhythmic reading and dictation.

Corequisite: MUSIC 16C

Prerequisite: MUSIC 15B and MUSIC 16B. MUSIC 15B with a grade of C- or better. MUSIC 16B with a grade of C- or better

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 16A. Music Theory. 4 Units.**

Review of music fundamentals. Triad and seventh chords, musical texture, chord spacing, embellishing tones, and introduction to diatonic harmony. Part-writing and model composition with tonic, dominant seventh, and subdominant harmonies.

Corequisite: MUSIC 15A

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 16B. Music Theory. 4 Units.**

Introduction to phrase structure. Part-writing and harmonization with predominants, linear dominants, 6/4 embellishing chords, leading-tone and other diatonic seventh chords. Advanced meters and rhythmic-metric dissonance. Diatonic sequence. Introduction to tonicization and modulation through motion to V and III.

Corequisite: MUSIC 15B

Prerequisite: MUSIC 15A and MUSIC 16A. MUSIC 15A with a grade of C- or better. MUSIC 16A with a grade of C- or better

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 16C. Music Theory. 4 Units.**

Tonicization and modulation to closely related keys. Simple binary and ternary forms. Voice-leading reductions and simple forms. Diatonic sequence with seventh chords. Introduction to chromatic harmony I: modal exchange and mixture chords, the Neapolitan and augmented sixth chords.

Corequisite: MUSIC 15C

Prerequisite: MUSIC 15B and MUSIC 16B. MUSIC 15B with a grade of C- or better. MUSIC 16B with a grade of C- or better

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 16D. Theory/Musicianship. 4 Units.**

Extended homophonic and contrapuntal formal designs (continuous variations, rondo form, sonata form, invention, fugue). Embellishing chromatic chords, dominant prolongation, modulations to foreign keys, extended harmonies, chromatic sequence, chromatic voice-leading and symmetrical divisions of the octave.

Prerequisite: MUSIC 15C and MUSIC 16C. MUSIC 15C with a grade of C- or better. MUSIC 16C with a grade of C- or better

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 21A. Keyboard Skills. 1 Unit.**

Designed to develop the foundational skills of sight-reading, harmonization, transposition, improvisation, figured bass realization, and score reading.

Repeatability: May be taken for credit 6 times.

Restriction: Lower-division students only. Music Majors only. Music - Performance Majors only.

**MUSIC 21B. Keyboard Skills. 1 Unit.**

Designed to develop the foundational skills of sight-reading, harmonization, transposition, improvisation, figured bass realization, and score reading.

Repeatability: May be taken for credit 6 times.

Restriction: Lower-division students only. Music Majors only. Music - Performance Majors only.

**MUSIC 21C. Keyboard Skills. 1 Unit.**

Designed to develop the foundational skills of sight-reading, harmonization, transposition, improvisation, figured bass realization, and score reading.

Repeatability: May be taken for credit 6 times.

Restriction: Lower-division students only. Music Majors only. Music - Performance Majors only.

**MUSIC 25. Fundamentals of Music. 4 Units.**

Gain comprehensive insight into the fundamental concepts of music theory, including notation, harmony, and score analysis. Designed for students of all levels to improve their understanding of how music is composed, performed, and heard. Formerly MUSIC 25A.

**(IV)****MUSIC 40B. History of European Music: From the Renaissance through the Baroque. 4 Units.**

An introduction to the analysis of musical styles and forms, to the sources for constructing music history and reconstructing historical music, and to J.S. Bach.

Prerequisite: MUSIC 16C. MUSIC 16C with a grade of C- or better

Restriction: Music Majors have first consideration for enrollment. Music - Performance Majors have first consideration for enrollment.

**(IV and VIII ).****MUSIC 40C. History of European Music: Hasse to Mahler. 4 Units.**

An introduction to the analysis of musical styles and forms, and to the sources for constructing music history and reconstructing historical music, to Richard Wagner.

Prerequisite: MUSIC 40B. MUSIC 40B with a grade of D or better. Recommended: MUSIC 16D

Restriction: Music Majors have first consideration for enrollment. Music - Performance Majors have first consideration for enrollment.

**(IV and VIII ).**

**MUSIC 40D. 20th Century Music. 4 Units.**

Survey of principal composers, movements, and compositional techniques of Western art music of the modern era.

Prerequisite: MUSIC 16C. MUSIC 16C with a grade of C- or better

Restriction: Music Majors have first consideration for enrollment. Music - Performance Majors have first consideration for enrollment.

(IV and VIII ).

**MUSIC 41. Major Composer. 4 Units.**

Study of the works of an important composer with emphasis on their significance in historical and social contexts. Composers selected represent a wide variety of historical periods, nationalities, and stylistic orientations.

Repeatability: May be taken for credit 2 times as topics vary.

(IV)

**MUSIC 42. Music and Gender. 4 Units.**

Explores various intersections between music and gender. Examines ways in which gender and sexuality have played a vital role in the creation, dissemination, and consumption of music ranging from medieval Christian mysticism to contemporary hip-hop artists.

(IV, VIII)

**MUSIC 44. Classical Music in Society. 4 Units.**

Examines some ways in which classical music has played an integral role in aspects of society. Studies pieces from different cultural, political, and historical contexts in order to understand how musical meaning is created and interpreted.

(IV, VIII)

**MUSIC 45. History of Film Music. 4 Units.**

Course provides an overview of film music history. Special emphasis will be placed on developing an analytic vocabulary for musical elements and cultivating an understanding of how music can function within a film.

(IV)

**MUSIC 46. Music in Multimedia. 4 Units.**

Students explore intersections between music and other media forms through creating multimedia projects, readings, lectures, and discussion. Students produce music, edit video, increase media literacy, and study theories behind how music communicates meaning.

(IV)

**MUSIC 47. Introductory Topics in Music Technology. 4 Units.**

Introductory topics in electronic music, digital audio, and other aspects of music technology.

Repeatability: Unlimited as topics vary.

(IV)

**MUSIC 48. Introductory Topics in Music and Culture. 4 Units.**

Examines music and musical practices in different historical periods, societies, and cultural settings.

Repeatability: Unlimited as topics vary.

(IV)

**MUSIC 51. Music Technology and Computers. 4 Units.**

A study of the influence of technology on the musical culture and aesthetics from the 20th century to the present, with particular emphasis on the role of the computer. Work includes lectures, readings, listenings, discussions, demonstrations, writing, and experimentation.

(IV)

**MUSIC 65. Piano for Music Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times as topics vary.

Restriction: Music Majors only.

**MUSIC 66. Strings for Music Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times as topics vary.

Restriction: Music Majors only.

**MUSIC 67. Winds for Music Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times as topics vary.

Restriction: Music Majors only.

**MUSIC 68. Voice for Music Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music Majors only.

**MUSIC 69. Percussion for Music Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times as topics vary.

Restriction: Music Majors only.

**MUSIC 70. Guitar, Lute, and Other Plucked Instruments for Music Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music Majors only.

**MUSIC 78. History of Jazz. 4 Units.**

Development of jazz from African and African American folk origins through blues, early jazz, swing, bebop, 'cool' jazz, fusion, free jazz, and contemporary trends.

Restriction: Music Majors have first consideration for enrollment. Music - Performance Majors have first consideration for enrollment.

(IV and VII ).

**MUSIC H80. Experiments in Music. 4 Units.**

Scientists explain the cognition of music using experimental methodology; artists expand the domain of music by trying previously unknown ways of making it. These two types of experiment deepen our understanding of music, from both scientific and artistic vantage points.

Restriction: Campuswide Honors Collegium students only.

(IV)

**MUSIC 82A. MAHUR-Pish Radif: Introduction to Classical Persian Music. 4 Units.**

Survey of art music in Iran and basic structures of classical Persian music, with emphasis on MAHUR modal system and different instruments of classical Persian music. No musical experience required, but interest in vocal music is strongly recommended.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 82B. HOMAYUN-Pish Radif: Introduction to Classical Persian Music. 4 Units.**

Survey of art music in Iran and basic structures of classical Persian music, with emphasis on HOMAYUN modal system and famous musicians and performers of classical Persian music. No musical experience required, but interest in vocal music is strongly recommended.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 82C. SHUR-Pish Radif: Introduction to Classical Persian Music. 4 Units.**

Survey of art music in Iran and basic structures of classical Persian music, with emphasis on the SHUR modal system and different poetic rhythms in classical Persian music. No musical experience required, but interest in vocal music is strongly recommended.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 122A. Piano Literature. 2 Units.**

Survey of stringed keyboard literature from the English Virginalists through twentieth-century composers. Historical, formal, and stylistic considerations of music presented. Performances by class participants and occasional outside guests.

Prerequisite: MUSIC 16A and MUSIC 16B and MUSIC 16C

Restriction: Upper-division students only. Music Majors only. Music - Performance Majors only.

**MUSIC 122B. Piano Literature. 2 Units.**

Survey of stringed keyboard literature from the English Virginalists through twentieth-century composers. Historical, formal, and stylistic considerations of music presented. Performances by class participants and occasional outside guests.

Prerequisite: MUSIC 16A and MUSIC 16B and MUSIC 16C

Restriction: Upper-division students only. Music Majors only. Music - Performance Majors only.

**MUSIC 122C. Piano Literature. 2 Units.**

Survey of stringed keyboard literature from the English Virginalists through twentieth-century composers. Historical, formal, and stylistic considerations of music presented. Performances by class participants and occasional outside guests.

Prerequisite: MUSIC 16A and MUSIC 16B and MUSIC 16C

Restriction: Upper-division students only. Music Majors only. Music - Performance Majors only.

**MUSIC 126. Piano Pedagogy. 2 Units.**

The materials and methods of piano instruction are examined and evaluated.

Restriction: Upper-division students only. Music Majors only. Music - Performance Majors only.

**MUSIC 131. Post-Tonal Theory. 4 Units.**

Significant harmonic, rhythmic, and structural practices since 1900. Analysis and written work exploring free atonality and serialism; neo-tonal practices such as use of extended tertian harmonies, modalism, pandiatonicism, and non-tertian harmonies; structural principles such as aleatory, metric modulation and minimalism.

Prerequisite: MUSIC 16D

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 132. Jazz Theory. 4 Units.**

Study of jazz harmony and melody construction in improvisation. Covered topics include terminology, chord symbols, notation, voicings, and scales as commonly used in jazz and popular music. Issues regarding tonality and ramifications of the blue scale are also examined.

Prerequisite: MUSIC 16D

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 136. Instrumentation. 4 Units.**

Ranges and capabilities of modern orchestral instruments. Exercise in writing for various combinations of wind, string, and percussion instruments and for full orchestra.

Prerequisite: MUSIC 16C

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 140. Topics in Medieval Music. 4 Units.**

Topics in medieval music.

Prerequisite: MUSIC 40B. MUSIC 40B with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 141. Topics in Renaissance Music. 4 Units.**

Topics in renaissance music.

Prerequisite: MUSIC 40B. MUSIC 40B with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 142. Topics in Baroque Music. 4 Units.**

Topics in Baroque music.

Prerequisite: MUSIC 40B. MUSIC 40B with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 142W. Topics in Baroque Music . 4 Units.**

Topics in Baroque music.

Prerequisite: MUSIC 40B. MUSIC 40B with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**(Ib)**

**MUSIC 143. Topics in Classical Music. 4 Units.**

Topics in Classical music.

Prerequisite: MUSIC 40C. MUSIC 40C with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 143W. Topics in Classical Music. 4 Units.**

Topics in Classical music.

Prerequisite: MUSIC 40C. MUSIC 40C with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**(Ib)**

**MUSIC 144. Topics in Romantic Music. 4 Units.**

Topics in Romantic music.

Prerequisite: MUSIC 40C. MUSIC 40C with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 144W. Topics in Romantic Music. 4 Units.**

Topics in Romantic music.

Prerequisite: MUSIC 40C. MUSIC 40C with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only.

**(Ib)**

**MUSIC 145. Topics in 20th Century Music. 4 Units.**

Topics in 20th century music.

Prerequisite: MUSIC 40D. MUSIC 40D with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 145W. Topics in 20th Century Music. 4 Units.**

Topics in 20th century music.

Prerequisite: MUSIC 40D. MUSIC 40D with a grade of D or better. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Upper-division students only. Music Majors only. Music - Performance Majors only.

**(Ib)****MUSIC 146. Studies in Jazz Music. 4 Units.**

Topics in Jazz Music.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 147. Studies in Music Technology. 4 Units.**

Specialized topics in electronic music, computer-aided music, and other aspects of music technology.

Repeatability: May be taken for credit 2 times as topics vary.

**MUSIC 148. Studies in Ethnomusicology. 4 Units.**

Topics in Ethnomusicology.

Repeatability: May be taken for credit 2 times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 149. Studies in Music History. 4 Units.**

Specialized topics in musical genres; culture and social issues; performance practices; and interrelated arts.

Prerequisite: MUSIC 40B and MUSIC 40C and MUSIC 40D. Satisfactory completion of the lower-division writing requirement.

Repeatability: May be taken for credit 3 times as topics vary.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 150. Composition. 4 Units.**

Exercises and projects for diverse instrumental-vocal combinations; contemporary techniques and problems. Participation in the improvisation ensemble and working with electronic media.

Prerequisite: MUSIC 16C

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 151. Computer Music Composition. 4 Units.**

Exercises in the composition of music uniquely possible by computer, including digital signal processing, computer control of synthesizers and processors, and algorithmic composition. Demonstrations and musical analyses in class; considerable studio work outside class.

Prerequisite: MUSIC 51

**MUSIC 152. Interactive Arts Programming. 4 Units.**

Study of artistic issues and programming techniques involved in the development of interactive computer art and music. Theoretical background, basic tenets of programming, and practical exercises in programming interactive computer multimedia art.

Prerequisite: MUSIC 51 or ART 65A or DANCE 163



**MUSIC 153. Counterpoint. 4 Units.**

Studies in contrapuntal practices of various style periods such as the 16th, 18th, and 20th centuries.

Prerequisite: MUSIC 16B. MUSIC 16B with a grade of C- or better

Restriction: Music Majors only.

**MUSIC 155. Analysis. 4 Units.**

Methods of formal analysis applicable to all Western musical styles: additive, continuous, transformational, and hierarchic forms; rhythm, texture, and sonority as form and process.

Prerequisite: MUSIC 16D

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 156A. Song Literature. 2 Units.**

A survey of song literature. Designed as an overview of the song repertoire, German Lieder.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 156B. Song Literature. 2 Units.**

A survey of song literature. Designed as an overview of the song repertoire, French mélodie.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 157. Advanced Study in Composition. 4 Units.**

Individual weekly lessons in composition.

Prerequisite: MUSIC 150. MUSIC 150 with a grade of C- or better

Repeatability: May be taken for credit 6 times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 158A. Diction. 2 Units.**

In-depth study of the International Phonetic Alphabet (IPA), including its transcription and pronunciation, and its application for singers. Introduction to IPA and Italian Diction.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 158B. Diction. 2 Units.**

In-depth study of the International Phonetic Alphabet (IPA), including its transcription and pronunciation, and its application for singers. German Diction.

Prerequisite: MUSIC 158A

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 158C. Diction. 2 Units.**

In-depth study of the International Phonetic Alphabet (IPA), including its transcription and pronunciation, and its application for singers. French Diction.

Prerequisite: MUSIC 158A and MUSIC 158B

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 159. Vocal Pedagogy. 2 Units.**

Survey about the physical structure of the singing mechanism, science, and philosophy of studio instruction.

Restriction: Music - Performance Majors only.

**MUSIC 160. University Orchestra. 2 Units.**

Study and performance of standard orchestral repertory and works by contemporary composers. Membership is open to all qualified students by audition only.

Prerequisite: Audition required.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 161. Wind Ensemble. 2 Units.**

Study and performance of works written for varying combinations of wind and percussion instruments. Membership is open to all qualified students by audition only.

Prerequisite: Audition required.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 162. University Chorus. 2 Units.**

Make-up of the ensembles varies and may include University Chorus, Chamber Choir, Madrigal Singers, Women's Chorus, and Reading Choir. Membership is open to all qualified students by audition only.

Corequisite: MUSIC 162L

Prerequisite: Audition required.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 162P. University Chorus: Accompanying. 2 Units.**

Keyboard accompanying for one of the UCI choral organizations, with individual coaching in sight reading, score reading, and other accompanying skills.

Repeatability: May be taken for credit 12 times.

**MUSIC 164. Opera Workshop. 2-4 Units.**

Preparation and performance of operatic repertoire, including arias, scenes, and fully staged operas, and/or stage training and role analysis.

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 164P. Opera Workshop: Accompanying. 2-4 Units.**

Training in techniques and operatic repertory for keyboard players.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 165. Piano for Music Performance Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music - Performance Majors only.

**MUSIC 166. Strings for Music Performance Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music - Performance Majors only.

**MUSIC 166P. String Accompaniment. 2 Units.**

Chamber ensemble experience with the solo string repertory for keyboard, participation in the weekly string master class, performance in public recitals.

Repeatability: May be taken for credit 3 times.

**MUSIC 167. Winds for Music Performance Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music - Performance Majors only.

**MUSIC 168. Voice for Music Performance Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music - Performance Majors only.

**MUSIC 169. Percussion for Music Performance Majors. 2 Units.**

Private weekly lessons. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music - Performance Majors only.

**MUSIC 170. Guitar, Lute, and Other Plucked Instruments for Music Performance Majors. 2 Units.**

Private weekly lessons and a weekly master class/workshop for the discussion of solo repertoire and performance practice, including special topics such as historical notational systems, traditional American guitar styles, and demonstrations of period plucked instruments. Materials fee.

Repeatability: May be taken for credit 6 times.

Restriction: Music - Performance Majors only.

**MUSIC 171. Chamber Singers. 2 Units.**

A select ensemble specializing in vocal chamber music from all periods. Frequent performances on and off campus. Membership is open to all singers by audition.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 176. Chamber Ensembles . 2 Units.**

Make-up of the ensembles varies and may include various Classical ensembles, Latin Jazz Ensemble, Small Jazz Combos, Percussion Ensemble, and Guitar Ensemble. Membership is open to all qualified students by audition only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Majors have first consideration for enrollment. Music - Performance Majors have first consideration for enrollment.

**MUSIC 178. Jazz Orchestra. 2 Units.**

Rehearsal and performance of literature written for large jazz ensemble with emphasis on methods and materials. Laboratory setting for new arrangers and/or composers of modern jazz pieces.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 181. Improvisation. 4 Units.**

Improvisation has been central to all music traditions. Course explores real-time music-making in a variety of non-notated contexts. Different improvisational styles are presented, including jazz, Asian improvisation, and experimental modern music. Emphasis on actual classroom performance.

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 182. Advanced Jazz Combo. 2 Units.**

Small-group jazz ensemble and improvisational workshop. Range of music covered encompasses the full traditional jazz from improvised ragtime up through the most current avant-garde musical techniques.

Repeatability: May be repeated for credit unlimited times.

**MUSIC 183A. Jazz Composition I. 4 Units.**

Performance and lecture course for writing and performing original jazz compositions. Emphasis is placed on composing as a way to create new improvisational frameworks. Cyclical forms, modal compositions, blues-oriented compositions, and ballad writing.

Prerequisite: MUSIC 78 and MUSIC 132

Restriction: Music Majors only.

**MUSIC 183B. Jazz Composition II. 4 Units.**

Performance and lecture course for writing and performing original jazz compositions. Emphasis is placed on composing as a way to create new improvisational frameworks. Non-functional harmony, contemporary forms, free-bop, and current trends.

Prerequisite: MUSIC 78 and MUSIC 132 and MUSIC 183A

Restriction: Music Majors only.

**MUSIC 183C. Jazz Composition III. 4 Units.**

Performance and lecture course for writing and performing original jazz compositions. Emphasis is placed on composing as a way to create new improvisational frameworks. Study of modern tonal-center compositions, intervallic compositions, and alternate rhythms.

Prerequisite: MUSIC 78 and MUSIC 132 and MUSIC 183A and MUSIC 183B

Restriction: Music Majors only.

**MUSIC 189. Accompanying for Plucked Strings: Continuo and Changes. 2 Units.**

Students apply theory to their instruments as they learn the basics of pre-1800 continuo playing and post-1900 jazz charts. Includes discussions of appropriate repertoire, treatment of harmonic progressions, and finer points of style and technique.

Prerequisite: MUSIC 16C

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 191. Tutorial in Music. 1-4 Units.**

Supplemental instruction related to student's area of study. Taken only when the materials studied lie outside regular departmental offerings, and when the student has no formal chance to pursue the subject.

Prerequisite: Undergraduate advisor approval required.

Repeatability: May be taken for credit 3 times.

**MUSIC 193. Conducting. 4 Units.**

Introduces students to the basic techniques employed in the practice of conducting and includes score study and development of leadership skills.

Prerequisite: MUSIC 16D and MUSIC 40B and MUSIC 40C

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 195A. Senior Thesis. 2 Units.**

With consultation in regularly scheduled meetings, students identify and study relevant texts and materials and prepare a prospectus for an original thesis.

Prerequisite: Senior standing in the Honors Program in Music and Culture.

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 195B. Senior Thesis. 2 Units.**

Students submit an outline and preliminary drafts of section of their thesis to the instructor, on a schedule supervised by the instructor. The final version will address the instructor's comments and criticisms.

Prerequisite: MUSIC 195A

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 197. Word and Music. 2 Units.**

Performance class for advanced singers and pianists with emphasis on collaborative approach to vocal literature.

Repeatability: May be repeated for credit unlimited times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 199. Independent Study. 2-4 Units.**

Student-devised research/composition project, with faculty guidance, resulting in a formal paper/project. Taken only when materials studied lie outside regular departmental offerings or when students have no formal chance to pursue the subject.

Prerequisite: Undergraduate or graduate advisor approval required.

Repeatability: May be taken for credit 3 times.

Restriction: Music Majors only. Music - Performance Majors only.

**MUSIC 200. Bibliography and Research. 4 Units.**

Required of all entering students. A systematic introduction to the bibliographical tools both in the general field of music and in the student's areas of specialization.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 201. Topics in Analysis . 4 Units.**

Seminar focusing on different analytical methods, modal, tonal, and post-tonal, and their applications to repertoires drawn from various historical periods through to the present day.

Prerequisite: Placement into MUSIC 201.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 202. Proseminar in Musicology. 4 Units.**

Introduces significant issues and recent developments in musicology and music criticism, including exposure to the controversies that have brought change and reflection to the discipline.

Corequisite: Recommended for musicology students: MUSIC 200

Prerequisite or corequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Restriction: Graduate students only.

**MUSIC 203. Music Thesis . 4 Units.**

Intensive work dedicated to researching and writing a Master's thesis under the supervision of a faculty advisor.

Prerequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 204. Proseminar in Music Theory and Analysis. 4 Units.**

Introduction to music theories, analytic approaches, and methodologies as applied to repertoires drawn from Western art and popular music.

Corequisite: Recommended for musicology students: MUSIC 200

Prerequisite or corequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Restriction: Graduate students only.

**MUSIC 209. Seminar in Creative Practices. 1-4 Units.**

Core first-year seminar required for graduate students in the Integrated Composition, Improvisation, and Technology emphasis of the M.A. and Ph.D. programs. Composition and presentation of original student works, lecture, and discussion.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 210. Choral Conducting . 4 Units.**

Intensive private instruction and study of the various choral literatures.

Repeatability: May be taken for credit 6 times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 211. Performance . 4 Units.**

Contents vary according to the student's major instrument. Intensive private instruction and study of the various literatures.

Repeatability: May be taken for credit 6 times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 212. Composition. 4 Units.**

Intensive work in composition geared to each student's level of competence.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 213. Orchestral Conducting. 4 Units.**

Intensive private instruction in instrumental conducting.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 214. Graduate Recital.**

Performance of public recital.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 215A. Computer Music Composition and Production. 4 Units.**

Study of the composition and production of music made uniquely possible by the computer, including usage of prevalent digital music technology, techniques of digital signal processing, and computer control of synthesizers and audio processors.

Restriction: Graduate students only. Music Majors only.

**MUSIC 215B. Computer Music Programming. 4 Units.**

Study of the artistic issues and programming techniques involved in the development of original applications for computer music composition and interactive performance.

Restriction: Graduate students only. Music Majors only.

**MUSIC 220. Seminar in Music History. 4 Units.**

Topics in music history.

Corequisite: MUSIC 200

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 222. Seminar in Musicology . 4 Units.**

Focuses on current scholarship in musicology and related fields with a strong critical content. Addresses topics relative to their historical and stylistic periods. Recent topics have included Stravinsky, Holy Women, Mahler, Historiography, Issues in Performance Practice, and Brahms's Chamber Music.

Corequisite: Recommended for musicology students: MUSIC 200

Prerequisite or corequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Repeatability: May be taken for credit for 4 units as topics vary.

Restriction: Graduate students only.

**MUSIC 224. Seminar in Music Theory and Analysis. 4 Units.**

Typical topics include Schenkerian theory and analysis, contemporary form theory, and advanced techniques in the analysis of late 19th-century and contemporary music (e.g., transformational theory, Neo-Riemannian, and scale network theory).

Corequisite: Recommended for musicology students: MUSIC 200

Prerequisite or corequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**MUSIC 230. Seminar in Contemporary Music. 4 Units.**

Special seminar projects dealing with contemporary music with emphasis on analytical techniques and style criticism.

Prerequisite or corequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 231. Improvisation. 4 Units.**

Introduces the practice and history of improvisation in diverse fields of Western music since 1950. Performance projects and group critiques, weekly reading and listening assignments, participation in a class concert, and a research paper.

Restriction: Graduate students only. Music Majors only.

**MUSIC 235. Critical Studies in Music. 4 Units.**

A critical examination of music traditions, institutions, and aesthetics, employing new scholarship in music and new critical studies in other disciplines.

Corequisite: Recommended for musicology students: MUSIC 200

Prerequisite or corequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 236. Theoretical ICIT Seminar. 1-4 Units.**

Seminar studying new genres and topics that integrate composition, improvisation, new technologies, and non-classical cultures.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 237. Practical ICIT Seminar. 1-4 Units.**

Study of new practices and techniques that integrate composition, improvisation, new technologies, and non-classical cultures.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 239. Thesis Colloquium. 1-2 Units.**

ICIT students present their thesis work-in-progress for discussion and criticism. Faculty and visiting artists/scholars also present their current work.

Repeatability: May be taken for credit for 8 units.

Restriction: Graduate students only. Music Majors only.

**MUSIC 240. Graduate Projects . 4 Units.**

Substantial projects in performance, conducting, or composition (other than those specifically required for the degree), accompanied by a summary paper.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 242A. First-Year Research and Writing Seminar I. 4 Units.**

Guided reading for one quarter on a broad subject selected by the instructor, followed by one quarter in which the student undertakes independent research on the selected topic, leading to a substantial term paper.

Prerequisite: MUSIC 200. MUSIC 200 with a grade of B or better

Restriction: Graduate students only.

**MUSIC 242B. First-Year Research and Writing Seminar II. 4 Units.**

Guided reading for one quarter on a broad subject selected by the instructor, followed by one quarter in which the student undertakes independent research on the selected topic, leading to a substantial term paper.

Prerequisite: MUSIC 200 and MUSIC 242A. MUSIC 200 with a grade of B or better. MUSIC 242A with a grade of B or better

Restriction: Graduate students only.

**MUSIC 243A. Second-Year Research and Writing Tutorial I. 4 Units.**

In this two-quarter sequence, students gain expertise in a first area of research concentration by undertaking directed reading on a topic of their choice and then writing a paper of near-publishable length and quality on that topic.

Prerequisite: MUSIC 242B. MUSIC 242B with a grade of B or better

Restriction: Graduate students only.

**MUSIC 243B. Second-Year Research and Writing Tutorial II. 4 Units.**

In this two-quarter sequence, students gain expertise in a first area of research concentration by undertaking directed reading on a topic of their choice and then writing a paper of near-publishable length and quality on that topic.

Prerequisite: MUSIC 243A. MUSIC 243A with a grade of B or better

Restriction: Graduate students only.

**MUSIC 244. Readings for the Qualifying Examination. 4-12 Units.**

Directed reading in preparation for the Qualifying Examination.

Prerequisite: MUSIC 243B. MUSIC 243B with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**MUSIC 245. Prospectus Research. 4-12 Units.**

Research and writing of the Dissertation Prospectus.

Prerequisite: MUSIC 244. MUSIC 244 with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**MUSIC 250. Directed Research. 4 Units.**

Preparation for qualifying exams and dissertation, or an individual research project resulting in a substantial paper or comparable documentation of the research results.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Music Majors only.

**MUSIC 276. Contemporary Ensemble. 2 Units.**

Chamber ensemble for the performance of contemporary music, including newly composed and improvised forms.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 290. Dissertation Research. 4-12 Units.**

Research and writing of the dissertation for the History and Music Theory Ph.D.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.



**MUSIC 299. Independent Study. 2-4 Units.**

Student-devised research/composition project, with faculty guidance, resulting in a formal paper/project. Taken only when materials studied lie outside regular departmental offerings or when students have no formal chance to pursue the subject.

Prerequisite: Graduate advisor approval required.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only. Music Majors only.

**MUSIC 399. University Teaching. 1-4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## History and Theory of Music, Ph.D.

The Ph.D. in History and Theory of Music is unique and combines both historical musicology and music theory and analysis to offer a Ph.D. program with a particular emphasis on music theory and analysis, critical theory, and the aesthetics and philosophy of music. The program rests on two central pillars: a sustained engagement with musical works that is underpinned by a thorough grounding in musical skills and literacy, and a strong focus on critical theory, which students learn to apply to musicological sub-disciplines such as music analysis and historical musicology.

The doctoral program in the History and Theory of Music is taught by a core faculty whose primary and secondary research interests cover a wide area: vocal music of the Italian baroque, Central European music and culture from the 19th century to the present, experimental music of the 20th century, popular music since 1950, American musical theater, especially that of Stephen Sondheim, and the intersection of theory, philosophy, and culture.

The program seeks students with a strong academic foundation, excellent writing skills, and a desire to develop a research idea into an original thesis. Applicants should possess an undergraduate degree in music or an equivalent level of training, and should demonstrate potential for creative research. Students are expected to have reading knowledge of French, German, Italian, or Spanish.

Applicants are normally expected to have earned an undergraduate degree with a major in music (B.A. or B.Mus.) and to possess strong analytical and writing skills. Applicants whose undergraduate major was in a subject other than music but who can demonstrate a strong background in music are otherwise qualified may also be considered.

The online application and all supporting materials must be received by December 1. Supporting materials must include:

- A personal statement of the applicant's experiences, primary interests, and career goals
- Two samples of academic writing on historical and/or analytical music topics, demonstrating writing and critical thinking skills
- Results of the GRE exam, taken within the last five years
- Three letters of recommendation

### Required Courses

At least 60 units must be earned in the first two years, excluding units earned in MUSIC 399. The number of units earned thereafter will vary in accordance with the time required to pass the qualifying examination, advance to candidacy, and complete the dissertation.

During the first two years in the program, students complete the following:

A. Complete:

MUSIC 200	Bibliography and Research
MUSIC 202	Proseminar in Musicology
MUSIC 204	Proseminar in Music Theory and Analysis

B. Select six topical seminars <sup>1</sup>

MUSIC 222	Seminar in Musicology <sup>2</sup>
MUSIC 224	Seminar in Music Theory and Analysis <sup>3</sup>

C. Select two elective courses <sup>4</sup>

D. Complete the following research and writing courses:

MUSIC 242A- 242B	First-Year Research and Writing Seminar I and First-Year Research and Writing Seminar II
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## MUSIC 243A- 243B

Second-Year Research and Writing Tutorial I  
and Second-Year Research and Writing Tutorial II

During the third year, students complete the following:

A. Complete:

MUSIC 244	Readings for the Qualifying Examination (two quarters)
MUSIC 245	Prospectus Research (one quarter)

During the fourth and fifth years, as needed, students take up to three quarters each year of MUSIC 290.

- 1 Normally three topical seminars are taken in the first year and three in the second.
- 2 Of the six topical seminars, at least two must be MUSIC 222.
- 3 Of the six topical seminars, at least two must be MUSIC 224.
- 4 These courses may be taken inside or outside the Department. At least two electives are required during the first two years.

## En Route M.A.

For students who enter the program without an M.A. in an appropriate area of study, the substantial research paper written in MUSIC 243B will constitute the Master's essay. If in the judgement of the advisor and the other two readers, the essay and the student's overall academic record are determined to be satisfactory, the student will be awarded the en route M.A. and be considered to have met the standards for continued Ph.D. study.

Students who enter the program with an M.A. in an appropriate area of study are not eligible for the en route M.A. The advisor and the other two readers will determine whether the student's essay in MUSIC 243B and overall academic record have met the standards for continued Ph.D. study.

## Language Requirement

Before advancing to candidacy, students must demonstrate a reading knowledge of one language other than English relevant to the student's program of study. This requirement is met by passing a translation examination administered by the Department.

## Advancement to Candidacy

The Qualifying Examination, administered by a committee of three faculty members, is typically taken in late winter or early spring quarter of the third year. It consists of an oral exam and a written, take-home exam in music analysis. The oral portion of the exam comprises two parts. In the first, the student is given short excerpts from several musical scores and is asked to identify each as closely as possible in terms of style and period. In the second, the student is examined in the two fields. The first field is related to the topic of the student's second-year research and writing project. The second field is prepared in the third year during completion of MUSIC 244. The take-home exam in music analysis is completed in 72 hours and shall take the form of an extended essay on an assigned composition.

The dissertation prospectus, typically growing out of one of the student's two fields, is presented in a colloquium that includes all three members of the dissertation committee. It cannot be presented until the foreign-language requirement and all course requirements outlined above have been met. Upon acceptance of the prospectus the student will advance to doctoral candidacy.

## Dissertation

The dissertation is an original research project of substantial length approved by the dissertation committee of three faculty members.

## Integrated Composition, Improvisation, and Technology, Ph.D.

The Ph.D. program in Integrated Composition, Improvisation, and Technology (ICIT) is taught by a core faculty whose work embraces diverse forms of music making, challenging conventional distinctions between classical composition, computer music, improvisation, and jazz. Students will receive close personal attention from faculty, and are encouraged to work on interdisciplinary projects. Applicants should possess an undergraduate degree in music or an equivalent level of training and should demonstrate potential for creative and innovative work integrating a wide range of contemporary music and ideas. In addition to the core ICIT faculty, the Music Department includes many other performers, musicologists, theorists, and historians, making for a rich environment in which to develop critical skills that are essential for the 21st-century musician.

In addition to meeting all general requirements for admission to graduate study, applicants should normally hold a B.A. in Music or a B.Mus. A master's degree is not required, but students with prior graduate study may request course requirement waivers as detailed below under Course Requirements. Applicants must demonstrate proficiency in vocal or instrumental performance commensurate with at least two years of individual undergraduate instruction, including exposure to improvisation and non-notated music.

The online application must be submitted and all supporting materials must be received by December 1. Supporting materials must include the following: Composition portfolio, Academic writing sample, and Performance audition (video).

Applicants are expected to have good general knowledge of music history and music theory and competence in basic musicianship skills. Entering students will be given diagnostic tests in these areas prior to the beginning of classes and will be expected to remedy any evident deficiencies during the first year in residence.

## Required Courses

Students may request that specific course requirements be waived based on equivalent graduate coursework completed at other institutions, up to a maximum of 12 units. Such requests must be submitted in fall quarter of their first year and accompanied by relevant course syllabi and transcripts.

### A. Complete:

MUSIC 200	Bibliography and Research
MUSIC 235	Critical Studies in Music
MUSIC 250	Directed Research (at least two quarters) <sup>2</sup>
MUSIC 215A	Computer Music Composition and Production
MUSIC 212	Composition (two quarters)
MUSIC 276	Contemporary Ensemble (two quarters) <sup>2</sup>
MUSIC 239	Thesis Colloquium (one quarter for one unit per year until advancement to candidacy) <sup>1,2</sup>

### B. Select 44 units of additional courses chosen from the following: <sup>3</sup>

MUSIC 209	Seminar in Creative Practices
MUSIC 236	Theoretical ICIT Seminar
MUSIC 237	Practical ICIT Seminar
MUSIC 215B	Computer Music Programming
MUSIC 276	Contemporary Ensemble
MUSIC 230	Seminar in Contemporary Music
MUSIC 231	Improvisation
MUSIC 220	Seminar in Music History
MUSIC 201	Topics in Analysis

<sup>1</sup> May be taken for 2 units with permission of instructor, for students presenting research in progress.

<sup>2</sup> Not eligible for equivalency from another institution.

<sup>3</sup> May satisfy up to 8 units with an approved comparable graduate seminar in another department.

Assuming advancement to candidacy by the end of the third year, these requirements amount to 79 required units, leaving sufficient room for students to take additional coursework in other departments.

## Language Requirement

Before advancing to candidacy, Ph.D. students must demonstrate a reading knowledge of a language other than English, at a level sufficient to conduct research in that language. This requirement may be met either by attaining a passing score in a translation examination administered by the department or by earning a grade of B or higher in level 2C (representing ability equivalent to two full years) of an approved undergraduate language course.

## Advancement to Candidacy

The normative time for students to pass the Qualifying Examination and advance to candidacy is nine quarters (three years). Candidacy Committee chairs are assigned in the spring quarter of the first year of Ph.D. study. Students must sign up for two quarters of MUSIC 250 with their Candidacy Committee chair to prepare for qualifying exams. During these quarters of MUSIC 250, the student works with the Candidacy Committee chair to designate the remaining four committee members, and develops a dissertation prospectus to submit to the committee prior to the candidacy exam. The candidacy exam consists of a response of roughly 20 single-spaced pages to a set of questions provided by the committee, followed by an oral examination with the Candidacy Committee.

Students are not admitted to an M.A.-only program, but may be granted an M.A. in recognition of progress toward the Ph.D. by completing six quarters of ICIT coursework and submitting a portfolio of original musical work completed during that period.

## Dissertation

After advancing to candidacy, the normative time to degree is three quarters (one year). The dissertation committee is chaired by a member of the core ICIT faculty and must include at least one other member of the Senate faculty in Music. A third committee member must be a UC Senate faculty from outside the UCI Music Department, and a fourth member must be a qualified faculty from any department including Music.

The Ph.D. dissertation in ICIT combines innovative creative activity with scholarly research. The goal of the dissertation is to address a major intellectual issue in the integration of composition, improvisation, and technology, and to make an original contribution to existing knowledge of that issue through

research and new artistic work. The tangible product will be a written dissertation that presents and contextualizes substantial innovative work in integrated composition/improvisation/technology, and music of significant scope that clearly demonstrates that work.

## Music, B.A.

The **Bachelor of Arts (B.A.)** degree program enables students to study music history, music theory, composition, or performance within a curriculum that is flexible enough to allow for a second major, study abroad, and other curricular options.

All applicants, regardless of their degree objective, apply to the B.A. program and must demonstrate appropriate vocal or instrumental proficiency, as determined by the results of the Department's required entrance audition (typically scheduled on campus in late January or early February). *For the most up-to-date audition information, visit the Music Department website (<http://music.arts.uci.edu>).*

**All students must meet University Requirements.**

**School Requirements: None.**

Departmental Requirements—Common Curriculum: All courses must be completed with a grade of C- or higher, with an exception listed below.\*

**A student who does not receive a passing grade in the departmental Common Curriculum may retake the course one additional time. If the student does not pass the course on the second attempt, they will be dismissed from the music major.**

The **Bachelor of Arts (B.A.)** degree program enables students to study music history, music theory, composition, or performance within a curriculum that is flexible enough to allow for a second major, study abroad, and other curricular options. A senior thesis or project is required.

All applicants, regardless of their degree objective, apply to the B.A. program and must demonstrate appropriate vocal or instrumental proficiency, as determined by the results of the Department's required entrance audition (typically scheduled on campus in late January or early February). *For the most up-to-date audition information, visit the Music Department website (<http://music.arts.uci.edu>).*

A. Complete the following:

MUSIC 15A- 15B- 15C	Musicianship I and Musicianship II and Musicianship III
MUSIC 16A- 16B- 16C	Music Theory and Music Theory and Music Theory
MUSIC 16D	Theory/Musicianship
MUSIC 40B- 40C	History of European Music: From the Renaissance through the Baroque and History of European Music: Hasse to Mahler
MUSIC 40D	20th Century Music

\*Exception: MUSIC 40B, MUSIC 40C, MUSIC 40D must be completed with a grade of D or higher.

B. Select six quarters of instrumental or vocal instruction for Music majors from the following:

MUSIC 65–70

### Additional Requirements for the Bachelor of Arts Degree

In addition to completing the common curriculum, students in the B.A. program must pass the departmental piano proficiency examination or take three quarters of MUSIC 10 (Piano for Majors) with a grade of C or better and complete the following course requirements:

A. Select three courses in Theory, Composition, and Technology from the following:

MUSIC 153	Counterpoint
MUSIC 51	Music Technology and Computers
MUSIC 131	Post-Tonal Theory
MUSIC 132	Jazz Theory
MUSIC 136	Instrumentation
MUSIC 147	Studies in Music Technology
MUSIC 150	Composition
MUSIC 151	Computer Music Composition
MUSIC 152	Interactive Arts Programming
MUSIC 155	Analysis
MUSIC 157	Advanced Study in Composition
MUSIC 183A	Jazz Composition I
MUSIC 183B	Jazz Composition II

MUSIC 183C	Jazz Composition III
MUSIC 189	Accompanying for Plucked Strings: Continuo and Changes
B. Select three courses in Music and Culture (including at least two upper-division courses) from the following:	
AFAM 143	Topics in African American Music
AFAM 144	Topics in Expressive Forms
MUSIC 4	Introduction to Opera
MUSIC 8	The Beatles and the Sixties
MUSIC 9	Rock: The Early Years
MUSIC 41	Major Composer
MUSIC 42	Music and Gender
MUSIC 44	Classical Music in Society
MUSIC 45	History of Film Music
MUSIC 48	Introductory Topics in Music and Culture
MUSIC 78	History of Jazz
MUSIC 82A	MAHUR-Pish Radif: Introduction to Classical Persian Music
MUSIC 82B	HOMAYUN-Pish Radif: Introduction to Classical Persian Music
MUSIC 82C	SHUR-Pish Radif: Introduction to Classical Persian Music
MUSIC 140	Topics in Medieval Music
MUSIC 141	Topics in Renaissance Music
MUSIC 142	Topics in Baroque Music
MUSIC 143	Topics in Classical Music
MUSIC 144	Topics in Romantic Music
MUSIC 145	Topics in 20th Century Music
MUSIC 146	Studies in Jazz Music
MUSIC 148	Studies in Ethnomusicology
MUSIC 149	Studies in Music History
MUSIC 156A	Song Literature
MUSIC 156B	Song Literature
MUSIC 180	
MUSIC 181	Improvisation
C. Select six courses in Performance and Practice from the following:	
MUSIC 21A	Keyboard Skills
MUSIC 21B	Keyboard Skills
MUSIC 21C	Keyboard Skills
MUSIC 158A	Diction
MUSIC 158B	Diction
MUSIC 158C	Diction
MUSIC 160	University Orchestra
MUSIC 161	Wind Ensemble
MUSIC 162	University Chorus
MUSIC 164	Opera Workshop
MUSIC 171	Chamber Singers
MUSIC 176	Chamber Ensembles
MUSIC 178	Jazz Orchestra
MUSIC 182	Advanced Jazz Combo
MUSIC 193	Conducting
MUSIC 197	Word and Music
D. Depending upon the student's area of emphasis, one of the following BA projects (which may develop work originally completed in meeting the requirements of another course) must be completed:	
(1) a formal lecture or lecture/performance lasting a minimum of 20 minutes	
(2) a composition or portfolio of compositions of appropriate length growing out of work done in MUSIC 157	
(3) a thesis of at least 20 double-spaced pages on an appropriate musical subject	

Proposed projects, along with the name of the Senate faculty member who has agreed to supervise it, must be submitted to the undergraduate faculty advisor by November 1 of the academic year in which graduation is expected. Upon approval of the project proposal the student may register for up to two quarters of independent study (MUSIC 199) in which to complete the project.

**NOTE:** In order to cover the extra costs generated by private lesson instruction, the Claire Trevor School of the Arts charges a laboratory fee for students enrolled in such courses (MUSIC 65-70, MUSIC 165-170).

## Departmental Honors Program in Music and Culture

The Honors Program in Music and Culture is designed to challenge superior students in the B.A. or B.Mus. program beyond the academic requirements of the Music major. It provides them with the opportunity to advance their knowledge in the scholarly fields of music while developing their writing, analytical, and research skills. The honors program is ideally suited for students who wish to study music at the graduate level, but not in performance, and who may be preparing for graduate work in arts criticism, the humanities, the social sciences, and the law.

Eligibility requirements are (1) completion of the core requirements for the major; (2) an overall GPA of 3.5 or higher; and (3) completion of the eligibility form (available for download through the Departmental website).

Admission to the Honors Program in Music and Culture is competitive. Students must apply no later than the spring quarter of their junior year. The application should be accompanied by two substantial writing samples. These may represent work done for courses at UCI. Only truly exceptional students may undertake Honors projects.

Students who are admitted to the Honors Program, regardless of whether they are in the B.A. or B.Mus. program, are required to complete three additional courses in categories 1 and 2 under Additional Requirements for the Bachelor of Arts Degree beyond those taken in fulfillment of the core requirement; all three must be upper-division courses (numbered 100 or higher). Relevant upper-division courses in other departments may be taken to fulfill this requirement by approval of the Department Honors Committee.

The capstone project is a senior thesis, an extended original research project prepared under the supervision of the faculty advisor on a topic chosen by the student in consultation with that advisor. The thesis topic must be approved by the Departmental Honors Committee prior to the end of the fall quarter of the senior year. Students develop their topic during an ensuing two-quarter sequence of Senior Thesis (MUSIC 195A-MUSIC 195B). Upon successful completion of the thesis, a single grade is applied for both quarters and 4 units (total) are posted to the student's record (2 units each for MUSIC 195A and MUSIC 195B).

## Music, B.Mus.

The **Bachelor of Music (B.Mus.)** degree program provides pre-professional training in music performance and is designed for students who aspire to work as professional musicians. The B.Mus. program offers students the opportunity in their junior and senior years to specialize in piano performance, vocal performance, instrumental performance (flute, oboe, clarinet, bassoon, horn, trumpet, trombone, tuba, percussion, violin, viola, violoncello, double bass, and harp), jazz studies (piano, saxophone, trumpet, trombone, bass, and percussion), and guitar and lute performance. Students in this program receive weekly private instrumental or vocal instruction, and present a public solo recital during their senior year.

Admission to the B.Mus. degree program is by a second audition (the B.Mus. audition), typically taken in the spring quarter of the second year (for most students) or, in certain circumstances, in the first year (for third-year transfers only). The B.Mus. audition is evaluated by at least two members of the faculty. No student will be allowed to begin the B.Mus. program before having completed MUSIC 15A, MUSIC 15B, MUSIC 15C and MUSIC 16A, MUSIC 16B, MUSIC 16C (or their equivalents at another institution).

In addition to completing the common curriculum, students in the B.Mus. program must pass the departmental piano proficiency examination, perform a senior recital (and, for voice students only, a junior recital), and complete the following course requirements:

A. Select three courses in Theory, Composition, and Technology from the following:

MUSIC 155	Analysis
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and select two others from the following:

MUSIC 153	Counterpoint
MUSIC 51	Music Technology and Computers
MUSIC 131	Post-Tonal Theory
MUSIC 132	Jazz Theory
MUSIC 136	Instrumentation
MUSIC 147	Studies in Music Technology
MUSIC 150	Composition
MUSIC 151	Computer Music Composition
MUSIC 152	Interactive Arts Programming
MUSIC 157	Advanced Study in Composition
MUSIC 183A	Jazz Composition I

MUSIC 183B	Jazz Composition II
MUSIC 183C	Jazz Composition III
MUSIC 189	Accompanying for Plucked Strings: Continuo and Changes
B. Select three courses in Music and Culture from the following:	
AFAM 143	Topics in African American Music
AFAM 144	Topics in Expressive Forms
MUSIC 41	Major Composer
MUSIC 42	Music and Gender
MUSIC 44	Classical Music in Society
MUSIC 45	History of Film Music
MUSIC 48	Introductory Topics in Music and Culture
MUSIC 82A	MAHUR-Pish Radif: Introduction to Classical Persian Music
MUSIC 82B	HOMAYUN-Pish Radif: Introduction to Classical Persian Music
MUSIC 82C	SHUR-Pish Radif: Introduction to Classical Persian Music
MUSIC 140	Topics in Medieval Music
MUSIC 141	Topics in Renaissance Music
MUSIC 142	Topics in Baroque Music
MUSIC 143	Topics in Classical Music
MUSIC 144	Topics in Romantic Music
MUSIC 145	Topics in 20th Century Music
MUSIC 146	Studies in Jazz Music
MUSIC 148	Studies in Ethnomusicology
MUSIC 149	Studies in Music History
MUSIC 180	
MUSIC 181	Improvisation
C. Select six quarters of instrumental or vocal instruction for Music Performance majors from the following:	
MUSIC 165–170	
D. Completion of the following courses according to the approved Bachelor of Music specialization:	
Guitar and Lute:	
MUSIC 176	Chamber Ensembles (every quarter in residence)
Jazz Studies:	
MUSIC 78	History of Jazz
MUSIC 132	Jazz Theory
MUSIC 160	University Orchestra (or MUSIC 161 Wind Ensemble or MUSIC 178 Jazz Orchestra, every quarter in residence)
MUSIC 176	Chamber Ensembles (or MUSIC 182 Advanced Jazz Combo, every quarter in residence)
Piano:	
MUSIC 21A	Keyboard Skills
MUSIC 21B	Keyboard Skills
MUSIC 21C	Keyboard Skills
MUSIC 122A	Piano Literature
MUSIC 122B	Piano Literature
MUSIC 122C	Piano Literature
MUSIC 126	Piano Pedagogy
MUSIC 176	Chamber Ensembles (six quarters, as assigned by the Department)
Select three quarters of the following as assigned by the Department:	
MUSIC 162P	University Chorus: Accompanying
or MUSIC 164P	Opera Workshop: Accompanying
or MUSIC 166P	String Accompaniment
or MUSIC 197	Word and Music
Transfer students must complete six quarters of chamber ensembles and/or accompanying in residence.	



Voice:

MUSIC 156A	Song Literature
MUSIC 156B	Song Literature
MUSIC 158A	Diction
MUSIC 158B	Diction
MUSIC 158C	Diction
MUSIC 164	Opera Workshop (two quarters)
Select nine quarters of choral ensembles (minimum of three quarters for junior transfers; minimum of six quarters for sophomore transfers) from the following:	
MUSIC 162	University Chorus
MUSIC 171	Chamber Singers

Woodwinds, Brass, Percussion, and Strings:

MUSIC 160	University Orchestra (or MUSIC 161 Wind Ensemble, every quarter in residence)
MUSIC 176	Chamber Ensembles (every quarter in residence)

**NOTE:** In order to cover the extra costs generated by private lesson instruction, the Claire Trevor School of the Arts charges a laboratory fee for students enrolled in such courses (MUSIC 65-70, MUSIC 165-170).

## Departmental Honors Program in Music and Culture

The Honors Program in Music and Culture is designed to challenge superior students in the B.A. or B.Mus. program beyond the academic requirements of the Music major. It provides them with the opportunity to advance their knowledge in the scholarly fields of music while developing their writing, analytical, and research skills. The honors program is ideally suited for students who wish to study music at the graduate level, but not in performance, and who may be preparing for graduate work in arts criticism, the humanities, the social sciences, and the law.

Eligibility requirements are (1) completion of the core requirements for the major; (2) an overall GPA of 3.5 or higher; and (3) completion of the eligibility form (available for download through the Departmental website).

Admission to the Honors Program in Music and Culture is competitive. Students must apply no later than the spring quarter of their junior year. The application should be accompanied by two substantial writing samples. These may represent work done for courses at UCI. Only truly exceptional students may undertake Honors projects.

Students who are admitted to the Honors Program, regardless of whether they are in the B.A. or B.Mus. program, are required to complete three additional courses in categories 1 and 2 under Additional Requirements for the Bachelor of Arts Degree beyond those taken in fulfillment of the core requirement; all three must be upper-division courses (numbered 100 or higher). Relevant upper-division courses in other departments may be taken to fulfill this requirement by approval of the Department Honors Committee.

The capstone project is a senior thesis, an extended original research project prepared under the supervision of the faculty advisor on a topic chosen by the student in consultation with that advisor. The thesis topic must be approved by the Departmental Honors Committee prior to the end of the fall quarter of the senior year. Students develop their topic during an ensuing two-quarter sequence of Senior Thesis (MUSIC 195A-MUSIC 195B). Upon successful completion of the thesis, a single grade is applied for both quarters and 4 units (total) are posted to the student's record (2 units each for MUSIC 195A and MUSIC 195B).

## Music, M.F.A.

The Department of Music offers an M.F.A. in Music with emphases in Choral Conducting, Collaborative Piano, Guitar/Lute Performance, Instrumental Performance, Piano Performance, and Vocal Arts. The graduate curriculum provides courses in music analysis, history, theory, critical studies, and research in addition to intensive performance training.

### Admission

In addition to meeting all general requirements for admission to graduate study, applicants should hold a B.A. in Music, a B.Mus., or the equivalent.

The online application must be submitted and all supporting materials must be received by January 15. Late applications cannot be considered. Supporting materials must include at least one substantial writing sample, preferably on a musical subject. This requirement may be fulfilled by the submission of an undergraduate paper of appropriate scope, preferably on a musical topic.

Applicants must audition for members of the Music faculty by February 1. In exceptional cases (as approved in advance by the departmental graduate advisor), a recently recorded performance may be accepted in lieu of a live audition. Applicants in composition must, in addition, submit a representative sample of scores and recordings of their works.



Applicants are expected to have good general knowledge of music history and music theory, competence in basic musicianship skills, including sight-singing, written and keyboard harmony, dictation, and basic keyboard facility (including sight-reading). Entering students will be given diagnostic tests in music theory prior to the beginning of classes and will be advised to remedy any evident deficiencies during the first year in residence by registering for the appropriate undergraduate courses or through other appropriate means. Credit earned in such courses cannot be counted toward fulfillment of any degree requirement.

## General Degree Requirements

Course requirements may be fulfilled only by graduate courses (numbered 200 and higher) and upper-division undergraduate courses (numbered 100 and higher), and only by those courses in which a grade of B or higher has been earned.

All students must complete the graduate core curriculum in bibliography (MUSIC 200). All students, except for those in Vocal Arts, must register for tutorial study in the major field (MUSIC 210, MUSIC 211, or MUSIC 212) during every quarter in residence. Students in the emphasis in Vocal Arts must register for MUSIC 211 every quarter for a minimum of 24 units. Students in the emphasis in Instrumental Performance must enroll in an approved large ensemble during every quarter in residence.

Students enrolled in the emphasis in Choral Conducting, Collaborative Piano, Piano Performance, and Vocal Arts must fulfill a foreign language requirement, as described in the individual emphasis descriptions below. This requirement may be met either by attaining a passing score in the departmental examination or by earning a grade of B or higher in level 2A of an approved undergraduate language course.

All students must pass the Comprehensive Examination (normally taken during the fifth quarter in residence) and perform one or more public recitals. Details are found in the individual emphasis descriptions below.

The normative time to degree for students in the M.F.A. program is two years. Residence is required. The normative time to degree can be extended to three years only through a petition to the Chair of the Department. The maximum time to degree is three years. Students who do not complete the degree in three years will be dropped from the program.

## Individual Emphasis Requirements

### Choral Conducting

*Languages:* Reading knowledge of French, German, or Italian.

*Course Work:*

A. Complete the following:

MUSIC 131	Post-Tonal Theory
MUSIC 158A- 158B- 158C	Diction and Diction and Diction <sup>1</sup>
MUSIC 200	Bibliography and Research
MUSIC 201	Topics in Analysis
MUSIC 210	Choral Conducting (every quarter in residence, maximum 24 units)

B. Select three seminars from the following:

MUSIC 220	Seminar in Music History
MUSIC 230	Seminar in Contemporary Music
MUSIC 235	Critical Studies in Music
MUSIC 236	Theoretical ICIT Seminar

C. Twelve units of electives, selected with advisor.

MUSIC 214	Graduate Recital
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<sup>1</sup> Note: This requirement is waived for students who demonstrate competence in this area by passing a diagnostic exam, in which case these 6 units are taken as electives

The total number of units for the specific course requirements that must be completed with a grade of at least B is 66.

*Comprehensive Examination:* This is a special field exam, related to (but not limited to) repertoire selected for the Graduate Recital. It is taken no later than March of the second year. The graduate committee sets the exam 24 hours in advance; the student makes an oral presentation and then fields the committee's questions.

### Collaborative Piano

*Languages:* Reading knowledge of French, German, Italian, or Spanish.

*Course Work:*

## A. Complete the following:

MUSIC 131	Post-Tonal Theory
MUSIC 156A- 156B	Song Literature and Song Literature
MUSIC 158A- 158B- 158C	Diction and Diction and Diction <sup>1</sup>
MUSIC 176	Chamber Ensembles (6 units)
MUSIC 200	Bibliography and Research
MUSIC 201	Topics in Analysis
MUSIC 211	Performance (every quarter in residence, maximum 24 units)

## B. Select one seminar from the following:

MUSIC 220	Seminar in Music History
MUSIC 230	Seminar in Contemporary Music
MUSIC 235	Critical Studies in Music
MUSIC 236	Theoretical ICIT Seminar

## C. Two Graduate Recitals:

MUSIC 214	Graduate Recital (one instrumental and one vocal)
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<sup>1</sup> Note: This requirement is waived for students who demonstrate competence in this area by passing a diagnostic exam, in which case these 6 units are taken as electives.

The total number of units for the specific course requirements that must be completed with a grade of at least B is 53.

*Comprehensive Examination:* This is a special field exam, related to (but not limited to) repertoire selected for the Graduate Recitals. It is taken no later than March of the second year. The graduate committee sets the exam 24 hours in advance; the student makes an oral presentation and then fields the committee's questions.

**Guitar/Lute Performance***Course Work:*

## A. Complete the following:

MUSIC 131	Post-Tonal Theory
MUSIC 176	Chamber Ensembles (6 units)
MUSIC 189	Accompanying for Plucked Strings: Continuo and Changes (taken three times)
MUSIC 200	Bibliography and Research
MUSIC 201	Topics in Analysis
MUSIC 211	Performance (every quarter in residence, maximum of 24 units)
MUSIC 214	Graduate Recital <sup>1</sup>
MUSIC 240	Graduate Projects

## B. Select two seminars from the following:

MUSIC 220	Seminar in Music History
MUSIC 230	Seminar in Contemporary Music
MUSIC 235	Critical Studies in Music
MUSIC 236	Theoretical ICIT Seminar

<sup>1</sup> Note: The recital is supported by a written essay, presented in advance of the Comprehensive Examination.

The total number of units for the specific course requirements that must be completed with a grade of at least B is 57.

*Comprehensive Examination:* This is a special field exam, related to (but not limited to) repertoire selected for the Graduate Recital. It is taken no later than March of the second year. The graduate committee sets the exam 24 hours in advance; the student makes an oral presentation and then fields the committee's questions.

**Instrumental Performance***Course Work:*

A. Complete the following:

MUSIC 131	Post-Tonal Theory
MUSIC 160	University Orchestra (taken every quarter in residence, maximum of 12 units)
or MUSIC 161	Wind Ensemble
MUSIC 176	Chamber Ensembles (6 units)
MUSIC 200	Bibliography and Research
MUSIC 201	Topics in Analysis
MUSIC 211	Performance (every quarter in residence, maximum of 24 units)
MUSIC 214	Graduate Recital

B. Select two seminars from the following:

MUSIC 220	Seminar in Music History
MUSIC 230	Seminar in Contemporary Music
MUSIC 235	Critical Studies in Music
MUSIC 236	Theoretical ICIT Seminar

The total number of units for the specific course requirements that must be completed with a grade of at least B is 59.

*Comprehensive Examination:* This is a special field exam, related to (but not limited to) repertoire selected for the Graduate Recital. It is taken no later than March of the second year. The graduate committee sets the exam 24 hours in advance; the student makes an oral presentation and then fields the committee's questions.

### Piano Performance

*Languages:* Reading knowledge of French, German, Italian, or Spanish.

*Course Work:*

A. Complete the following:

MUSIC 131	Post-Tonal Theory
MUSIC 176	Chamber Ensembles (6 units)
MUSIC 200	Bibliography and Research
MUSIC 201	Topics in Analysis
MUSIC 211	Performance (every quarter in residence, maximum of 24 units)
MUSIC 214	Graduate Recital (twice)

B. Select two seminars from the following:

MUSIC 220	Seminar in Music History
MUSIC 230	Seminar in Contemporary Music
MUSIC 235	Critical Studies in Music
MUSIC 236	Theoretical ICIT Seminar

C. Four units of electives, selected with advisor (upper-division or graduate, Music or non-Music).

The total number of units for the specific course requirements that must be completed with a grade of at least B is 51.

*Comprehensive Examination:* This is a special field exam, related to (but not limited to) repertoire selected for the Graduate Recitals. It is taken no later than March of the second year. The graduate committee sets the exam 24 hours in advance; the student makes an oral presentation and then fields the committee's questions.

### Vocal Arts

*Languages:* Reading knowledge of French, German, Italian, or Spanish.

*Course Work:*

A. Complete the following:

MUSIC 158A	Diction
MUSIC 158B	Diction
MUSIC 158C	Diction
MUSIC 164	Opera Workshop (4 units)
MUSIC 200	Bibliography and Research

MUSIC 211	Performance (every quarter, minimum of 24 units)
MUSIC 214	Graduate Recital
B. Select one of the following:	
MUSIC 131	Post-Tonal Theory
MUSIC 201	Topics in Analysis
C. Select two seminars from the following:	
MUSIC 140	Topics in Medieval Music
MUSIC 141	Topics in Renaissance Music
MUSIC 142	Topics in Baroque Music
MUSIC 143	Topics in Classical Music
MUSIC 144	Topics in Romantic Music
MUSIC 145	Topics in 20th Century Music
MUSIC 146	Studies in Jazz Music
MUSIC 147	Studies in Music Technology
MUSIC 148	Studies in Ethnomusicology
MUSIC 220	Seminar in Music History
MUSIC 230	Seminar in Contemporary Music
MUSIC 235	Critical Studies in Music
MUSIC 236	Theoretical ICIT Seminar
D. Complete four units of electives selected with advisor (upper-division or graduate, music or non-music, lower-division acceptable for language study).	

The total number of units for the specific course requirements that must be completed with a grade of at least B is 52.

*Comprehensive Examination:* This is a special field exam, related to (but not limited to) repertoire selected for the Graduate Recital. It is taken no later than March of the second year. The graduate committee sets the exam 24 hours in advance; the student makes an oral presentation and then fields the committee's questions.

# Department of Pharmaceutical Sciences

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**Jan Hirsch, Dean**

**A. Richard Chamberlin, Department of Pharmaceutical Sciences Chair**

**Alexandre Chan, Department of Clinical Pharmacy Practice Chair**

209 Steinhaus Hall

949-824-1991

<http://www.pharmsci.uci.edu>

The Department of Pharmaceutical Sciences offers undergraduate and PhD & MSP students unparalleled training for future careers in biomedical research, pharmacy, medicine, and various other positions within the health sciences and pharmaceutical industry. Our innovative, rigorous curriculum integrates concepts from biology, chemistry, chemical engineering, pharmacology and physiology, and collaborative interdisciplinary research is supported by joint faculty appointments shared with other UCI departments. Alumni pursue exciting professional opportunities that improve our society's health and well-being.

## Honors

**Undergraduate Honors.** Honors at graduation, e.g., *cum laude*, *magna cum laude*, *summa cum laude*, are awarded to approximately the top 16 percent of the graduating seniors. To be eligible for honors, a general criterion is that students must have completed at least 72 units in residence at a University of California campus. Other important factors are considered visit at Honors Recognition.

- Pharmaceutical Sciences, B.S.
- Pharmacological Sciences, Ph.D.
- Pharmacology, M.S.

## Faculty

Amal Alachkar, Ph.D. University of Manchester, *Associate Professor of Teaching of Pharmaceutical Sciences* (neurotransmitter systems, molecular pharmacology, neuropsychopharmacology)

Kevin T. Beier, Ph.D. Harvard University, *Assistant Professor of Physiology and Biophysics; Pharmaceutical Sciences*

James D. Belluzzi, Ph.D. University of Chicago, *Adjunct Professor of Pharmaceutical Sciences*

Claudia Benavente, Ph.D. University of Arizona, *Assistant Professor of Pharmaceutical Sciences; Developmental and Cell Biology* (genetics, epigenetics, cancer, pediatric cancer, retinoblastoma, osteosarcoma)

Bruce Blumberg, Ph.D. University of California, Los Angeles, *Professor of Developmental and Cell Biology; Biomedical Engineering; Environmental Health Sciences; Pharmaceutical Sciences* (gene regulation by nuclear hormone receptors in vertebrate development physiology, endocrine disruption)

Emiliana Borrelli, Ph.D. University of Strasbourg, *Chancellor's Professor of Microbiology and Molecular Genetics; Pharmaceutical Sciences*

Rémi Buisson, Ph.D. Université Laval, *Assistant Professor of Biological Chemistry; Pharmaceutical Sciences*

A. Richard Chamberlin, Ph.D. University of California, San Diego, *Department Chair and Professor Emeritus of Pharmaceutical Sciences; Chemistry* (chemical biology, organic and synthetic)

Alexandre Chan, Pharm.D. Rutgers University, *Department Chair and Professor of Clinical Pharmacy Practice*

John Charles Chaput, Ph.D. University of California, Riverside, *Professor of Pharmaceutical Sciences; Chemistry; Molecular Biology and Biochemistry* (chemical and synthetic biology)

Olivier Civelli, Ph.D. Swiss Federal Institute of Technology in Zurich, *Professor of Pharmaceutical Sciences; Developmental and Cell Biology* (novel neuroactive molecules, molecular neuropharmacology)

Melanie Cocco, Ph.D. Pennsylvania State University, *Associate Professor of Molecular Biology and Biochemistry; Pharmaceutical Sciences*

Dan M. Cooper, M.D. University of California, San Francisco, *Senior Associate Dean, Clinical Translational Science and Associate Vice Chancellor, Clinical Translational Research and Professor of Pediatrics; Biomedical Engineering; Pharmaceutical Sciences*

Sue P. Duckles, Ph.D. University of California, San Francisco, *Professor Emeritus of Pharmaceutical Sciences*

John P. Fruehauf, M.D. Rush University, *Professor Emeritus of Medicine; Pharmaceutical Sciences*

Kelvin W. Gee, Ph.D. University of California, Davis, *Professor of Pharmaceutical Sciences*

Celia Goulding, Ph.D. King's College London, *Professor of Molecular Biology and Biochemistry; Pharmaceutical Sciences*

Stephen Hanessian, Ph.D. Ohio State University, *Professor of Pharmaceutical Sciences; Chemistry* (organic chemistry, medicinal chemistry)

Jan Hirsch, Ph.D. University of South Carolina, *Director and Founding Dean and Professor of Clinical Pharmacy Practice*

Naoto Hoshi, Ph.D. Kanazawa University, *Associate Professor of Pharmaceutical Sciences; Physiology and Biophysics*

Lan Huang, Ph.D. University of Florida, *Professor of Physiology and Biophysics; Biological Chemistry; Biomedical Engineering; Pharmaceutical Sciences*

Mahtab F. Jafari, Pharm.D. University of California, San Francisco, *Director of the Center for Healthspan Pharmacology and Professor of Pharmaceutical Sciences; Ecology and Evolutionary Biology* (anti-aging pharmacology and preventive medicine)

Diana N. Krause, Ph.D. University of California, Los Angeles, *Adjunct Professor of Pharmaceutical Sciences*

Young Jik Kwon, Ph.D. University of Southern California, *Professor of Pharmaceutical Sciences; Biomedical Engineering; Chemical and Biomolecular Engineering; Molecular Biology and Biochemistry* (gene therapy, drug delivery, cancer-targeted therapeutics, artificially-induced cellular vesicles, multi-modal therapies)

Frances L. Leslie, Ph.D. University of Aberdeen, *Professor Emeritus of Pharmaceutical Sciences*

Anthony D. Long, Ph.D. McMaster University, *Professor of Ecology and Evolutionary Biology; Pharmaceutical Sciences*

Shahrdad Lotfipour, Ph.D. University of California, Irvine, *Assistant Professor of Emergency Medicine; Pharmaceutical Sciences*

Zhigang D. Luo, M.D., Ph.D. State University of New York at Buffalo, *Professor of Anesthesiology and Perioperative Care; Pharmacology*

Andrej Luptak, Ph.D. Yale University, *Professor of Pharmaceutical Sciences; Chemistry; Molecular Biology and Biochemistry* (chemical biology)

Sarah McBane, Pharm.D. University of North Carolina at Chapel Hill, *Health Sciences Clinical Professor of Clinical Pharmacy Practice*

David L. Mobley, Ph.D. University of California, Davis, *Vice Chair and Professor of Pharmaceutical Sciences; Chemistry* (chemical biology, physical chemistry and chemical physics, theoretical and computational)

Trina Norden-Krichmar, Ph.D. University of California, San Diego, *Assistant Professor of Epidemiology; Biological Chemistry; Computer Science; Pharmaceutical Sciences*

James S. Nowick, Ph.D. Massachusetts Institute of Technology, *Professor of Chemistry; Pharmaceutical Sciences* (chemical biology, organic and synthetic, polymer, materials, nanoscience)

Brian Paegel, Ph.D. University of California, Berkeley, *Professor of Pharmaceutical Sciences* (chemical biology, drug discovery, drug discovery, miniaturization, evolution)

Daniele Piomelli, Ph.D. Columbia University, *Louise Turner Arnold Chair in the Neurosciences and Distinguished Professor of Anatomy and Neurobiology; Biological Chemistry; Pharmaceutical Sciences*

Lawrence Plon, Pharm.D. M.A. University of Southern California, *Assistant Adjunct Professor of Pharmaceutical Sciences*

Thomas L. Poulos, Ph.D. University of California, San Diego, *Distinguished Professor of Molecular Biology and Biochemistry; Chemistry; Pharmaceutical Sciences* (chemical biology)

Jennifer A. Prescher, Ph.D. University of California, Berkeley, *Professor of Chemistry; Molecular Biology and Biochemistry; Pharmaceutical Sciences* (chemical biology, organic and synthetic)

Ralph Purdy, Ph.D. University of California, Los Angeles, *Professor Emeritus of Pharmaceutical Sciences*

Paolo Sassone-Corsi, Ph.D. University of Naples Federico II, *Donald Bren Professor and Distinguished Professor of Biological Chemistry; Microbiology and Molecular Genetics; Pharmaceutical Sciences*

Samuel E. Schriener, Ph.D. University of Washington, *Vice Chair and Assistant Professor of Teaching of Pharmaceutical Sciences* (aging, genetics, biochemistry, mitochondria)

Robert Spitale, Ph.D. University of Rochester, *Director of the UCI Transcriptomics Core and Associate Professor of Pharmaceutical Sciences; Chemistry; Molecular Biology and Biochemistry* (chemistry, chemical biology, RNA biology)

Shiou-Chuan (Sheryl) Tsai, Ph.D. University of California, Berkeley, *Professor of Molecular Biology and Biochemistry; Chemistry; Pharmaceutical Sciences*

Christopher Vanderwal, Ph.D. Scripps Research Institute, *Professor of Chemistry; Pharmaceutical Sciences* (organic and synthetic)

Gregory A. Weiss, Ph.D. Harvard University, *Professor of Chemistry; Molecular Biology and Biochemistry; Pharmaceutical Sciences* (analytical, chemical biology, organic and synthetic, polymer, materials, nanoscience)

Weian Zhao, Ph.D. McMaster University, *Associate Professor of Pharmaceutical Sciences; Biological Chemistry; Biomedical Engineering; Materials Science and Engineering* (stem cell therapy, diagnostics, biosensors, immunotherapy, single-cell analysis)

Qun-Yong Zhou, Ph.D. Oregon Health & Science University, *Professor of Pharmaceutical Sciences*

Xiaolin Zi, Ph.D. Shanghai University, *Associate Professor of Urology; Pharmaceutical Sciences*

## Medical Pharmacology Courses

### **PHARM 241. Advanced Topics in Pharmacology. 2 Units.**

Application of pharmacological principles in disease therapy. Advanced pharmacological mechanisms and in-depth study of drug action. Discussion of several major drug classes/therapeutic strategies: molecular mechanisms of action, physiological consequences of administration, and clinical use.

### **PHARM 251. Experimental Pharmacology. 4 Units.**

Introduction to the concepts and techniques used in pharmacological science. Molecular biology, quantitative and biochemical pharmacology, fluorescent probes, behavior, genetics, animal handling, anatomical and receptor binding analysis, methods for ion channel study, the absorption, distribution, metabolism and elimination of drugs.

### **PHARM 254. Introduction to Pharmacology. 4 Units.**

Ligand-gated ion channels, G protein-coupled receptors, receptor tyrosine kinases, ligand-regulated transcription factors, their signaling mechanisms, trafficking, macromolecular complexes, and physiological responses.

### **PHARM 255. Neuropharmacology. 2 Units.**

Mechanisms underlying chemical signaling processes in the brain and periphery. Molecular biology, signal transduction, transmitter synthesis, and inactivation of major neurotransmitter systems. Drugs that act on these major neurotransmitters.

Restriction: Graduate students only.

### **PHARM 256. Experimental Design for Pharmacologists. 1 Unit.**

Population and sample statistics, hypothesis testing, analysis of variance, nonparametric statistics, experimental design, power, and the use of statistical computer software.

Prerequisite: PHARM 251

### **PHARM 257. Ethics in Research. 1 Unit.**

Ethical conduct in research including data handling, authorship, conflict of interest, animal rights, handling of misconduct.

Prerequisite: PHARM 299

Repeatability: May be taken for credit 2 times.

### **PHARM 270. Applied Pharmacology . 3 Units.**

One week (five days, 40 hours) in-residence course offered on the UCI campus. Introduction to pharmacological techniques and current research problems; includes laboratory demonstrations and research seminars.

Restriction: Pharmacology Majors only.

### **PHARM 271. Principles of Pharmacology . 3 Units.**

Principles of pharmacology: pharmacodynamics, pharmacokinetics, pharmacogenetics, drug interactions, and toxicity.

Restriction: Pharmacology Majors only.

### **PHARM 272. Receptors and Drug Targets . 3 Units.**

Molecular basis of drug-receptor interaction. Receptor properties including gene and protein structure, signaling mechanisms, trafficking and physiological effects: G-protein linked receptors, ligand-gated ion channels, receptor tyrosine kinases, nuclear receptors, and ligand regulated transcription factors.

Restriction: Pharmacology Majors only.



**PHARM 274. Research Techniques in Pharmacology. 3 Units.**

Experimental techniques and model systems used in pharmacological research. Receptor analysis, bioassay, molecular biology, in vitro pharmacology, biochemical pharmacology, imaging, electrophysiology, in vivo pharmacology, disease models.

Restriction: Pharmacology Majors only.

**PHARM 276. Experimental Design and Data Analysis . 3 Units.**

Experimental design, data analysis and interpretation. Population and sample statistics, hypothesis testing, analysis of variance, nonparametric statistics, and power calculations.

Restriction: Pharmacology Majors only.

**PHARM 277. Ethics in Scientific Research. 3 Units.**

Ethical conduct in research including data handling, authorship, conflict of interest, animal rights, and handling of misconduct.

Restriction: Pharmacology Majors only.

**PHARM 278. Concepts in Drug Discovery. 3 Units.**

Critical steps involved in discovery and optimization of a new drug. Target selection, relationship of molecular structure to pharmacological activities, screening methods, strategies to identify lead compounds, and preclinical characterization necessary for development of the drug for clinical trials.

Restriction: Pharmacology Majors only.

**PHARM 279. Special Topics in Pharmacology. 3 Units.**

Topics of current interest in pharmacology; discussion of recent research publications.

Restriction: Pharmacology Majors only.

**PHARM 280. Master's Project in Pharmacology. 3 Units.**

Capstone research paper on topic of interest in pharmacology.

Restriction: Pharmacology Majors only.

**PHARM 281. Neuropharmacology . 3 Units.**

Autonomic and central nervous system pharmacology, including major drug classes and therapeutic uses. Mechanisms underlying chemical signaling processes in the brain and peripheral nervous system, including neurotransmitter synthesis, inactivation, and receptor action.

Restriction: Pharmacology Majors only.

**PHARM 282. Behavioral Pharmacology. 3 Units.**

Pharmacology of integrative function and behavior. Drug treatment of pain. Mechanisms of reward, addiction, and drugs of abuse.

Restriction: Pharmacology Majors only.

**PHARM 283. Cardiovascular Pharmacology. 3 Units.**

Basic understanding of drugs used in the prevention and treatment of cardiovascular disease. Mechanisms of action, clinical and adverse effects.

Restriction: Pharmacology Majors only.

**PHARM 284. Endocrine, Respiratory, and Gastrointestinal Pharmacology . 3 Units.**

Basic understanding of drugs used in endocrine, respiratory, and gastrointestinal conditions, including hormone replacement, contraceptives, and drugs for diabetes, asthma, obesity, ulcer, and gastric reflux. Mechanisms of drug action, clinical and adverse effects.

Restriction: Pharmacology Majors only.

**PHARM 298. Seminar. 2 Units.**

Presentation and discussion of current problems and methods in teaching and research in pharmacology, toxicology, and therapeutics.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHARM 299. Research. 1-12 Units.**

Independent research with Pharmacology and Toxicology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.



## Pharmaceutical Sciences Courses

### **PHRMSCI 1. New Student Seminar. 1 Unit.**

Weekly meetings consisting of presentations by faculty, professional staff, and Peer Academic Advisors provide information about the Pharmaceutical Sciences major, campus resources, learning skills, and special programs and opportunities.

Grading Option: Pass/no pass only.

Restriction: Pharmaceutical Sciences Majors only. New students only.

### **PHRMSCI 3. Professional Development and Careers in the Pharmaceutical Sciences. 1 Workload Unit.**

Designed to help Pharmaceutical Science majors select a career track and prepare for graduate program applications and careers in industry.

Grading Option: Workload Credit Letter Grade with P/NP.

Restriction: Juniors only. Pharmaceutical Sciences Majors only.

### **PHRMSCI 42. Life 101 . 2 Units.**

Covers the latest scientific work on the impact of nutrition, exercise, and lifestyle choices on mental and physical health. Motivates students to make positive changes by fostering personal growth.

### **PHRMSCI 76. Ethical Conduct of Research. 2 Units.**

Covers the ethical responsibilities of biomedical scientists. Topics include, as discussions and case studies, the high standards of science, the responsible conduct of research, animal experimentation, and clinical trials as they relate to the pharmaceutical sciences.

### **PHRMSCI H80. Drugs and Society. 4 Units.**

Where drugs come from, how drugs work, how and why people abuse drugs, the costs of drug abuse on society, which drugs are commonly abused, and how drug abuse can be prevented and treated. Course intended for non-science majors.

Prerequisite: Recommended: High school chemistry and biology.

Restriction: Campuswide Honors Collegium students only.

## **(II)**

### **PHRMSCI 90. Speaking about Science. 4 Units.**

Students learn to effectively prepare and present public speeches and slide presentations. Included are storytelling, informative, commemorative, and persuasive speeches, and scientific presentation. Evaluating speeches and strategies to reduce speaker apprehension is also covered.

Restriction: Pharmaceutical Sciences Majors have first consideration for enrollment.

### **PHRMSCI 120. Human Physiology. 4 Units.**

Covers the function of the human body. All major organ systems are discussed. Designed to prepare students for healthcare careers, such as medicine, pharmacy, dentistry, and for research careers which require basic knowledge of how the human body functions.

Corequisite: PHRMSCI 120L

Prerequisite: BIO SCI 99

Overlaps with BIO SCI E109.

### **PHRMSCI 120L. Human Physiology Lab. 3 Units.**

Designed to complement PHRMSCI 120. Computer-based lab simulations will be used to study the function of the human body. Class will physically meet for review sessions and exams.

Corequisite: PHRMSCI 120

Prerequisite: BIO SCI E109

Overlaps with BIO SCI E112L.

### **PHRMSCI 142. Healthspan Sciences. 4 Units.**

Covers the complex and multi-factorial process of aging and increases the understanding of factors that contribute to enhanced lifespan, including basic principles of health and wellness and scientifically proven interventions, both pharmacological and non-pharmacological.

Prerequisite: BIO SCI 98 and BIO SCI 99 and PHRMSCI 120

Restriction: Upper-division students only.

**PHRMSCI 155. Neuropsychopharmacology. 4 Units.**

Mechanisms underlying chemical signaling processes in the nervous system. Fundamental knowledge for understanding the cellular and molecular actions of drugs and their mechanisms of action on synaptic transmission. Applied neuropsychopharmacology including major drug classes and therapeutic uses.

Prerequisite: PHRMSCI 170A. PHRMSCI 170A with a grade of C- or better

Restriction: Upper-division students only.

**PHRMSCI 163. Pharmacogenomics and Epigenetics. 4 Units.**

Survey of the genetic and epigenetic basis of inter-subject variability in response to drugs. Covers drug efficacy, safety, and need for their optimization in pharmacotherapy. Emphasizes genetic mechanisms of polymorphisms in the pharmacokinetics and pharmacodynamics of representative therapeutic drugs.

Prerequisite: BIO SCI 99

Concurrent with PHRMSCI 263.

**PHRMSCI 170A. Molecular Pharmacology I. 4 Units.**

Molecular basis of drug-receptor action at the molecular and cellular levels. Structure-function of drug targets emphasizing enzymes, ion channels, and membrane transport proteins. Understanding how the drugs' mechanisms of action contribute to the development of more efficacious and safer drugs.

Prerequisite or corequisite: (CHEM 51C or CHEM H52C) and (PHRMSCI 120 or BIO SCI E109)

Restriction: Pharmaceutical Sciences Majors have first consideration for enrollment.

**PHRMSCI 170B. Molecular Pharmacology II. 4 Units.**

Introductory survey covering the molecular mechanisms of drugs that target the nervous system, such as anxiolytics, antidepressants, antipsychotics, hypnotics, muscle relaxants, and recreational drugs; drugs related to the immune system, including antibiotics, antihistamines, and immunosuppressants; drugs used to treat cancer.

Prerequisite: PHRMSCI 170A

**PHRMSCI 171. Physical Biochemistry. 4 Units.**

Thermodynamics and kinetic fundamentals as applied to problems relevant to pharmaceutical sciences such as receptor/enzyme-ligand interactions. Fundamentals of biophysical methods used in the pharmaceutical sciences including structure determination and biomolecular spectroscopy.

Prerequisite: MATH 2B and PHYSICS 3C and (CHEM 1C or CHEM H2C) and BIO SCI 99

Restriction: Pharmaceutical Sciences Majors have first consideration for enrollment.

**PHRMSCI 172. Topics in Pharmaceutical Sciences. 2 Units.**

Presents information about various fields of research, study, careers, and graduate school opportunities in pharmaceutical sciences. Taught by guest lecturers from various disciplines including 199 research course faculty. Helps Pharmaceutical Sciences students select electives appropriate to their future goals.

Prerequisite or corequisite: BIO SCI 99 and (CHEM 51C or CHEM H52C)

Grading Option: Pass/no pass only.

**PHRMSCI 173. Pharmacotherapy. 4 Units.**

An exploration of the clinical application of medications to selected disease states. Focus is on an understanding of underlying principles of pharmacology and how this knowledge can be applied to treatment of diseases.

Prerequisite or corequisite: PHRMSCI 170B

**PHRMSCI 174. Biopharmaceutics and Nanomedicine. 4 Units.**

Introduces theories and tools of new drug formulations. Particularly new novel therapeutics based on biological materials, pathological characteristics utilized to achieve the maximum efficacy and specificity, and drug delivery systems based on emerging nanotechnology are extensively discussed.

Prerequisite: PHRMSCI 170B

Restriction: Pharmaceutical Sciences Majors have first consideration for enrollment.

**PHRMSCI 174L. Biopharmaceutics and Nanomedicine Lab. 3 Units.**

Introduction to cancer drug screening using cellular models, and confirmation of comprehensive therapeutic efficacy using a live animal model. Includes basic cell culture, cytotoxicity assays, cell analysis, drug circulation test, and tumor eradication and imaging experiments. Materials fee.

Prerequisite: PHRMSCI 170B and BIO SCI 100

(Ib)

**PHRMSCI 175. Drug Discovery Computing Techniques. 4 Units.**

Techniques used in computer-aided drug discovery, including theory behind these techniques and practical applications. Topics include scientific computing; python; classical force fields and simulations; visualization and movie-making; quantum mechanics in drug discovery; molecular dynamics; solvation models; and several others.

Prerequisite: CSE 41 or I&C SCI 31. CSE 42 or I&C SCI 32 is recommended.

Concurrent with PHRMSCI 275.

**PHRMSCI 177. Medicinal Chemistry. 4 Units.**

An introduction of the basics of drug activity and mechanisms. Strategies used to identify lead compounds such as natural product chemistry, combinatorial chemistry, molecular modeling, and high-through put screening. Relationship of molecular structure to pharmacological activity.

Prerequisite: CHEM 51A and CHEM 51B and CHEM 51C and (BIO SCI 98 or CHEM 128)

Same as CHEM 177.

Restriction: Pharmaceutical Sciences Majors have first consideration for enrollment.

**PHRMSCI 177L. Medicinal Chemistry Laboratory. 3 Units.**

An introduction of the basics of drug activity and mechanisms. Strategies used to identify lead compounds such as natural product chemistry, combinatorial chemistry, molecular modeling, and high-through put screening. Relationship of molecular structure to pharmacological activity. Materials fee.

Corequisite: PHRMSCI 177 or CHEM 177.

Prerequisite: CHEM 51A and CHEM 51B and CHEM 51C and BIO SCI 100 and (BIO SCI 98 or CHEM 128)

Same as CHEM 177L.

Restriction: Pharmaceutical Sciences Majors have first consideration for enrollment.

(Ib)

**PHRMSCI 178. Stem Cell Therapy . 4 Units.**

Introduces new paradigms in regenerative medicine involving stem cells, and emerging molecular, nano- and micro-engineered tools for in vivo imaging that is critical for studying and monitoring regeneration. Selected topics include stem cell biology and in vivo imaging modalities.

Prerequisite: BIO SCI D103

Concurrent with PHRMSCI 278.

**PHRMSCI 179. Emerging Technologies in Pharmaceutical Sciences and Medicine. 4 Units.**

Introduces emerging, ground-breaking technologies in pharmaceutical sciences and medicine, including pharmacogenomics, genome editing, and stem cell and engineered T cell therapies. Explores these novel technologies with both their underlying theories and forward-thinking applications.

Concurrent with PHRMSCI 279.

**PHRMSCI 197. Professional Internship. 4 Units.**

Provides students with opportunity to develop leadership and professional skills necessary for competitive placement in their chosen industry. Students gain new and field-specific skills outside the classroom environment while participating in a supervised internship for a total of 100 hours.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Seniors only.

**PHRMSCI 198. Independent Study in Pharmaceutical Sciences. 1-4 Units.**

Students interested in independent study should arrange with a faculty member to sponsor and supervise such work. A time commitment of three hours per week per unit is expected. A written report is required at the end of each quarter.

Repeatability: May be taken for credit for 4 units.

**PHRMSCI 199. Undergraduate Research. 1-4 Units.**

Original research in the laboratory of Pharmaceutical Sciences faculty. Attendance at regular research group meetings is also generally expected, and a quarterly written report is required. Strongly recommended for students considering research careers and/or graduate degree programs.

Repeatability: May be repeated for credit unlimited times.

**PHRMSCI H199. Honors Research in Pharmaceutical Sciences. 1-4 Units.**

Undergraduate honors research in Pharmaceutical Sciences. A student time commitment of 10-15 hours per week is required.

Repeatability: May be repeated for credit unlimited times.

**PHRMSCI 223. Biological Macromolecules. 4 Units.**

Introduction to nucleic acid and protein structure, dynamics, and function. Topics include analytical methods, molecular evolution, folding, and catalysis.

Same as CHEM 223.

**PHRMSCI 250A. Current Topics in Pharmaceutical Sciences. 1 Unit.**

Intended to expose students to the primary literature and current research in the field of Pharmaceutical Sciences. Students analyze and present information for discussion. Guest speakers from academia and industry may participate throughout the quarter.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only. Math and Computational Biology Majors only.

**PHRMSCI 250B. Current Topics in Pharmaceutical Sciences. 1 Unit.**

Intended to expose students to the primary literature and current research in the field of Pharmaceutical Sciences. Students analyze and present information for discussion. Guest speakers from academia and industry may participate throughout the quarter.

Prerequisite: PHRMSCI 250A

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only. Math and Computational Biology Majors only.

**PHRMSCI 250C. Current Topics in Pharmaceutical Sciences. 1 Unit.**

Intended to expose students to the primary literature and current research in the field of Pharmaceutical Sciences. Students analyze and present information for discussion. Guest speakers from academia and industry may participate throughout the quarter.

Prerequisite: PHRMSCI 250B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only. Math and Computational Biology Majors only.

**PHRMSCI 263. Pharmacogenomics and Epigenetics. 4 Units.**

Survey of the genetic and epigenetic basis of inter-subject variability in response to drugs. Covers drug efficacy, safety, and the need for their optimization in pharmacotherapy. Emphasizes genetic mechanisms of polymorphisms in the pharmacokinetics and pharmacodynamics of representative therapeutic drugs.

Restriction: Graduate students only.

Concurrent with PHRMSCI 163.

**PHRMSCI 264. The RNA World: From Discovery to Mechanism. 4 Units.**

Provides a comprehensive understanding of RNA in biology. Use of knowledge gained in organic chemistry, biochemistry, genomics, and molecular biology to understand how RNA is integrated into contemporary biology.

Restriction: Graduate students only.

**PHRMSCI 265. New Frontiers in Chemical and Synthetic Biology. 4 Units.**

Explores new developments in chemical and synthetic biology that span the areas of chemistry, molecular biology, genetics, bioengineering, systems biology, and computational genomics.

Restriction: Graduate students only.

**PHRMSCI 270. Advanced Pharmacology. 4 Units.**

Provides a mechanism-based overview of pharmacology with strong emphasis on clinical application of pharmacology. Students learn the most recent advances in pharmacology as they relate to drug discovery, development, and clinical application.

Restriction: Graduate students only.

Concurrent with PHRMSCI 170A.

**PHRMSCI 272. Special Topics in Pharmaceutical Sciences. 2-4 Units.**

Reserved for current topics of particular interest in areas of pharmaceutical sciences that are not covered by other courses. The subject will vary from year to year, highlighting, for example, significant emerging fields or highly specialized but vital research areas.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PHRMSCI 275. Drug Discovery Computing Techniques. 4 Units.**

Techniques used in computer-aided drug discovery, including theory behind these techniques and practical applications. Topics include scientific computing; python; classical force fields and simulations; visualization and movie-making; quantum mechanics in drug discovery; molecular dynamics; solvation models; and several others.

Restriction: Graduate students only.

Concurrent with PHRMSCI 175.

**PHRMSCI 277. Medicinal Chemistry. 4 Units.**

Fundamentals of medicinal chemistry covering diverse aspects of drug design, discovery, synthesis, and development. Molecular basis of drug action with an emphasis on the structure-to-function continuum.

**PHRMSCI 278. Stem Cell Therapy . 4 Units.**

Introduces new paradigms in regenerative medicine particularly those that involve stem cells, and emerging molecular, nano- and micro-engineered tools for in vivo imaging that is critical for studying and monitoring regeneration.

Restriction: Graduate students only.

**PHRMSCI 279. Emerging Technologies in Pharmaceutical Sciences and Medicine. 4 Units.**

Introduces emerging, ground-breaking technologies in pharmaceutical sciences and medicine, including pharmacogenomics, genome editing, and stem cell and engineered T cell therapies. Explores these novel technologies with both their underlying theories and forward-thinking applications.

Concurrent with PHRMSCI 179.

**PHRMSCI 298. Research Seminar . 2 Units.**

Presentation and discussion of current problems and methods in teaching and research in pharmaceutical sciences.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHRMSCI 299. Graduate Research. 1-12 Units.**

Supervised original research or investigation under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

**PHRMSCI 399. University Teaching. 1-4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Pharmaceutical Sciences, B.S.

The B.S. program in Pharmaceutical Sciences trains students in a multidisciplinary approach so that they can contribute to the advancement of new pharmaceutical technologies such as accelerated chemical synthesis, molecular-based assays using cloned enzymes, biopharmaceutical techniques, novel diagnostics, computational chemistry, and gene therapies. Pharmaceutical scientists are rapidly changing the field of drug discovery and development. The graduates of this program may seek employment in public and private sectors or choose to pursue graduate degrees such as a Ph.D., M.D., or Pharm.D.

**Undergraduate Honors.** Honors at graduation, e.g., *cum laude*, *magna cum laude*, *summa cum laude*, are awarded to approximately the top 16 percent of the graduating seniors. To be eligible for honors, a general criterion is that students must have completed at least 72 units in residence at a University of California campus. Other important factors are considered visit at Honors Recognition.

Students may be admitted to the Pharmaceutical Sciences major upon entering the University as freshmen, via change of major, or as transfer students from other colleges and universities.

Information about change-of-major policies is available in the Department of Pharmaceutical Sciences office and at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>).

**Transfer Students:** All applicants must have completed the following required courses with a grade of B- or better in all courses: one year of general chemistry with laboratory equivalent to UCI's CHEM 1A-CHEM 1B-CHEM 1C and CHEM 1LC-CHEM 1LD **AND** one year of organic chemistry with laboratory equivalent to UCI's CHEM 51A-CHEM 51B-CHEM 51C and CHEM 51LB-CHEM 51LC-CHEM 51LD. Transfer students must also complete two years of biology courses equivalent to UCI's BIO SCI 93, BIO SCI 94, BIO SCI 97, BIO SCI 98, and BIO SCI 99. Moreover, all transfer applicants must have a cumulative GPA of 3.0 or better. Additional courses that are recommended, but not required: one year of calculus and one year of calculus-based physics.

**All students must meet the University Requirements.**

### Major Requirements

#### A. Lower-Division Requirements:

1. Select one of the following sequences:

CHEM 1A- 1B- 1C

General Chemistry  
and General Chemistry  
and General Chemistry

CHEM H2A- H2B- H2C

Honors General Chemistry  
and Honors General Chemistry  
and Honors General Chemistry

and select one of the following lab sequences:

CHEM 1LC- 1LD

General Chemistry Laboratory  
and General Chemistry Laboratory

CHEM H2LA- H2LB- H2LC

Honors General Chemistry Laboratory  
and Honors General Chemistry Laboratory  
and Honors General Chemistry Laboratory

CHEM M2LA- M2LB- M3LC

Majors General Chemistry Laboratory  
and Majors General Chemistry Laboratory  
and Majors Quantitative Analytical Chemistry Laboratory

Complete the following organic chemistry sequence and accompanying labs:

CHEM 51A- 51B- 51C

Organic Chemistry  
and Organic Chemistry  
and Organic Chemistry<sup>3</sup>

CHEM 51LB- 51LC- 51LD

Organic Chemistry Laboratory  
and Organic Chemistry Laboratory  
and Organic Chemistry Laboratory

2. Complete:

MATH 2A- 2B

Single-Variable Calculus  
and Single-Variable Calculus

and select one of the following:

MATH 2D	Multivariable Calculus
MATH 3A	Introduction to Linear Algebra
STATS 7	Basic Statistics
STATS 8	Introduction to Biological Statistics

3. Select one of the following physics sequences:

PHYSICS 3A- 3B- 3C	Basic Physics I and Basic Physics II and Basic Physics III
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or

PHYSICS 7C- 7D- 7E	Classical Physics and Classical Physics and Classical Physics
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4. Complete:

BIO SCI 93	From DNA to Organisms
BIO SCI 94	From Organisms to Ecosystems
BIO SCI 97	Genetics
BIO SCI 98	Biochemistry
BIO SCI 99	Molecular Biology

5. Complete: <sup>2</sup>

PHRMSCI 1	New Student Seminar
PHRMSCI 42	Life 101
PHRMSCI 76	Ethical Conduct of Research

#### **B. Upper-Division Requirements:**

Complete:

BIO SCI 100	Scientific Writing
BIO SCI 194S	Safety and Ethics for Research
PHRMSCI 120- 120L	Human Physiology and Human Physiology Lab <sup>2</sup>
PHRMSCI 170A- 170B	Molecular Pharmacology I and Molecular Pharmacology II <sup>2</sup>
PHRMSCI 171	Physical Biochemistry <sup>2</sup>
PHRMSCI 172	Topics in Pharmaceutical Sciences <sup>2</sup>
PHRMSCI 173	Pharmacotherapy <sup>2</sup>
PHRMSCI 174- 174L	Biopharmaceutics and Nanomedicine and Biopharmaceutics and Nanomedicine Lab <sup>2</sup>
PHRMSCI 177- 177L	Medicinal Chemistry and Medicinal Chemistry Laboratory <sup>2</sup>

#### **C. Upper-Division Electives (8 units):**

The upper-division electives may be selected from the following: <sup>1,2</sup>

BIO SCI D103	Cell Biology
BIO SCI D104	Developmental Biology
BIO SCI D111L	Developmental and Cell Biology Laboratory
BIO SCI D136	Human Anatomy
BIO SCI D137	Eukaryotic and Human Genetics
BIO SCI D145	Genomics, Development, and Medicine
BIO SCI D148	Development and Disease
BIO SCI D170	Applied Human Anatomy
BIO SCI E136	The Physiology of Human Nutrition
BIO SCI E142W	Writing/Philosophy of Biology
BIO SCI E189	Environmental Ethics
BIO SCI M114	Advanced Biochemistry
BIO SCI M114L	Biochemistry Laboratory

BIO SCI M116L	Molecular Biology Laboratory
BIO SCI M118L	Experimental Microbiology Laboratory
BIO SCI M120	Signal Transduction in Mammalian Cells
BIO SCI M121	Immunology with Hematology
BIO SCI M122	General Microbiology
BIO SCI M123	Introduction to Computational Biology
BIO SCI M124A	Virology
BIO SCI M124B	Viral Pathogenesis and Immunity
BIO SCI M125	Molecular Biology of Cancer
BIO SCI M137	Microbial Genetics
BIO SCI M143	Human Parasitology
BIO SCI M144	Cell Organelles and Membranes
BIO SCI N110	Neurobiology and Behavior
BIO SCI N113L	Neurobiology Laboratory
BIO SCI N153	Neuropharmacology
BIO SCI N154	Molecular Neurobiology
CHEM 107	Inorganic Chemistry
CHEM 107L	Inorganic Chemistry Laboratory
CHEM 125	Advanced Organic Chemistry
CHEM 128	Introduction to Chemical Biology
CHEM 128L	Introduction to Chemical Biology Laboratory Techniques
CHEM 138	Introduction to Computational Organic Chemistry
CHEM 156	Advanced Laboratory in Chemistry and Synthesis of Materials
CHEM 160	Organic Synthesis Laboratory
CHEM 170	Radioisotope Techniques
PUBHLTH 121	Introduction to Complementary and Alternative Medicine

<sup>1</sup> Course may not be used to satisfy more than one requirement.

<sup>2</sup> Courses must be completed with a grade of C- or better.

<sup>3</sup> Courses must be completed with a grade of C- or better by winter quarter of the second year.

**Upper-Division Writing Requirement:** Pharmaceutical Sciences majors satisfy the upper-division writing requirement by completing BIO SCI 100 with a grade of C or better, followed by the completion of PHRMSCI 174L and PHRMSCI 177L.

**NOTE:** Double majors with Pharmaceutical Sciences, Public Health Sciences, Nursing Science, Biomedical Engineering: Premedical, or with any of the School of Biological Sciences majors are not permitted.

Freshman		
Fall	Winter	Spring
BIO SCI 93	BIO SCI 94	CHEM 1C- 1LC
CHEM 1A	CHEM 1B	MATH 2A
HUMAN 1A	WRITING 39B	WRITING 39C or HUMAN 1C
PHRMSCI 1	General Education	General Education
General Education		
Sophomore		
Fall	Winter	Spring
BIO SCI 97	BIO SCI 98	BIO SCI 99
CHEM 51A- 1LD	CHEM 51B- 51LB	CHEM 51C- 51LC
MATH 2B	PHRMSCI 42	General Education
BIO SCI 194S	General Education	
Junior		
Fall	Winter	Spring
PHRMSCI 120- 120L	PHRMSCI 170A	PHRMSCI 170B
BIO SCI 100	General Education	Elective
PHYSICS 3A, 7C, or 7LD	PHYSICS 3B, 7D, or 7LD	PHYSICS 3C or 7E
CHEM 51LD	Elective	PHRMSCI 76
	STATS 7, 8, MATH 2D, or MATH 3A	



Senior		
Fall	Winter	Spring
PHRMSCI 171	PHRMSCI 177- 177L	General Education
PHRMSCI 174- 174L	General Education	Upper-Division Elective
General Education	Upper-Division Elective	PHRMSCI 173
PHRMSCI 172		

## Pharmacological Sciences, Ph.D.

The Pharmacological Sciences Ph.D. program provides a unique opportunity for students interested in any scientific discipline represented by the Department of Pharmaceutical Sciences faculty to have a year of broad, interdisciplinary training followed by focused doctoral research in the Pharmaceutical Sciences research group of their choice. Students in the program choose one of three tracks in Pharmaceutical Sciences, Pharmacology, or Medicinal Chemistry at the start of their first year. At the end of their first year of interdisciplinary training, they transition into a research group to begin their more focused doctoral research under the guidance of a Pharmaceutical Sciences faculty member. The Ph.D. program prepares students for careers in academic research institutions, in the biotechnology and pharmaceutical industry, in federal and state agencies, and in private research institutions by providing a research-intensive approach to the study of pharmaceutical sciences.

Faculty research programs in the Pharmacological Sciences Ph.D. program include molecular and cellular pharmacology, circadian rhythms, epigenetic modifications, neuropharmacology, psychopharmacology, cardiovascular pharmacology, the pharmacology of aging, structure-based drug design, screening-based drug discovery, medicinal chemistry, structural biology, natural product biosynthesis, synthase engineering, cancer detection, prevention and therapy, gene regulation and intercellular signaling, computational biology and bioinformatics, and nanomedicine for targeted drug and gene delivery testing.

### Prerequisites

- An M.S. degree is not required for consideration. However, research experience (laboratory or fieldwork) is a primary criterion for acceptance into your graduate programs.
- Some biology and chemistry courses are required. However, because we are an interdisciplinary program, we admit students from various academic backgrounds, so there are no specific course requirements. Applicants recently admitted to our program have undergraduate degrees in a wide range of disciplines, including molecular biology, psychology, and chemical engineering, as well as chemistry and biology.
- Minimum cumulative undergraduate GPA of 3.0

### Application Instructions

The online application (<https://apply.grad.uci.edu/apply/>) and supporting materials should be received by December 1 for full consideration, but submissions received up until January 5 may be considered.

In addition to the online application and all supporting materials required by the UCI Graduate Admissions Office, applicants should include specific research interests and three possible research advisors in their personal statement.

### International Applicants

- TOEFL scores are required for all international applicants
- However, if your undergraduate degree was obtained in a country where English was the primary language, the TOEFL exam is not required. For more information regarding admissions requirements for international students, visit the Academic Qualifications (<https://grad.uci.edu/admissions/applying-to-uci/international-qualifications.php>) webpage.
- Teaching Assistant (TA) Eligibility
  - A score of 26 or higher on the speaking component of the TOEFL IBT;
  - A score of 8 or higher on the speaking module of the IELTS; or
  - A score of 50 or higher on the TSE.
- For more information about the English language requirements for TAs, please visit the English Language Proficiency Requirements for TAs webpage (<https://grad.uci.edu/admissions/applying-to-uci/english-proficiency.php>).
- Information regarding visas, student employment, and any other services to help international students transition into life at UCI is overseen by the UCI International Center (<https://ic.uci.edu/>).

## Course Requirements

The primary difference between the three tracks are the first-year course requirements, where the Pharmacology Track focuses on mainline pharmacology topics, while the Pharmaceutical Sciences and Medicinal Chemistry Tracks encompass a broad range of allied fields. Students will choose a track during orientation before the start of their first quarter.

### Coursework Requirements - Pharmacology Track

New students who select the Pharmacology Track are subject to the coursework requirement as listed below.

## Required Courses:

PHARM 241	Advanced Topics in Pharmacology
PHARM 251	Experimental Pharmacology
PHARM 254	Introduction to Pharmacology
PHARM 255	Neuropharmacology
PHARM 256	Experimental Design for Pharmacologists
PHARM 257	Ethics in Research
PHARM 298	Seminar
PHARM 299	Research

Courses from the Pharmaceutical Sciences Track required course list below may be substituted for some of the Pharmacology Track required courses with the consent of the Track or Graduate Advisor, in alignment with the student's research interests.

**Coursework Requirements - Pharmaceutical Sciences Track**

New students who select the Pharmaceutical Sciences Track are subject to the first year coursework requirements listed below.

Choose three of the following plus three electives:

PHRMSCI 223	Biological Macromolecules
PHARM 254	Introduction to Pharmacology
or PHRMSCI 270	Advanced Pharmacology
PHARM 255	Neuropharmacology
PHRMSCI 263	Pharmacogenomics and Epigenetics
PHRMSCI 264	The RNA World: From Discovery to Mechanism
PHRMSCI 265	New Frontiers in Chemical and Synthetic Biology
PHRMSCI 272	Special Topics in Pharmaceutical Sciences
PHRMSCI 275	Drug Discovery Computing Techniques
PHRMSCI 277	Medicinal Chemistry
PHRMSCI 278	Stem Cell Therapy
PHRMSCI 279	Emerging Technologies in Pharmaceutical Sciences and Medicine

First-year coursework must include training in the ethical conduct of research (e.g., PHARM 257 or equivalent), three courses from the required list above, and three electives chosen from 1) the same list; 2) from the Pharmacology Track required courses above; 3) from the Medicinal Chemistry Track elective list below; or 4) any UCI four-unit letter-graded graduate course approved as an elective by the Pharmaceutical Sciences Track Advisor.

**Coursework Requirements - Medicinal Chemistry Track**

New students who select the Medicinal Chemistry Track are subject to the first year coursework requirements listed below

PHRMSCI 223	Biological Macromolecules
PHARM 254	Introduction to Pharmacology
PHRMSCI 277	Medicinal Chemistry
PHRMSCI 250A	Current Topics in Pharmaceutical Sciences

In addition to the above required courses, Medicinal Chemistry Track students must take at least two elective courses from the Medicinal Chemistry elective list below or any UCI four-unit letter-graded graduate course approved as an elective by the Graduate Advisor by the end of Year 1.

**Medicinal Chemistry Elective Course List****Chemistry Department**

CHEM 201	Organic Reaction Mechanisms I
CHEM 202	Organic Reaction Mechanisms II
CHEM 203	Organic Spectroscopy
CHEM 204	Organic Synthesis I
CHEM 205	Organic Synthesis II
CHEM 218	Metallobiochemistry
CHEM 219	Chemical and Structural Biology
CHEM 221A	Fundamentals of Molecular Biophysics

**Molecular Biology and Biochemistry Department**

MOL BIO 203	Nucleic Acid Structure and Function
MOL BIO 204	Protein Structure and Function
MOL BIO 211	High-Resolution Structures: NMR and X-ray
<b>Pharmaceutical Sciences Department</b>	
PHRMSCI 263	Pharmacogenomics and Epigenetics
PHRMSCI 264	The RNA World: From Discovery to Mechanism
PHRMSCI 265	New Frontiers in Chemical and Synthetic Biology
PHRMSCI 270	Advanced Pharmacology
PHRMSCI 275	Drug Discovery Computing Techniques
PHRMSCI 278	Stem Cell Therapy
PHRMSCI 279	Emerging Technologies in Pharmaceutical Sciences and Medicine
PHARM 255	Neuropharmacology

## Comprehensive Exam

After completion of first year courses, each student must pass a Comprehensive Exam or equivalent covering first year coursework subjects. For Pharmacology Track students, it will be offered once per year during the summer and will normally be taken prior to the second year. It may be deferred to the following year only under unusual circumstances and with the prior approval of the Graduate Advisor. There will be a single Comprehensive Exam offered, covering subjects appropriate for students in any concentration. Each candidate for the Ph.D. must pass the Comprehensive Exam or equivalent no later than the end of their second year.

## Advancement to Candidacy

Each student must complete an advancement examination, consisting of a written document and an oral presentation, for their Advancement Committee in accordance with Graduate Council and Department of Pharmaceutical Sciences procedures. To form the five-member Advancement Committee, students must provide the Graduate Advisor with two faculty names and the Graduate Advisor selects three additional faculty. The Advancement Exam will normally take place no earlier than the sixth quarter or no later than the ninth quarter; exceptions must be approved in advance by the Graduate Advisor. After all members of the Advancement Committee vote to pass a student at the time of their oral exam, the student will officially advance to candidacy.

## Dissertation

A three-member Doctoral Committee formed from the Advancement Committee will meet with the candidate annually to assess and guide the student's progress toward completion of the dissertation. When the student's research advisor and Doctoral Committee members determine that a sufficient body of original research has been completed, the student will prepare the dissertation for a public defense before the Doctoral Committee.

## Final Examination

Upon completion of the dissertation the student will take a public oral examination on the content of his or her dissertation or related topics. The examination will be conducted by all members of the student's Doctoral Committee.

# Pharmacology, M.S.

The online M.S. in Pharmacology is designed to meet the needs of working professionals and non-traditional students by providing educational access and flexibility in an online format. It is well-suited to meet the goals of individuals who are seeking leadership positions within their organizations in a variety of fields.

The curriculum emphasizes both theoretical and practical applications and an interdisciplinary approach that serves not only as excellent pathways to career advancement, but also provides a solid foundation from which to pursue doctoral study in related fields.

The M.S. in Pharmacology prepares students for careers in academic research institutions, in the biotechnology and pharmaceutical industry, in federal and state agencies, and in private research institutions.

The online M.S. in Pharmacology is targeted to working professionals in the pharmaceutical industry and related fields, and is open to any non-traditional student who can benefit from the flexibility and convenience of online learning. Admission requirements include:

- A bachelor's degree from a recognized and accredited academic institution with degree standards equivalent to UC
- A minimum cumulative undergraduate GPA of 3.0
- Some coursework in biology is required, but applicants may be admitted with a variety of undergraduate disciplines, including biology, molecular biology, psychology, chemistry, etc.
- Some research experience is required
- GRE is NOT required

To apply to the program, applicants must complete the UCI Graduate Division's online application for admission and upload the following materials:

- Personal statement: The personal statement should include a personal history describing your professional and academic achievements, and in particular, your laboratory and research experience; current and future goals, specifically how and why the MSP will help you achieve them; and your understanding of the challenges of online learning and your readiness to participate in this type of instructional modality.
- Three letters of recommendation uploaded to the application directly by individuals who can evaluate your academic and/or professional achievements, describe your strengths and weaknesses, and comment on your character, integrity and motivation.
- Unofficial transcripts uploaded to the application. (Official transcripts will be requested by the Graduate Division if you are admitted and plan to enroll.)
- Non-refundable application fee
- International students must submit recent TOEFL exam scores (institution code: 4859)

The priority deadline for applications is March 1. The final deadline to apply is June 15.

## Requirements

The program consists of 13 required courses (39 units) to be completed sequentially over two years of study (six quarters).

A. Complete the following:

PHARM 270	Applied Pharmacology <sup>1</sup>
PHARM 271	Principles of Pharmacology
PHARM 272	Receptors and Drug Targets
PHARM 274	Research Techniques in Pharmacology
PHARM 276	Experimental Design and Data Analysis
PHARM 277	Ethics in Scientific Research
PHARM 278	Concepts in Drug Discovery
PHARM 279	Special Topics in Pharmacology
PHARM 280	Master's Project in Pharmacology
PHARM 281	Neuropharmacology
PHARM 282	Behavioral Pharmacology
PHARM 283	Cardiovascular Pharmacology
PHARM 284	Endocrine, Respiratory, and Gastrointestinal Pharmacology

<sup>1</sup> Students take PHARM 270 at the beginning of the first year; it is an accelerated five-day in-residence course offered on the UCI campus.

The capstone paper is written while the student is enrolled in PHARM 280. The student, in consultation with their faculty mentor, selects a topic of interest in pharmacology. The final product will be evaluated by the mentor and the course director for acceptability in meeting the capstone requirement.

Students submit an application for advancement to candidacy in the fifth quarter of study. The capstone research project and required courses for the fifth and sixth quarters must be completed before the degree will be conferred. The normative time to degree is two years.

# Division of Undergraduate Education

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**Michael Dennin, Dean**

**Dean's Office**

611 Aldrich Hall

949-824-3291

<http://www.due.uci.edu>

The core mission of the Division of Undergraduate Education is to support and enrich the academic experiences of undergraduate students so that they succeed and thrive. The Division provides campus leadership, programs, and services that enhance the quality of undergraduate education at UCI. An advocate and steward for educational excellence, the Division works with all academic units, programs, and members of the UCI community to foster a climate of learning, discovery, and engagement for every undergraduate student. Through its diverse and innovative programs and services, the Division provides support for student academic achievement, for a rich and coherent curriculum, and for outstanding teaching through the integration of teaching and research activities and the facilitation of effective pedagogy.

The Division also supports excellence in undergraduate education through assessment of student learning outcomes and a comprehensive program of research and evaluation conducted by its Center for Assessment and Applied Research. This center coordinates the campus approach to educational assessment and provides data and information on undergraduate students, programs, and policies for use in decision-making by the Dean of the Division and other campus leaders. It also provides consultation and technical advice for faculty and staff on assessment of student learning, program evaluation, survey research, statistical analyses of student data, and development of new undergraduate majors and minors with a view to enhance undergraduate education at UCI. For further information visit the Center (<http://www.assessment.uci.edu>) for Assessment and Applied Research website (<http://assessment.uci.edu/>).

A current list of DUE Program faculty directors and advisors can be found on the DUE Homepage. (<http://home.due.uci.edu/>)

The Division of Undergraduate Education is responsible for the following student programs and services. These programs and services are described in detail below.

## Academic Testing Center

3040 Anteater Instructional Research Building (AIRB)

949-824-6207

<http://testingcenter.uci.edu> (<http://testingcenter.uci.edu/>)

### Placement Testing

UCI's Academic Testing Center (ATC) administers placement tests to new and continuing students to ensure correct placement in selected introductory courses and to help students assess their readiness for University-level work. These tests are selected or developed by UCI faculty who also determine the grading criteria for each test. Results from placement tests are used by students and their academic counselors to create a plan of study which is best suited to the students' learning needs and career goals and to determine enrollment in introductory courses. Additional information, such as entrance examination scores, Advanced Placement (AP) scores, and high school work, also may be used to determine course placement.

Placement tests are given in the areas of Calculus, Arabic, Chinese, French, German, Armenian, Japanese, Korean, Persian, Russian, Spanish, Vietnamese, and Academic English/English as a Second Language. Detailed information about who needs to take which test is available on the Academic Testing Center website (<http://www.testingcenter.uci.edu/which%20tests%20to%20take.html>).

All newly admitted freshmen will be directed to information about summer orientation, placement testing, and registering for courses in late spring. Participation in summer orientation and advising is required of new freshmen. Freshmen will register for their fall quarter courses at orientation. Students are strongly advised, therefore, to take any required placement tests *before* their orientation program.

The Academic Testing Center also administers other language tests for exemptions from general education categories VI and VIII. More information is available at the Language Testing Program website (<http://www.testingcenter.uci.edu/Language%20Testing%20Program.html>). The Academic Testing Center administers the challenge by examination for I&C SCI 31, I&C SCI 45C, and I&C SCI 45J in cooperation with the Donald Bren School of Information and Computer Sciences.

For further information on placement testing and summer testing dates, visit the Academic Testing Center website (<http://www.testingcenter.uci.edu/>) or email the Center at [testcenter@uci.edu](mailto:testcenter@uci.edu).

### UC Analytical Writing Placement Examination

The Academic Testing Center is responsible for the campus-based administration of the UC Analytical Writing Placement Examination. The Academic Testing Center also processes results from the state-wide Analytical Writing Placement Examination given in May.

Results from the UC Analytical Writing Placement Examination are used to place students in UCI writing courses. There is a nonrefundable administrative fee associated with the examination. The fee payment process and waiver information are explained in materials students receive in April from the University of California Office of the President. Students who receive admission application fee waivers will automatically have this examination fee waived. Refer to the section on Requirements for a Bachelor's Degree for complete information on the UC Analytical Writing Placement Examination (<http://catalogue.uci.edu/informationforadmittedstudents/requirementsforabachelorsdegree/>) and the UC Entry Level Writing requirement (<http://catalogue.uci.edu/informationforadmittedstudents/requirementsforabachelorsdegree/>). Important information about the examination is also available here (<http://www.testingcenter.uci.edu/analyticalWriting.html>).

## **ANTrepreneur Center**

233 Pereira Drive  
(949) 614-0101  
<http://antrepreneur.uci.edu/>  
[antrepreneur@uci.edu](mailto:antrepreneur@uci.edu)

In partnership with UCI Applied Innovation, the ANTrepreneur Center has the mission of integrating entrepreneurial and innovative thinking into the UC Irvine campus and to UC Irvine students in starting new ventures. This center provides free mentorship learning opportunities, resources to help students scale their business, and connections to the greater Irvine entrepreneurial network.

For more information visit the ANTrepreneur Center website (<http://antrepreneur.uci.edu>).

## **Blum Center for Poverty Alleviation**

5548 Social & Behavioral Sciences Gateway  
949-824-6307  
<http://blumcenter.uci.edu/>  
[blumcenter@uci.edu](mailto:blumcenter@uci.edu) (%20blumcenter@uci.edu)

The UCI Blum Center's mission is to promote social change and inspire the next generation of leaders to action with research on poverty alleviation. By collaborating across disciplines with students, faculty and practitioners, the UCI Blum Center rigorously explores systemic, geopolitical, technological and climate forces affecting poverty. The UCI Blum Center's innovative education programs, basic and applied research, and work in community development and policy-making engage future leaders to reduce the risks of poverty for vulnerable populations and improve humanity and its institutions. The Blum Center at University of California Irvine focuses its work around 3 key division areas: 1. Flood Hazards, 2. Human Trafficking and 3. Science & Practice of Compassion with partnerships in Environmental Peacemaking, Technology Innovation for Humanitarian Action and policy making in Washington D.C.

The Blum Center's signature offerings include:

- Global Service Scholars (<http://globalservicescholars.uci.edu/>)
- Small Change, Better World (<http://blumcenter.uci.edu/smallchange/>) micro grant program
- The Science and Practice of Compassion (PSCI 192B) (<http://blumcenter.uci.edu/students/education/science-compassion/>) online course
- Global Poverty & Inequality in the 21st Century (UPPP 115) (<http://blumcenter.uci.edu/students/education/global-poverty/>) online course
- Poverty Track, Civic & Community Engagement Minor (<http://engage.due.uci.edu/>)

## **Campuswide Honors Collegium**

**Charles E. Wright, Associate Dean**  
1200 Student Services II  
949-824-5461  
<http://honors.uci.edu>  
[honors@uci.edu](mailto:honors@uci.edu)

The Campuswide Honors Collegium is dedicated to promoting high standards of scholastic excellence and personal growth by combining the qualities and support of a liberal arts college with the resources and prestige offered by a major research university. The unique opportunities provided by the Campuswide Honors Collegium for students to learn and engage with other talented and motivated students and with faculty in a supportive learning community help students get the most out of their education, achieve ambitious goals, and prepare for future careers and graduate and professional school.

For more information, visit the honors section.

## **Capital Internship Program**

1100 Student Services II  
949-824-5400  
<http://capitalinternships.uci.edu/>

dccenter@uci.edu

### **UC Washington, D.C. (UCDC) Academic Internship Program**

The UCDC Academic Internship Program supervises and supports students who pursue internships, elective courses, research, and creative activities in the nation's capital. This UC systemwide program, situated in the exciting environment of Washington, D.C., is open to students in all majors. Students may enroll for fall, winter, or spring quarter. While living in Washington, D.C., students are enrolled at UCI and earn 12–16 units of credit. Financial aid eligibility is maintained and is adjusted to cover the total cost of the program. Students live in the UC Washington Center building together with students from all of the participating UC campuses, which provides a social and intellectual community throughout the quarter. Internship opportunities are available in almost any setting including Capitol Hill, the White House, government agencies, nonprofit organizations, think tanks, art museums, educational institutions, media outlets, and scientific organizations, just to name a few. Interested students with strong academic records are encouraged to apply.

### **UC Center Sacramento Internship Program**

The UCCS Internship Program supervises and supports students who pursue internships, elective courses, research, and creative activities in the state capital. This UC systemwide program is open to students in all majors, and is available for the fall, winter, spring, or summer terms. While living in Sacramento, students are enrolled at UC and earn 12–16 units of credit. Financial aid eligibility is maintained. Internship opportunities are available for students in many different settings including the offices of Assembly Members, Senators, and the Governor, as well as with State agencies, nonprofit organizations, and lobbying organizations. Interested students with strong academic records are encouraged to apply.

## **Center for Excellence in Writing and Communication**

193 Science Library

949-824-8949

<http://writingcenter.uci.edu> (<http://www.writingcenter.uci.edu/>)

writing-center@uci.edu

The UCI Center for Excellence in Writing and Communication offers free writing support to all enrolled UCI undergraduate students; we strive to make better writers, not just better writing. Our services include individual writing consultations (<http://www.writingcenter.uci.edu/appointments/>), online tutorials (<http://www.writingcenter.uci.edu/resources/resources-for-students/>), peer tutoring (<http://www.writingcenter.uci.edu/peer-tutors/>), workshops (<http://writing.uci.edu/services/workshops/>) about writing for different occasions and needs, and assistance with developing research skills.

The Writing Center, in conjunction with the Campus Writing Coordinator and the Division of Undergraduate Education, also conducts research (<http://writing.uci.edu/research/>) about best practices (<http://writing.uci.edu/resources/student-resources/>) in the teaching of writing, and is the central campus hub for developing a culture of writing and communication at UCI.

## **Civic and Community Engagement Minor**

<http://engage.uci.edu/>

CCEMinor@uci.edu

The Minor in Civic and Community Engagement is an interdisciplinary program that provides students with the knowledge, skills, attitudes, and values to engage as citizens and active community members in the 21st century. It provides a theoretical and empirical framework to increase students' understanding of public problems (environmental, social, and other) from multiple disciplinary perspectives. Students learn about strategies to address public problems, including through public policy; through the involvement of community-based and nonprofit organizations; and through the cultivation of leadership. The minor also empowers students by providing them opportunities to cultivate leadership in public and private settings. The minor is open to students of all majors and is distinguished both by what students learn and by how they learn it - through a combination of coursework, research, and service.

Additional information is available at the Interdisciplinary section of the *Catalogue*.

## **Freshman Seminar Program**

611C Aldrich Hall

949-824-1955

<http://freshmanseminar.uci.edu/> (Freshmen)

seminars@uci.edu

Small seminars are offered to new Freshmen students to introduce them to the academic culture of UC Irvine. Faculty from a broad range of disciplines teach about topics of current interest in sections of up to 15 students. These seminars are a great way for new students to learn about a variety of academic fields, meet a faculty member who can serve as a mentor, get to know other new students with similar interests, and take a small class as one of their first courses on campus.

Freshman Seminars (UNI STU 3 classes) are offered all three quarters, with priority given to new students who can enroll in a maximum of three sections during their time at UCI. Details of each quarter's offerings are available on the program website and in the Schedule of Classes.



## International Students Excellence Program

949-824-2422

<http://isep.due.uci.edu/>khuie@uci.edu (<http://catalogue.uci.edu/divisionofundergraduateeducation/mail%20to:khuie@uci.edu>)

The International Student Excellence Program's (ISEP) mission is to assist UCI's international freshmen in making a smooth transition into university life. ISEP provides both academic excellence and social support in order to engage international students in UCI's vibrant campus life and help them create solid relationships in their new environment. Its signature program, the International Peer Group Scholars Program (IPG), is based on strong mentor/mentee relationships that encourage cultural exploration as well as academic and personal success. In addition to individual mentoring, ISEP offers small group meetings and larger group events during Welcome Week and throughout the year. Students with questions or who do not yet have a mentor should contact the office.

## Learning and Academic Resource Center

3500 Anteater Learning Pavilion

949-824-6451

<http://larc.uci.edu>

larc@uci.edu

The Learning and Academic Resource Center (LARC) provides academic support programs for undergraduate students. These include course-specific tutorials, as well as Academic Learning Skills workshops on specific study skills (e.g. time management, academic reading, preparing for exams, etc.) that can be applied to all courses. Tutorials are regularly-scheduled, informal review sessions in which 12-15 students enrolled in the same lecture compare notes, discuss readings, develop organizational tools, and predict test items in two, 50-minute LARC Sessions per week. The primary goal of the LARC program is to facilitate student collaboration among peers to increase understanding and retention of course-specific material for academic success. By working together, students learn how to integrate course content and learning skills to become independent, successful learners.

## Scholarship Opportunities Program

193 Science Library

949-824-0189

<http://scholars.uci.edu> (<http://scholars.uci.edu/>)sklrship@uci.edu ([sklrship@uci.edu](mailto:sklrship@uci.edu))

**The Scholarship Opportunities Program (SOP)** works toward UCI's mission to encourage high-achieving undergraduates to compete successfully for the most prestigious scholarships, grants, and graduate fellowships available, and to begin learning about the process as early as possible. **SOP** organizes and disseminates information on a select group of prestigious awards that are national and international in scope, including opportunities for funded research and study at both the undergraduate and graduate levels. **SOP** also facilitates UCI's processes for evaluating applications and endorsing candidates for awards requiring University nomination. Additionally, staff provide individual and group counseling, present workshops, assist students with curriculum vitae (CVs), and edit Statements of Purpose and research/project proposals, and strengthen interviewing skills.

## Student Success Initiatives

2200 Student Services II

949-824-6234

<http://ssi.uci.edu> (<http://sss.uci.edu>)

Student Success Initiatives (SSI) provides students with the personal, academic, and professional support and development to thrive and succeed at UCI and beyond. SSI is dedicated to serving and assisting with the transitions of low-income students, first-generation students, undocumented students, former foster youth, transfer students, post-traditional students, students with dependents, international students, students in transition, and students with disabilities. SSI also provides a learning community that empowers students to be productive and engaged in their academic careers and personal endeavors. Drop-in counseling, scholarships for tutoring, peer mentoring, and weekly workshops are offered throughout the year.

Programs within SSI include:

- Dream Scholars
- Foster Youth Resilience in Education (FYRE) Scholars Program
- Gateway Scholars and Gateway Initiative
- TRIO Scholars Program
- Summer Bridge Scholars Program



- International Student Excellence Program
- SPF (Student Parents and Families Program)
- Transfer Success Programs
- Summer Edge Programs

Students are encouraged to visit SSI and meet our staff. Appointments can be made with the SSI staff by phone or email. Additional information is available on the SSI website (<http://ssi.uci.edu/>).

## Study Abroad Center

### Study Abroad Center

1100 Student Services II

949-824-6343

<http://studyabroad.uci.edu> (<http://studyabroad.uci.edu/>)

[studyabroad@uci.edu](mailto:studyabroad@uci.edu)

In partnership with the Office of Global Engagement, the Study Abroad Center is a comprehensive resource and counseling center that helps students take advantage of the many worldwide opportunities that exist for study, work, internship, volunteering, research, and non-credentialed teaching that relates to their degree programs at UCI.

Studying abroad is an important resource for achieving the skills, knowledge, and understanding that will make today's undergraduates effective citizens and leaders in local, national, and global affairs once they depart the University. In today's political and business environment, college graduates must be informed decision-makers with a capacity to reflect on their own values while understanding the complex identities, histories, and cultures of others. Studying abroad provides students with the language skills and cultural competence necessary to meet the current demands of business, government, and educational institutions.

Professional staff and peer advisors, who have returned from experiences abroad, are available to guide students in making appropriate choices of international programs for their educational goals. Advising is available when UCI is in session. Participants are provided with pre-departure and reentry orientations.

Students are advised to plan early in their academic career in order to best match studying abroad with their major to graduate on time. Programs are available for students in every major. The wide variety of programs includes those offering general curriculum, intensive language study, and programs focusing on a specific academic subject area. Preliminary guidance is available at the How to Study Abroad (<https://studyabroad.uci.edu/how-to-study-abroad/choose/academic-counselors-study-abroad-advising/>) webpage. Students are encouraged to combine undergraduate research and studying abroad. Coordinated advising between the [Undergraduate Research Opportunities Program](http://www.urop.uci.edu/) (<http://www.urop.uci.edu/>) and the Study Abroad Center facilitates this option. Participation in study abroad satisfies category VIII, international/global issues, of the UCI general education requirement. Students are encouraged to study abroad as a sophomore or junior, allowing the opportunity to incorporate their international learning into their final year at UCI.

The cost of studying abroad is often comparable to the cost of studying at UCI, while some options cost more and some cost less. Financial aid and scholarships (<https://studyabroad.uci.edu/finances/>) are available.

Students may participate in the University of California Education Abroad Program (UCEAP) offering more than 200 programs in 50 countries for UC students; other programs offered by UC campuses; and approved Independent Programs offered by private providers and foreign institutions.

Some UCI academic units have faculty-led programs abroad, such as the Olive Tree Initiative (<https://www.olivetreeinitiative.org/>). The Study Abroad Center is supporting those initiatives and working to develop more UCI Departmental faculty-led programs. For more information, contact Ms. Jeanne d'Arc Gomis ([%20jagomis@uci.edu](mailto:%20jagomis@uci.edu)).

## Transfer Student Hub

2200 Student Services II

949-824-1142

<http://transferhub.uci.edu/>

[transfer@uci.edu](mailto:transfer@uci.edu)

The Transfer Student Hub (TSH) works with new and returning transfer students to facilitate their transition and overall success at UCI by directing them to appropriate campus programs and services, organizing weekly workshops, providing formal and informal mentoring, and offering a space for study. The Transfer Student Hub strives to foster a sense of community among the transfer student population at UCI and advocates for transfer students in order to enhance their academic and social experience. The Transfer Student Hub works closely with Tau Sigma National Honor Society for transfer students and provides guidance in this organizations' work to advocate and support transfer students at UCI.

Students are encouraged to visit TSH and meet with the staff. TSH staff can be reached in person, by telephone or via e-mail. Additional information is available on the TSH website (<http://transfercenter.uci.edu/>). (<http://transferhub.uci.edu/>)

## Undergraduate Research Opportunities Program

2100 Student Services II  
949-824-4189  
<http://uop.uci.edu> (<http://uop.uci.edu/>)  
[uop@uci.edu](mailto:uop@uci.edu)

The Undergraduate Research Opportunities Program (UROP) encourages and facilitates research and creative activities by undergraduates. Research opportunities are available not only from every discipline, interdisciplinary programs, and schools, but also from many outside agencies, including national laboratories, industrial partners, and other universities. UROP offers assistance to students and faculty through all phases of the research activity: proposal writing, developing research plans, resource support, conducting the research and analyzing data, and presenting results of the research at the annual spring UCI Undergraduate Research Symposium. Calls for proposals are issued in the fall and spring quarters. Projects supported by UROP may be done at any time during the academic year and/or summer, and the research performed must meet established academic standards and emphasize interaction between the student and the faculty supervisor. In addition, all students participating in faculty-guided research activities are welcome to submit their research papers for faculty review and possible publication in the annual *UCI Undergraduate Research Journal*.

UROP also sponsors the following programs:

- On- and off-campus research opportunities
- UROP grants and fellowships
- Multidisciplinary Design Program (MDP)
- Summer Undergraduate Research Program (SURP)
- Summer Undergraduate Research Fellowship in the Internet of Things (SURF-IoT)
- Edwards Lifesciences Summer Undergraduate Research Program (E-SURP)
- International Summer Undergraduate Research Fellowship (I-SURF)

Complete information on current UROP programs can be found on the [UROP website \(http://www.urop.uci.edu/\)](http://www.urop.uci.edu/). For additional questions, contact UROP in person, telephone or by email.

## Undergraduate/Undeclared Advising Program

256 Aldrich Hall  
949-824-6987  
<http://uu.uci.edu>

Students who enter the University as freshmen or sophomores may be uncertain about which major they should choose and may not feel ready to declare their major or even to identify their interests with a particular school. Such students participate in the Undergraduate/Undeclared Advising Program, which is administered by the Division of Undergraduate Education. The goal of the Undergraduate/Undeclared Advising Program is to help students make the best informed choice of a major that is possible to meet their academic goals. All students at UCI are required to choose their major by the time they reach junior status.

To make a good decision about which major to declare, students should know the range of programs UCI offers and have some experience with them, have a good knowledge of their own abilities and interests, have clear educational goals, and have a sense of their vocational goals and of the academic programs at UCI that will provide appropriate preparation. Students in the Undergraduate/Undeclared Advising Program receive quarterly individualized staff counseling that helps them explore the variety of course offerings on campus, become more aware of their own interests and abilities, formulate sound educational goals, and learn how to prepare for graduate education and/or possible careers.

To assist students in choosing a major, the program offers a course designed to expose undeclared students to a variety of opportunities and resources available to them and to introduce students to the schools and majors offered. In addition, students learn about research and career opportunities within different disciplines.

## UTeach

611C Aldrich Hall  
949-824-1955  
<http://sites.uci.edu/uteach/>  
[uci.uteach@gmail.com](mailto:uci.uteach@gmail.com)

The UTeach program enables upper-division UCI undergraduates to design, develop, and deliver their own lower-division seminar classes. This provides an opportunity to integrate research, teaching, and learning, as contemplated by UC's mission.

Candidate student-instructors (prospective “UTeachers”) apply for the program in the spring quarter, describing their proposed course and designating a faculty mentor to supervise their research and development. Applications are reviewed near the end of the quarter by the UTeach Student-Faculty Advisory Board (for more information, see the UTeach website (<http://sites.uci.edu/uteach/>)).

During the summer and fall, prospective UTeachers are expected to conduct research with their faculty mentor. They enroll in an independent study course (UNI STU 197A) with their mentor in the fall, producing a draft syllabus and course plan. The Advisory Board reviews these documents at the end of fall quarter. UTeachers whose courses pass the review enroll in a pedagogy seminar (UNI STU 197B) in the winter quarter; this seminar focuses on presentation skills, classroom management, active learning, and discussion of each other's teaching presentations. After final approval of the syllabus and course plan, UTeachers deliver their seminars in the spring quarter and attend a weekly seminar (UNI STU 197C) that addresses practical teaching issues that have come up in the UTeachers' classes.

The UTeach seminars (sections of UNI STU 7) are offered for one unit of P/NP credit in spring quarter. In their entire time at UCI, students may enroll for credit in at most two sections of UNI STU 7.

## Reserve Officers Training Corps Courses

### **ROTC 10L. Military Science-Basic Leadership Laboratory. 1 Workload Unit.**

Provides hands-on and practical military science material covered in the corresponding military science courses.

Grading Option: Workload Credit P/NP Only.

Repeatability: May be repeated for credit unlimited times.

### **ROTC 11. Military Science-Personal Development. 1 Workload Unit.**

Focuses on life skills such as physical fitness, nutrition, and time management while providing an introduction to military knowledge, customs, and skills.

Grading Option: Workload Credit Letter Grade with P/NP.

### **ROTC 12. Military Science-Leadership I. 1 Workload Unit.**

Focuses on the fundamentals of leadership, Army leadership values, ethics, and counseling techniques.

Grading Option: Workload Credit Letter Grade with P/NP.

### **ROTC 13. Military Science-Tactical Leadership I. 1 Workload Unit.**

Focuses on leadership at the tactical level and includes instruction in fundamental military skills such as map reading, land navigation, squad and platoon operations, and resource planning techniques.

Grading Option: Workload Credit Letter Grade with P/NP.

### **ROTC 21. Military Science-Team Leadership I. 2 Workload Units.**

Explores the dimensions of creative and innovative tactical leadership strategies and styles by examining team dynamics and two historical leadership theories that form the basis of the Army leadership requirements model.

Grading Option: Workload Credit Letter Grade with P/NP.

### **ROTC 22. Military Science-Team Leadership II. 2 Workload Units.**

Explores team dynamics and two historical leadership theories that form the basis of the Army leadership requirements model.

Grading Option: Workload Credit Letter Grade with P/NP.

### **ROTC 23. Military Science-Tactical Leadership II. 2 Workload Units.**

Examines the challenges of leading tactical teams in the OE. Highlights dimensions of terrain analysis, patrolling, and operation orders.

Grading Option: Workload Credit Letter Grade with P/NP.

### **ROTC 100L. Military Science-Advanced Leadership Laboratory. 1 Workload Unit.**

Provides hands-on and practical exercises for the military science material covered in the corresponding military science courses as well as leader training through practical application of the Leadership Development Program.

Corequisite: ROTC 131 or ROTC 132 or ROTC 133 or ROTC 141 or ROTC 142 or ROTC 143 or ROTC 197.

Grading Option: Workload Credit P/NP Only.

Repeatability: May be repeated for credit unlimited times.

**ROTC 131. Military Science-Leadership II. 3 Workload Units.**

Challenges cadets to study, practice, and evaluate adaptive leadership skills as they are presented with challenging scenarios related to squad tactical operations. Cadets receive systematic and specified feedback on their leadership attributes and core leader competencies.

Corequisite: ROTC 100L

Prerequisite: ROTC 11 and ROTC 12 and ROTC 13 and ROTC 21 and ROTC 22 and ROTC 23

Grading Option: Workload Credit Letter Grade with P/NP.

**ROTC 132. Military Science-Team Leadership III. 3 Workload Units.**

Provides cadets systematic and specific feedback on their leadership attributes and core leader competencies. Based on such feedback, as well as their own self-evaluations, cadets continue to develop their leadership and critical thinking abilities.

Corequisite: ROTC 100L

Prerequisite: ROTC 11 and ROTC 12 and ROTC 13 and ROTC 21 and ROTC 22 and ROTC 23

Grading Option: Workload Credit Letter Grade with P/NP.

**ROTC 133. Military Science-Tactical Leadership III. 3 Workload Units.**

Uses increasingly intense situational leadership challenges to build cadet awareness and skills in leading small units. Skills in decision-making, persuading, and motivating team members when 'under fire' are explored, evaluated, and developed.

Corequisite: ROTC 100L

Prerequisite: ROTC 11 and ROTC 12 and ROTC 13 and ROTC 21 and ROTC 22 and ROTC 23

Grading Option: Workload Credit Letter Grade with P/NP.

**ROTC 141. Military Science-Leadership III. 3 Workload Units.**

Transitions the focus of student learning from being trained, mentored, and evaluated as a cadet to learning how to train, mentor, and evaluate cadets. Cadets begin to learn the duties and responsibilities of an Army staff officer.

Corequisite: ROTC 100L

Prerequisite: ROTC 131 and ROTC 132 and ROTC 133

Grading Option: Workload Credit Letter Grade with P/NP.

**ROTC 142. Military Science-Leadership IV. 3 Workload Units.**

Requires students to continue to train, mentor, and evaluate underclass cadets. Cadets learn to safely conduct training by understanding and employing the Composite Risk Management Process and the Comprehensive Soldier Fitness (CSF) program.

Corequisite: ROTC 100L

Prerequisite: ROTC 131 and ROTC 132 and ROTC 133 and ROTC 141

Grading Option: Workload Credit Letter Grade with P/NP.

**ROTC 143. Military Science-Officership. 3 Workload Units.**

Explores the dynamics of leading in the complex situations of current military operations in the OE. Cadets examine differences in customs and courtesies, military law, principles of war, and rules of engagement in the face of international terrorism.

Corequisite: ROTC 100L

Prerequisite: ROTC 131 and ROTC 132 and ROTC 133 and ROTC 141 and ROTC 142

**ROTC 151. United States Military History-1607 to 1865. 3 Workload Units.**

Examines the creation of the American military establishment and traces its evolution in the context of the changing nature of warfare, the progression of military professionalism, and social, political, economic, and technological developments through the Civil War.

Grading Option: Workload Credit Letter Grade with P/NP.

**ROTC 152. United States Military History-1865 to 1945. 3 Workload Units.**

Examines the evolution of the American military establishment and the progression of military professionalism in terms of social, political, economic, military, and technological developments from the end of the Civil War through World War II.

Grading Option: Workload Credit Letter Grade with P/NP.

**ROTC 153. United States Military History-1945 to 2001. 3 Workload Units.**

Examines the evolution of the American military establishment and the progression of military professionalism in terms of social, political, economic, military, and technological developments from the Cold War to the War on Terrorism.

Grading Option: Workload Credit Letter Grade with P/NP.

**ROTC 197. Military Science Independent Studies. 2-4 Workload Units.**

Provides intensive, individual study with scheduled meetings to be arranged between Cadre and student. Assigned reading and tangible evidence of mastery of subject matter required.

Grading Option: Workload Credit Letter Grade with P/NP.

Repeatability: May be taken for credit for 12 units.

## UC Washington DC Courses

**UCDC 170. Washington DC Internship. 4-8 Units.**

Supervised internship (20-40 hours per week) in Washington DC government, nonprofit, or private institution consistent with student's interest.

Corequisite: UCDC 180

Prerequisite: Selected for Washington DC Center Program.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**UCDC 180. Washington-Themed Seminar. 4 Units.**

UCDC core course (multiple topics offered each quarter). Enhances students' experiential learning and imparts knowledge and skills to help them transition into public service/private sector positions. One core course per quarter mandatory for all participants in Washington DC Center Program.

Prerequisite: Selected for Washington DC Center Program.

Repeatability: May be taken for credit 3 times as topics vary.

**UCDC 190. Washington DC Elective. 4 Units.**

Studies in selected areas related to the UC Washington, DC Center Program (UCDC).

Prerequisite: Selected for Washington DC Center Program.

Repeatability: May be taken for credit 3 times as topics vary.

## University Affairs Courses

**UNI AFF 1A. Student Participation. 1.3 Unit.**

Campus projects with a University department to enrich academic growth and development as well as academic growth and development of UCI. Includes 30 hours per quarter working on proposed project under faculty/staff supervision. Paper required.

Prerequisite: Project must be approved by a Student Affairs Department head and the instructor.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**UNI AFF 1B. Student Participation. 1.3 Unit.**

Campus projects with a University department to enrich academic growth and development as well as academic growth and development of UCI. Includes 30 hours per quarter working on proposed project under faculty/staff supervision. Paper required.

Prerequisite: UNI AFF 1A

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**UNI AFF 1C. Student Participation. 1.3 Unit.**

Campus projects with a University department to enrich academic growth and development as well as academic growth and development of UCI. Includes 30 hours per quarter working on proposed project under faculty/staff supervision. Paper required.

Prerequisite: UNI AFF 1B

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

## University Studies Courses

**UNI STU 1. Freshman Experience. 2 Units.**

An introduction to the freshman experience provides an overview of the University's aims and resources and exploration of developmental theories and skills necessary for academic success. Attention is also paid to questions of personal development and major choice. Materials fee.

Grading Option: Pass/no pass only.

**UNI STU 3. Mini-Seminars . 1 Unit.**

Designed primarily for freshmen as introduction to scholarly inquiry. Each section is taught by a faculty member from one of the academic disciplines and presents interesting and challenging topics representing the instructor's interest. Students participate in discussions, presentations, and projects.

Repeatability: May be taken for credit 3 times as topics vary.

**UNI STU 4. Transfer Student Seminars. 1 Unit.**

Designed primarily for transfer students during their first year at UCI. Each section is taught by a faculty member from one of the academic disciplines as introduction to scholarly inquiry in their discipline. Students participate in discussions, presentations, and projects.

Repeatability: May be taken for credit 2 times.

Restriction: New students only. Upper-division only until first week of classes.

**UNI STU 6. University Studies International Village Seminar. 1 Unit.**

Seminars held in International Village that are specifically designed to either (a) introduce visiting international students to the U.S. and/or local area and institutions or (b) engage both international and U.S. students in discussion of topics of international interest.

Grading Option: Pass/no pass only.

Repeatability: Unlimited as topics vary.

**UNI STU 7. UTeach: Student-Taught Seminar. 1 Unit.**

Student-taught seminar courses on selected topics. Topics vary each year according to the interest of the students teaching the classes.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**UNI STU 10. Introduction to Civic and Community Engagement and Community Research. 4 Units.**

Provides a foundation for understanding the role of public scholarship, civic engagement, and social action, and the relationship between service learning and engaged citizenship. Introduces key theoretical and research methodologies on the traditions and innovations of civic and community engagement.

**UNI STU 13A. Introduction to Global Sustainability I. 4 Units.**

Introduces Earth as a system and living planet. Examines physical and biological resources as well as energy, water, climate, and ecosystems. Introduces and applies analytic lens of environmental, social, and economic sustainability to examine human impacts and resource use.

Restriction: Lower-division students only.

(II)

**UNI STU 13B. Introduction to Global Sustainability II. 4 Units.**

Introduces Earth as a system and living planet. Examines physical and biological resources as well as energy, water, climate, and ecosystems. Introduces and applies analytic lens of environmental, social, and economic sustainability to examine human impacts and resource use.

Prerequisite: UNI STU 13A

(II)

**UNI STU 13C. Introduction to Global Sustainability III. 4 Units.**

Introduces Earth as a system and living planet. Examines physical and biological resources as well as energy, water, climate, and ecosystems. Introduces and applies analytic lens of environmental, social, and economic sustainability to examine human impacts and resource use.

Prerequisite: UNI STU 13B

(III)

**UNI STU 43. Topics in Illuminations . 1 Unit.**

This course connects students to Illuminations, the Chancellor's Arts and Culture Initiative. Students will attend five Illuminations-sponsored events and engage in brief preparatory and reflective activities in response to these events.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times as topics vary.

**UNI STU 45. Graduate School Opportunities and Preparation. 1 Unit.**

Explores the opportunities associated with graduate school by considering a wide range of disciplines and career paths. Reviews professional and academic paths in graduate school and the ways to prepare for a chosen path.

**UNI STU H80. Neurodivergent. 4 Units.**

Examines the evolution of the diagnosis of autism through history. Deep inquiry of the neuroscience, etiology, and genetics of neurodivergent individuals as well as a review of the validity of the varied treatments will inform critical thinking.

Restriction: Campuswide Honors Collegium students only.

(III)

**UNI STU 83. Pathways to University Success. 2 Units.**

Helps first-year students transition to UC Irvine and promotes a successful University experience. Students learn about academic resources and programs that support acclimation to the campus and enhance academic development through lectures, discussions, and a range of co-curricular activities.

Overlaps with UNI STU 84.

**UNI STU 84. Bridges to University Success. 4 Units.**

Helps first-year students transition to UC Irvine and promotes a successful University experience. Students learn about academic resources/programs that support acclimation to the campus and enhance academic development through lectures, writing laboratories, discussions, and a range of co-curricular activities.

Overlaps with UNI STU 83.

**UNI STU 85A. Leading from Within. 4 Units.**

Students examine characteristics and behaviors of effective leaders. Study the history and theoretical framework for understanding effective leadership. In addition, examine their own leadership strengths and weakness and become familiar with the theory behind and use of comprehensive self-assessment tools.

(III)

**UNI STU 85B. Leading Others. 4 Units.**

Students examine best practices within a team environment. They learn goal setting, diagnosing performance problems, designing solutions, and recognizing relevant differences in culture, priorities, and values within a team through lectures, writing, discussions, and practical activities.

(III)

**UNI STU 85C. Leading Change. 4 Units.**

Focused on a global viewpoint, students learn the theoretical framework behind innovation and change management. Develop innovative solutions to real-world challenges, design strategies to bring an expansive vision into fruition, and learn to communicate a vision and strategies.

(III)

**UNI STU 93. Strategies for Success. 2 Workload Units.**

Designed to develop good study skills in technical fields and the participation of students as active learners in their education. Topics include time management, analytical thinking, text analysis, academic survival strategies, and goal setting.

Grading Option: Workload Credit P/NP Only.



**UNI STU 100. Doing Research in the Community. 4 Units.**

Critically reimagines the research endeavor and its participants/outcomes. Grapples with methods, values, and relationships involved in research. Explores alternative conceptions of research; focus is community-based. Students work in teams on real-world community research projects with faculty mentors and community partners.

Prerequisite: UNI STU 10

**UNI STU 110. Philanthropy in the Community. 4 Units.**

Introduces the role of community engagement, social action and philanthropy. Examines theories and practices of philanthropy, and strategies for social change. Involves hand-on engagement with philanthropy in the form of students making decisions about the distribution of a real fund.

**UNI STU 170. Advanced Internship in Undergraduate Education. 1-2 Workload Units.**

Advanced interns have a year's internship experience and return to contribute to Undergraduate Education programs in a leadership position. Students work three-five hours per week in a DUE office to coordinate or lead less-experienced interns and/or events.

Prerequisite: UNI AFF 1A and UNI AFF 1B and UNI AFF 1C

Grading Option: Workload Credit P/NP Only.

Repeatability: May be taken for credit for 6 units.

**UNI STU 175. Methods and Application in Small Group Instruction. 2 Workload Units.**

Explores various theories and methods of learning and development and their practical application in small group settings. Peer tutors receive instruction in the design, implementation, and evaluation of an effective learning environment for undergraduate students.

Grading Option: Workload Credit P/NP Only.

Restriction: Learning and Academic Resource Center employed tutors only.

**UNI STU 176. Pedagogy of Small Group Facilitation - LAs. 2 Units.**

Overview and readings in evidence-based instruction for undergraduate learning assistants. LAs receive instruction, training, and feedback on effective small group facilitation and active learning. To be taken while serving as a learning assistant in a course.

**UNI STU H176A. Campuswide Honors Thesis Seminar. 2 Units.**

Supports the honors thesis research activities of Campuswide Honors Program students. Students set research goals, discuss, and develop their research interests.

Corequisite: Students must sign up separately for 8 units of independent study with faculty mentors.

Grading Option: Pass/no pass only.

Restriction: Campuswide Honors Collegium students only.

**UNI STU H176C. Campuswide Honors Thesis Seminar. 2 Units.**

Supports the honors thesis research activities of Campuswide Honors Program students. Students work with each other to improve both written and spoken presentations of their results.

Corequisite: Students must sign up separately for 8 units of independent study with faculty mentors.

Prerequisite: UNI STU H176A

Grading Option: Pass/no pass only.

Restriction: Campuswide Honors Collegium students only.

**UNI STU 181. Internship in Civic and Community Engagement. 2-4 Workload Units.**

Provides an opportunity to extend learning into a community-based setting addressing important social, environmental, and public issues. The internship project has a creative and scholarly component where students initiate their own action or inquiry experience.

Prerequisite: UNI STU 10

Grading Option: Workload Credit P/NP Only.

Repeatability: May be taken for credit for 8 units.



**UNI STU 190. Teaching Seminar: Theory and Practice. 2 Units.**

For students selected to be discussion leaders for University Studies 2. Models of teaching, developmental theory applied to college freshmen, curriculum development. Practice of teaching techniques and group management skills.

Repeatability: May be taken for credit 2 times.

**UNI STU 192. Group Project for Discussion Leaders. 4 Units.**

For discussion leaders for University Studies 2. Weekly discussion group training for leading effective groups in addition to evaluations of weekly discussion sections and completion of a special project on issues of freshman development. Materials fee.

Repeatability: May be taken for credit 4 times.

Restriction: Discussion leaders only.

**UNI STU 193. Internship. 2-4 Units.**

Enables students from all majors to receive credit for an approved internship on or off-campus. Internship sites may be public or private, for profit or non-profit agencies, organizations, companies, or corporations offering paid or unpaid learning experiences.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**UNI STU 196. Directed Studies in Undergraduate Education. 1-4 Units.**

Students do directed study (research, readings, etc.) on a topic related to Undergraduate Education under the supervision of one of the faculty who serve as Deans or Faculty Directors in the Division of Undergraduate Education.

Repeatability: May be taken for credit for 12 units.

**UNI STU 197A. UTeach Special Study. 2 Units.**

Students accepted to teach a UTeach course in spring quarter enroll in Special or Independent Study with their faculty mentor during the preceding fall quarter to develop their detailed course syllabus.

Repeatability: Unlimited as topics vary.

Restriction: UTeach Program students only.

**UNI STU 197B. UTeach: Teaching Theory and Practice. 2 Units.**

Students accepted to teach a UTeach course in spring quarter enroll during the winter to develop their teaching skills in preparation for teaching the following quarter.

Prerequisite: UNI STU 197A

Grading Option: Pass/no pass only.

Restriction: UTeach Program students only.

**UNI STU 197C. UTeach: Teaching Practicum. 2 Units.**

Students selected to teach in the UTeach Program teach their courses and meet weekly in a seminar to continue to develop and enhance their teaching skills.

Prerequisite: UNI STU 197B

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

Restriction: UTeach Program students only.

**UNI STU 197D. Study Abroad Experiential Learning. 1 Unit.**

Study abroad on an approved program. Complete critical reflection (written paper, blog, etc.) submitted no later than the end of the quarter following the completion of the study abroad program. Enroll while studying abroad or the quarter immediately following return.

Grading Option: Pass/no pass only.

**UNI STU 197E. Reflections While Abroad. 1 Unit.**

For students while they are studying abroad; maximizing learning outcomes by critically reflecting on learning experiences while abroad. Topics include cultural observations, professional issues, cultural competence, etc. Participants are located in different countries around the world.

Grading Option: Pass/no pass only.

**UNI STU 197F. Internship Plus. 1 Unit.**

Provides training and development of career readiness competencies in parallel with a student's internship experience. Internship sites may be public or private, for profit or non-profit agencies, organizations, companies, or corporations offering paid or unpaid learning experiences.

Grading Option: Pass/no pass only.

**UNI STU 198. Mentored Learning Assistant Field Work. 1-3 Units.**

Oversight of trained learning assistants by the course instructor, including training in the discipline and responsibilities associated with supporting active group work. Instructor mentors LAs in how assisting small groups supports their career goals.

Corequisite: UNI STU 176

Repeatability: May be taken for credit for 9 units.

**UNI STU 296. Graduate Legal Studies . 0.3 Units.**

Monthly faculty/student colloquium to present and discuss socio-legal related research/issues. Course convened by Law School faculty with other faculty participation. Required for PLGS students enrolled in Law portion of degree.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Law students only.

**UNI STU 297. California Community College Internship. 2-8 Units.**

The California Community College Internship offers graduate students the opportunity to learn about faculty life, governance, and teaching at local community colleges. Structures fieldwork for students to participate in and reflect on the educational mission of community colleges.

Prerequisite: Teaching experience.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit for 10 units.

Restriction: MFA or Doctoral students who have advanced to candidacy.

**UNI STU 390A. Advanced Pedagogy and Academic Job Preparation. 2-4 Units.**

Focuses on advanced pedagogical research and practices. Students design and implement an integrated curriculum in the context of the TA Professional Development Program. Prepare for the academic job market by developing application materials and reviewing Pedagogical Fellow applicants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Must be a pedagogical fellow.

**UNI STU 390B. Advanced Pedagogy and Academic Job Preparation. 2-4 Units.**

Focuses on advanced pedagogical research and practices. Students design and implement an integrated curriculum in the context of the TA Professional Development Program. Prepare for the academic job market by developing application materials and reviewing Pedagogical Fellow applicants.

Prerequisite: UNI STU 390A

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Must be a pedagogical fellow.

**UNI STU 390C. Advanced Pedagogy and Academic Job Preparation. 2-4 Units.**

Focuses on advanced pedagogical research and practices. Students design and implement an integrated curriculum in the context of the TA Professional Development Program. Prepare for the academic job market by developing application materials and reviewing Pedagogical Fellow applicants.

Prerequisite: UNI STU 390B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Must be a pedagogical fellow.

**UNI STU 390X. Developing Teaching Excellence. 2-4 Units.**

An introduction to evidence-based instructional design and methods, specifically for higher education courses. Students practice, observe, and design instruction based on pedagogical literature. Meets most of the requirements for the Certificate in Teaching Excellence Program.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit for 8 units.

**UNI STU 390Z. Advanced Course Design for Instructors of Record. 2-4 Units.**

Confirmed instructors of record who have earned the Certificate in Teaching Excellence design their course (syllabus, lesson plans, activities, assessments, assignments) using best practices in pedagogy. By the end of the course, participants have their full course mapped.

Prerequisite: Certificate of Teaching Excellence required, proof of instructor of record appointment required.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit for 12 units.

Restriction: Graduate students only.

**UNI STU 395. Seminar for Teaching as Research. 1 Unit.**

Preparation and implementation of a teaching as research project in higher education. Participants learn research, experimental design, human subjects, and statistical analysis.

Prerequisite: UNI STU 390B

Repeatability: May be taken for credit 2 times.

# Donald Bren School of Information and Computer Sciences

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**Marios C. Papaefthymiou, Dean**

6210 Donald Bren Hall

Academic Counseling: 949-824-5156

<http://www.ics.uci.edu> (<http://www.ics.uci.edu/>)

The Donald Bren School of Information and Computer Sciences (ICS) embodies excellence, creativity, and collaborative innovation in computer science and information technology. As the only independent computing school in the University of California system, it is well-positioned to continue its tradition of exploring and advancing the boundaries of a broad, multidisciplinary field on a global scale.

ICS faculty have extensive training in traditional computer science, as well as engineering, mathematics and statistics, and the social sciences. The School's stand-alone structure, as opposed to being part of an engineering school, enables the faculty to take the broadest possible view of computer science and information technology. This breadth is reflected in the diverse set of academic degree options for undergraduate and graduate students, some of which are interdisciplinary and jointly administered with other academic units.

The School's three departments — Computer Science, Informatics, and Statistics — fuel a wide range of instructional and research efforts, including: design of algorithms and data structures; computer architecture and embedded computer systems; networked and distributed systems; systems software; social and mobile computing; artificial intelligence, machine learning and data mining; computer games and virtual worlds; databases and information retrieval; computer graphics and visualization; bioinformatics, computational biology and genomics; computer-supported cooperative work, human-centered computing and human-computer interaction; security and privacy; software engineering; managerial and social aspects of computing technology; and statistics. The vibrant ICS community continues to explore innovative topics ranging from building complete computer systems on chips smaller than a human fingernail to developing user-interface systems that allow workers on opposite sides of the world to collaborate effectively. ICS research continues to focus on how computing and information technology can be used to solve a broad set of real-world problems, such as improving how first responders communicate during a crisis, optimizing transportation systems, analyzing data to expedite biological research, and improving network security.

ICS faculty actively lead and participate in a variety of research laboratories, institutes and centers, including the Institute for Genomics and Bioinformatics; Institute for Software Research; Institute for Virtual Environments and Computer Games; California Institute for Telecommunications and Information Technology (Calit2); Data Science Initiative; Center for Machine Learning and Intelligent Systems; Center for Digital Transformation; Center for Emergency Response Technologies; Center for Algorithms and Theory of Computation; Center for Research in Sustainability, Collapse-Preparedness & Information Technology; Secure Computing and Networking Center; Center for Ethnography; Social & Technological Action Research Group; Secure Systems and Software Laboratory; Software Engineering and Analysis Lab; Computational Vision Lab; Transformative Play Lab; Laboratory for Ubiquitous Computing and Interaction; and Institute for Future Health.

Faculty and student-driven research in ICS is supported through a variety of grants, gifts, and contracts from public and private institutions such as the State of California, the U.S. Department of Education, various U.S. defense agencies, the National Science Foundation, the National Institutes of Health, NASA, and various companies, including The Aerospace Corporation, Boeing, Disney, Experian, Google, IBM, Intel, Microsoft, Samsung, Facebook, and Yahoo!

Faculty and alumni of ICS have contributed some of computing's most significant advancements, including revolutionizing computer-aided drafting techniques; the creation of the current Hypertext Transfer Protocol (HTTP/1.1); development of the Internet standards for HTTP and Uniform Resource Identifiers (URI); the founding of the Apache HTTP Server Project that produces the software for more than 60 percent of public Internet websites; and the creation of the Domain Name System (DNS) that translates Web and e-mail addresses into the numeric system used to route information along the Internet.

ICS is committed to increasing diversity in the computing and information technology fields. The Office of Access and Inclusion (<http://tech.uci.edu/access/>) was created in 2014 as a joint initiative between ICS and UCI's Samueli School of Engineering to support the recruitment, retention, and graduation of undergraduate and graduate students from populations underrepresented in engineering and computer science. The School is also an active partner of the National Center for Women & Information Technology (NCWIT), whose overarching goal is parity in the professional information technology workforce, and a committed BRAID (Building, Recruiting And Inclusion for Diversity) Institution, working to increase the percentage of women and students of color majoring in computer science.

## Honors

Honors at graduation, e.g., *cum laude*, *magna cum laude*, *summa cum laude*, are awarded to approximately the top 16 percent of the graduating seniors. A general criterion is that a student must have completed at least 72 units in residence at the University of California. The student's cumulative record at the end of the final quarter is the basis for consideration of awarding Latin Honors. Other important factors are considered, please visit Honors Recognition.

## Careers

Graduates of the Donald Bren School of Information and Computer Sciences go on to pursue a variety of careers in both industry and academia in the areas of cutting-edge technology, science and business. With the goal of solving real-world problems with a global impact, ICS graduates find limitless opportunities as leaders in virtually every domain—from aerospace, automotive, biomedical, business information management, consumer products, cybersecurity, data science, engineering, entertainment, environmental, finance, gaming, national defense, pharmacology, and software engineering. ICS graduates often find jobs as members of research and development teams—building advanced technologies; designing software and hardware systems; analyzing and securing data; and specifying, designing, and maintaining computing infrastructures for a variety of institutions—while others venture off to form successful start-up companies or work as independent consultants. It is also common for ICS graduates to spend a few years in their related industry before moving into management or advanced technical positions, while others find that the undergraduate educational experience in ICS is the perfect stepping-stone for pursuing graduate studies in various computer science, informatics and statistics degrees, or venturing off into other academic areas such as medicine, law, engineering, or management.

- Department of Computer Science
- Department of Informatics
- Department of Statistics
  
- Bioinformatics, Minor
- Business Information Management, B.S.
- Computer Game Science, B.S.
- Computer Science and Engineering, B.S.
- Computer Science, B.S.
- Computer Science, M.S.
- Computer Science, Ph.D.
- Data Science, B.S.
- Digital Information Systems, Minor
- Engineering and Computer Science in the Global Context, Concentration
- Health Informatics, Minor
- Informatics, B.S.
- Informatics, M.S.
- Informatics, Minor
- Informatics, Ph.D.
- Information and Computer Science, B.S.
- Information and Computer Science, M.S.
- Information and Computer Science, Minor
- Master of Computer Science
- Master of Human Computer Interaction and Design
- Master of Software Engineering
- Networked Systems, M.S.
- Networked Systems, Ph.D.
- Software Engineering, B.S.
- Software Engineering, M.S.
- Software Engineering, Ph.D.
- Statistics, M.S.
- Statistics, Minor
- Statistics, Ph.D.

## Undergraduate Programs

A Donald Bren School of ICS undergraduate education is a blend of scholarship, science, technology, and practical application that forms an excellent foundation for professional life.

The basis of the undergraduate programs are a set of fundamental courses in mathematics and computer science, supplemented by general education courses from other academic disciplines. A premium is placed on both communication and quantitative skills. Students quickly gain hands-on experience with advanced computing systems, and intense use of computer and network technologies continues throughout the undergraduate program. Students study data organization, algorithm design and analysis, design and organization of hardware and network systems, software engineering, artificial

intelligence, social aspects of system design and use, and management of technology. In the process, students work with state-of-the-art hardware and software technologies, and learn several contemporary programming languages.

Visit the ICS Student Affairs Office website for Majors and Minors restrictions ([http://www.ics.uci.edu/ugrad/degrees/MajorMinor\\_Restrictions\\_Chart.pdf](http://www.ics.uci.edu/ugrad/degrees/MajorMinor_Restrictions_Chart.pdf)) and Double Major Restrictions ([http://www.ics.uci.edu/ugrad/degrees/DbI\\_Major\\_Restrictions\\_Chart.pdf](http://www.ics.uci.edu/ugrad/degrees/DbI_Major_Restrictions_Chart.pdf)).

## Admissions

To ensure admission consideration for the fall quarter, students should be sure to file their application by November 30 of the prior year. The selection criteria include grades, test scores, and other considerations.

## Transfer Student Policy

Transfer requirements vary by major.

Business Information Management  
Computer Game Science  
Computer Science  
Computer Science and Engineering  
Data Science  
Informatics  
Software Engineering

**NOTE TO TRANSFER APPLICANTS:** These majors require a series of lower-division courses, and prerequisites constrain the order in which they can be taken. Junior-level transfer students who must complete a significant part of this sequence may find that it will take longer than two years at UCI to complete their degree. Python, Java, and C++ are used in the curriculum; therefore, transfer students should plan to learn these languages by studying on their own or by completing related programming courses prior to their first quarter at UCI. **Please note:** a minimum grade of B will be expected for each major's required courses for admission.

It is recommended that students review the articulation agreement between their community colleges and a major at UC Irvine. This will allow them to make efficient progress toward the major.

## Change of Major

Students interested in changing their major to one offered by the School should contact the ICS Student Affairs Office for more information and assistance. Information is also available at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu>).

## Major and Minor Restrictions

ICS majors (including shared majors, BIM and CSE) pursuing minors within the Donald Bren School of ICS may not count more than five courses toward both the major and minor. Some ICS majors and minors outside of the School are not permitted due to significant overlap. Visit the ICS Student Affairs Office website for Majors and Minors restrictions. ([http://www.ics.uci.edu/ugrad/degrees/MajorMinor\\_Restrictions\\_Chart.pdf](http://www.ics.uci.edu/ugrad/degrees/MajorMinor_Restrictions_Chart.pdf)) All students should check the Double Major Restrictions Chart ([http://www.ics.uci.edu/ugrad/degrees/DbI\\_Major\\_Restr\\_Chart.pdf](http://www.ics.uci.edu/ugrad/degrees/DbI_Major_Restr_Chart.pdf)) and view our information page ([http://www.ics.uci.edu/ugrad/degrees/Double\\_Majors.php](http://www.ics.uci.edu/ugrad/degrees/Double_Majors.php)) on double majoring to see what degree programs are eligible for double majoring.

## Special Programs and Courses

### The ICS Honors Program

The ICS Honors Program provides selected upper-division students an opportunity to carry out a research project under the direction of a faculty member in the School. Eligible students participate in the ICS Honors Seminar (I&C SCI H197), which provides an introduction to the range of current faculty research. Each student then affiliates with an ICS faculty advisor who agrees to supervise a minimum of two quarters of research. The participating student prepares a final written research report and submits a copy for review to both the faculty advisor and the Honors Program advisor. Successful completion of the Honors Program earns the student a certificate and medal from the School. Further, a notation of successful completion is added to the student's transcript. For more information about course requirements, application procedures, and deadlines visit <http://honors.ics.uci.edu/>, or contact the Student Affairs Office at 949 824-5156.

### Other Opportunities

ICS undergraduates may complement their educational experience by participating in other programs. Information about the following programs is available elsewhere in the *Catalogue* and via the program Web sites: Campuswide Honors Collegium, Undergraduate Research Opportunities Program, Education Road Program, and Student Achievement Guided by Experience (SAGE Scholars).

## Graduate Programs in Information and Computer Sciences

### Admission

Applicants will be evaluated on the basis of their prior academic record. Applicants for the M.S. are expected to have a bachelor's degree in computer science or a related field. Ph.D. applicants will additionally be evaluated in their potential for creative research and teaching in Information and Computer Sciences.

Applicants are expected to have (1) skills in computer programming at least equivalent to those obtained in college-level courses in programming and language development; (2) skills in mathematics equivalent to those obtained in complete college-level courses in logic and set theory, analysis, linear algebra and modern algebra, or probability and statistics; (3) data structures, analysis of algorithms, automata theory, or formal languages; and (4) computer architectures.

All applicants are evaluated on the materials submitted: letters of recommendation, official GRE test scores (optional for M.S./Ph.D. in Informatics, M.S./Ph.D. in Software Engineering, the Master of Human Computer Interaction and Design, and the Master of Software Engineering) official college transcripts, statement of purpose, and personal history statement.

An applicant to the M.S./Ph.D. in Informatics, M.S./Ph.D. in Software Engineering, the Master of Human Computer Interaction and Design, or the Master of Software Engineering is strongly encouraged to submit additional material that enriches their application and speaks to the applicant's strengths (e.g., design portfolio, link to GitHub profile, GRE test scores, scholarly papers submitted and/or published, writing samples).

For more information, contact the ICS graduate counselor at 949-824-5156 or send an email to [gcounsel@ics.uci.edu](mailto:gcounsel@ics.uci.edu) (%20gcounsel@ics.uci.edu).

### Financial Assistance

Financial assistance is available to Ph.D. students in the form of fellowships, teaching assistantships, and research assistantships. Although assistance varies, it is the School's goal to support all entering Ph.D. students, subject to availability of funds. International students who are not citizens of countries where English is either the primary or dominant language, as approved by Graduate Council, and who apply for teaching assistantships must take one of the approved English proficiency examinations. More information is available in the Graduate Division section of the *Catalogue*.

### Students with a Previously Earned Master's Degree

Credit for one or all required courses may be given at the time of admission to those students who have completed a master's degree in computer science or a closely related field. Course equivalency will be determined by the Bren School Associate Dean for Student Affairs following a written recommendation from a sponsoring research advisor. Research advisors can require that a student take additional courses when this is appropriate.

An additional M.S. will not be awarded if the student currently holds an M.S. in computer science or a related field from another university.

### Faculty

Iftekhar Ahmed, Ph.D. Oregon State University, *Assistant Professor of Informatics* (data mining, software engineering, software testing and analysis, software maintenance, empirical studies)

Mohammad A. Al Faruque, Ph.D. University of Kaiserslautern, *Chair of Emulex Career Development and Associate Professor of Electrical Engineering and Computer Science; Computer Science; Mechanical and Aerospace Engineering* (cyber-physical systems, internet of things, embedded systems, CPS security)

Jonathan Alexander, Ph.D. Louisiana State University, *Associate Dean, Division of Undergraduate Education and Campus Writing Coordinator and Chancellor's Professor of English; Culture and Theory; Education; Gender and Sexuality Studies; Informatics* (writing studies, sexuality studies, queer theory, new media studies)

Shannon L. Alfaro, M.S. University of California, Irvine, *Continuing Lecturer of Computer Science* (design/analysis of combinational and sequential systems using SSI/MSI/LSI modules, hardware/firmware implementation of algorithms)

Animashree Anandkumar, Ph.D. Cornell University, *Assistant Professor of Computer Science* (statistical inference and learning of graphical models, scalable network algorithms)

Nader Bagherzadeh, Ph.D. University of Texas at Austin, *Professor of Electrical Engineering and Computer Science; Computer Science* (parallel processing, computer architecture, computer graphics, memory systems, 3-D ICs, heterogeneous computing, low-power processing)

Brigitte Baldi, Ph.D. Massachusetts Institute of Technology, *Lecturer of Statistics*

Pierre F. Baldi, Ph.D. California Institute of Technology, *Director of the Institute for Genomics and Bioinformatics and Distinguished Professor of Computer Science; Biological Chemistry; Biomedical Engineering; Developmental and Cell Biology; Mathematics* (artificial intelligence and machine learning, biomedical informatics, databases and data mining, environmental informatics, statistics and statistical theory)

Scott Bartell, Ph.D. University of California, Davis, *Associate Professor of Program in Public Health; Environmental Health Sciences; Statistics*



Veronica Berrocal, Ph.D. University of Washington, *Associate Professor of Statistics*

Lubomir Bic, Ph.D. University of California, Irvine, *Professor of Computer Science* (parallel and distributed computing, mobile agents, networks, and distributed systems)

Rebecca W. Black, Ph.D. University of Wisconsin-Madison, *Associate Professor of Informatics; Education* (digital media and learning, fan studies)

Geoffrey C. Bowker, Ph.D. University of Melbourne, *Chancellor's and Donald Bren Professor of Informatics; Visual Studies* (values in design, social studies of databases, science and technology studies)

Elaheh Bozorgzadeh, Ph.D. University of California, Los Angeles, *Professor of Computer Science* (computer architecture and design, design automation and synthesis for embedded systems, VLSI CAD, reconfigurable computing)

Stacy Branham, Ph.D. Virginia Tech, *Assistant Professor of Informatics* (human-computer interaction, design, assistive technology, safe and brave space, well-being, disability, feminism, marginality, inclusion, interdependence)

Anton Burtsev, Ph.D. University of Utah, *Assistant Adjunct Professor of Computer Science* (novel low-latency datacenters, microkernels, virtualization, datacenter environments)

Carter Butts, Ph.D. Carnegie Mellon University, *Professor of Sociology; Computer Science; Electrical Engineering and Computer Science; Statistics* (mathematical sociology, social networks, quantitative methodology, human judgment and decision making, economic sociology)

Michael Carey, Ph.D. University of California, Berkeley, *Donald Bren Professor of Information & Computer Sciences and Distinguished Professor of Computer Science* (databases and data mining, parallel and distributed systems)

Aparna Chandramowlishwaran, Ph.D. Georgia Institute of Technology, *Assistant Professor of Electrical Engineering and Computer Science; Computer Science; Mechanical and Aerospace Engineering* (high-performance computing, domain-specific compilers, algorithm-architecture co-design, data analysis, and scientific computing)

Peter Chang, M.D. Northwestern University, *Assistant Professor in Residence of Radiological Sciences; Computer Science; Pathology and Laboratory Medicine*

Qi Alfred Chen, Ph.D. University of Michigan, *Assistant Professor of Computer Science* (smart systems and IoT)

Yunan Chen, Ph.D. Drexel University, *Associate Professor of Informatics; Program in Public Health* (medical informatics, human computer interaction)

John L. Crawford, Media Artist and Software Designer, *Professor of Dance; Informatics* (screendance, interactive media, telematic performance, motion capture, digital arts)

Roderic N. Crooks, Ph.D. University of California, Los Angeles, *Assistant Professor of Informatics* (science and technology studies, education technology, critical data studies, data visualization, community archives)

Rina Dechter, Ph.D. University of California, Los Angeles, *UCI Chancellor's Professor of Computer Science* (automated reasoning, knowledge-representation, planning and learning)

Darren Denenberg, Ph.D. University of Maryland, *Lecturer of Informatics*

Michael B. Dillencourt, Ph.D. University of Maryland, College Park, *Professor of Computer Science* (algorithms and complexity, networks and distributed systems, data structures, computational geometry, graph algorithms)

John Christopher Dobrian, Ph.D. University of California, San Diego, *Professor of Music; Informatics*

Rainer B. Doemer, Ph.D. Dortmund University, *Professor of Electrical Engineering and Computer Science; Computer Science* (system-level design, embedded computer systems, design methodologies, specification and modeling languages, advanced parallel simulation, integration of hardware and software systems)

Mine Dogucu, Ph.D. Ohio State University, *Assistant Professor of Teaching of Statistics*

Shayan Doroudi, Ph.D. Carnegie Mellon University, *Assistant Professor of Education; Informatics* (learning analytics, learning sciences, educational technology)

James P. Dourish, Ph.D. University College London, *Chancellor's Professor of Informatics* (human-computer interaction, computer-supported cooperative work)

Nikil D. Dutt, Ph.D. University of Illinois at Urbana-Champaign, *UCI Chancellor's Professor of Computer Science; Cognitive Sciences; Electrical Engineering and Computer Science* (embedded systems, computer architecture, electronic design automation, software systems, brain-inspired architectures and computing)



Magda S. El Zarki, Ph.D. Columbia University, *Professor of Computer Science; Informatics* (telecommunications, networks, wireless communication, video transmission)

David A. Eppstein, Ph.D. Columbia University, *UCI Chancellor's Professor of Computer Science* (algorithms and complexity; computer graphics and visualization; geometric optimization)

Daniel Epstein, Ph.D. University of Washington, *Assistant Professor of Informatics; Computer Science* (human-computer interaction, personal informatics, ubiquitous computing, social computing, health informatics)

Julian Feldman, Ph.D. Carnegie Institute of Technology, *Professor Emeritus of Computer Science*

Charles C. Fowlkes, Ph.D. University of California, Berkeley, *Professor of Computer Science; Cognitive Sciences* (artificial intelligence, computer vision, machine learning, computational biology)

Roy Fox, Ph.D. The Hebrew University of Jerusalem, *Assistant Professor of Computer Science* (theory and applications of reinforcement learning, dynamical systems, information theory, robotics)

Michael S. Franz, Ph.D. Swiss Federal Institute of Technology in Zurich, *UCI Chancellor's Professor of Computer Science; Electrical Engineering and Computer Science* (systems software, particularly compilers and virtual machines, trustworthy computing, software engineering)

Daniel H. Frost, M.S. University of California, Irvine, *Professor of Teaching Emeritus of Computer Science* (artificial intelligence, software engineering, computer graphics, teaching of programming)

Richard Futrell, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Computer Science; Language Science* (language processing, Bayesian modeling, NLP)

Sergio Gago-Masague, Ph.D., *Assistant Professor of Teaching of Computer Science* (pervasive computing, user-centric software design, human computer interaction, serious games)

Joshua Garcia, Ph.D. University of Southern California, *Assistant Professor of Informatics* (software engineering, software security, software analysis and testing, software architecture, software maintenance)

Irene Gassko, Ph.D. Boston University, *Lecturer of Computer Science*

Jean-Luc Gaudiot, Ph.D. University of California, Los Angeles, *Professor of Electrical Engineering and Computer Science; Computer Science* (parallel processing, computer architecture, processor architecture)

Daniel L. Gillen, Ph.D. University of Washington, *Department Chair and Professor of Statistics; Program in Public Health*

Tony D. Givargis, Ph.D. University of California, Riverside, *Professor of Computer Science* (embedded systems, platform-based system-on-a-chip design, low-power electronics)

Michael T. Goodrich, Ph.D. Purdue University, *UCI Chancellor's Professor of Computer Science* (computer security, algorithm design, data structures, Internet algorithmics, geometric computing, graphic drawing)

Richard H. Granger, Ph.D. Yale University, *Professor Emeritus of Computer Science*

Michele Guindani, Ph.D. Università Luigi Bocconi, *Professor of Statistics*

Vijay Gurbaxani, Ph.D. University of Rochester, *Taco Bell Chair in Information Technology Management and Professor of Paul Merage School of Business; Informatics* (economics of information systems management, impact of information technology on organization and market structure)

Matthew Harding, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Economics; Statistics*

Ian G. Harris, Ph.D. University of California, San Diego, *Professor of Computer Science; Electrical Engineering and Computer Science* (hardware/software covalidation, manufacturing test)

Gillian Hayes, Ph.D. Georgia Institute of Technology, *Robert A. and Barbara L. Kleist Professor of Informatics; Education* (interactive and collaborative technology, human-computer interaction, computer-supported cooperative work, educational technology, ubiquitous computing)

Wayne B. Hayes, Ph.D. University of Toronto, *Associate Professor of Computer Science* (biomedical informatics and computational biology, computer vision, scientific and numerical computing)

Dan S. Hirschberg, Ph.D. Princeton University, *Professor of Computer Science* (analyses of algorithms, concrete complexity, data structures, models of computation)

Mustafa Ibrahim, M.S. California State University, *Lecturer of Computer Science* (software engineering)

Alexander T. Ihler, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Computer Science* (artificial intelligence and machine learning, probabilistic models, sensor networks, and distributed systems)

Sandra S. Irani, Ph.D. University of California, Berkeley, *Professor of Computer Science* (algorithms and complexity)

Jesse C. Jackson, M.A. University of Toronto, *Director of the Minor in Digital Arts and Associate Professor of Art; Informatics* (digital art, informatics, design, architecture)

Ramesh Chandra Jain, Ph.D. Indian Institute of Technology Kharagpur, *Donald Bren Professor of Information & Computer Sciences and Distinguished Professor of Computer Science* (computer vision, multimedia computing, image databases, machine vision, intelligent systems)

Stanislaw M. Jarecki, Ph.D. Massachusetts Institute of Technology, *Professor of Computer Science* (algorithms and complexity, applies and distributed cryptograph)

Ivan G. Jeliazkov, Ph.D. Washington University, *Associate Professor of Economics; Statistics*

Wesley O. Johnson, Ph.D. University of Minnesota, *Professor Emeritus of Statistics*

James Jones, Ph.D. Georgia Institute of Technology, *Associate Professor of Informatics* (software engineering, software testing and analysis, debugging and fault localization, static and dynamic analysis, software visualization)

Scott A. Jordan, Ph.D. University of California, Berkeley, *Professor of Computer Science; Electrical Engineering and Computer Science* (pricing and differentiated services in the Internet, resource allocation in wireless networks, telecommunications policy)

Sang-Woo Jun, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Computer Science* (computer systems architecture, hardware acceleration, non-volatile memory)

Kalev Kask, Ph.D. University of California, Irvine, *Lecturer of Computer Science* (artificial intelligence focusing on automated reasoning, graphical models)

David G. Kay, J.D. Loyola Marymount University, *Professor Emeritus of Teaching of Informatics; Computer Science* (computer law, computer science education)

Solmaz S. Kia, Ph.D. University of California, Irvine, *Assistant Professor of Mechanical and Aerospace Engineering; Computer Science* (systems and control, decentralized/distributed algorithm design for multi-agent systems, cooperative robotics)

Dennis F. Kibler, Ph.D. University of California, Irvine, *Professor Emeritus of Computer Science* (artificial intelligence and machine learning, gene regulation, biological genomes)

Raymond O. Klefstad, Ph.D. University of California, Irvine, *Associate Professor of Teaching of Computer Science* (embedded systems, networks and distributed systems, programming languages and systems)

Alfred Kobsa, Ph.D. University of Vienna, *Professor Emeritus of Informatics; Computer Science* (user modeling, human-computer interaction, artificial intelligence, cognitive science, interdisciplinary computer science)

Peter O. Krapp, Ph.D. University of California, Santa Barbara, *Professor of Film and Media Studies; English; European Languages and Studies; Informatics; Music; Visual Studies* (digital culture, media history, cultural memory)

Jeffrey L. Krichmar, Ph.D. George Mason University, *Professor of Cognitive Sciences; Computer Science* (computational neuroscience, robotics)

Fadi J. Kurdahi, Ph.D. University of Southern California, *Director, Center for Embedded Computer Systems and Associate Dean for Graduate and Professional Studies and Professor of Electrical Engineering and Computer Science; Computer Science* (embedded and cyber-physical systems, VLSI system design, design automation of digital systems)

Richard H. Lathrop, Ph.D. Massachusetts Institute of Technology, *Professor of Computer Science* (modeling structure and function, machine learning, intelligent systems and molecular biology, protein structure/function prediction)

Marco Levorato, Ph.D. University of Padua, *Assistant Professor of Computer Science; Electrical Engineering and Computer Science* (artificial intelligence and machine learning, networks and distributed systems, statistics and statistical theory, stochastic modeling, signal processing)

Chen Li, Ph.D. Stanford University, *Professor of Computer Science* (databases and text processing, multimedia databases, data integration)

Kwei-Jay Lin, Ph.D. University of Maryland, College Park, *Professor of Electrical Engineering and Computer Science; Computer Science* (real-time systems, distributed systems, service-oriented computing)

Cristina V. Lopes, Ph.D. Northeastern University, *Professor of Informatics* (programming languages, acoustic communications, operating systems, software engineering)

George S. Lueker, Ph.D. Princeton University, *Professor Emeritus of Computer Science* (algorithms and complexity)

Scott Mahlke, Ph.D. University of Illinois at Urbana-Champaign, *Professor of Computer Science* (custom-fit architectures for energy efficiency and reliability, compilers and run-time systems)

Aditi Majumder, Ph.D. University of North Carolina at Chapel Hill, *Professor of Computer Science; Electrical Engineering and Computer Science* (novel displays and cameras for computer graphics and visualization, human-computer interaction, applied computer vision)

Sam Malek, Ph.D. University of Southern California, *Associate Professor of Informatics* (software engineering, software architecture, software security, software analysis and testing)

Stephan Mandt, Ph.D. University of Cologne, *Assistant Professor of Computer Science* (artificial intelligence and machine learning, probabilistic modeling, Bayesian deep learning, variational inference)

Gloria J. Mark, Ph.D. Columbia University, *Professor of Informatics* (computer-supported cooperative work, human-computer interaction)

Athina Markopoulou, Ph.D. Stanford University, *Nicolaos G. and Sue Curtis Alexopoulos Presidential Chair in Electrical Engineering and Computer Science and Department Chair and Professor of Electrical Engineering and Computer Science; Computer Science* (networking: including network protocols, network measurement and analysis, mobile systems and mobile data analysis, network security and privacy)

Melissa Mazmanian, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Informatics* (computer-mediated communication, organization studies, information and communication technologies in practice, social response to emerging technologies, work/non-work negotiations in the information age)

Gopi Meenakshisundaram, Ph.D. University of North Carolina at Chapel Hill, *Professor of Computer Science* (geometry and topology for computer graphics, image-based rendering, object representation, surface reconstruction, collision detection, virtual reality, telepresence)

Sharad Mehrotra, Ph.D. University of Texas at Austin, *Professor of Computer Science* (databases and data mining, multimedia computing, networks and distributed systems)

Milena Mihail, Ph.D. Harvard University, *Associate Professor of Computer Science* (randomization, expander graphs, Markov chains, network design)

Volodymyr Minin, Ph.D. University of California, Los Angeles, *Professor of Statistics*

Eric D. Mjolsness, Ph.D. California Institute of Technology, *Professor of Computer Science; Mathematics* (artificial intelligence and machine learning, biomedical informatics and computational biology, applied mathematics, mathematical biology, modeling languages)

Bin Nan, Ph.D. University of Washington, *Professor of Statistics*

Bonnie A. Nardi, Ph.D. University of California, Irvine, *Professor Emeritus of Informatics* (computer-supported collaborative work, human-computer interaction, computer-mediated communication, user studies methods, activity theory, cultural responses to technology development)

Emily Navarro, Ph.D. University of California, Irvine, *Lecturer of Informatics*

Emre Neftci, Ph.D. University of Zurich, *Assistant Professor of Cognitive Sciences; Computer Science* (computational neuroscience, neuromorphic engineering, machine learning)

Alexandru Nicolau, Ph.D. Yale University, *Department Chair and Professor of Computer Science* (architecture, parallel computation, programming languages and compilers)

Trina Norden-Krichmar, Ph.D. University of California, San Diego, *Assistant Professor of Epidemiology; Biological Chemistry; Computer Science; Pharmaceutical Sciences*

Gary Olson, Ph.D. Stanford University, *Professor Emeritus of Informatics* (interactive and collaborative technology, human-computer interaction, computer-supported cooperative work)

Judith Olson, Ph.D. University of Michigan, *Professor Emeritus of Informatics; Paul Merage School of Business; Urban Planning and Public Policy* (interactive and collaborative technology, human-computer interaction, computer-supported cooperative work)

Marios Papaefthymiou, Ph.D. Massachusetts Institute of Technology, *Ted and Janice Smith Family Foundation Dean and Professor of Computer Science* (computer architecture and design, networks and distributed systems)

Richard Pattis, M.S. Stanford University, *Professor of Teaching of Computer Science; Informatics* (MicroWorlds for teaching programming, debugging, computational tools for non-computer scientists)

Simon G. Penny, M.F.A. Sydney College of the Arts, *Professor of Art; Informatics* (informatics, robotic sculpture, interactive environments, electronic media)

Kylie Peppler, Ph.D. University of California, Los Angeles, *Associate Professor of Informatics; Education* (learning sciences, design, maker culture, arts, game design, computer programming, wearables)

Kavita S. Philip, Ph.D. Cornell University, *Professor of History; Informatics* (history of modern South Asia, science and technology, political ecology, critical theoretical studies of race, gender, colonialism, new media, and globalization)

Annie Qu, Ph.D. The Pennsylvania State University, *Professor of Statistics*

David F. Redmiles, Ph.D. University of Colorado Boulder, *Professor of Informatics* (computer-supported cooperative work, human computer interaction, software engineering, globally distributed development teams, user interfaces, software tools)

Amelia C. Regan, Ph.D. University of Texas at Austin, *Professor of Computer Science* (algorithm development and complexity, networks and distributed systems, network optimization)

Stephanie Reich, Ph.D. Vanderbilt University, *Associate Professor of Education; Informatics; Psychological Science* (child development, parenting, peer interactions, media, program evaluation)

Debra J. Richardson, Ph.D. University of Massachusetts, *Professor Emeritus of Informatics* (software engineering, program testing, life-cycle validation, software environments)

Katie Salen Tekinba#, M.F.A. Rhode Island School of Design, *Professor of Informatics* (game design, connected learning design, human-computer interaction)

Ardalan Amiri Sani, Ph.D. Rice University, *Assistant Professor of Computer Science* (involves building efficient, high performance, and reliable systems)

Isaac D. Scherson, Ph.D. Weizmann Institute of Science, *Professor of Computer Science; Electrical Engineering and Computer Science* (parallel computing architectures, massively parallel systems, parallel algorithms, interconnection networks, performance evaluation)

Patricia Seed, Ph.D. University of Wisconsin-Madison, *Professor of History; Informatics* (mapping: history and design, game design, navigation)

Babak Shahbaba, Ph.D. University of Toronto, *Professor of Statistics; Computer Science*

Weining Shen, Ph.D. North Carolina State University, *Assistant Professor of Statistics*

Phillip C-Y Sheu, Ph.D. University of California, Berkeley, *Professor of Electrical Engineering and Computer Science; Biomedical Engineering; Computer Science* (semantic computing, robotic computing, artificial intelligence, biomedical computing, multimedia computing)

Michael Shindler, Ph.D. University of California, Los Angeles, *Assistant Professor of Teaching of Computer Science* (theory and machine learning, computer science education)

Alice Silverberg, Ph.D. Princeton University, *Distinguished Professor Emerita of Mathematics; Computer Science* (algebra and number theory)

Sameer Singh, Ph.D. University of Massachusetts Amherst, *Assistant Professor of Computer Science; Electrical Engineering and Computer Science; Language Science* (artificial intelligence and machine learning, databases and data mining, scientific and numerical computing)

Padhraic J. Smyth, Ph.D. California Institute of Technology, *Professor of Computer Science; Education; Statistics* (artificial intelligence and machine learning, pattern recognition, applied statistics, data mining, information theory)

Kurt Squire, Ph.D. Indiana University, *Professor of Informatics; Education* (video game design, games for learning, mobile technologies, civic engagement, place-based learning)

Thomas A. Standish, Ph.D. Carnegie Institute of Technology, *Professor Emeritus of Information and Computer Sciences* (software testing and analysis, software semantics and epistemology, programming and cognition, software comprehension)

Constance Steinkuehler, Ph.D. University of Wisconsin-Madison, *Professor of Informatics; Education* (video games for impact, game-mediated cognition and learning, online social interaction, video games and policy)

Hal S. Stern, Ph.D. Stanford University, *UCI Chancellor's Professor of Statistics; Cognitive Sciences*

Mark Steyvers, Ph.D. Indiana University, *Professor of Cognitive Sciences; Computer Science; Psychological Science* (higher-order cognition, cognitive neuroscience, computational modeling, collective intelligence)

Erik B. Sudderth, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Computer Science; Statistics* (artificial intelligence and machine learning, computer vision, statistics and statistical theory)

Theresa Tanenbaum, Ph.D. Simon Fraser University, *Assistant Professor of Informatics* (digital games and narrative, tangible and wearable interaction, maker and DIY culture, nonverbal communication and virtual worlds)

Richard N. Taylor, Ph.D. University of Colorado Boulder, *Professor Emeritus of Informatics* (software engineering, user interfaces, environments, team support)

Alexander W. Thornton, B.S. University of California, Irvine, *Continuing Lecturer of Computer Science*

William M. Tomlinson, Ph.D. Massachusetts Institute of Technology, *Professor of Informatics; Education* (environmental informatics, educational technology, computer graphics/visualization/digital arts)

Gene Y. Tsudik, Ph.D. University of Southern California, *UCI Chancellor's Professor of Computer Science* (computer and network security and privacy; applied cryptography)

Kojiro Umezaki, M.A. Dartmouth College, *Professor of Music; Computer Science*

Jessica Utts, Ph.D. Pennsylvania State University, *Professor Emeritus of Statistics*

André W. Van der Hoek, Ph.D. University of Colorado Boulder, *Professor of Informatics* (software engineering)

Joachim S. Vandekerckhove, Ph.D. University of Leuven, *Associate Professor of Cognitive Sciences; Statistics* (response time modeling, model fitting, computational statistics, psychometrics, bayesian statistics)

Vijay Vazirani, Ph.D. University of California, Berkeley, *Distinguished Professor of Computer Science* (algorithms and complexity, scientific and numerical computing)

Alexander Veidenbaum, Ph.D. University of Illinois at Urbana-Champaign, *Professor of Computer Science* (computer architecture, embedded systems, compilers, programming languages and systems, database and data mining)

Nalini Venkatasubramanian, Ph.D. University of Illinois at Urbana-Champaign, *Professor of Computer Science* (multimedia computing, networks and distributed systems, global information infrastructure, multiple resource management services)

Richert Wang, Ph.D. University of California, Irvine, *Lecturer of Computer Science*

Mark J. Warschauer, Ph.D. University of Hawaii at Manoa, *Professor of Education; Informatics* (language, literacy, technology, STEM)

Jennifer Wong-Ma, Ph.D. University of California, Los Angeles, *Associate Professor of Teaching of Computer Science* (computer architecture and design, embedded systems, hardware intellectual property protection, statistical optimization)

Xaiohui Xie, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Computer Science; Developmental and Cell Biology* (computational biology, bioinformatics, genomics, neural computation, machine learning)

Xiangmin Xu, Ph.D. Vanderbilt University, *Professor of Anatomy and Neurobiology; Biomedical Engineering; Computer Science*

Yaming Yu, Ph.D. Harvard University, *Associate Professor of Statistics*

Zhaoxia Yu, Ph.D. William Marsh Rice University, *Associate Professor of Statistics*

Charles S. Zender, Ph.D. University of Colorado Boulder, *Professor of Earth System Science; Computer Science*

Hong-Kai Zhao, Ph.D. University of California, Los Angeles, *Chancellor's Professor of Mathematics; Computer Science* (applied and computational mathematics, inverse problems and imaging)

Shuang Zhao, Ph.D. Cornell University, *Assistant Professor of Computer Science* (computer graphics with a focus on material appearance modeling and physically-based rendering)

Kai Zheng, Ph.D. Carnegie Mellon University, *Associate Professor of Informatics* (health informatics, human factors and human-computer interaction, technology adoption and acceptance, outcomes and evaluation)

Hadar Ziv, Ph.D. University of California, Irvine, *Associate Professor of Teaching of Informatics* (software testing, requirements engineering, Bayesian modeling)



## Computer Science Courses

### **COMPSCI 103. Advanced Programming and Problem Solving with C++. 4 Units.**

Advanced programming language concepts for more complex, higher performance software design. Builds depth of programming skills in C++ as a foundation for upper-division courses and projects. Focuses on strengthening programming, debugging, and problem solving skills.

Prerequisite: I&C SCI 45C

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

### **COMPSCI 111. Digital Image Processing. 4 Units.**

Introduction to the fundamental concepts of digital signal and image processing as applicable in areas such as multimedia, graphics, AI, data mining, databases, vision, or video games. Topics include image representation, space- and frequency-domain transformations, filters, segmentation, and compression.

Prerequisite: (I&C SCI 46 or CSE 46) and I&C SCI 6D and (MATH 3A or I&C SCI 6N). I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better. I&C SCI 6D with a grade of C or better. MATH 3A with a grade of C or better. I&C SCI 6N with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

### **COMPSCI 112. Computer Graphics. 4 Units.**

Introduction to the fundamental principles of 3D computer graphics including polygonal modeling, geometric transformations, visibility algorithms, illumination models, texturing, and rasterization. Use of an independently-learned 3D graphics API to implement these techniques.

Prerequisite: (I&C SCI 45C or CSE 45C) and (MATH 3A or I&C SCI 6N). I&C SCI 45C with a grade of C or better. CSE 45C with a grade of C or better. MATH 3A with a grade of C or better. I&C SCI 6N with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

### **COMPSCI 113. Computer Game Development. 4 Units.**

Introduction to the principles of interactive 2D and 3D computer game development. Concepts in computer graphics, algorithms, software engineering, art and graphics, music and sound, story analysis, and artificial intelligence are presented and are the basis for student work.

Prerequisite: COMPSCI 112 or COMPSCI 171 or IN4MATX 121 or ART 106B or I&C SCI 163 or I&C SCI 166

Same as IN4MATX 125.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

### **COMPSCI 114. Projects in Advanced 3D Computer Graphics. 4 Units.**

Projects in advanced 3D graphics such as illumination, geometric modeling, visualization, and animation. Topics include physically based and global illumination, solid modeling, curved surfaces, multiresolution modeling, image-based rendering, basic concepts of animation, and scientific visualization.

Prerequisite: COMPSCI 112 and (I&C SCI 45C or CSE 45C). I&C SCI 45C with a grade of C or better. CSE 45C with a grade of C or better.

Recommended: COMPSCI 161 or CSE 161 or COMPSCI 164 or COMPSCI 165.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

### **COMPSCI 115. Computer Simulation. 4 Units.**

Discrete event-driven simulation; continuous system simulation; basic probability as pertaining to input distributions and output analysis; stochastic and deterministic simulation; static and dynamic system simulation.

Prerequisite: I&C SCI 6B and (I&C SCI 6N or MATH 3A) and (STATS 67 or STATS 7) and STATS 120A and I&C SCI 51 and IN4MATX 43. I&C SCI 6B with a grade of C or better. I&C SCI 6N with a grade of C or better. MATH 3A with a grade of C or better. STATS 67 with a grade of C or better. STATS 7 with a grade of C or better. STATS 120A with a grade of C or better. I&C SCI 51 with a grade of C or better. IN4MATX 43 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 116. Computational Photography and Vision. 4 Units.**

Introduces the problems of computer vision through the application of computational photography. Specific topics include photo-editing (image warping, compositing, hole filling), panoramic image stitching, and face detection for digital photographs.

Prerequisite: I&C SCI 6D and (MATH 6G or MATH 3A or I&C SCI 6N) and MATH 2B and (I&C SCI 46 or CSE 46). I&C SCI 6D with a grade of C or better. MATH 6G with a grade of C or better. MATH 3A with a grade of C or better. I&C SCI 6N with a grade of C or better. MATH 2B with a grade of C or better. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 117. Project in Computer Vision. 4 Units.**

Students undertake construction of a computer vision system. Topics include automatically building 3D models from photographs, searching photo collections, robot navigation, and human motion tracking.

Prerequisite: I&C SCI 6D and (MATH 3A or I&C SCI 6N) and MATH 2B and (I&C SCI 46 or CSE 46) and (COMPSCI 112 or COMPSCI 116 or COMPSCI 171 or COMPSCI 178). I&C SCI 6D with a grade of C or better. MATH 3A with a grade of C or better. I&C SCI 6N with a grade of C or better. MATH 2B with a grade of C or better. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 121. Information Retrieval. 4 Units.**

An introduction to information retrieval including indexing, retrieval, classifying, and clustering text and multimedia documents.

Prerequisite: (I&C SCI 45C or I&C SCI 45J) and (STATS 7 or STATS 67). I&C SCI 45C with a grade of C or better. I&C SCI 45J with a grade of C or better

Same as IN4MATX 141.

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**COMPSCI 122A. Introduction to Data Management. 4 Units.**

Introduction to the design of databases and the use of database management systems (DBMS) for applications. Topics include entity-relationship modeling for design, relational data model, relational algebra, relational design theory, and Structured Query Language (SQL) programming.

Prerequisite: I&C SCI 33 or CSE 43 or EECS 114. I&C SCI 33 with a grade of C or better. CSE 43 with a grade of C or better

Same as EECS 116.

Restriction: Computer Science Engineering Majors have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment.

**COMPSCI 122B. Project in Databases and Web Applications. 4 Units.**

Introduces students to advanced database technologies and Web applications. Topics include database connectivity (ODBC/JDBC), extending databases using stored procedures, database administration, Web servers, Web programming languages (Java servlets, XML, Ajax, and mobile platforms).

Prerequisite: (COMPSCI 122A or EECS 116) and I&C SCI 45J

Overlaps with COMPSCI 137, IN4MATX 124.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 122C. Principles of Data Management. 4 Units.**

Covers fundamental principles underlying data management systems. Content includes key techniques including storage management, buffer management, record-oriented file system, access methods, query optimization, and query processing.

Prerequisite: COMPSCI 122A and (I&C SCI 53 or COMPSCI 143A)

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 222.

**COMPSCI 122D. Beyond SQL Data Management. 4 Units.**

Survey of modern data management and analysis technologies beyond relational (SQL) database management. Topics include semistructured data, NoSQL databases, big data analysis, and text search/query engines. Additional topics vary and may include data frames, streaming data, and/or time-series data.

Prerequisite: I&C SCI 46 and I&C SCI 51 and (COMPSCI 122A or EECS 116)

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**COMPSCI 125. Next Generation Search Systems. 4 Units.**

Discusses concepts and techniques related to all aspects of search systems. After considering basic search technology and the state-of-art systems, rapidly developing techniques for multimedia search, local search, event-search, and video-on-demand are explored.

Prerequisite: I&C SCI 31 or CSE 41 or I&C SCI 32A

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 225.

**COMPSCI 131. Parallel and Distributed Computing. 4 Units.**

Parallel and distributed computer systems. Parallel programming models. Common parallel and distributed programming issues. Specific topics include parallel programming, performance models, coordination and synchronization, consistency and replication, transactions, fault tolerance.

Prerequisite: (I&C SCI 53 and I&C SCI 53L) or COMPSCI 143A

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 132. Computer Networks. 4 Units.**

Computer network architectures, protocols, and applications. Internet congestion control, addressing, and routing. Local area networks. Multimedia networking.

Prerequisite: EECS 55 or STATS 67

Same as EECS 148.

Restriction: Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 133. Advanced Computer Networks. 4 Units.**

Fundamental principles in computer networks are applied to obtain practical experience and skills necessary for designing and implementing computer networks, protocols, and network applications. Various network design techniques, simulation techniques, and UNIX network programming are covered.

Prerequisite: COMPSCI 132 or EECS 148

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 134. Computer and Network Security. 4 Units.**

Overview of modern computer and networks security, attacks, and countermeasures. Authentication, identification, data secrecy, data integrity, authorization, access control, computer viruses, network security. Also covers secure e-commerce and applications of public key methods, digital certificates, and credentials.

Prerequisite: I&C SCI 6D and (I&C SCI 33 or CSE 43) and (COMPSCI 122A or EECS 116 or COMPSCI 132 or COMPSCI 143A)

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.



**COMPSCI 137. Internet Applications Engineering. 4 Units.**

Concepts in Internet applications engineering with emphasis on the Web. Peer-to-Peer and Interoperability. Topics include HTTP and REST, Remote Procedure/Method Calls, Web Services, data representations, content distribution networks, identity management, relevant W3C/IETF standards, and relevant new large-scale computing styles.

Prerequisite: (COMPSCI 132 or EECS 148) and I&C SCI 45J

Same as IN4MATX 124.

Overlaps with COMPSCI 122B.

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 141. Concepts in Programming Languages I. 4 Units.**

In-depth study of several contemporary programming languages stressing variety in data structures, operations, notation, and control. Examination of different programming paradigms, such as logic programming, functional programming and object-oriented programming; implementation strategies, programming environments, and programming style.

Prerequisite: (I&C SCI 51 or CSE 31 or EECS 31) and (I&C SCI 46 or CSE 46). I&C SCI 51 with a grade of C or better. CSE 31 with a grade of C or better. EECS 31 with a grade of C or better. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better

Same as IN4MATX 101.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 142A. Compilers and Interpreters. 4 Units.**

Introduction to the theory of programming language processors covering lexical analysis, syntax analysis, semantic analysis, intermediate representations, code generation, optimization, interpretation, and run-time support.

Prerequisite: CSE 141 or COMPSCI 141 or IN4MATX 101

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 142B. Language Processor Construction. 4 Units.**

Project course which provides working laboratory experience in construction and behavior of compilers and interpreters. Students build actual language processors and perform experiments which reveal their behaviors.

Prerequisite: COMPSCI 142A or CSE 142

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 143A. Principles of Operating Systems. 4 Units.**

Principles and concepts of process and resource management, especially as seen in operating systems. Processes, memory management, protection, scheduling, file systems, and I/O systems are covered. Concepts illustrated in the context of several well-known systems.

Prerequisite: (I&C SCI 46 or CSE 46) and (I&C SCI 51 or EECS 31 or CSE 31)

Overlaps with EECS 111.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 143B. Project in Operating System Organization. 4 Units.**

Detailed specification and design of critical components of an actual operating system including a memory manager, a process server, and a file/IO subsystem. Hardware/software tradeoffs. Emphasis on logical organization of system and communication.

Prerequisite: COMPSCI 143A

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 145. Embedded Software. 4 Units.**

Principles of embedded computing systems: embedded systems architecture, hardware/software components, system software and interfacing, real-time operating systems, hardware/software co-development, and communication issues. Examples of embedded computing in real-world application domains. Simple programming using an embedded systems development environment.

Corequisite: COMPSCI 145L

Prerequisite: (CSE 46 or I&C SCI 46) and (I&C SCI 51 or EECS 31 or CSE 31)

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 145L. Embedded Software Laboratory. 2 Units.**

Laboratory section to accompany COMPSCI 145.

Corequisite: COMPSCI 145

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 146. Programming in Multitasking Operating Systems. 4 Units.**

User- and systems-level programming of modern Internet-connected, multi-user, multitasking operating systems. Shells, scripting, filters, pipelines, programmability, extensibility, concurrency, inter-process communication. Concrete examples of a modern operating system (such as, but not necessarily, Unix programmed in C) are used.

Prerequisite: (I&C SCI 46 or CSE 46) and I&C SCI 51. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better. I&C SCI 51 with a grade of C or better. Recommended: COMPSCI 143A.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 147. Internet of Things (IoT) Software and Systems. 4 Units.**

Introduction to the Internet of Things (IoT) from a systems and software perspective. IoT ecosystem including sensors, embedded CPUs, networking protocols, software, cloud services, and security and privacy requirements. IoT use cases, system design, and programming project.

Prerequisite: I&C SCI 33 or CSE 43

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 151. Digital Logic Design. 4 Units.**

Boolean algebra. Design/analysis of combinational and sequential systems using SSI/MSI/LSI modules. Number systems. Error detecting and correction codes. Arithmetic algorithms. Hardware/ firmware implementation of algorithms.

Prerequisite: (I&C SCI 33 or CSE 43) and I&C SCI 51 and I&C SCI 6B and I&C SCI 6D. I&C SCI 33 with a grade of C or better. CSE 43 with a grade of C or better. I&C SCI 51 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 152. Computer Systems Architecture. 4 Units.**

Design of computer elements; ALU, control unit, and arithmetic circuits. Memory hierarchy and organization. Caches. Function unit sharing and pipelining. I/O and interrupt processing. RTL and behavioral modeling using hardware description languages. Microprocessor organization and implementation techniques.

Prerequisite: COMPSCI 151

Overlaps with I&C SCI 160, EECS 112.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 153. Logic Design Laboratory. 4 Units.**

Introduction to standard integrated circuits. Construction and debugging techniques. Design of digital systems using LSI and MSI components. Practical use of circuits in a laboratory environment, including implementation of small digital systems such as arithmetic modules, displays, and timers.

Prerequisite: COMPSCI 151

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 154. Computer Design Laboratory. 4 Units.**

Underlying primitives of computer instruction sets. Principles of microprogramming. Microprogramming. Microprograms written for one or more systems. Typical microprogramming applications discussed and implemented or simulated.

Prerequisite or corequisite: COMPSCI 151

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 161. Design and Analysis of Algorithms. 4 Units.**

Techniques for efficient algorithm design, including divide-and-conquer and dynamic programming, and time/space analysis. Fast algorithms for problems applicable to networks, computer games, and scientific computing, such as sorting, shortest paths, minimum spanning trees, network flow, and pattern matching.

Prerequisite: (I&C SCI 46 or CSE 46) and I&C SCI 6B and I&C SCI 6D and MATH 2B. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Software Engineering Majors have first consideration for enrollment. Data Science Majors have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment. Computer Science Majors have first consideration for enrollment. Business Information Management, Computer Game Science, and Informatics majors have second right of consideration.

**COMPSCI 162. Formal Languages and Automata. 4 Units.**

Formal aspects of describing and recognizing languages by grammars and automata. Parsing regular and context-free languages. Ambiguity, nondeterminism. Elements of computability; Turing machines, random access machines, undecidable problems, NP-completeness.

Prerequisite: (I&C SCI 46 or CSE 46) and MATH 2B and I&C SCI 6B and I&C SCI 6D. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better

Same as LSCI 102.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment. Language Science Majors have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 163. Graph Algorithms. 4 Units.**

Algorithms for solving fundamental problems in graph theory. Graph representations, graph traversal, network flow, connectivity, graph layout, matching problems.

Prerequisite: COMPSCI 161 or CSE 161

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 265.

**COMPSCI 164. Computational Geometry and Geometric Modeling. 4 Units.**

Algorithms and data structures for computational geometry and geometric modeling, with applications to game and graphics programming. Topics: convex hulls, Voronoi diagrams, algorithms for triangulation, motion planning, and data structures for geometric searching and modeling of 2D and 3D objects.

Prerequisite: I&C SCI 46 or CSE 46. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 165. Project In Algorithms And Data Structures. 4 Units.**

Design, implementation, execution, and analysis of algorithms for problems such as sorting, searching, data compression, and data encryption. Time-space-structure trade-offs.

Prerequisite: COMPSCI 161 or CSE 161. Recommended: I&C SCI 45C OR CSE 45C.

**COMPSCI 166. Quantum Computation and Information. 4 Units.**

Basic models for quantum computation and their foundations in quantum mechanics. Quantum complexity classes and quantum algorithms, including algorithms for factoring and quantum simulation. Introduction to quantum information theory and quantum entanglement.

Prerequisite: (I&C SCI 6N or MATH 3A) and COMPSCI 161

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 167. Introduction to Applied Cryptography. 4 Units.**

An introduction to the essential aspects of applied cryptography, as it is used in practice. Topics include classical cryptography, block ciphers, stream ciphers, public-key cryptography, digital signatures, one-way hash functions, basic cryptographic protocols, and digital certificates and credentials.

Prerequisite: COMPSCI 161 or CSE 161

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 169. Introduction to Optimization. 4 Units.**

A broad introduction to optimization. Unconstrained and constrained optimization. Equality and inequality constraints. Linear and integer programming. Stochastic dynamic programming.

Prerequisite: (I&C SCI 6N or MATH 3A) and (STATS 67 or (STATS 7 and STATS 120A))

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 268.

**COMPSCI 171. Introduction to Artificial Intelligence. 4 Units.**

Different means of representing knowledge and uses of representations in heuristic problem solving. Representations considered include predicate logic, semantic nets, procedural representations, natural language grammars, and search trees.

Prerequisite or corequisite: ((STATS 7 and STATS 120A) or STATS 67) ( and (I&C SCI 46 or CSE 46) and MATH 2B)

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 172B. Neural Networks and Deep Learning . 4 Units.**

Neural network and deep learning from multiple perspectives. Theory of parallel distributed processing systems, algorithmic approaches for learning from data in various manners, applications to difficult problems in AI from computer vision, to natural language understanding, to bioinformatics and chemoinformatics.

Prerequisite: (STATS 120A and STATS 120B) or MATH 121A or COMPSCI 178 or COMPSCI 273A

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 274C.

**COMPSCI 172C. Artificial Intelligence Frontiers: Technical, Ethical, and Societal. 4 Units.**

Explores the frontiers of artificial intelligence and related technologies with a focus on the underlying ethical, legal, and societal challenges and opportunities they create. Encourages critical thinking about these issues.

Prerequisite: COMPSCI 171 and COMPSCI 172B. Recommended: COMPSCI 178

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 274D.

**COMPSCI 175. Project in Artificial Intelligence. 4 Units.**

Construction of a working artificial intelligence system. Evaluation of capabilities of the system including impact of knowledge representation.

Prerequisite: COMPSCI 171 and COMPSCI 178

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 177. Applications of Probability in Computer Science. 4 Units.**

Application of probability to real-world problems in computer science. Typical topics include analysis of algorithms and graphs, probabilistic language models, network traffic modeling, data compression, and reliability modeling.

Prerequisite: MATH 2B and STATS 67 and I&C SCI 6B and I&C SCI 6D and (MATH 3A or I&C SCI 6N)

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 178. Machine Learning and Data-Mining. 4 Units.**

Introduction to principles of machine learning and data-mining applied to real-world datasets. Typical applications include spam filtering, object recognition, and credit scoring.

Prerequisite: I&C SCI 6B and I&C SCI 6D and (I&C SCI 6N or MATH 3A) and MATH 2B and (STATS 67 or (STATS 7 and STATS 120A))

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 179. Algorithms for Probabilistic and Deterministic Graphical Models. 4 Units.**

Graphical model techniques dealing with probabilistic and deterministic knowledge representations. Focuses on graphical models such as constraint networks, Bayesian networks, and Markov networks that have become a central paradigm for knowledge representation and reasoning in AI and general computer science.

Prerequisite: COMPSCI 171

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 183. Introduction to Computational Biology. 4 Units.**

The use of theories and methods based on computer science, mathematics, and physics in molecular biology and biochemistry. Basics in biomolecular modeling. Analysis of sequence and structural data of biomolecules. Analysis of biomolecular functions.

Prerequisite: MATH 2D or MATH 3A or STATS 7 or STATS 8

Same as BME 132, BIO SCI M123.

Concurrent with MOL BIO 223 and BME 232.

**COMPSCI 184A. Artificial Intelligence in Biology and Medicine. 4 Units.**

Introduction to computational methods in molecular biology, aimed at those interested in learning about this interdisciplinary area. Covers computational approaches to understanding and predicting the structure, function, interactions, and evolution of DNA, RNA, proteins, and related molecules and processes.

Prerequisite: I&C SCI 6N or MATH 3A

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 284A.

**COMPSCI 184C. Computational Systems Biology. 4 Units.**

Computational inference and modeling of gene regulation networks, signal transduction pathways, and the effects of regulatory networks in cellular processes, development, and disease. Introduction of required mathematical, computational, and data handling tools.

Prerequisite: COMPSCI 184A

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 284C.

**COMPSCI 190. Special Topics in Information and Computer Science. 4 Units.**

Studies in selected areas of Information and Computer Science. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**COMPSCI H198. Honors Research. 4 Units.**

Directed independent research in computer science for honors students.

Repeatability: May be repeated for credit unlimited times.

Restriction: Campuswide Honors Collegium students only. Bren School of ICS Honors students only. Upper-division students only.

**COMPSCI 199. Individual Study. 2-5 Units.**

Individual research or investigation with Computer Science faculty.

Repeatability: May be repeated for credit unlimited times.

**COMPSCI 200S. Seminar in Computer Science Research. 1 Unit.**

Graduate colloquium series. Includes weekly talks by notable computer scientists.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**COMPSCI 201. Foundations of Cryptographic Protocols. 4 Units.**

Explores fundamental cryptographic tools, including encryption, signatures, and identification schemes. Students are introduced to the provable security paradigm of modern cryptography, focusing on understanding of security properties provided by cryptographic tools, and on proving security (or insecurity) of cryptographic constructions.

Prerequisite: COMPSCI 260 or COMPSCI 263

**COMPSCI 201P. Introduction to Computer Security. 4 Units.**

Introduction to computer security, including systems, technology, and management. Topics include authorization, authentication, data integrity, malware, operating systems security, network security, web security, and basic cryptography.

Prerequisite: Knowledge of Python or C++ programming is required.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 202. Applied Cryptography. 4 Units.**

Design and analysis of algorithms for applied cryptography. Topics include symmetric and asymmetric key encryption, digital signatures, one-way hash functions, digital certificates and credentials, and techniques for authorization, non-repudiation, authentication, identification, data integrity, proofs of knowledge, and access control.

Prerequisite: COMPSCI 260 and COMPSCI 263

**COMPSCI 202P. Applied Cryptography . 4 Units.**

Design and analysis of algorithms for applied cryptography. Topics include symmetric and asymmetric key encryption, digital signatures, one-way hash functions, digital certificates and credentials, and techniques for authorization, non-repudiation, authentication, identification, data integrity, proofs of knowledge, and access control.

Restriction: Graduate students only.

**COMPSCI 203. Network and Distributed Systems Security. 4 Units.**

Modern computer and networks security: attacks and countermeasures, authentication, identification, data secrecy, data integrity, authorization, access control, computer viruses, network security. Group communication and multicast security techniques. Covers secure e-commerce and applications of public key methods, digital certificates, and credentials.

Prerequisite: EECS 148 or COMPSCI 132

Same as NET SYS 240.

**COMPSCI 203P. Network Security. 4 Units.**

Introduction to network security, including network threats and attacks, as well as defenses against such attacks. Topics include network infrastructure security, mobile and Wi-Fi security, spam, phishing, firewalls, anonymity, secure email, secure and private cloud computing, and web security.

Prerequisite: COMPSCI 201P or COMPSCI 202P

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 204. Usable Security and Privacy. 4 Units.**

Introduces usability problems in security and privacy methods, tools, and software. Overviews prominent examples of both failures and successes in usable security and privacy. Surveys state-of-the-art techniques and evaluation methodologies.

Same as IN4MATX 237.

Overlaps with IN4MATX 231, COMPSCI 203.

Restriction: Informatics Majors have first consideration for enrollment. Computer Science Majors have first consideration for enrollment. Undergraduate degree in CompSci or Informatics is strongly recommended.

**COMPSCI 205. Computer and Systems Security . 4 Units.**

Lecture and discuss latest security research in software, OS, protocols, mobile devices, machine learning, sensors, and emerging IoT/CPS systems such as smart home and smart transportation. Students perform research projects and gain hands-on experience evaluating and designing secure systems.

Prerequisite: COMPSCI 134 and COMPSCI 142A and COMPSCI 143A

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Graduate students only.

**COMPSCI 206. Principles of Scientific Computing. 4 Units.**

Overview of widely used principles and methods of numerical and scientific computing, including basic concepts and computational methods in linear algebra, optimization, and probability.

Prerequisite: Basic courses in multivariate calculus, linear algebra, and probability.

Overlaps with STATS 230.

**COMPSCI 206P. Principles of Scientific Computing. 4 Units.**

Overview of widely used principles and methods of numerical and scientific computing, including basic concepts and computational methods in floating-point, linear algebra, optimization, simulation, modeling, and probability/statistics as it relates to model evaluation.

Prerequisite: Basic knowledge of multivariate calculus, linear algebra, and familiarity with MATLAB.

Restriction: Graduate students only.

**COMPSCI 210P. Computer Graphics and Visualization . 4 Units.**

Interactive 3D graphics rendering pipeline, illumination and shading, ray tracing, texture-, bump-, mip-mapping, hidden surface removal, anti-aliasing, multiresolution representations, volume rendering techniques, iso-surface extraction.

Prerequisite: Familiarity with linear algebra is required.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 211A. Visual Computing. 4 Units.**

Fundamentals of image processing (convolution, linear filters, spectral analysis), vision geometry (projective geometry, camera models and calibration, stereo reconstruction), radiometry (color, shading, illumination, BRDF), and visual content synthesis (graphics pipeline, texture- bump-, mip-mapping, hidden surface removal, anti-aliasing).



**COMPSCI 211B. Computer Graphics and Visualization. 4 Units.**

Interactive 3D graphics rendering pipeline, illumination and shading, ray tracing, texture-, bump-, mip-mapping, hidden surface removal, anti-aliasing, multiresolution representations, volume rendering techniques, iso-surface extraction.

Prerequisite: COMPSCI 211A

**COMPSCI 211P. Visual Computing . 4 Units.**

Develops a comprehensive understanding of fundamentals of image processing (convolution, linear filters, spectral analysis), vision geometry (projective geometry, camera models and calibration, stereo reconstruction), radiometry (color, shading, illumination, BRDF), visual content synthesis (graphics pipeline, texture- bump-, mip-mapping, hidden surface, anti-aliasing).

Prerequisite: Undergraduate-level familiarity with Linear algebra (matrices and operations), eigenvalue, eigenvectors, linear regression; basic of algorithms; programming in C/C++

Restriction: Graduate students only.

**COMPSCI 212. Multimedia Systems and Applications. 4 Units.**

Organization and structure of modern multimedia systems; audio and video encoding/compression; quality of service concepts; scheduling algorithms for multimedia; resource management in distributed and multimedia systems; multimedia protocols over high-speed networks; synchronization schemes; multimedia applications; and teleservices.

Prerequisite: COMPSCI 143A and COMPSCI 161. B.S. degree in Computer Science is also accepted. Recommended: COMPSCI 131 and COMPSCI 132 and COMPSCI 133.

**COMPSCI 213. Introduction to Visual Perception. 4 Units.**

Introduction to the process of human visual perception. Offers the physiological and psychophysical approach to understand vision, introducing concepts of perception of color, depth, movement. Examples of quantification and application of these models in computer vision, computer graphics, multimedia, HCI.

Prerequisite: MATH 121A

**COMPSCI 216. Image Understanding. 4 Units.**

The goal of image understanding is to extract useful semantic information from image data. Course covers low-level image and video processing techniques, feature descriptors, segmentation, objection recognition, and tracking.

Prerequisite: I&C SCI 6D and (I&C SCI 6N or MATH 6G or MATH 3A) and MATH 2B and I&C SCI 46

**COMPSCI 217. Light and Geometry in Computer Vision. 4 Units.**

Examines the issues of light transport and multiview geometry in computer vision. Applications include camera calibration, 3D understanding, stereo reconstruction, and illumination estimation.

Prerequisite: I&C SCI 6D and (I&C SCI 6N or MATH 6G or MATH 3A) and MATH 2B and I&C SCI 46 and COMPSCI 211A

**COMPSCI 221. Information Retrieval, Filtering, and Classification. 4 Units.**

Algorithms for the storage, retrieval, filtering, and classification of textual and multimedia data. The vector space model, Boolean and probabilistic queries, and relevance feedback. Latent semantic indexing; collaborative filtering; and relationship to machine learning methods.

Prerequisite: COMPSCI 161 and COMPSCI 171 and (I&C SCI 6N or MATH 3A or MATH 6G)

Same as SWE 225.

Restriction: Graduate students only.

**COMPSCI 222. Principles of Data Management. 4 Units.**

Covers fundamental principles underlying data management systems. Content includes key techniques including storage management, buffer management, record-oriented file system, access methods, query optimization, and query processing.

Prerequisite: COMPSCI 122A and (I&C SCI 53 or COMPSCI 143A)

Concurrent with COMPSCI 122C.



**COMPSCI 222P. Principles of Data Management. 4 Units.**

Covers fundamental principles underlying data management systems. Understanding and implementation of key techniques including storage management, buffer management, record-oriented file system, access methods, query optimization, and query processing.

Prerequisite: C++ programming skills, understanding of Data Structures and Algorithms

Restriction: Graduate students only.

**COMPSCI 223. Transaction Processing and Distributed Data Management. 4 Units.**

Covers fundamental principles underlying transaction processing including database consistency, concurrency control, database recovery, and fault-tolerance. Includes transaction processing in centralized, distributed, parallel, and client-server environments.

Prerequisite: COMPSCI 222 and COMPSCI 131

**COMPSCI 225. Next Generation Search Systems. 4 Units.**

Discusses concepts and techniques related to all aspects of search systems. After considering basic search technology and the state-of-art systems, rapidly developing techniques for multimedia search, local search, event-search, and video-on-demand are explored.

Prerequisite: I&C SCI 21 or CSE 21 or IN4MATX 41 or I&C SCI 31 or CSE 41

Restriction: Upper-division students only. Graduate students only.

Concurrent with COMPSCI 125.

**COMPSCI 230. Distributed Computer Systems. 4 Units.**

Principles of distributed computing systems. Topics covered include message-passing, remote procedure calls, distributed shared memory synchronization, resource and process/thread management, distributed file systems, naming and security.

**COMPSCI 230P. Distributed Computer Systems . 4 Units.**

Principles of distributed computing systems. Topics covered include message-passing, remote procedure calls, distributed shared memory synchronization, resource and process/thread management, distributed file systems, naming and security.

Restriction: Graduate students only.

**COMPSCI 231P. Parallel and Distributed Computing for Professionals . 4 Units.**

Covers a wide variety of concepts related to the design and application of high-performance concurrent computing systems, including architectural features, communications networks and models, parallel program development for numerical and non-numerical applications, programming models, and more.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 232. Computer and Communication Networks. 4 Units.**

Network architecture of the Internet, telephone networks, cable networks, and cell phone networks. Network performance models. Network performance models. Advanced concepts and implementations of flow and congestion control, addressing, internetworking, forwarding, routing, multiple access, streaming, and quality-of-service.

Prerequisite: EECS 148 or COMPSCI 132

Same as EECS 248A, NET SYS 201.

Restriction: Graduate students only.

**COMPSCI 232P. Computer and Communication Networks . 4 Units.**

Internet architecture, protocols, and services. Advanced concepts of IP and TCP, including addressing, internetworking, forwarding, routing, and implementations of flow and congestion control. Internet services such as Network Address Translation and Domain Name Servers. Overview of Local Area Networks.

Restriction: Graduate students only.

**COMPSCI 233. Networking Laboratory. 4 Units.**

A laboratory-based introduction to basic networking concepts such as addressing, sub-netting, bridging, ARP, and routing. Network simulation and design. Structured around weekly readings and laboratory assignments.

Prerequisite: EECS 148 or COMPSCI 132

Same as NET SYS 202.

**COMPSCI 234. Advanced Networks. 4 Units.**

Design principles of networked systems, advanced routing and congestion control algorithms, network algorithms, network measurement, management, security, Internet economics, and emerging networks.

Prerequisite: NET SYS 201 or COMPSCI 232 or EECS 248A

Same as NET SYS 210.

**COMPSCI 236. Wireless and Mobile Networking. 4 Units.**

Introduction to wireless networking. The focus is on layers 2 and 3 of the OSI reference model, design, performance analysis, and protocols. Topics covered include: an introduction to wireless networking, digital cellular, next generation cellular, wireless LANs, and mobile IP.

Prerequisite: EECS 148 or COMPSCI 132

Same as NET SYS 230.

**COMPSCI 237. Middleware for Networked and Distributed Systems. 4 Units.**

Discusses concepts, techniques, and issues in developing distributed systems middleware that provides high performance and Quality of Service for emerging applications. Also covers existing standards (e.g., CORBA, DCOM, Jini, Espeak) and their relative advantages and shortcomings.

Prerequisite: An undergraduate-level course in operating systems and networks.

Same as NET SYS 260.

**COMPSCI 238. Advanced Operating Systems. 4 Units.**

Focuses on advanced and graduate-level topics in operating systems. Presents important recent developments in operating systems, topics not covered in undergraduate operating systems courses. This includes novel operating system designs and techniques to improve existing ones.

Prerequisite: COMPSCI 143A

**COMPSCI 238P. Operating Systems. 4 Units.**

In-depth organization of the core operating system abstraction and its implementation (virtual memory, kernel and user mode, system calls, threads, context switches, interrupts, inter-process communication, hardware interface, etc.) and a range of recent developments in de-facto industry standard operating systems.

Prerequisite: Working knowledge of C and the Linux environment.

Restriction: School of Info & Computer Sci students only. Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 241. Advanced Compiler Construction. 4 Units.**

Advanced study of programming language implementation techniques: optimizations such as common sub-expression elimination, register allocation, and instruction scheduling. Implementation of language features such as type-directed dispatch, garbage collection, dynamic linking, and just-in-time code generation.

Prerequisite: COMPSCI 142A

**COMPSCI 242. Parallel Computing. 4 Units.**

Definition of parallel processing systems. Theory and application of arrays, trees, and hypercubes. Computational models, applications: sorting, integer arithmetic, matrix operations, Fast Fourier Transform, and others. Interconnection networks: a framework for the description, analysis, and construction of hypercube-derived networks.

**COMPSCI 242P. Compilers and Interpreters. 4 Units.**

Provides in-depth study of compilers and interpreters which are the primary forms of programming language processing in computing.

Prerequisite: Knowledge of C++ programming is required.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 243. High-Performance Architectures and Their Compilers. 4 Units.**

Emphasis on the development of automatic tools (i.e., compilers/environments) for the efficient exploitation of parallel machines, and the trade-offs between hardware and software in the design of supercomputing and high-performance machines.

**COMPSCI 244. Introduction to Embedded and Ubiquitous Systems. 4 Units.**

Embedded and ubiquitous system technologies including processors, DSP, memory, and software. System interfacing basics; communication strategies; sensors and actuators, mobile and wireless technology. Using pre-designed hardware and software components. Design case studies in wireless, multimedia, and/or networking domains.

Prerequisite: I&C SCI 51 and COMPSCI 152 and COMPSCI 161 and (I&C SCI 6N or MATH 3A or MATH 6G or I&C SCI 6D). B.S. degree in Computer Science is also accepted.

Same as IN4MATX 244.

**COMPSCI 244P. Introduction to the Internet of Things. 4 Units.**

Develops a comprehensive understanding of the hardware and software technology, the communication protocols, and the security and privacy requirements underlying the Internet of Things ecosystem, particularly those using computing elements (processors, DSPs/ ASIPs), sensors, and accessing cloud services.

Prerequisite: Undergraduate-level familiarity with fundamentals of integrated circuit blocks, processors, optimization/algorithm design, and some programming experience.

Restriction: Graduate students only.

**COMPSCI 245. Software for Embedded Systems. 4 Units.**

Embedded computing elements, device interfaces, time-critical IO handling. Embedded software design under size, performance, and reliability constraints. Software timing and functional validation. Programming methods and compilation for embeddable software. Embedded runtime systems. Case studies of real-time software systems.

Prerequisite: I&C SCI 51 and COMPSCI 152 and COMPSCI 161 and (I&C SCI 6N or MATH 3A or MATH 6G or I&C SCI 6D). B.S. degree in Computer Science is also accepted.

**COMPSCI 246. Dependability, Validation, and Testing of Embedded Systems. 4 Units.**

Embedded system building blocks, including IP cores. Dependability and Resilience. Co-simulation. Formal verification using model checking. Verification environments. Test challenges in core integration: compliance, feature, random, and collision testing. Core access and test integration. Interface-based verification and standards.

Prerequisite: B.S. degree in Computer Science or basic courses in algorithms and data structures, calculus, discrete math, linear algebra, symbolic logic.

**COMPSCI 247. Complex Software Systems: Project Course. 4 Units.**

Building complex systems software systems, such as Database Management Systems, Operating Systems, and Optimizing Compilers. Such systems often involve low-level programming and intricate performance optimizations. Students learn how to build such a system.

Prerequisite or corequisite: COMPSCI 222 or COMPSCI 238 or COMPSCI 241

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**COMPSCI 248A. Introduction to Ubiquitous Computing. 4 Units.**

The 'disappearing computer' paradigm. Differences to the desktop computing model: applications, interaction in augmented environments, security, alternate media, small operating systems, sensors, and embedded systems design. Evaluation by project work and class participation.

Same as IN4MATX 241.

**COMPSCI 250A. Computer Systems Architecture. 4 Units.**

Study of architectural issues and their relation to technology and software: design of processor, interconnections, and memory hierarchies.

Prerequisite: COMPSCI 152

**COMPSCI 250B. Modern Computer Systems. 4 Units.**

Fundamental concepts and recent advances in computer systems architecture necessary to achieve high performance and efficiency on systems available today. Topics span modern processor features, accelerators, storage and network architectures, as well as architecture-optimized software.

Prerequisite: Required: Undergraduate-level understanding of computer architecture concepts.

Overlaps with COMPSCI 243.

**COMPSCI 250P. Computer Systems Architecture . 4 Units.**

Study of architectural issues and their relation to technology and software: design of processor, interconnections, and memory hierarchies.

Prerequisite: Undergraduate-level familiarity with fundamentals of integrated circuit blocks, processors, and optimization/algorithm design, and some programming experience.

Restriction: Graduate students only.

**COMPSCI 252. Introduction to Computer Design. 4 Units.**

The methodology and use of CAD tools for computer design, accomplished by a lab in which students practice design using commercially available silicon compilers and other tools.

Prerequisite: COMPSCI 151 and COMPSCI 152

**COMPSCI 253. Analysis of Programming Languages. 4 Units.**

Concepts in modern programming languages, their interaction, and the relationship between programming languages and methods for large-scale, extensible software development. Empirical analysis of programming language usage.

Same as SWE 212.

**COMPSCI 253P. Advanced Programming and Problem Solving. 4 Units.**

Provides in-depth preparation for industry interviews requiring demonstration of problem solving and programming skills. Emphasis is on understanding problem statements, considering edge cases, developing effective test cases, designing correct solutions, explaining these clearly, and implementing a solution correctly.

Corequisite: COMPSCI 260P

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 259S. Seminar in Design Science. 2 Units.**

Current research and research trends in design science. Forum for presentation and criticism by students of research work in progress.

Repeatability: May be taken for credit 18 times.

**COMPSCI 260. Fundamentals of the Design and Analysis of Algorithms. 4 Units.**

Covers fundamental concepts in the design and analysis of algorithms and is geared toward non-specialists in theoretical computer science. Topics include: deterministic and randomized graph algorithms, fundamental algorithmic techniques like divide-and-conquer strategies and dynamic programming, and NP-completeness.

Prerequisite: COMPSCI 161

**COMPSCI 260P. Fundamentals of Algorithms with Applications. 4 Units.**

Covers fundamental concepts in the design and analysis of algorithms and is geared toward practical application and implementation. Topics include greedy algorithms, deterministic and randomized graph algorithms, models of network flow, fundamental algorithmic techniques, and NP-completeness.

Restriction: Graduate students only.

**COMPSCI 261. Data Structures. 4 Units.**

An in-depth treatment of data structures and their associated management algorithms including resource complexity analysis.

Prerequisite: I&C SCI 46 and COMPSCI 161

**COMPSCI 261P. Data Structures with Applications . 4 Units.**

Data structures and their associated management algorithms, including their applications and analysis.

Restriction: Graduate students only.

**COMPSCI 262. Computational Complexity. 4 Units.**

Advanced course in computational models and complexity classes. Covers the fundamentals of Turing Machines, Decidability, and NP-completeness. Includes discussion of more advanced topics including polynomial hierarchy, randomized complexity classes, #P-completeness and hardness of approximation.

Prerequisite: COMPSCI 162

**COMPSCI 262P. Text Processing and Pattern Matching. 4 Units.**

Techniques for pattern matching and parsing character strings. Topics include substring searching, finite state machines, regular expressions, and context-free grammars, as well as applications in lexical analyzers, compilers, word processors, malware detectors, and search engines.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 263. Analysis of Algorithms. 4 Units.**

Analysis of correctness and complexity of various efficient algorithms; discussion of problems for which no efficient solutions are known.

Prerequisite: COMPSCI 161 and COMPSCI 261

**COMPSCI 264. Quantum Computation and Information. 4 Units.**

Basic models for quantum computation and their foundations in quantum mechanics. Quantum complexity classes and quantum algorithms, including algorithms for factoring and quantum simulation. Introduction to quantum information theory and quantum entanglement.

Prerequisite: Basic courses in linear algebra and algorithms.

**COMPSCI 265. Graph Algorithms. 4 Units.**

Graph definitions, representation methods, graph problems, algorithms, approximation methods, and applications.

Prerequisite: COMPSCI 161 and COMPSCI 261

Concurrent with COMPSCI 163.

**COMPSCI 266. Computational Geometry. 4 Units.**

An overview of some of the basic problems in computational geometry and of some algorithmic and data-structuring techniques appropriate to their solution.

Prerequisite: COMPSCI 161 and COMPSCI 261

**COMPSCI 267P. Data Compression. 4 Units.**

An introduction to the theory and practice of modern data compression techniques. Topics include codes, coding, modeling, text compression, lossless and lossy image compression standards and systems, audio compression.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 268. Introduction to Optimization. 4 Units.**

A broad introduction to optimization. Unconstrained and constrained optimization. Equality and inequality constraints. Linear and integer programming. Stochastic dynamic programming.

Prerequisite: STATS 67 or (STATS 7 and STATS 120A) and (I&C SCI 6N or MATH 3A)

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

Concurrent with COMPSCI 169.

**COMPSCI 268P. Introduction to Optimization Modeling . 4 Units.**

A broad introduction to optimization methods and their applications. Unconstrained and constrained optimization. Direct, first, and second order methods. Use of optimization software libraries. Equality and inequality constraints, optimal conditions, and methods. Applications to modeling in computer science, engineering.

Restriction: Graduate students only.

**COMPSCI 269S. Seminar in the Theory of Algorithms and Data Structures. 2 Units.**

Current research and research trends in the Theory of algorithms and data structures.

Repeatability: May be taken for credit 18 times.

**COMPSCI 271. Introduction to Artificial Intelligence. 4 Units.**

The study of theories and computational models for systems which behave and act in an intelligent manner. Fundamental subdisciplines of artificial intelligence including knowledge representation, search, deduction, planning, probabilistic reasoning, natural language parsing and comprehension, knowledge-based systems, and learning.

**COMPSCI 271P. Introduction to Artificial Intelligence. 4 Units.**

The study of theories and computational models for systems which behave and act in an intelligent manner. Fundamental sub-disciplines of artificial intelligence, including knowledge representation, search, deduction, planning, probabilistic reasoning, natural language parsing and comprehension, knowledge-based systems, and learning.

Restriction: Graduate students only.

**COMPSCI 272. Statistical Natural Language Processing. 4 Units.**

Statistical models, machine learning algorithms, and computational tasks involved in natural language processing. Focuses on approaches that learn these models from data, and covers applications such as information extraction, dialog systems, machine translation, and question answering.

Prerequisite: COMPSCI 171 and COMPSCI 178

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Graduate students only.

**COMPSCI 273A. Machine Learning. 4 Units.**

Computational approaches to learning algorithms for classifications, regression, and clustering. Emphasis is on discriminative classification methods such as decision trees, rules, nearest neighbor, linear models, and naive Bayes.

Prerequisite: COMPSCI 271 and COMPSCI 206

**COMPSCI 273P. Machine Learning and Data Mining . 4 Units.**

Introduction to principles of machine learning and data-mining. Learning algorithms for classifications, regression, and clustering. Emphasis is on discriminative classification methods such as decision trees, rules, nearest neighbor, linear models, and naive Bayes.

Prerequisite: Python programming knowledge is required.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 274A. Probabilistic Learning: Theory and Algorithms. 4 Units.**

An introduction to probabilistic and statistical techniques for learning from data, including parameter estimation, density estimation, regression, classification, and mixture modeling.

Prerequisite: COMPSCI 206

**COMPSCI 274B. Learning in Graphical Models. 4 Units.**

Models for data analysis are presented in the unifying framework of graphical models. The emphasis is on learning from data but inference is also covered. Real world examples are used to illustrate the material.

Prerequisite: COMPSCI 274A

**COMPSCI 274C. Neural Networks and Deep Learning. 4 Units.**

Neural network and deep learning from multiple perspectives. Theory of parallel distributed processing systems, algorithmic approaches for learning from data in various manners, applications to difficult problems in AI from computer vision, to natural language understanding, to bioinformatics and chemoinformatics.

Prerequisite: (STATS 120A and STATS 120B) or MATH 121A or COMPSCI 178 or COMPSCI 273A

Overlaps with COMPSCI 274A, COMPSCI 277, COMPSCI 276, COMPSCI 278, COMPSCI 274B, COMPSCI 273A.

Concurrent with COMPSCI 172B.

**COMPSCI 274D. Artificial Intelligence Frontiers: Technical, Ethical, and Societal. 4 Units.**

Explores the frontiers of artificial intelligence and related technologies with a focus on the underlying ethical, legal, and societal challenges and opportunities they create. Encourages critical thinking about these issues.

Prerequisite: Recommended: COMPSCI 172B and COMPSCI 178.

Restriction: Graduate students only.

Concurrent with COMPSCI 172C.

**COMPSCI 274E. Deep Generative Models. 4 Units.**

Discusses probabilistic approaches to deep learning such as generative models and their applications in computer vision, NLP, the natural sciences, and other fields. Coursework may include both homework and project components.

Prerequisite: COMPSCI 178 or COMPSCI 273A or STATS 120B. Recommended: Advanced machine learning or graphical models courses such as COMPSCI 274A or COMPSCI 274B or CS 273C or COMPSCI 276.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Graduate students only.

**COMPSCI 274P. Neural Networks and Deep Learning. 4 Units.**

Introduction to principles of machine learning and neural networks. Architecture design. Feedforward and recurrent networks. Learning models and algorithms. Applications to data analysis and prediction problems in areas such as machine vision, natural language processing, biomed, and finance.

Prerequisite: COMPSCI 271P. COMPSCI 271P with a grade of B or better. Knowledge of Python programming is required.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 276. Reasoning in Probabilistic Graphical Models. 4 Units.**

Focuses on algorithms for probabilistic reasoning using graphical models such as Bayesian Networks and Markov Networks that encode knowledge as local probabilistic relations. Tasks include finding most likely scenarios over a subset of variables, or updating posterior probability, given observations.

Prerequisite: A basic course in probability.

**COMPSCI 278. Probability Models. 4 Units.**

Advanced probability, discrete time Markov chains, Poisson processes, continuous time Markov chains. Queuing or simulation as time permits.

Prerequisite: STATS 120A

Concurrent with STATS 121.

**COMPSCI 284A. Artificial Intelligence in Biology and Medicine. 4 Units.**

Introduction to computational methods in molecular biology, aimed at those interested in learning about this interdisciplinary area. Covers computational approaches to understanding and predicting the structure, function, interactions, and evolution of DNA, RNA, proteins, and related molecules and processes.

Prerequisite: A Basic course in algorithms or a basic course in molecular biology.

Concurrent with COMPSCI 184A.

**COMPSCI 284C. Computational Systems Biology. 4 Units.**

Computational inference and modeling of gene regulation networks, signal transduction pathways, and the effects of regulatory networks in cellular processes, development, and disease. Introduction of required mathematical, computational, and data handling tools.

Prerequisite: COMPSCI 284A or (BIO SCI 99 and MATH 2D)

Concurrent with COMPSCI 184C.

**COMPSCI 285. Mathematical and Computational Biology . 4 Units.**

Analytical and numerical methods for dynamical systems, temporal-spatial dynamics, steady state, stability, stochasticity. Application to life sciences: genetics, tissue growth and patterning, cancers, ion channels gating, signaling networks, morphogen gradients. Probabilistic methods.

Prerequisite: MATH 227A

Same as MATH 227C.

**COMPSCI 290. Research Seminar. 2 Units.**

Forum for presentation and criticism by students of research work in progress. Presentation of problem areas and related work. Specific goals and progress of research.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.



**COMPSCI 294P. Keystone Professional Writing and Communication for Computer Science Careers. 4 Units.**

Well-developed written and oral communication skills relevant to computer science professionals including oral presentations, short descriptive writing assignments, and one longer writing assignment related to a research replication project.

Restriction: Graduate students only.

**COMPSCI 295. Special Topics in Information and Computer Science . 4 Units.**

Studies in selected areas of Information and Computer Science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**COMPSCI 295P. Keystone Project for Computer Science. 4 Units.**

Design and development of a software system or a hardware component of a system based on knowledge of advanced computer science principles. Students implement at least a working prototype and test this using relevant input data.

Restriction: Graduate students only.

**COMPSCI 296. Elements of Scientific Writing. 4 Units.**

Introduces the concepts and principles of good scientific writing, demonstrates them by examples drawn from the literature, and uses a hands-on approach to apply them to documents being written by the participants.

Grading Option: Satisfactory/unsatisfactory only.

**COMPSCI 296P. Capstone Professional Writing and Communication for Computer Science Careers . 4 Units.**

Written and oral communication for computer science and IT careers. Production of the detailed design and development document for the concurrent capstone design class and refinement of written documents and oral communications skills needed for a successful job search.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 297P. Capstone Design Project for Computer Science . 4 Units.**

Design and development of app, software system, or hardware component of system based on students' prior knowledge of advanced computer science principles. Implement at least a working prototype and test this using relevant use cases and/or input data.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 298. Thesis Supervision. 2-12 Units.**

Individual research or investigation conducted in preparation for the M.S. thesis option or the dissertation requirements for the Ph.D. program.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Information and Computer Science majors only.

**COMPSCI 298P. Computer Science Practicum. 1-4 Units.**

Internship in which students work individually at an outside organization to gain experience with the challenges involved in technology-related work.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: School of Info & Computer Sci students only. Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 299. Individual Study. 1-12 Units.**

Individual research or investigation with Computer Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Information and Computer Science majors only.

**COMPSCI 299P. Individual Study. 4-8 Units.**

Supervised individual study in computer science.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 4 times.

Restriction: Master of Computer Science Degree students have first consideration for enrollment. Graduate students only.



## Informatics Courses

### **IN4MATX 12. Barter to Bitcoin: Society, Technology and the Future of Money. 4 Units.**

Digital money has captured the broad imagination of speculators, coders, regulators, criminals and the mass media. Course puts this change in context: how do we understand money as a social, political and technological phenomenon?.

Same as SOC SCI 11A.

(II and III ).

### **IN4MATX 43. Introduction to Software Engineering. 4 Units.**

Concepts, methods, and current practice of software engineering. Large-scale software production, software life cycle models, principles and techniques for each stage of development.

Prerequisite: I&C SCI 32 or I&C SCI 32A

Overlaps with I&C SCI 105.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

### **IN4MATX H81. Ethics, Technology, and Design. 4 Units.**

Provides a critical framework for how and why biases of many kinds are built into everyday digital tools. Reflections on ethics, technology, and design through case studies drawn from machine learning, CS education, engineering, social media, and criminal justice.

Restriction: Campuswide Honors Collegium students only.

(III)

### **IN4MATX 101. Concepts in Programming Languages I. 4 Units.**

In-depth study of several contemporary programming languages stressing variety in data structures, operations, notation, and control. Examination of different programming paradigms, such as logic programming, functional programming and object-oriented programming; implementation strategies, programming environments, and programming style.

Prerequisite: (I&C SCI 51 or CSE 31 or EECS 31) and (I&C SCI 46 or CSE 46). I&C SCI 51 with a grade of C or better. CSE 31 with a grade of C or better. EECS 31 with a grade of C or better. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better

Same as COMPSCI 141.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

### **IN4MATX 102. Concepts of Programming Language II. 4 Units.**

In-depth study of major programming paradigms: imperative, functional, declarative, object-oriented, and aspect-oriented. Understanding the role of programming languages in software development and the suitability of languages in context. Domain-specific languages. Designing new languages for better software development support.

Prerequisite: IN4MATX 101 or COMPSCI 141 or CSE 141

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

### **IN4MATX 113. Requirements Analysis and Engineering. 4 Units.**

Equips students to develop techniques of software-intensive systems through successful requirements analysis techniques and requirements engineering. Students learn systematic process of developing requirements through cooperative problem analysis, representation, and validation.

Prerequisite: (I&C SCI 33 or CSE 43) and IN4MATX 43. I&C SCI 33 with a grade of C or better. CSE 43 with a grade of C or better. IN4MATX 43 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 115. Software Testing, Analysis, and Quality Assurance. 4 Units.**

Preparation for developing high-quality software through successful verification and validation techniques. Fundamental principles of software testing, implementing software testing practices, ensuring the thoroughness of testing to gain confidence in the correctness of the software.

Prerequisite: (I&C SCI 45J or I&C SCI 45C or I&C SCI 46 or CSE 46) and IN4MATX 43. I&C SCI 45J with a grade of C or better. I&C SCI 45C with a grade of C or better. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better. IN4MATX 43 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 117. Project in Software System Design. 4 Units.**

Specification, design, construction, testing, and documentation of a complete software system. Special emphasis on the need for and use of teamwork, careful planning, and other techniques for working with large systems.

Prerequisite: (IN4MATX 43 and I&C SCI 33) or CSE 43

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 121. Software Design: Applications. 4 Units.**

Introduction to application design: designing the overall functionality of a software application. Topics include general design theory, software design theory, and software architecture. Includes practice in designing and case studies of existing designs.

Prerequisite: I&C SCI 33 or CSE 43. I&C SCI 33 with a grade of C or better. CSE 43 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 122. Software Design: Structure and Implementation. 4 Units.**

Introduction to implementation design: designing the internals of a software application. Topics include design aesthetics, design implementation, design recovery, design patterns, and component reuse. Includes practice in designing and case studies of existing designs.

Prerequisite: (I&C SCI 45J or I&C SCI 46 or IN4MATX 45) and (IN4MATX 101 or COMPSCI 141 or CSE 141)

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 124. Internet Applications Engineering. 4 Units.**

Concepts in Internet applications engineering with emphasis on the Web. Peer-to-Peer and Interoperability. Topics include HTTP and REST, Remote Procedure/Method Calls, Web Services, data representations, content distribution networks, identity management, relevant W3C/IETF standards, and relevant new large-scale computing styles.

Prerequisite: (COMPSCI 132 or EECS 148) and I&C SCI 45J

Same as COMPSCI 137.

Overlaps with COMPSCI 122B.

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 125. Computer Game Development. 4 Units.**

Introduction to the principles of interactive 2D and 3D computer game development. Concepts in computer graphics, algorithms, software engineering, art and graphics, music and sound, story analysis, and artificial intelligence are presented and are the basis for student work.

Prerequisite: COMPSCI 112 or COMPSCI 171 or IN4MATX 121 or ART 106B or I&C SCI 163 or I&C SCI 166

Same as COMPSCI 113.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 131. Human Computer Interaction. 4 Units.**

Basic principles of human-computer interaction (HCI). Introduces students to user interface design techniques, design guidelines, and usability testing. Students gain the ability to design and evaluate user interfaces and become familiar with some of the outstanding research problems in HCI.

Prerequisite: I&C SCI 10 or I&C SCI 31 or I&C SCI 32A or CSE 41 or ENGR 10 or ENGRMAE 10 or EECS 10. I&C SCI 10 with a grade of C or better. I&C SCI 31 with a grade of C or better. I&C SCI 32A with a grade of C or better. CSE 41 with a grade of C or better. ENGR 10 with a grade of C or better. ENGRMAE 10 with a grade of C or better. EECS 10 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 132. Project in Human-Computer Interaction Requirements and Evaluation. 4 Units.**

Students undertake significant projects in the elicitation and specification of HCI requirements and the thorough evaluation of user interfaces.

Prerequisite: IN4MATX 131

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 133. User Interaction Software. 4 Units.**

Introduction to human-computer interaction programming. Emphasis on current tools, standards, methodologies for implementing effective interaction designs. Widget toolkits, Web interface programming, geo-spatial and map interfaces, mobile phone interfaces.

Prerequisite: I&C SCI 45J or I&C SCI 45C. I&C SCI 45J with a grade of C or better. I&C SCI 45C with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 134. Project in User Interaction Software. 4 Units.**

Students complete an end-to-end user interface programming project based on an iterative design paradigm. Topics may include requirements brainstorming, paper prototyping, iterative development, cognitive walk-through, quantitative evaluation, and acceptance testing. Materials fee.

Prerequisite: IN4MATX 131 and IN4MATX 133

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 141. Information Retrieval. 4 Units.**

An introduction to information retrieval including indexing, retrieval, classifying, and clustering text and multimedia documents.

Prerequisite: (I&C SCI 45C or I&C SCI 45J) and (STATS 7 or STATS 67). I&C SCI 45C with a grade of C or better. I&C SCI 45J with a grade of C or better

Same as COMPSCI 121.

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**IN4MATX 143. Information Visualization. 4 Units.**

Introduction to interactive visual interfaces for large datasets, and to principles of human visual perception and human computer interaction that inform their design. Various applications for data analysis and monitoring are discussed.

Prerequisite: (IN4MATX 131 or IN4MATX 43) and (I&C SCI 31 or I&C SCI 32A or CSE 41). IN4MATX 131 with a grade of C or better. IN4MATX 43 with a grade of C or better. I&C SCI 31 with a grade of C or better. I&C SCI 32A with a grade of C or better. CSE 41 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**IN4MATX 148. Project in Ubiquitous Computing. 4 Units.**

Introduction to ubiquitous computing research methods, tools, and techniques. Prototyping, design, and evaluation of physical computing applications, smart environments, embedded systems, and future computing scenarios. Includes hands-on in-class laboratory exercises. Materials fee.

Prerequisite: I&C SCI 10 or I&C SCI 31 or CSE 41 or I&C SCI 32A. I&C SCI 10 with a grade of C or better. I&C SCI 31 with a grade of C or better. CSE 41 with a grade of C or better. I&C SCI 32A with a grade of C or better

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment.

**IN4MATX 151. Project Management. 4 Units.**

Introduces theoretical and practical aspects of project management. Topics include organizational theory, group behavior, project management skills, case studies, personal and group productivity tools, management of distributed work, stakeholders, consultants, and knowledge management. Students do a project exercise.

Prerequisite: IN4MATX 43

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**IN4MATX 153. Computer Supported Cooperative Work. 4 Units.**

Introduces concepts and principles of collaborative systems. Topics may include shared workspaces, group interaction, workflow, architectures, interaction between social and technical features of group work, and examples of collaborative systems used in real-world settings. Students develop a simple collaborative application.

Prerequisite: (IN4MATX 161 or IN4MATX 43) and (I&C SCI 31 or I&C SCI 32A or CSE 41). I&C SCI 31 with a grade of C or better. I&C SCI 32A with a grade of C or better. CSE 41 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**IN4MATX 161. Social Analysis of Computing. 4 Units.**

Introduction of computing as a social process. Examines the social opportunities and problems raised by new information technologies, and the consequences of different ways of organizing. Topics include computing and work life, privacy, virtual communities, productivity paradox, systems risks.

Prerequisite: I&C SCI 10 or I&C SCI 31 or I&C SCI 32A or CSE 41 or ENGR 10 or EECS 10 or ENGRMAE 10. I&C SCI 10 with a grade of C or better. I&C SCI 31 with a grade of C or better. I&C SCI 32A with a grade of C or better. CSE 41 with a grade of C or better. ENGR 10 with a grade of C or better. EECS 10 with a grade of C or better. ENGRMAE 10 with a grade of C or better. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**IN4MATX 162W. Organizational Information Systems. 4 Units.**

Introduction to role of information systems in organizations, components and structure of organizational information systems, and techniques used in information systems analysis, design, and implementation.

Prerequisite: IN4MATX 161. Satisfactory completion of the Lower-Division Writing requirement.

**(Ib)****IN4MATX 163. Project in the Social and Organizational Impacts of Computing . 4 Units.**

Students undertake projects intended to gather and analyze data from situations in which computers are used, organize and conduct experiments intended to test hypotheses about impacts, and explore the application of concepts learned in previous courses.

Prerequisite: IN4MATX 162W

**IN4MATX 164. Children's Learning and Media. 4 Units.**

Examines how popular media may impact how young people learn, develop, and communicate by looking at research related to the impacts of a wide range of popular media including television, video games, digital environments, mobile devices, and other multimedia.

Same as EDUC 130.

Restriction: Education Sciences Majors only. Informatics Majors only. Informatics Minors only.

**IN4MATX 171. Introduction to Medical Informatics. 4 Units.**

Broad overview of medical informatics for students with varied backgrounds. Electronic medical records, online resources, mobile technologies, patient safety, and computational design. Legal, ethical, and public policy issues. Health systems management. Evaluation and fieldwork for health systems.

Prerequisite: WRITING 39C or WRITING 30 or WRITING 31 or HUMAN 1C or HUMAN H1C. WRITING 39C with a grade of C or better. WRITING 30 with a grade of C or better. WRITING 31 with a grade of C or better. HUMAN 1C with a grade of C or better. HUMAN H1C with a grade of C or better

Same as PUBHLTH 105.

Restriction: Upper-division students only. Satisfactory completion of the Lower-Division Writing requirement.

**IN4MATX 172. Project in Health Informatics. 4 Units.**

Students undertake significant quarter-long projects related to health informatics. Topics may include field evaluations of health care technologies, prototypes, iterative design, and system implementations.

Prerequisite: PUBHLTH 105 or IN4MATX 171

Same as PUBHLTH 106.

**IN4MATX 190. Special Topics in Informatics. 4 Units.**

Studies in selected areas of informatics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**IN4MATX 191A. Senior Design Project. 4 Units.**

Group supervised project in which students analyze, specify, design, construct, evaluate, and adapt a significant information processing system. Topics include team management, professional ethics, and systems analysis.

Prerequisite: IN4MATX 113 and IN4MATX 121 and IN4MATX 131 and IN4MATX 151

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Seniors only. Software Engineering Majors have first consideration for enrollment. Informatics Majors have first consideration for enrollment.

**IN4MATX 191B. Senior Design Project. 4 Units.**

Group supervised project in which students analyze, specify, design, construct, evaluate, and adapt a significant information processing system. Topics include team management, professional ethics, and systems analysis.

Prerequisite: IN4MATX 191A. In Progress (IP) grade for IN4MATX 191A is also accepted.

Restriction: Seniors only.

**IN4MATX H198. Honors Research. 4 Units.**

Directed independent research in Informatics for honors students.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be repeated for credit unlimited times.

Restriction: Bren School of ICS Honors students only. Campuswide Honors Collegium students only.

**IN4MATX 199. Individual Study. 2-5 Units.**

Individual research or investigation under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

**IN4MATX 201. Research Methodology for Informatics. 4 Units.**

Introduction to strategies and idioms of research in Informatics. Includes examination of issues in scientific inquiry, qualitative and quantitative methods, and research design. Both classic texts and contemporary research literature are read and analyzed.

**IN4MATX 203. Qualitative Research Methods in Information Systems. 4 Units.**

Introduction to qualitative research methods used to study computerization and information systems, such as open-ended interviewing, participant observation, and ethnography. Studies of the methods in practice through examination of research literature.

Prerequisite: IN4MATX 261 or IN4MATX 251

**IN4MATX 205. Quantitative Research Methods in Information Systems. 4 Units.**

Quantitative research methods used to study computerization and information systems. Design of instruments, sampling, sample sizes, and data analysis. Validity and reliability. Longitudinal versus cross-sectional designs. Analysis of secondary data. Studies of the methods through examination of research literature.

Prerequisite: IN4MATX 251 or IN4MATX 261. Basic knowledge of elementary statistics is also required.

**IN4MATX 207S. Doctoral Seminar on Research and Writing. 2 Units.**

Doctoral seminar centered on original research and writing. Provides a chance for doctoral students at all levels to present original work, brainstorm ongoing issues, and learn to provide and receive critical feedback from peers.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**IN4MATX 209S. Seminar in Informatics. 2 Units.**

Current research and research trends in informatics. Forum for presentation and criticism by students of research work in progress.

Repeatability: Unlimited as topics vary.

**IN4MATX 231. User Interface Design and Evaluation. 4 Units.**

Introduction to the design and evaluation of user interfaces, with an emphasis on methodology. Cognitive principles, design life cycle, on-line and off-line prototyping techniques. Toolkits and architectures for interactive systems. Evaluation techniques, including heuristic and laboratory methods.

**IN4MATX 232. Research in Human-Centered Computing. 4 Units.**

Introduction to contemporary topics in human-computer interaction, including methods, technologies, design, and evaluation. Emerging application domains and their challenges to traditional research methods. Advanced architectures and technologies. Critical issues.

Prerequisite: Some familiarity with HCI principles.

**IN4MATX 237. Usable Security and Privacy. 4 Units.**

Introduces usability problems in security and privacy methods, tools, and software. Overviews prominent examples of both failures and successes in usable security and privacy. Surveys state-of-the-art techniques and evaluation methodologies.

Same as COMPSCI 204.

Overlaps with IN4MATX 231, COMPSCI 203.

Restriction: Informatics Majors have first consideration for enrollment. Computer Science Majors have first consideration for enrollment. Undergraduate degree in CompSci or Informatics is strongly recommended.

**IN4MATX 241. Introduction to Ubiquitous Computing. 4 Units.**

The 'disappearing computer' paradigm. Differences to the desktop computing model: applications, interaction in augmented environments, security, alternate media, small operating systems, sensors, and embedded systems design. Evaluation by project work and class participation.

Same as COMPSCI 248A.

**IN4MATX 244. Introduction to Embedded and Ubiquitous Systems. 4 Units.**

Embedded and ubiquitous system technologies including processors, DSP, memory, and software. System interfacing basics; communication strategies; sensors and actuators, mobile and wireless technology. Using pre-designed hardware and software components. Design case studies in wireless, multimedia, and/or networking domains.

Prerequisite: I&C SCI 51 and COMPSCI 152 and COMPSCI 161 and (I&C SCI 6N or MATH 3A or MATH 6G or I&C SCI 6D). B.S. degree in Computer Science is also accepted.

Same as COMPSCI 244.

**IN4MATX 251. Computer-Supported Cooperative Work. 4 Units.**

The role of information systems in supporting work in groups and organizations. Examines various technologies designed to support communication, information sharing, and coordination. Focuses on behavioral and social aspects of designing and using group support technologies.

**IN4MATX 261. Social Analysis of Computing. 4 Units.**

The social and economic impacts of computing and information technologies on groups, organizations, and society. Topics include computerization and changes in the character of work, social control and privacy, electronic communities, and risks of safety-critical systems to people.

**IN4MATX 263. Computerization, Work, and Organizations. 4 Units.**

Selected topics in the influence of computerization and information systems in transforming work and organizations. Theories of organization and organizational change. Processes by which diverse information technologies influence changes in work and organizations over short and long time periods.

Prerequisite: IN4MATX 251 or IN4MATX 261

**IN4MATX 265. Theories of Information Society . 4 Units.**

Social and economic conceptions of information technology. Macrosocial and economic conditions that foster changes in information technologies. Social construction of information and computer technology in professional worlds. Theories of information technology and large-scale social change.

Prerequisite: IN4MATX 251 or IN4MATX 261

**IN4MATX 267. Digital Media and Society. 4 Units.**

Selected topics in the technological and social aspects of online interactions, and policy including online games, social media, electronic activism, e-commerce, and digital libraries. Media-theoretic approaches to digital technology. Architectures, infrastructure considerations, and their consequences.

Prerequisite: IN4MATX 251 or IN4MATX 261

**IN4MATX 273. Information Technology in Global Sustainability. 4 Units.**

Explores the relationship between recent developments in information technology and the global transition to sustainability. Topics include the role of IT systems in the provision of human needs and wants (e.g., smart grids, food systems, and other IT-enabled infrastructure).

Restriction: Graduate students only.

**IN4MATX 280. Overview of Human-Computer Interaction and Design . 4 Units.**

Introduction to human-computer interaction and user-centered design. The material is focused on laying the groundwork for understanding the history, importance, and methods of human-computer interaction and design.

**IN4MATX 281. User Needs Analysis . 4 Units.**

Understanding the user's context, needs, and preferences. Topics include interviews and observations, modeling the context, flow, culture, space and artifacts involved in an endeavor, ways of aggregating what is found, and presenting these findings to others.

Prerequisite: IN4MATX 280

**IN4MATX 282. Design and Prototyping . 4 Units.**

Introduction to user-centered design and prototyping. Focused on practical methods for interaction design. Topics include the nature of design and the challenges to creating and evaluating good designs, as well specific skills for designing interactive systems.

Prerequisite: IN4MATX 280

**IN4MATX 283. User Experience Evaluation . 4 Units.**

Evaluating prototypes and completed systems. Topics include comparative analysis, laboratory experiments, heuristic evaluation, cognitive walkthroughs, surveys, clickstreams, and help-desk.

Prerequisite: IN4MATX 280

**IN4MATX 284. Advanced Design and Prototyping . 4 Units.**

Develop and communicate interactive technology design prototypes. Moving concepts from brainstorming and paper prototypes to wireframe and limited functionality mock-ups.

Prerequisite: IN4MATX 282

**IN4MATX 285. Interactive Technology Studio . 4 Units.**

Technologies, languages, and skills required for creating prototypes to communicate interactive technology concepts. Topics include HTTP, CSS, CSS scripting, AJAX, Design Patterns, Javascript, Javascript libraries such as jQuery, SQL, MVC, and cloud architectures.

Prerequisite: IN4MATX 280

**IN4MATX 286. Innovations in HCI and Design . 4 Units.**

Recent social and technological developments in human-computer interaction and design. Topics will vary as the field progresses but include novel input techniques, novel platforms, and innovations in theory and methods of design.

Prerequisite: IN4MATX 280

**IN4MATX 287. Capstone Project in HCI and Design . 4 Units.**

Group project that reinforces all concepts learned in this program, including knowing where user experience work is most appropriate and essential, and executing the appropriate steps.

Prerequisite: IN4MATX 283 and IN4MATX 284



**IN4MATX 288. Capstone Project and Portfolio . 4 Units.**

Completion of capstone projects and development of portfolios. Ideation, critique, development, and critique.

Prerequisite: IN4MATX 287

**IN4MATX 290. Research Seminar. 2 Units.**

Forum for presentation and criticism by students of research work in progress. Presentation of problem areas and related work. Specific goals and progress of research.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IN4MATX 291S. Literature Survey in Software Engineering. 2 Units.**

Reading and analysis of relevant literature in Software Engineering under the direction of a faculty member.

Repeatability: May be repeated for credit unlimited times.

**IN4MATX 295. Special Topics in Informatics. 4 Units.**

Studies in selected areas of informatics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**IN4MATX 298. Thesis Supervision. 2-12 Units.**

Individual research or investigation conducted in preparation for the M.S. thesis option or the dissertation requirements for the Ph.D. program.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IN4MATX 299. Individual Study. 1-12 Units.**

Individual research or investigation under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Information and Computer Sci Courses

**I&C SCI 3. Internet Technologies and their Social Impact. 4 Units.**

Examines current Internet technologies and social implications at the individual, group, and societal level. Blogs, wikis, sharing of video, photos, and music, e-commerce, social networking, gaming, and virtual environments. Issues include privacy, trust, identity, reputation, governance, copyright, and malicious behavior.

(III)

**I&C SCI 4. Human Factors for the Web. 4 Units.**

Principles of human-computer interaction in evaluating, designing, and developing information presented on the World Wide Web. User characteristics, usability analysis, navigation and organization. Color, typography, multimedia, information visualization, prototyping, user studies, evaluation strategies. Web accessibility.

Restriction: May not be taken for credit after IN4MATX 131.

(II)

**I&C SCI 5. Global Disruption and Information Technology. 4 Units.**

Explores how new forms of information technology may support transition to a sustainable civilization. Topics include design and implementation of IT systems, science of global change, online community building, and "green IT". Activities involve reading, writing, discussion, and final project.

(II)



**I&C SCI 6B. Boolean Logic and Discrete Structures. 4 Units.**

Relations and their properties; Boolean algebras, formal languages; finite automata.

Prerequisite: High school mathematics through trigonometry.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**(Vb)**

**I&C SCI 6D. Discrete Mathematics for Computer Science. 4 Units.**

Covers essential tools from discrete mathematics used in computer science with an emphasis on the process of abstracting computational problems and analyzing them mathematically. Topics include mathematical induction, combinatorics, and recurrence relations.

Prerequisite: Recommended: I&C SCI 6B

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment. Computer Engineering majors have second consideration.

**(Vb)**

**I&C SCI 6N. Computational Linear Algebra. 4 Units.**

Matrices and linear transformations, systems of linear equations, determinants, linear vector spaces, eigenvalues and eigenvectors, orthogonal matrices, diagonalization, and least squares. Topics taught primarily from an algorithmic perspective, including computational solutions, applications, and numerical error analysis.

Overlaps with MATH 6G, MATH 3A.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**(II and V.B ).**

**I&C SCI 7. Introducing Modern Computational Tools. 4 Units.**

A unified look at a spectrum of modern tools for building, solving, and analyzing simple computational models (deterministic and random) in diverse subject areas. Tools include those for numeric/symbolic computation, and those for acquiring, organizing, translating, processing, and displaying information.

**(Va)**

**I&C SCI 10. How Computers Work. 4 Units.**

Introduction to digital computer and communication systems. Capabilities and limitations of information technology. Representing information in digital form. Overview of computer organization, internet, operating systems, software. Human-computer interaction and social impact.

Restriction: May not be taken for credit after I&C SCI 31, I&C SCI 32, I&C SCI 32A, I&C SCI 51, I&C SCI 105, or IN4MATX 43.

**(II)**

**I&C SCI 11. The Internet and Public Policy. 4 Units.**

How the Internet works. Current public policy issues concerning the Internet. Introductory economics. Communications law. Interactions between information technology, economics, and law. Case studies about Internet and communications policy.

Same as ECON 11.

**(II or III ).**

**I&C SCI 20. Invitation to Computing. 4 Units.**

Foundational principles of computer science for students with no computing background that are interested in a related career. Big ideas of computing explored, including programming through use of sequential, conditional, iterative logic. Good computational practices, problem solving, and organization discussed.

**I&C SCI 31. Introduction to Programming. 4 Units.**

Introduction to fundamental concepts and techniques for writing software in a high-level programming language. Covers the syntax and semantics of data types, expressions, exceptions, control structures, input/output, methods, classes, and pragmatics of programming.

Overlaps with EECS 10, EECS 12, ENGRMAE 10.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**(II and VB ).**

**I&C SCI 32. Programming with Software Libraries. 4 Units.**

Construction of programs for problems and computing environments more varied than in I&C SCI 31. Using library modules for applications such as graphics, sound, GUI, database, Web, and network programming. Language features beyond those in I&C SCI 31 are introduced as needed.

Prerequisite: I&C SCI 31 or CSE 41. I&C SCI 31 with a grade of C or better. CSE 41 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**(II and (VA or VB) ).**

**I&C SCI 32A. Python Programming and Libraries (Accelerated). 4 Units.**

Introduces Python syntax and semantics for fundamental programming concepts. Constructing programs for varied problems and environments. Using library modules for applications such as graphics, sound, GUI, database, Web, and network programming. Accelerated course for students with previous programming background.

Prerequisite: AP Computer Science A. AP Computer Science A with a minimum score of 3. Placement via a transfer course in computer programming or equivalent experience may also be accepted upon review.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**(II and (VA or VB) ).**

**I&C SCI 33. Intermediate Programming. 4 Units.**

Intermediate-level language features and programming concepts for larger, more complex, higher-quality software. Functional programming, name spaces, modules, class protocols, inheritance, iterators, generators, operator overloading, reflection. Analysis of time and space efficiency.

Prerequisite: I&C SCI 32 or CSE 42 or I&C SCI 32A. I&C SCI 32 with a grade of C or better. CSE 42 with a grade of C or better. I&C SCI 32A with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**(II and VB ).**

**I&C SCI 45C. Programming in C/C++ as a Second Language. 4 Units.**

An introduction to the lexical, syntactic, semantic, and pragmatic characteristics of the C/C++ languages for experienced programmers. Emphasis on object-oriented programming, using standard libraries, and programming with manual garbage collection.

Prerequisite: I&C SCI 33 or CSE 43 or EECS 40. I&C SCI 33 with a grade of C or better. CSE 43 with a grade of C or better. EECS 40 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**I&C SCI 45J. Programming in Java as a Second Language. 4 Units.**

An introduction to the lexical, syntactic, semantic, and pragmatic characteristics of the Java language for experienced programmers. Emphasis on object-oriented programming, using standard libraries, and programming with automatic garbage collection.

Prerequisite: I&C SCI 33 or CSE 43. I&C SCI 33 with a grade of C or better. CSE 43 with a grade of C or better

Overlaps with I&C SCI 22, I&C SCI 23, CSE 23.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment. I&C SCI 45J may not be taken for credit after I&C SCI 22, I&C SCI 23, or CSE 23.

**I&C SCI 46. Data Structure Implementation and Analysis. 4 Units.**

Focuses on implementation and mathematical analysis of fundamental data structures and algorithms. Covers storage allocation and memory management techniques.

Prerequisite: CSE 45C or I&C SCI 45C. CSE 45C with a grade of C or better. I&C SCI 45C with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**(Vb)****I&C SCI 51. Introductory Computer Organization. 6 Units.**

Multilevel view of system hardware and software. Operation and interconnection of hardware elements. Instruction sets and addressing modes. Virtual memory and operating systems. Laboratory work using low-level programming languages.

Prerequisite: (I&C SCI 31 or CSE 41 or I&C SCI 32A) and I&C SCI 6B

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**(II)****I&C SCI 53. Principles in System Design. 4 Units.**

Introduces basic principles of system software: operating systems, compilers, and networking. Exposure to the following topics through theoretical and practical programming experiences: linking and loading, process and memory management, concurrency and synchronization, network communication, programming for performance, etc.

Corequisite: I&C SCI 53L

Prerequisite: I&C SCI 46 and I&C SCI 51. I&C SCI 46 with a grade of C or better. I&C SCI 51 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**I&C SCI 53L. Principles in System Design Library. 2 Units.**

Required laboratory section and co-requisite for I&C SCI 53.

Corequisite: I&C SCI 53

Prerequisite: I&C SCI 51

**I&C SCI 60. Computer Games and Society. 4 Units.**

The study and critical analysis of computer games as art objects, cultural artifacts, gateways to virtual worlds, educational aids, and tools for persuasion and social change. Emphasis on understanding games in their historical and cultural context.

Prerequisite: Satisfaction of the UC Entry Level Writing Requirement.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Game Science Majors have first consideration for enrollment.

**(III)****I&C SCI 61. Game Systems and Design. 4 Units.**

Principles and usage of game design elements. Introduction to technologies that support modern computer games. Students design, implement, and critique several small games.

Restriction: Computer Game Science Majors have first consideration for enrollment.

**(II)****I&C SCI 62. Game Technologies and Interactive Media. 4 Units.**

Technologies for interactive media and game design. Web-based software systems, virtual world platforms, and game engines. Emphasis is on conceptual and architectural aspects of these technologies.

Prerequisite: I&C SCI 31 or I&C SCI 32A

**I&C SCI 90. New Students Seminar. 1 Unit.**

Introduces students to the Donald Bren School of Information and Computer Sciences. Focuses on advising students making the transition to UCI, community building, and mostly surveying the technical areas within departments in ICS, via talks by faculty on their research.

Grading Option: Pass/no pass only.

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**I&C SCI 105. Digital Information Systems. 4 Units.**

Design and analysis of digital information systems. Covers underlying database and network technology, and software engineering principles used to build these systems. Evaluating digital information systems, and recognizing common flaws and vulnerabilities.

Prerequisite: I&C SCI 10 or I&C SCI 21 or CSE 21 or I&C SCI H21 or IN4MATX 41. I&C SCI 10 with a grade of C or better. I&C SCI 21 with a grade of C or better. CSE 21 with a grade of C or better. I&C SCI H21 with a grade of C or better. IN4MATX 41 with a grade of C or better

Overlaps with I&C SCI 52, IN4MATX 43.

**I&C SCI 139W. Critical Writing on Information Technology. 4 Units.**

Study and practice of critical writing and oral communication as it applies to information technology. Each student writes assignments of varying lengths, totaling at least 4,000 words.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment.

**(Ib)****I&C SCI 161. Game Engine Lab. 4 Units.**

The use of an open source game or graphics engine in the design and implementation of a computer game. Principles of game engine design. Students work on teams to design, implement, and evaluate new computer games based on an engine.

Prerequisite: I&C SCI 45C or CSE 45C

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**I&C SCI 162. Modeling and World Building. 4 Units.**

Use of 3D modeling software and related tools to design and create animated, textured models, and expansive virtual worlds incorporating objects, scenes, and venues for activity within game worlds and online environments.

Prerequisite or corequisite: I&C SCI 33 and (I&C SCI 6N or MATH 3A) and I&C SCI 61

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**I&C SCI 163. Mobile and Ubiquitous Games. 4 Units.**

Design and technology of mobile games, including mixed reality gaming, urban games, and locative media. Case studies of significant systems. Uses and limitations of location-based technologies. Infrastructures and their relationships to gameplay and design.

Prerequisite: I&C SCI 61 and (I&C SCI 10 or I&C SCI 31 or I&C SCI 32A)

**I&C SCI 166. Game Design. 4 Units.**

Game design takes into consideration psychology, narrative, platform features and limitations, marketing, computer science capabilities, human-computer interface principles, industry trends, aesthetic judgment, and other factors. Students focus on video game design through lectures, readings, presentations, implementation, and play testing.

Prerequisite: I&C SCI 61 and IN4MATX 43

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Game Science Majors have first consideration for enrollment.

**I&C SCI 167. Multiplayer Game Systems. 4 Units.**

Foundations and technologies that enable multiuser, networked, and persistent virtual environments. Emphasis on database design and management, network protocols, and concurrency control to accommodate large numbers of simultaneous users.

Prerequisite: I&C SCI 51

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Game Science Majors have first consideration for enrollment.

**I&C SCI 168. Multiplayer Game Project. 4 Units.**

Designing and implementing a multiuser, networked, and persistent virtual environment or game. Emphasis on cultural aspects, community building, user interface issues and design, security, privacy, and economics.

Prerequisite: IN4MATX 43 and I&C SCI 167. IN4MATX 43 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Game Science Majors have first consideration for enrollment.

**I&C SCI 169A. Capstone Game Project I. 4 Units.**

Students work in teams to design and implement a new computer game or virtual world. Emphasis on sound, art, and level design, building a community, cut scenes, production values, full utilization of hardware and software platform, and current industry trends.

Prerequisite: I&C SCI 168

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Computer Game Science Majors have first consideration for enrollment.

**I&C SCI 169B. Capstone Game Project II. 4 Units.**

Students work in teams to design and implement a new computer game or virtual world. Emphasis on sound, art, and level design, building a community, cut scenes, production values, full utilization of hardware and software platform, and current industry trends.

Prerequisite: I&C SCI 169A. I&C SCI 169A with a grade of D- or better. In Progress grade for I&C SCI 169A also accepted.

Restriction: Computer Game Science Majors have first consideration for enrollment.

**I&C SCI 192. Industrial or Public Sector Field Study. 2-4 Units.**

Students participate in an off-campus, supervised internship for a minimum of 60 hours. Students apply classroom knowledge through internship projects in the private sector or nonprofit agencies.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**I&C SCI 193. Tutoring in ICS. 2 Units.**

Principles and practice of providing technical assistance to novice learners in information and computer sciences.

Repeatability: May be taken for credit for 18 units.

Restriction: ICS Peer Tutoring Program students only.

**I&C SCI H197. Honors Seminar. 2 Units.**

An overview of computer science and selected recent trends in research. Students attend talks on current faculty research, with opportunities for discussion.

Grading Option: Pass/no pass only.

Restriction: Bren School of ICS Honors students only. Campuswide Honors Collegium students only.

**I&C SCI 398A. Teaching Assistant Training Seminar. 2 Units.**

Theories, methods, and resources for teaching computer science at the university level, particularly by teaching assistants. Classroom presentations, working with individuals, grading, motivating students. Participants will give and critique presentations and may be videotaped while teaching.

Grading Option: Satisfactory/unsatisfactory only.

**I&C SCI 398B. Advanced Teaching Assistant Seminar. 4 Units.**

Teaching computer science at the university level, emphasizing issues in teaching an entire course. Course organization, designing examinations and projects, grading, motivating students. Participants will begin to assemble teaching portfolios.

Prerequisite: I&C SCI 398A

Grading Option: Satisfactory/unsatisfactory only.

**I&C SCI 399. University Teaching. 4 Units.**

Involves on-the-job experience for Teaching Assistants.

Repeatability: May be repeated for credit unlimited times.

Restriction: Teaching assistants only.

## Software Engineering Courses

**SWE 211. Software Engineering. 4 Units.**

Study of the concepts, methods, and tools for the analysis, design, construction, and measurement of complex software-intensive systems. Underlying principles emphasized. State-of-the-art software engineering and promising research areas covered, including project management.

**SWE 212. Analysis of Programming Languages. 4 Units.**

Concepts in modern programming languages, their interaction, and the relationship between programming languages and methods for large-scale, extensible software development. Empirical analysis of programming language usage.

Same as CS 253.

**SWE 213. Requirements Engineering and Specification. 4 Units.**

Rigorous techniques in requirements engineering - the requirements definition phase of software development - with a focus on modeling and specification. Topics include notations and models for requirements specification; and methods, tools, and processes for software requirements elicitation, representation, analysis.

Restriction: Graduate students only.

**SWE 214. Program Analysis. 4 Units.**

Covers principles and concepts of automated program analysis. Topics include program representations; intra-procedural data-flow analysis; call-graph construction; pointer analysis; alias analysis; inter-procedural analysis; inter-procedural finite distributive subset problems; inter-procedural distributive environment problems; symbolic execution; and program-analysis applications.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Graduate students only.

**SWE 215. Software Analysis and Testing. 4 Units.**

Studies techniques for developing confidence in software from traditional testing schemes to integrated, multitechnique analytic approaches. Considers strengths and weaknesses and explores opportunities for synergistic technique application. Emphasis is on approaches integrated into the software process.

Restriction: Graduate students only.

**SWE 221. Software Architecture. 4 Units.**

Study of the concepts, representation techniques, development methods, and tools for architecture-centric software engineering. Topics include domain-specific software architectures, architectural styles, architecture description languages, software connectors, and dynamism in architectures.

Restriction: Graduate students only.

**SWE 225. Information Retrieval, Filtering, and Classification. 4 Units.**

Algorithms for the storage, retrieval, filtering, and classification of textual and multimedia data. The vector space model, Boolean and probabilistic queries, and relevance feedback. Latent semantic indexing; collaborative filtering; and relationship to machine learning methods.

Prerequisite: CS 161 and CS 171 and (ICS 6N or MATH 3A or MATH 6G)

Same as CS 221.

Restriction: Graduate students only.

**SWE 233. Intelligent User Interfaces. 4 Units.**

Explores example software systems and their underlying concepts that leverage computing to empower and augment human individuals in their activities. Topics span the fields of user interface design, human-computer interaction, software engineering, and cognitive computing.

Prerequisite: CS 171

Restriction: Graduate students only.

**SWE 234. Human Aspects of Software Engineering. 4 Units.**

Selected topics about the cooperative and human aspects of software engineering from the perspective that software engineering is inherently an endeavor involving human stakeholders. Topics may include but are not limited to collaboration, trust, emotion, language, gender, and software tools.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Graduate students only.

**SWE 241P. Applied Data Structures and Algorithms. 2 Units.**

Exploration of strategies to tackle computational problems whose solutions include well-known algorithms and data structures. Topics include sorting, searching, indexing, among others.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only.

**SWE 242P. Network Programming. 2 Units.**

Exploration of networking principles and concepts for the development of distributed software. Topics include programming against well-known network protocols, ports and sockets, and network APIs.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only.

**SWE 243P. Database Programming . 2 Units.**

Exploration of software development with substantial reliance on a database for storage and retrieval of data. Topics include relational databases, structured query language, relational database management systems, APIs and libraries for database programming, among others.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only.

**SWE 244P. Concurrent Programming. 2 Units.**

Exploration of concepts and mechanisms for the development of concurrent software. Topics include threads, locks, race conditions, and deadlocks, among others.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 245P. GUI Programming . 2 Units.**

Exploration of interactive software with substantial graphical user interface elements. Topics include libraries and frameworks for GUI programming, layout design and alternatives, event-driven programming, among others.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 246P. Mobile Programming. 2 Units.**

Exploration of contemporary libraries and frameworks for construction of mobile applications. Topics include emulators, mobile development standards and patterns, energy consumption issues, screen layout, among others.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 247P. Applied Information Retrieval. 2 Units.**

Exploration of principles and concepts for textual information retrieval. Topics include tokenization, inverted indexes, scored retrieval, and precision and recall.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 248P. Neural Network Programming . 2 Units.**

Exploration of the concepts, terminology, and processes for training and using deep neural networks for classification problems. Topics include tensors and tensor operations, gradient-based optimization, feature engineering and learning, and workflow of learning systems.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 249P. Applied Data Analytics. 2 Units.**

Exploration of the concepts, terminology, and processes used in supervised and unsupervised learning for classification and clustering, from a software engineering perspective. Topics include K-Nearest Neighbors, Logistic Regression, Random Forests, Support Vector Machines, K-Means, and model assessment.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only.

**SWE 250P. Web Programming. 2 Units.**

Exploration of the concepts, terminology, and popular frameworks for developing full-stack web applications. Students develop simple applications using multiple development stacks, and deploy them on the cloud.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only.

**SWE 261P. Software Testing and Debugging. 4 Units.**

Designed to teach students how to ensure high-quality software by means of testing, debugging, and other quality assurance activities. Students learn a combination of both theoretical and practical skills, including hands-on experience with modern tools and approaches.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 262P. Programming Styles. 4 Units.**

Designed to teach students the various ways software can be decomposed and put back together. Students are exposed to a variety of different programming styles and composition mechanisms.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 263P. User Experience and Interaction. 4 Units.**

Provides an introduction to the basic principles of human-computer interaction (HCI) and the pragmatic aspects of usability engineering. Topics include the fundamentals of interaction, user experience, design for usability, and evaluation of products for their usability.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 264P. Distributed Software Architecture. 4 Units.**

Study of software system architectures and architectural styles for large-scale distributed applications, and contemporary technologies and standards for their construction. Topics include client-server, peer-to-peer, publish-subscribe, REST, cloud computing, content distribution networks, scalability, latency, caching, and security, among others.

Restriction: Master of Software Engineering Degree students only.

**SWE 265P. Reverse Engineering and Modeling. 4 Units.**

Introduces theories, concepts, representations, techniques, and case studies in understanding large-scale, complex software systems. Topics include static and dynamic modeling notations, manual and (semi-)automated reverse engineering techniques, APIs, patterns, and styles. A significant, hands-on project is included.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 266P. Software Security and Dependability . 4 Units.**

Principles and concepts for the design and construction of secure software. Topics include common types of software security vulnerabilities, methods for detecting vulnerabilities, design and process methodologies to improve security of software, and techniques for assessing security properties of software.

Restriction: Master of Software Engineering Degree students only. Graduate students only.



**SWE 271P. Career and Entrepreneurship. 4 Units.**

Teaches practical skills for spoken, written, and electronic communication in a range of business and technical contexts, including promoting project ideas and portfolio development. Students practice their skills in classroom presentations and written exercises.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 272P. Project Management. 4 Units.**

Provides an introduction to project management in software engineering from several perspectives. Topics include team behavior; globally distributed work; resource estimation, scheduling, and budgeting. Students apply their knowledge in an ongoing class project.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 275P. Curricular Practical Training. 1 Unit.**

Mandatory internship in which students individually work at an outside organization to gain experience with the challenges involved in the practice of software engineering.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 276P. Capstone Project in Software Engineering. 4 Units.**

Quarter-long software-intensive project focusing on the design and implementation of a novel software system. Students are expected to bring to bear the concepts acquired during the program.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 290. Research Seminar. 2 Units.**

Forum for presentation and criticism by students of research work in progress. Presentation of problem areas and related work. Specific goals and progress of research.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**SWE 290P. Advisement. 0.3 Units.**

Mandatory weekly meetings with a faculty advisor.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 295. Special Topics in Software Engineering. 4 Units.**

Studies in selected areas of software engineering. Topics addressed vary each quarter.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**SWE 298. Thesis Supervision. 2-12 Units.**

Individual research or investigation conducted in preparation for the M.S. thesis option or the dissertation requirements for the Ph.D. program.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**SWE 299. Individual Study. 1-12 Units.**

Individual research or investigation under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Statistics Courses

### **STATS 5. Seminar in Data Science. 1 Unit.**

An introduction to the field of Data Science; intended for entering freshman and transfers.

Grading Option: Pass/no pass only.

Restriction: Information Computer Science Majors only.

### **STATS 7. Basic Statistics. 4 Units.**

Introduces basic inferential statistics including confidence intervals and hypothesis testing on means and proportions, t-distribution, Chi Square, regression and correlation. F-distribution and nonparametric statistics included if time permits.

Overlaps with STATS 8, MGMT 7, SOCECOL 13.

Restriction: STATS 7 may not be taken for credit concurrently with or after STATS 110, STATS 111, STATS 112.

**(Va)**

### **STATS 8. Introduction to Biological Statistics . 4 Units.**

Introductory statistical techniques used to collect and analyze experimental and observational data from health sciences and biology. Includes exploration of data, probability and sampling distributions, basic statistical inference for means and proportions, linear regression, and analysis of variance.

Overlaps with SOCECOL 13, MGMT 7, STATS 7.

Restriction: STATS 8 may not be taken for credit concurrently with or after STATS 110, STATS 111, STATS 112.

**(Va)**

### **STATS 67. Introduction to Probability and Statistics for Computer Science. 4 Units.**

Introduction to the basic concepts of probability and statistics with discussion of applications to computer science.

Prerequisite: MATH 2B

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment. STATS 67 may not be taken for credit concurrently with or after STATS 120B.

**(Va)**

### **STATS 68. Statistical Computing and Exploratory Data Analysis. 4 Units.**

Introduces key concepts in statistical computing. Techniques such as exploratory data analysis, data visualization, simulation, and optimization methods, will be presented in the context of data analysis within a statistical computing environment.

Prerequisite: STATS 7 and I&C SCI 31

### **STATS 110. Statistical Methods for Data Analysis I. 4 Units.**

Introduction to statistical methods for analyzing data from experiments and surveys. Methods covered include two-sample procedures, analysis of variance, simple and multiple linear regression.

Prerequisite: STATS 7 or STATS 8 or AP90 or (STATS 120A and STATS 120B and STATS 120C). AP90 with a minimum score of 3

Restriction: School of Info & Computer Sci students only.

### **STATS 111. Statistical Methods for Data Analysis II. 4 Units.**

Introduction to statistical methods for analyzing data from surveys or experiments. Emphasizes application and understanding of methods for categorical data including contingency tables, logistic and Poisson regression, loglinear models.

Prerequisite: STATS 110

Concurrent with STATS 202.

**STATS 112. Statistical Methods for Data Analysis III. 4 Units.**

Introduction to statistical methods for analyzing longitudinal data from experiments and cohort studies. Topics covered include survival methods for censored time-to-event data, linear mixed models, non-linear mixed effects models, and generalized estimating equations.

Prerequisite: STATS 111

Concurrent with STATS 203.

**STATS 115. Introduction to Bayesian Data Analysis. 4 Units.**

Basic Bayesian concepts and methods with emphasis on data analysis. Special emphasis on specification of prior distributions. Development for one-two samples and on to binary, Poisson, and linear regression. Analyses performed using free OpenBugs software.

Prerequisite: STATS 120C. Recommended: STATS 110.

**STATS 120A. Introduction to Probability and Statistics I. 4 Units.**

Introduction to basic principles of probability and statistical inference. Axiomatic definition of probability, random variables, probability distributions, expectation.

Prerequisite: MATH 2A and MATH 2B and (MATH 2D or MATH 4)

Restriction: Data Science Majors have first consideration for enrollment. Quantitative Economics majors have second consideration.

Concurrent with STATS 281A.

**STATS 120B. Introduction to Probability and Statistics II. 4 Units.**

Introduction to basic principles of probability and statistical inference. Point estimation, interval estimating, and testing hypotheses, Bayesian approaches to inference.

Prerequisite: STATS 120A

Restriction: Data Science Majors have first consideration for enrollment. Quantitative Economics majors have second consideration.

Concurrent with STATS 281B.

**STATS 120C. Introduction to Probability and Statistics III. 4 Units.**

Introduction to basic principles of probability and statistical inference. Linear regression, analysis of variance, model checking.

Prerequisite: STATS 120B and (MATH 3A or MATH 6G or I&C SCI 6N)

Restriction: Data Science Majors have first consideration for enrollment. Quantitative Economics majors have second consideration.

Concurrent with STATS 281C.

**STATS 140. Multivariate Statistical Methods. 4 Units.**

Theory and application of multivariate statistical methods. Topics include statistical inference for the multivariate normal model and its extensions to multiple samples and regression, use of statistical packages for data visualization and reduction, discriminant analysis, cluster analysis, and factor analysis.

Prerequisite: STATS 120C and (MATH 3A or I&C SCI 6N)

Concurrent with STATS 240.

**STATS 170A. Project in Data Science I. 4 Units.**

Problem definition and analysis, data representation, algorithm selection, solution validation, and results presentation. Students do team projects and lectures cover analysis alternatives, project planning, and data analysis issues. First quarter emphasizes approach selection, project planning, and experimental design.

Prerequisite: STATS 68 and STATS 112 and IN4MATX 43 and COMPSCI 122A and COMPSCI 161 and COMPSCI 178

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Seniors only. Data Science Majors have first consideration for enrollment.

**STATS 170B. Project in Data Science II. 4 Units.**

Problem definition and analysis, data representation, algorithm selection, solution validation, and results presentation. Students do team projects and lectures cover analysis alternatives, project planning, and data analysis issues. Second quarter emphasizes project execution and analysis, and presentation of results.

Prerequisite: STATS 170A. In Progress (IP) grade for STATS 170A is also accepted.

Restriction: Seniors only. Data Science Majors have first consideration for enrollment.

**STATS 199. Individual Study. 2-5 Units.**

Individual research or investigations under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

**STATS 200A. Intermediate Probability and Statistical Theory. 4 Units.**

Basics of probability theory, random variables and basic transformations, univariate distributions—discrete and continuous, multivariate distributions.

Prerequisite: STATS 120C

**STATS 200B. Intermediate Probability and Statistical Theory. 4 Units.**

Random samples, transformations, limit laws, normal distribution theory, introduction to stochastic processes, data reduction, point estimation (maximum likelihood).

Prerequisite: STATS 200A

**STATS 200C. Intermediate Probability and Statistical Theory. 4 Units.**

Interval estimation, hypothesis testing, decision theory and Bayesian inference, basic linear model theory.

Prerequisite: STATS 200B

**STATS 201. Statistical Methods for Data Analysis I. 4 Units.**

Introduction to statistical methods for analyzing data from experiments and surveys. Methods covered include two-sample procedures, analysis of variance, simple and multiple linear regression.

Prerequisite: STATS 7 or STATS 8

Restriction: STATS 201 cannot be taken for credit after taking STATS 210.

**STATS 202. Statistical Methods for Data Analysis II. 4 Units.**

Introduction to statistical methods for analyzing data from surveys or experiments. Emphasizes application and understanding of methods for categorical data including contingency tables, logistic and Poisson regression, loglinear models.

Prerequisite: STATS 201 or STATS 210

Concurrent with STATS 111.

**STATS 203. Statistical Methods for Data Analysis III. 4 Units.**

Introduction to statistical methods for analyzing longitudinal data from experiments and cohort studies. Topics covered include survival methods for censored time-to-event data, linear mixed models, non-linear mixed effects models, and generalized estimating equations.

Prerequisite: STATS 202

Concurrent with STATS 112.

**STATS 205. Introduction to Bayesian Data Analysis. 4 Units.**

Basic Bayesian concepts and methods with emphasis on data analysis. Special emphasis on specification of prior distributions. Development for one-two samples and on to binary, Poisson and linear regression. Analyses performed using free OpenBugs software.

Prerequisite: STATS 120C. Recommended: STATS 201 or STATS 210.

**STATS 210. Statistical Methods I: Linear Models. 4 Units.**

Statistical methods for analyzing data from surveys and experiments. Topics include randomization and model-based inference, two-sample methods, analysis of variance, linear regression and model diagnostics.

Prerequisite: Knowledge of basic statistics, calculus, linear algebra.

**STATS 210A. Statistical Methods I: Linear Models. 4 Units.**

Statistical methods for analyzing data from surveys and experiments. Topics include randomization and model-based inference, two-sample methods, analysis of variance, linear regression, and model diagnostics.

Prerequisite: Knowledge of basic statistics (at the level of STATS 7), calculus, and linear algebra.

Restriction: Graduate students only.

**STATS 210B. Statistical Methods II: Categorical Data. 4 Units.**

Introduction to statistical methods for analyzing discrete and non-normal outcomes. Emphasizes the development and application of methods for categorical data, including contingency tables, logistic and Poisson regression, loglinear models.

Prerequisite: STATS 210. May not be taken for graduate credit by Ph.D. students in Statistics.

Restriction: Graduate students only.

**STATS 210C. Statistical Methods III: Longitudinal Data. 4 Units.**

Introduction to statistical methods for analyzing longitudinal outcomes. Emphasizes the development and application of regression methods for correlated and censored outcomes. Methods for continuous and discrete correlated outcomes, as well as censored outcomes, are covered.

Prerequisite: STATS 210B. May not be taken for graduate credit by Ph.D. students in Statistics.

Restriction: Graduate students only.

**STATS 211. Statistical Methods II: Generalized Linear Models. 4 Units.**

Development of the theory and application of generalized linear models. Topics include likelihood estimation and asymptotic distributional theory for exponential families, quasi-likelihood and mixed model development. Emphasizes methodological development and application to real scientific problems.

Prerequisite or corequisite: STATS 210

**STATS 212. Statistical Methods III: Methods for Correlated Data. 4 Units.**

Development and application of statistical methods for analyzing correlated data. Topics covered include repeated measures ANOVA, linear mixed models, non-linear mixed effects models, and generalized estimating equations. Emphasizes both theoretical development and application of the presented methodology.

Prerequisite: STATS 211

**STATS 220A. Advanced Probability and Statistics Topics. 4 Units.**

Advanced topics in probability and statistical inference including measure theoretic probability, large sample theory, decision theory, resampling and Monte Carlo methods, nonparametric methods.

Prerequisite: STATS 200C

**STATS 220B. Advanced Probability and Statistics Topics. 4 Units.**

Advanced topics in probability and statistical inference, including measure theoretic probability, large sample theory, decision theory, resampling and Monte Carlo methods, nonparametric methods.

Prerequisite: STATS 220A and MATH 140B

**STATS 225. Bayesian Statistical Analysis. 4 Units.**

Introduction to the Bayesian approach to statistical inference. Topics include univariate and multivariate models, choice of prior distributions, hierarchical models, computation including Markov chain Monte Carlo, model checking, and model selection.

Prerequisite: STATS 205 and STATS 230

**STATS 226. Advanced Topics in Modern Bayesian Statistical Inference. 4 Units.**

Modern Bayesian Statistics: selected topics from theory of Markov chains, application of theory to modern methods of Markov chain Monte Carlo sampling; Bayesian non-parametric and semiparametric modeling, including Dirichlet Process Mixtures; Mixtures of Polya Trees.

Prerequisite: STATS 200C and STATS 225

**STATS 230. Statistical Computing Methods. 4 Units.**

Numerical computations and algorithms with applications in statistics. Topics include optimization methods including the EM algorithm, random number generation and simulation, Markov chain simulation tools, and numerical integration.

Prerequisite: Two quarters of upper-division or graduate training in probability and statistics.

Overlaps with COMPSCI 206.

**STATS 235. Modern Data Analysis Methods . 4 Units.**

Introduces selected modern tools for data analysis. Emphasizes use of computational and resampling techniques for data analyses when the data do not conform to standard toolbox of regression models and/or complexity of modeling problem threatens validity of standard methods.

Prerequisite: STATS 120C and STATS 205 and (STATS 201 or STATS 210)

Restriction: Graduate students only.

**STATS 240. Multivariate Statistical Methods. 4 Units.**

Theory and application of multivariate statistical methods. Topics include statistical inference for the multivariate normal model and its extensions to multiple samples and regression, use of statistical packages for data visualization and reduction, discriminant analysis, cluster analysis, and factor analysis.

Prerequisite: STATS 120C and (MATH 3A or I&C SCI 6N)

Concurrent with STATS 140.

**STATS 245. Time Series Analysis. 4 Units.**

Statistical models for analysis of time series from time and frequency domain perspectives. Emphasizes theory and application of time series data analysis methods. Topics include ARMA/ARIMA models, model identification/estimation, linear operators, Fourier analysis, spectral estimation, state space models, Kalman filter.

Corequisite: STATS 200C

Prerequisite or corequisite: STATS 201 or STATS 210

**STATS 250. Biostatistics. 4 Units.**

Statistical methods commonly used to analyze data arising from clinical studies. Topics include analysis of observational studies and randomized clinical trials, techniques in the analysis of survival and longitudinal data, approaches to handling missing data, meta-analysis, nonparametric methods.

Prerequisite: STATS 210

**STATS 255. Statistical Methods for Survival Data. 4 Units.**

Statistical methods for analyzing survival data from cohort studies. Topics include parametric and nonparametric methods, the Kaplan-Meier estimator, log-rank tests, regression models, the Cox proportional hazards model and accelerated failure time models, efficient sampling designs, discrete survival models.

Corequisite: STATS 202 or STATS 211.

Prerequisite: STATS 210

Restriction: Graduate students only.

**STATS 257. Introduction to Statistical Genetics. 4 Units.**

Provides students with knowledge of the basic principles, concepts, and methods used in statistical genetic research. Topics include principles of population genetics, and statistical methods for family- and population-based studies.

Prerequisite: Two quarters of upper-division or graduate training in statistical methods.

Same as EPIDEM 215.

**STATS 260. Inference with Missing Data. 4 Units.**

Statistical methods and theory useful for analysis of multivariate data with partially observed variables. Bayesian and likelihood-based methods developed. Topics include EM-type algorithms, MCMC samplers, multiple imputation, and general location model. Applications from economics, education, and medicine are discussed.

Prerequisite or corequisite: STATS 210 or STATS 200C. STATS 230.

**STATS 262. Theory and Practice of Sample Surveys. 4 Units.**

Basic techniques and statistical methods used in designing surveys and analyzing collected survey data. Topics include simple random sampling, ratio and regression estimates, stratified sampling, cluster sampling, sampling with unequal probabilities, multistage sampling, and methods to handle nonresponse.

Prerequisite: STATS 120C

**STATS 265. Causal Inference. 4 Units.**

Various approaches to causal inference focusing on the Rubin causal model and propensity-score methods. Topics include randomized experiments, observational studies, non-compliance, ignorable and non-ignorable treatment assignment, instrumental variables, and sensitivity analysis. Applications from economics, politics, education, and medicine.

Prerequisite: STATS 200C and STATS 210

**STATS 270. Stochastic Processes. 4 Units.**

Introduction to the theory and application of stochastic processes. Topics include Markov chains, continuous-time Markov processes, Poisson processes, and Brownian motion. Applications include Markov chain Monte Carlo methods and financial modeling (for example, option pricing).

Prerequisite: STATS 120C

Overlaps with MATH 271A, MATH 271B, MATH 271C.

**STATS 275. Statistical Consulting. 4 Units.**

Training in collaborative research and practical application of statistics. Emphasis on effective communication as it relates to identifying scientific objectives, formulating a statistical analysis plan, choice of statistical methods, and interpretation of results and their limitations to non-statisticians.

Prerequisite: STATS 203 or STATS 212 or STATS 210C. STATS 203 with a grade of B or better. STATS 212 with a grade of B or better. STATS 210C with a grade of B or better

Restriction: Graduate students only.

**STATS 280. Seminar in Statistics. 0.5 Units.**

Periodic seminar series covering topics of current research in statistics and its application.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**STATS 281A. Introduction to Probability and Statistics I. 4 Units.**

Introduction to basic principles of probability and statistical inference. Axiomatic definition of probability, random variables, probability distributions, expectation.

Restriction: Graduate students only.

Concurrent with STATS 120A.

**STATS 281B. Introduction to Probability and Statistics II. 4 Units.**

Introduction to basic principles of probability and statistical inference. Point estimation, interval estimating, and testing hypotheses, Bayesian approaches to inference.

Restriction: Graduate students only.

Concurrent with STATS 120B.

**STATS 281C. Introduction to Probability and Statistics III. 4 Units.**

Introduction to basic principles of probability and statistical inference. Contingency table analysis, linear regression, analysis of variance, model checking.

Restriction: Graduate students only.

Concurrent with STATS 120C.

**STATS 295. Special Topics in Statistics. 4 Units.**

Studies in selected areas of statistics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**STATS 298. Thesis Supervision. 2-12 Units.**

Individual research or investigation conducted in preparation for the M.S. thesis option or the dissertation requirements for the Ph.D. program.

Repeatability: May be repeated for credit unlimited times.

**STATS 299. Individual Study. 2-12 Units.**

Individual research or investigation under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

## Computer Game Science, B.S.

**NOTE:** Effective Fall 2021, the B.S. in Computer Game Science will be renamed as the B.S. in Game Design and Interactive Media. For additional information on the program, visit the following website: <https://www.informatics.uci.edu/undergrad/bs-game-design-interactive-media> (<https://www.informatics.uci.edu/undergrad/bs-computer-game-science/>)

The Computer Game Science major gives students a strong foundation in introductory information and computer science, an extensive education in technologies and design practices associated with computer games, and an opportunity to focus in two areas of particular interest to the student. Students who complete the major will be able to create interactive and human-centered game designs; implement games using skills in modeling, graphics, software engineering, hardware architectures, human interfaces, and aesthetics; and evaluate games and game technology for their use in education, art, and social change.

Freshman Applicants: See the Undergraduate Admissions section.

**Transfer Applicants:**

Transfer applicants who satisfactorily complete course prerequisites will be given preference for admission. All applicants must complete the following required courses: one year of approved calculus, one year of object-oriented programming (python, java, C++), additional courses as specified by the major, and completion of lower-division writing. Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Visit the *UCI Office of Admissions website* for information on transfer requirements for our major.

**Lower-division**

A. Select one of the following series:

I&C SCI 31- 32- 33

Introduction to Programming  
and Programming with Software Libraries  
and Intermediate Programming

or

I&C SCI 32A- 33

Python Programming and Libraries (Accelerated)  
and Intermediate Programming

B. Complete:

I&C SCI 45C

Programming in C/C++ as a Second Language

I&C SCI 46

Data Structure Implementation and Analysis

I&C SCI 51

Introductory Computer Organization

I&C SCI 60

Computer Games and Society

I&C SCI 61

Game Systems and Design

I&C SCI 62

Game Technologies and Interactive Media

IN4MATX 43

Introduction to Software Engineering

MATH 2A

Single-Variable Calculus

MATH 2B

Single-Variable Calculus

I&C SCI 6N

Computational Linear Algebra

or MATH 3A

Introduction to Linear Algebra

I&C SCI 6B

Boolean Logic and Discrete Structures

I&C SCI 6D

Discrete Mathematics for Computer Science

STATS 67

Introduction to Probability and Statistics for Computer Science

PHYSICS 3A

Basic Physics I

FLM&MDA 85A

Introduction to Film and Visual Analysis

or FLM&MDA 85C

New Media and Digital Technologies

**Upper-division**

A. Computer Game Science Core Requirements



COMPSCI 171	Introduction to Artificial Intelligence
I&C SCI 161	Game Engine Lab
I&C SCI 162	Modeling and World Building
I&C SCI 167	Multiplayer Game Systems
I&C SCI 168	Multiplayer Game Project
I&C SCI 169A- 169B	Capstone Game Project I and Capstone Game Project II
and select two of the following:	
COMPSCI 112	Computer Graphics
I&C SCI 163	Mobile and Ubiquitous Games
I&C SCI 166	Game Design
B. Select two of the following:	
COMPSCI 122A	Introduction to Data Management
COMPSCI 132	Computer Networks
COMPSCI 143A	Principles of Operating Systems
COMPSCI 152	Computer Systems Architecture
IN4MATX 113	Requirements Analysis and Engineering
IN4MATX 121	Software Design: Applications
IN4MATX 131	Human Computer Interaction
C. CGS Elective Courses:	
Five additional courses:	
1. Two courses from A-C.	
2. Three courses must be in the same Bren ICS track.	

**Bren ICS Tracks:****Algorithms**

COMPSCI 161	Design and Analysis of Algorithms
COMPSCI 162	Formal Languages and Automata
COMPSCI 163	Graph Algorithms
COMPSCI 164	Computational Geometry and Geometric Modeling
COMPSCI 165	Project In Algorithms And Data Structures

**Artificial Intelligence**

COMPSCI 171	Introduction to Artificial Intelligence
COMPSCI 175	Project in Artificial Intelligence
COMPSCI 177	Applications of Probability in Computer Science
COMPSCI 178	Machine Learning and Data-Mining
COMPSCI 179	Algorithms for Probabilistic and Deterministic Graphical Models

**Computational Biology**

COMPSCI 183	Introduction to Computational Biology
COMPSCI 184A	Artificial Intelligence in Biology and Medicine
COMPSCI 184C	Computational Systems Biology

**Computer Graphics and Vision**

COMPSCI 111	Digital Image Processing
COMPSCI 112	Computer Graphics
COMPSCI 114	Projects in Advanced 3D Computer Graphics
COMPSCI 116	Computational Photography and Vision
COMPSCI 117	Project in Computer Vision

**Computer Networks**

COMPSCI 131	Parallel and Distributed Computing
COMPSCI 132	Computer Networks
COMPSCI 133	Advanced Computer Networks
COMPSCI 134	Computer and Network Security
COMPSCI 137/IN4MATX 124	Internet Applications Engineering

**Databases**

COMPSCI 121/IN4MATX 141	Information Retrieval
COMPSCI 122A	Introduction to Data Management
COMPSCI 122B	Project in Databases and Web Applications
COMPSCI 125	Next Generation Search Systems

**Hardware**

COMPSCI 145	Embedded Software
COMPSCI 151	Digital Logic Design
COMPSCI 153	Logic Design Laboratory
COMPSCI 154	Computer Design Laboratory

**Human-Computer Interaction**

IN4MATX 131	Human Computer Interaction
IN4MATX 132	Project in Human-Computer Interaction Requirements and Evaluation
IN4MATX 133	User Interaction Software
IN4MATX 134	Project in User Interaction Software

**Operating Systems**

COMPSCI 143A	Principles of Operating Systems
COMPSCI 143B	Project in Operating System Organization
COMPSCI 146	Programming in Multitasking Operating Systems

**Programming Languages and Compilers**

IN4MATX 101	Concepts in Programming Languages I (same as COMPSCI 141)
IN4MATX 102	Concepts of Programming Language II
COMPSCI 142A	Compilers and Interpreters
COMPSCI 142B	Language Processor Construction

**Social and Organizational Computing**

IN4MATX 151	Project Management
IN4MATX 153	Computer Supported Cooperative Work
IN4MATX 161	Social Analysis of Computing
IN4MATX 162W	Organizational Information Systems
IN4MATX 163	Project in the Social and Organizational Impacts of Computing
IN4MATX 171	Introduction to Medical Informatics

**Software Engineering**

IN4MATX 113	Requirements Analysis and Engineering
IN4MATX 115	Software Testing, Analysis, and Quality Assurance
IN4MATX 117	Project in Software System Design
IN4MATX 121	Software Design: Applications
IN4MATX 122	Software Design: Structure and Implementation
IN4MATX 124	Internet Applications Engineering (same as COMPSCI 137)

**Non-Track Courses (some of these courses have prerequisites that are not part of the CGS major):****Computer Game Science**

I&C SCI 162	Modeling and World Building
I&C SCI 163	Mobile and Ubiquitous Games
I&C SCI 166	Game Design

**Business Management**

MGMT 101	Management Science
MGMT 102	Managing Organizational Behavior
MGMT 105	Introduction to Marketing
MGMT 154	Global Marketing
MGMT 155	Brand Management

**Cognitive Science**

PSYCH 130A	Perception and Sensory Processes
PSYCH 131A	Vision

PSYCH 131B	Hearing
PSYCH 135M	The Mind/Body Problem
PSYCH 140C	Cognitive Science
<b>Mathematics</b>	
MATH 112A- 112B- 112C	Introduction to Partial Differential Equations and Applications and Introduction to Partial Differential Equations and Applications and Introduction to Partial Differential Equations and Applications
MATH 115	Mathematical Modeling
MATH 121A- 121B	Linear Algebra and Linear Algebra
<b>Film and Media Studies</b>	
FLM&MDA 113	Narrative/Image
FLM&MDA 114	Film, Media, and the Arts
FLM&MDA 117A	Introduction to Screenwriting
FLM&MDA 144	Studies in New Media

With prior approval of the ICS Associate Dean for Student Affairs, a student may design a new track, or an Independent Study, Honors Research, or Special Topics course may be substituted for a course in a track. Computer Game Science (CGS) elective courses may not be counted as part of the Management minor. NOTE: All proposed courses must be upper-division and at least 4 units in value.

**Major and minor restrictions:** Click on the 'Majors/Minors Restrictions' tab at the top of this page.

<b>Freshman</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
I&C SCI 31	I&C SCI 32	I&C SCI 33
I&C SCI 60 <sup>1</sup>	I&C SCI 61	I&C SCI 62
MATH 2A	MATH 2B	I&C SCI 6B
	WRITING 39B	WRITING 39C
<b>Sophomore</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
I&C SCI 45C	I&C SCI 46	IN4MATX 43
I&C SCI 51	I&C SCI 161	I&C SCI 162
I&C SCI 6D	I&C SCI 6N	STATS 67
		General Education III/VII
<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
COMPSCI 112, IC SCI 163, or IC SCI 166	I&C SCI 167	COMPSCI 112, IC SCI 163, or IC SCI 166
COMPSCI 171	COMPSCI 122A, IN4MATX 113, IN4MATX 121, or IN4MATX 131 <sup>3</sup>	I&C SCI 168
FLM&MDA 85A or 85C <sup>2</sup>	U-D Writing	Computer Game Science Elective
PHYSICS 3A		
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
I&C SCI 169A	I&C SCI 169B	Computer Game Science Elective
General Education III	Computer Game Science Elective	General Education VI
General Education IV	General Education IV	General Education VIII

<sup>1</sup> Fulfills GE III. Note, you must satisfy the UC Entry Level Writing requirement to enroll in I&C SCI 60.

<sup>2</sup> Fulfills GE IV.

<sup>3</sup> Select two of these.

#### NOTES:

1. Students are advised that this sample program lists the minimum requirements; it is possible that students may have to take additional courses to prepare for required courses.

2. The lower-division writing requirement must be completed by the end of the seventh quarter at UCI.

3. This is only a sample plan. Course offerings may be moved due to unforeseen circumstances. It is strongly recommended that students meet with an academic advisor to create an academic plan tailored to meet their specific areas of interest.

A wide variety of careers and graduate programs are open to Computer Game Science (CGS) graduates. The video game industry is comparable in size to the film and music industries, and job growth projections are strong for people with strong technical backgrounds. Many other fields, including mobile software development, interactive entertainment, and training and education software have demand for similar skill sets and knowledge. CGS graduates are well-trained in computer science, and can thus pursue graduate programs or any career that involves designing, implementing, evaluating, or interacting with computer-based systems.

## Department of Computer Science

**Alexandru Nicolau, Department Chair**

**Sandy Irani, Department Vice Chair**

3019 Donald Bren Hall

949-824-1546

<http://www.cs.uci.edu/>

With over 56 full-time faculty members, 300+ graduate students, and more than 2,000 undergraduates, we provide a world-class research environment spanning not only the core areas of computer science — including computer architecture, system software, networking and distributed computing, data and information systems, the theory of computation, artificial intelligence, and computer graphics — but also highly interdisciplinary programs, such as biomedical informatics, data mining, security and privacy, and ubiquitous computing.

The diverse research interests of our faculty are reflected directly in our educational programs. Computer Science faculty teach most of the undergraduate and graduate courses for the degree programs in both Computer Science and Information and Computer Science. We jointly offer with our colleagues in The Henry Samueli School of Engineering an undergraduate degree in Computer Science and Engineering, as well as the graduate program in Networked Systems. We also have a major in Computer Game Science, jointly offered with the Department of Informatics.

Our department collaborates with many other institutions in the United States and abroad, and its doors are always open to a multitude of visitors and collaborators from all corners of the globe.

- Bioinformatics, Minor
- Computer Science and Engineering, B.S.
- Computer Science, B.S.
- Computer Science, M.S.
- Computer Science, Ph.D.
- Master of Computer Science
- Mathematical, Computational, and Systems Biology, M.S.
- Mathematical, Computational, and Systems Biology, Ph.D.
- Networked Systems, M.S.

## Faculty

Mohammad A. Al Faruque, Ph.D. University of Kaiserslautern, *Chair of Emulex Career Development and Associate Professor of Electrical Engineering and Computer Science; Computer Science; Mechanical and Aerospace Engineering* (cyber-physical systems, internet of things, embedded systems, CPS security)

Shannon L. Alfaro, M.S. University of California, Irvine, *Continuing Lecturer of Computer Science* (design/analysis of combinational and sequential systems using SSI/MSI/LSI modules, hardware/firmware implementation of algorithms)

Animashree Anandkumar, Ph.D. Cornell University, *Assistant Professor of Computer Science* (statistical inference and learning of graphical models, scalable network algorithms)

Nader Bagherzadeh, Ph.D. University of Texas at Austin, *Professor of Electrical Engineering and Computer Science; Computer Science* (parallel processing, computer architecture, computer graphics, memory systems, 3-D ICs, heterogeneous computing, low-power processing)

Pierre F. Baldi, Ph.D. California Institute of Technology, *Director of the Institute for Genomics and Bioinformatics and Distinguished Professor of Computer Science; Biological Chemistry; Biomedical Engineering; Developmental and Cell Biology; Mathematics* (artificial intelligence and machine learning, biomedical informatics, databases and data mining, environmental informatics, statistics and statistical theory)

Lubomir Bic, Ph.D. University of California, Irvine, *Professor of Computer Science* (parallel and distributed computing, mobile agents, networks, and distributed systems)

Elaheh Bozorgzadeh, Ph.D. University of California, Los Angeles, *Professor of Computer Science* (computer architecture and design, design automation and synthesis for embedded systems, VLSI CAD, reconfigurable computing)

Anton Burtsev, Ph.D. University of Utah, *Assistant Adjunct Professor of Computer Science* (novel low-latency datacenters, microkernels, virtualization, datacenter environments)

Carter Butts, Ph.D. Carnegie Mellon University, *Professor of Sociology; Computer Science; Electrical Engineering and Computer Science; Statistics* (mathematical sociology, social networks, quantitative methodology, human judgment and decision making, economic sociology)

Michael Carey, Ph.D. University of California, Berkeley, *Donald Bren Professor of Information & Computer Sciences and Distinguished Professor of Computer Science* (databases and data mining, parallel and distributed systems)

Aparna Chandramowlishwaran, Ph.D. Georgia Institute of Technology, *Assistant Professor of Electrical Engineering and Computer Science; Computer Science; Mechanical and Aerospace Engineering* (high-performance computing, domain-specific compilers, algorithm-architecture co-design, data analysis, and scientific computing)

Peter Chang, M.D. Northwestern University, *Assistant Professor in Residence of Radiological Sciences; Computer Science; Pathology and Laboratory Medicine*

Qi Alfred Chen, Ph.D. University of Michigan, *Assistant Professor of Computer Science* (smart systems and IoT)

Rina Dechter, Ph.D. University of California, Los Angeles, *UCI Chancellor's Professor of Computer Science* (automated reasoning, knowledge-representation, planning and learning)

Michael B. Dillencourt, Ph.D. University of Maryland, College Park, *Professor of Computer Science* (algorithms and complexity, networks and distributed systems, data structures, computational geometry, graph algorithms)

Rainer B. Doemer, Ph.D. Dortmund University, *Professor of Electrical Engineering and Computer Science; Computer Science* (system-level design, embedded computer systems, design methodologies, specification and modeling languages, advanced parallel simulation, integration of hardware and software systems)

Nikil D. Dutt, Ph.D. University of Illinois at Urbana–Champaign, *UCI Chancellor's Professor of Computer Science; Cognitive Sciences; Electrical Engineering and Computer Science* (embedded systems, computer architecture, electronic design automation, software systems, brain-inspired architectures and computing)

Magda S. El Zarki, Ph.D. Columbia University, *Professor of Computer Science; Informatics* (telecommunications, networks, wireless communication, video transmission)

David A. Eppstein, Ph.D. Columbia University, *UCI Chancellor's Professor of Computer Science* (algorithms and complexity; computer graphics and visualization; geometric optimization)

Daniel Epstein, Ph.D. University of Washington, *Assistant Professor of Informatics; Computer Science* (human-computer interaction, personal informatics, ubiquitous computing, social computing, health informatics)

Julian Feldman, Ph.D. Carnegie Institute of Technology, *Professor Emeritus of Computer Science*

Charles C. Fowlkes, Ph.D. University of California, Berkeley, *Professor of Computer Science; Cognitive Sciences* (artificial intelligence, computer vision, machine learning, computational biology)

Roy Fox, Ph.D. The Hebrew University of Jerusalem, *Assistant Professor of Computer Science* (theory and applications of reinforcement learning, dynamical systems, information theory, robotics)

Michael S. Franz, Ph.D. Swiss Federal Institute of Technology in Zurich, *UCI Chancellor's Professor of Computer Science; Electrical Engineering and Computer Science* (systems software, particularly compilers and virtual machines, trustworthy computing, software engineering)

Daniel H. Frost, M.S. University of California, Irvine, *Professor of Teaching Emeritus of Computer Science* (artificial intelligence, software engineering, computer graphics, teaching of programming)

Richard Futrell, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Computer Science; Language Science* (language processing, Bayesian modeling, NLP)

Sergio Gago-Masague, Ph.D., *Assistant Professor of Teaching of Computer Science* (pervasive computing, user-centric software design, human computer interaction, serious games)

Irene Gassko, Ph.D. Boston University, *Lecturer of Computer Science*

Jean-Luc Gaudiot, Ph.D. University of California, Los Angeles, *Professor of Electrical Engineering and Computer Science; Computer Science* (parallel processing, computer architecture, processor architecture)

Tony D. Givargis, Ph.D. University of California, Riverside, *Professor of Computer Science* (embedded systems, platform-based system-on-a-chip design, low-power electronics)

Michael T. Goodrich, Ph.D. Purdue University, *UCI Chancellor's Professor of Computer Science* (computer security, algorithm design, data structures, Internet algorithmics, geometric computing, graphic drawing)

Richard H. Granger, Ph.D. Yale University, *Professor Emeritus of Computer Science*

Ian G. Harris, Ph.D. University of California, San Diego, *Professor of Computer Science; Electrical Engineering and Computer Science* (hardware/software covalidation, manufacturing test)

Wayne B. Hayes, Ph.D. University of Toronto, *Associate Professor of Computer Science* (biomedical informatics and computational biology, computer vision, scientific and numerical computing)

Dan S. Hirschberg, Ph.D. Princeton University, *Professor of Computer Science* (analyses of algorithms, concrete complexity, data structures, models of computation)

Mustafa Ibrahim, M.S. California State University, *Lecturer of Computer Science* (software engineering)

Alexander T. Ihler, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Computer Science* (artificial intelligence and machine learning, probabilistic models, sensor networks, and distributed systems)

Sandra S. Irani, Ph.D. University of California, Berkeley, *Professor of Computer Science* (algorithms and complexity)

Ramesh Chandra Jain, Ph.D. Indian Institute of Technology Kharagpur, *Donald Bren Professor of Information & Computer Sciences and Distinguished Professor of Computer Science* (computer vision, multimedia computing, image databases, machine vision, intelligent systems)

Stanislaw M. Jarecki, Ph.D. Massachusetts Institute of Technology, *Professor of Computer Science* (algorithms and complexity, applies and distributed cryptograph)

Scott A. Jordan, Ph.D. University of California, Berkeley, *Professor of Computer Science; Electrical Engineering and Computer Science* (pricing and differentiated services in the Internet, resource allocation in wireless networks, telecommunications policy)

Sang-Woo Jun, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Computer Science* (computer systems architecture, hardware acceleration, non-volatile memory)

Kalev Kask, Ph.D. University of California, Irvine, *Lecturer of Computer Science* (artificial intelligence focusing on automated reasoning, graphical models)

David G. Kay, J.D. Loyola Marymount University, *Professor Emeritus of Teaching of Informatics; Computer Science* (computer law, computer science education)

Solmaz S. Kia, Ph.D. University of California, Irvine, *Assistant Professor of Mechanical and Aerospace Engineering; Computer Science* (systems and control, decentralized/distributed algorithm design for multi-agent systems, cooperative robotics)

Dennis F. Kibler, Ph.D. University of California, Irvine, *Professor Emeritus of Computer Science* (artificial intelligence and machine learning, gene regulation, biological genomes)

Raymond O. Klefstad, Ph.D. University of California, Irvine, *Associate Professor of Teaching of Computer Science* (embedded systems, networks and distributed systems, programming languages and systems)

Alfred Kobsa, Ph.D. University of Vienna, *Professor Emeritus of Informatics; Computer Science* (user modeling, human-computer interaction, artificial intelligence, cognitive science, interdisciplinary computer science)

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Richard H. Lathrop, Ph.D. Massachusetts Institute of Technology, *Professor of Computer Science* (modeling structure and function, machine learning, intelligent systems and molecular biology, protein structure/function prediction)

Marco Levorato, Ph.D. University of Padua, *Assistant Professor of Computer Science; Electrical Engineering and Computer Science* (artificial intelligence and machine learning, networks and distributed systems, statistics and statistical theory, stochastic modeling, signal processing)

Chen Li, Ph.D. Stanford University, *Professor of Computer Science* (databases and text processing, multimedia databases, data integration)



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George S. Lueker, Ph.D. Princeton University, *Professor Emeritus of Computer Science* (algorithms and complexity)

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Stephan Mandt, Ph.D. University of Cologne, *Assistant Professor of Computer Science* (artificial intelligence and machine learning, probabilistic modeling, Bayesian deep learning, variational inference)

Athina Markopoulou, Ph.D. Stanford University, *Nicolaos G. and Sue Curtis Alexopoulos Presidential Chair in Electrical Engineering and Computer Science and Department Chair and Professor of Electrical Engineering and Computer Science; Computer Science* (networking: including network protocols, network measurement and analysis, mobile systems and mobile data analysis, network security and privacy)

Gopi Meenakshisundaram, Ph.D. University of North Carolina at Chapel Hill, *Professor of Computer Science* (geometry and topology for computer graphics, image-based rendering, object representation, surface reconstruction, collision detection, virtual reality, telepresence)

Sharad Mehrotra, Ph.D. University of Texas at Austin, *Professor of Computer Science* (databases and data mining, multimedia computing, networks and distributed systems)

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Richard Pattis, M.S. Stanford University, *Professor of Teaching of Computer Science; Informatics* (MicroWorlds for teaching programming, debugging, computational tools for non-computer scientists)

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Ardalan Amiri Sani, Ph.D. Rice University, *Assistant Professor of Computer Science* (involves building efficient, high performance, and reliable systems)

Isaac D. Scherson, Ph.D. Weizmann Institute of Science, *Professor of Computer Science; Electrical Engineering and Computer Science* (parallel computing architectures, massively parallel systems, parallel algorithms, interconnection networks, performance evaluation)

Babak Shahbaba, Ph.D. University of Toronto, *Professor of Statistics; Computer Science*

Phillip C-Y Sheu, Ph.D. University of California, Berkeley, *Professor of Electrical Engineering and Computer Science; Biomedical Engineering; Computer Science* (semantic computing, robotic computing, artificial intelligence, biomedical computing, multimedia computing)

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Alice Silverberg, Ph.D. Princeton University, *Distinguished Professor Emerita of Mathematics; Computer Science* (algebra and number theory)

Sameer Singh, Ph.D. University of Massachusetts Amherst, *Assistant Professor of Computer Science; Electrical Engineering and Computer Science; Language Science* (artificial intelligence and machine learning, databases and data mining, scientific and numerical computing)

Padhraic J. Smyth, Ph.D. California Institute of Technology, *Professor of Computer Science; Education; Statistics* (artificial intelligence and machine learning, pattern recognition, applied statistics, data mining, information theory)

Mark Steyvers, Ph.D. Indiana University, *Professor of Cognitive Sciences; Computer Science; Psychological Science* (higher-order cognition, cognitive neuroscience, computational modeling, collective intelligence)

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Xiangmin Xu, Ph.D. Vanderbilt University, *Professor of Anatomy and Neurobiology; Biomedical Engineering; Computer Science*

Charles S. Zender, Ph.D. University of Colorado Boulder, *Professor of Earth System Science; Computer Science*

Hong-Kai Zhao, Ph.D. University of California, Los Angeles, *Chancellor's Professor of Mathematics; Computer Science* (applied and computational mathematics, inverse problems and imaging)

Shuang Zhao, Ph.D. Cornell University, *Assistant Professor of Computer Science* (computer graphics with a focus on material appearance modeling and physically-based rendering)

## Courses

### **COMPSCI 103. Advanced Programming and Problem Solving with C++. 4 Units.**

Advanced programming language concepts for more complex, higher performance software design. Builds depth of programming skills in C++ as a foundation for upper-division courses and projects. Focuses on strengthening programming, debugging, and problem solving skills.

Prerequisite: I&C SCI 45C

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

### **COMPSCI 111. Digital Image Processing. 4 Units.**

Introduction to the fundamental concepts of digital signal and image processing as applicable in areas such as multimedia, graphics, AI, data mining, databases, vision, or video games. Topics include image representation, space- and frequency-domain transformations, filters, segmentation, and compression.

Prerequisite: (I&C SCI 46 or CSE 46) and I&C SCI 6D and (MATH 3A or I&C SCI 6N). I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better. I&C SCI 6D with a grade of C or better. MATH 3A with a grade of C or better. I&C SCI 6N with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.



**COMPSCI 112. Computer Graphics. 4 Units.**

Introduction to the fundamental principles of 3D computer graphics including polygonal modeling, geometric transformations, visibility algorithms, illumination models, texturing, and rasterization. Use of an independently-learned 3D graphics API to implement these techniques.

Prerequisite: (I&C SCI 45C or CSE 45C) and (MATH 3A or I&C SCI 6N). I&C SCI 45C with a grade of C or better. CSE 45C with a grade of C or better. MATH 3A with a grade of C or better. I&C SCI 6N with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 113. Computer Game Development. 4 Units.**

Introduction to the principles of interactive 2D and 3D computer game development. Concepts in computer graphics, algorithms, software engineering, art and graphics, music and sound, story analysis, and artificial intelligence are presented and are the basis for student work.

Prerequisite: COMPSCI 112 or COMPSCI 171 or IN4MATX 121 or ART 106B or I&C SCI 163 or I&C SCI 166

Same as IN4MATX 125.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 114. Projects in Advanced 3D Computer Graphics. 4 Units.**

Projects in advanced 3D graphics such as illumination, geometric modeling, visualization, and animation. Topics include physically based and global illumination, solid modeling, curved surfaces, multiresolution modeling, image-based rendering, basic concepts of animation, and scientific visualization.

Prerequisite: COMPSCI 112 and (I&C SCI 45C or CSE 45C). I&C SCI 45C with a grade of C or better. CSE 45C with a grade of C or better.

Recommended: COMPSCI 161 or CSE 161 or COMPSCI 164 or COMPSCI 165.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 115. Computer Simulation. 4 Units.**

Discrete event-driven simulation; continuous system simulation; basic probability as pertaining to input distributions and output analysis; stochastic and deterministic simulation; static and dynamic system simulation.

Prerequisite: I&C SCI 6B and (I&C SCI 6N or MATH 3A) and (STATS 67 or STATS 7) and STATS 120A and I&C SCI 51 and IN4MATX 43. I&C SCI 6B with a grade of C or better. I&C SCI 6N with a grade of C or better. MATH 3A with a grade of C or better. STATS 67 with a grade of C or better. STATS 7 with a grade of C or better. STATS 120A with a grade of C or better. I&C SCI 51 with a grade of C or better. IN4MATX 43 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 116. Computational Photography and Vision. 4 Units.**

Introduces the problems of computer vision through the application of computational photography. Specific topics include photo-editing (image warping, compositing, hole filling), panoramic image stitching, and face detection for digital photographs.

Prerequisite: I&C SCI 6D and (MATH 6G or MATH 3A or I&C SCI 6N) and MATH 2B and (I&C SCI 46 or CSE 46). I&C SCI 6D with a grade of C or better. MATH 6G with a grade of C or better. MATH 3A with a grade of C or better. I&C SCI 6N with a grade of C or better. MATH 2B with a grade of C or better. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 117. Project in Computer Vision. 4 Units.**

Students undertake construction of a computer vision system. Topics include automatically building 3D models from photographs, searching photo collections, robot navigation, and human motion tracking.

Prerequisite: I&C SCI 6D and (MATH 3A or I&C SCI 6N) and MATH 2B and (I&C SCI 46 or CSE 46) and (COMPSCI 112 or COMPSCI 116 or COMPSCI 171 or COMPSCI 178). I&C SCI 6D with a grade of C or better. MATH 3A with a grade of C or better. I&C SCI 6N with a grade of C or better. MATH 2B with a grade of C or better. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 121. Information Retrieval. 4 Units.**

An introduction to information retrieval including indexing, retrieval, classifying, and clustering text and multimedia documents.

Prerequisite: (I&C SCI 45C or I&C SCI 45J) and (STATS 7 or STATS 67). I&C SCI 45C with a grade of C or better. I&C SCI 45J with a grade of C or better

Same as IN4MATX 141.

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**COMPSCI 122A. Introduction to Data Management. 4 Units.**

Introduction to the design of databases and the use of database management systems (DBMS) for applications. Topics include entity-relationship modeling for design, relational data model, relational algebra, relational design theory, and Structured Query Language (SQL) programming.

Prerequisite: I&C SCI 33 or CSE 43 or EECS 114. I&C SCI 33 with a grade of C or better. CSE 43 with a grade of C or better

Same as EECS 116.

Restriction: Computer Science Engineering Majors have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment.

**COMPSCI 122B. Project in Databases and Web Applications. 4 Units.**

Introduces students to advanced database technologies and Web applications. Topics include database connectivity (ODBC/JDBC), extending databases using stored procedures, database administration, Web servers, Web programming languages (Java servlets, XML, Ajax, and mobile platforms).

Prerequisite: (COMPSCI 122A or EECS 116) and I&C SCI 45J

Overlaps with COMPSCI 137, IN4MATX 124.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 122C. Principles of Data Management. 4 Units.**

Covers fundamental principles underlying data management systems. Content includes key techniques including storage management, buffer management, record-oriented file system, access methods, query optimization, and query processing.

Prerequisite: COMPSCI 122A and (I&C SCI 53 or COMPSCI 143A)

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 222.

**COMPSCI 122D. Beyond SQL Data Management. 4 Units.**

Survey of modern data management and analysis technologies beyond relational (SQL) database management. Topics include semistructured data, NoSQL databases, big data analysis, and text search/query engines. Additional topics vary and may include data frames, streaming data, and/or time-series data.

Prerequisite: I&C SCI 46 and I&C SCI 51 and (COMPSCI 122A or EECS 116)

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**COMPSCI 125. Next Generation Search Systems. 4 Units.**

Discusses concepts and techniques related to all aspects of search systems. After considering basic search technology and the state-of-art systems, rapidly developing techniques for multimedia search, local search, event-search, and video-on-demand are explored.

Prerequisite: I&C SCI 31 or CSE 41 or I&C SCI 32A

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 225.

**COMPSCI 131. Parallel and Distributed Computing. 4 Units.**

Parallel and distributed computer systems. Parallel programming models. Common parallel and distributed programming issues. Specific topics include parallel programming, performance models, coordination and synchronization, consistency and replication, transactions, fault tolerance.

Prerequisite: (I&C SCI 53 and I&C SCI 53L) or COMPSCI 143A

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 132. Computer Networks. 4 Units.**

Computer network architectures, protocols, and applications. Internet congestion control, addressing, and routing. Local area networks. Multimedia networking.

Prerequisite: EECS 55 or STATS 67

Same as EECS 148.

Restriction: Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 133. Advanced Computer Networks. 4 Units.**

Fundamental principles in computer networks are applied to obtain practical experience and skills necessary for designing and implementing computer networks, protocols, and network applications. Various network design techniques, simulation techniques, and UNIX network programming are covered.

Prerequisite: COMPSCI 132 or EECS 148

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 134. Computer and Network Security. 4 Units.**

Overview of modern computer and networks security, attacks, and countermeasures. Authentication, identification, data secrecy, data integrity, authorization, access control, computer viruses, network security. Also covers secure e-commerce and applications of public key methods, digital certificates, and credentials.

Prerequisite: I&C SCI 6D and (I&C SCI 33 or CSE 43) and (COMPSCI 122A or EECS 116 or COMPSCI 132 or COMPSCI 143A)

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 137. Internet Applications Engineering. 4 Units.**

Concepts in Internet applications engineering with emphasis on the Web. Peer-to-Peer and Interoperability. Topics include HTTP and REST, Remote Procedure/Method Calls, Web Services, data representations, content distribution networks, identity management, relevant W3C/IETF standards, and relevant new large-scale computing styles.

Prerequisite: (COMPSCI 132 or EECS 148) and I&C SCI 45J

Same as IN4MATX 124.

Overlaps with COMPSCI 122B.

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 141. Concepts in Programming Languages I. 4 Units.**

In-depth study of several contemporary programming languages stressing variety in data structures, operations, notation, and control. Examination of different programming paradigms, such as logic programming, functional programming and object-oriented programming; implementation strategies, programming environments, and programming style.

Prerequisite: (I&C SCI 51 or CSE 31 or EECS 31) and (I&C SCI 46 or CSE 46). I&C SCI 51 with a grade of C or better. CSE 31 with a grade of C or better. EECS 31 with a grade of C or better. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better

Same as IN4MATX 101.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 142A. Compilers and Interpreters. 4 Units.**

Introduction to the theory of programming language processors covering lexical analysis, syntax analysis, semantic analysis, intermediate representations, code generation, optimization, interpretation, and run-time support.

Prerequisite: CSE 141 or COMPSCI 141 or IN4MATX 101

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 142B. Language Processor Construction. 4 Units.**

Project course which provides working laboratory experience in construction and behavior of compilers and interpreters. Students build actual language processors and perform experiments which reveal their behaviors.

Prerequisite: COMPSCI 142A or CSE 142

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 143A. Principles of Operating Systems. 4 Units.**

Principles and concepts of process and resource management, especially as seen in operating systems. Processes, memory management, protection, scheduling, file systems, and I/O systems are covered. Concepts illustrated in the context of several well-known systems.

Prerequisite: (I&C SCI 46 or CSE 46) and (I&C SCI 51 or EECS 31 or CSE 31)

Overlaps with EECS 111.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 143B. Project in Operating System Organization. 4 Units.**

Detailed specification and design of critical components of an actual operating system including a memory manager, a process server, and a file/IO subsystem. Hardware/software tradeoffs. Emphasis on logical organization of system and communication.

Prerequisite: COMPSCI 143A

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 145. Embedded Software. 4 Units.**

Principles of embedded computing systems: embedded systems architecture, hardware/software components, system software and interfacing, real-time operating systems, hardware/software co-development, and communication issues. Examples of embedded computing in real-world application domains. Simple programming using an embedded systems development environment.

Corequisite: COMPSCI 145L

Prerequisite: (CSE 46 or I&C SCI 46) and (I&C SCI 51 or EECS 31 or CSE 31)

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 145L. Embedded Software Laboratory. 2 Units.**

Laboratory section to accompany COMPSCI 145.

Corequisite: COMPSCI 145

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 146. Programming in Multitasking Operating Systems. 4 Units.**

User- and systems-level programming of modern Internet-connected, multi-user, multitasking operating systems. Shells, scripting, filters, pipelines, programmability, extensibility, concurrency, inter-process communication. Concrete examples of a modern operating system (such as, but not necessarily, Unix programmed in C) are used.

Prerequisite: (I&C SCI 46 or CSE 46) and I&C SCI 51. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better. I&C SCI 51 with a grade of C or better. Recommended: COMPSCI 143A.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 147. Internet of Things (IoT) Software and Systems. 4 Units.**

Introduction to the Internet of Things (IoT) from a systems and software perspective. IoT ecosystem including sensors, embedded CPUs, networking protocols, software, cloud services, and security and privacy requirements. IoT use cases, system design, and programming project.

Prerequisite: I&C SCI 33 or CSE 43

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 151. Digital Logic Design. 4 Units.**

Boolean algebra. Design/analysis of combinational and sequential systems using SSI/MSI/LSI modules. Number systems. Error detecting and correction codes. Arithmetic algorithms. Hardware/ firmware implementation of algorithms.

Prerequisite: (I&C SCI 33 or CSE 43) and I&C SCI 51 and I&C SCI 6B and I&C SCI 6D. I&C SCI 33 with a grade of C or better. CSE 43 with a grade of C or better. I&C SCI 51 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 152. Computer Systems Architecture. 4 Units.**

Design of computer elements; ALU, control unit, and arithmetic circuits. Memory hierarchy and organization. Caches. Function unit sharing and pipelining. I/O and interrupt processing. RTL and behavioral modeling using hardware description languages. Microprocessor organization and implementation techniques.

Prerequisite: COMPSCI 151

Overlaps with I&C SCI 160, EECS 112.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 153. Logic Design Laboratory. 4 Units.**

Introduction to standard integrated circuits. Construction and debugging techniques. Design of digital systems using LSI and MSI components. Practical use of circuits in a laboratory environment, including implementation of small digital systems such as arithmetic modules, displays, and timers.

Prerequisite: COMPSCI 151

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 154. Computer Design Laboratory. 4 Units.**

Underlying primitives of computer instruction sets. Principles of microprogramming. Microprogramming. Microprograms written for one or more systems. Typical microprogramming applications discussed and implemented or simulated.

Prerequisite or corequisite: COMPSCI 151

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 161. Design and Analysis of Algorithms. 4 Units.**

Techniques for efficient algorithm design, including divide-and-conquer and dynamic programming, and time/space analysis. Fast algorithms for problems applicable to networks, computer games, and scientific computing, such as sorting, shortest paths, minimum spanning trees, network flow, and pattern matching.

Prerequisite: (I&C SCI 46 or CSE 46) and I&C SCI 6B and I&C SCI 6D and MATH 2B. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Software Engineering Majors have first consideration for enrollment. Data Science Majors have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment. Computer Science Majors have first consideration for enrollment. Business Information Management, Computer Game Science, and Informatics majors have second right of consideration.

**COMPSCI 162. Formal Languages and Automata. 4 Units.**

Formal aspects of describing and recognizing languages by grammars and automata. Parsing regular and context-free languages. Ambiguity, nondeterminism. Elements of computability; Turing machines, random access machines, undecidable problems, NP-completeness.

Prerequisite: (I&C SCI 46 or CSE 46) and MATH 2B and I&C SCI 6B and I&C SCI 6D. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better

Same as LSCI 102.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment. Language Science Majors have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 163. Graph Algorithms. 4 Units.**

Algorithms for solving fundamental problems in graph theory. Graph representations, graph traversal, network flow, connectivity, graph layout, matching problems.

Prerequisite: COMPSCI 161 or CSE 161

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 265.

**COMPSCI 164. Computational Geometry and Geometric Modeling. 4 Units.**

Algorithms and data structures for computational geometry and geometric modeling, with applications to game and graphics programming. Topics: convex hulls, Voronoi diagrams, algorithms for triangulation, motion planning, and data structures for geometric searching and modeling of 2D and 3D objects.

Prerequisite: I&C SCI 46 or CSE 46. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 165. Project In Algorithms And Data Structures. 4 Units.**

Design, implementation, execution, and analysis of algorithms for problems such as sorting, searching, data compression, and data encryption. Time-space-structure trade-offs.

Prerequisite: COMPSCI 161 or CSE 161. Recommended: I&C SCI 45C OR CSE 45C.

**COMPSCI 166. Quantum Computation and Information. 4 Units.**

Basic models for quantum computation and their foundations in quantum mechanics. Quantum complexity classes and quantum algorithms, including algorithms for factoring and quantum simulation. Introduction to quantum information theory and quantum entanglement.

Prerequisite: (I&C SCI 6N or MATH 3A) and COMPSCI 161

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 167. Introduction to Applied Cryptography. 4 Units.**

An introduction to the essential aspects of applied cryptography, as it is used in practice. Topics include classical cryptography, block ciphers, stream ciphers, public-key cryptography, digital signatures, one-way hash functions, basic cryptographic protocols, and digital certificates and credentials.

Prerequisite: COMPSCI 161 or CSE 161

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 169. Introduction to Optimization. 4 Units.**

A broad introduction to optimization. Unconstrained and constrained optimization. Equality and inequality constraints. Linear and integer programming. Stochastic dynamic programming.

Prerequisite: (I&C SCI 6N or MATH 3A) and (STATS 67 or (STATS 7 and STATS 120A))

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 268.

**COMPSCI 171. Introduction to Artificial Intelligence. 4 Units.**

Different means of representing knowledge and uses of representations in heuristic problem solving. Representations considered include predicate logic, semantic nets, procedural representations, natural language grammars, and search trees.

Prerequisite or corequisite: ((STATS 7 and STATS 120A) or STATS 67) ( and (I&C SCI 46 or CSE 46) and MATH 2B)

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 172B. Neural Networks and Deep Learning . 4 Units.**

Neural network and deep learning from multiple perspectives. Theory of parallel distributed processing systems, algorithmic approaches for learning from data in various manners, applications to difficult problems in AI from computer vision, to natural language understanding, to bioinformatics and chemoinformatics.

Prerequisite: (STATS 120A and STATS 120B) or MATH 121A or COMPSCI 178 or COMPSCI 273A

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 274C.

**COMPSCI 172C. Artificial Intelligence Frontiers: Technical, Ethical, and Societal. 4 Units.**

Explores the frontiers of artificial intelligence and related technologies with a focus on the underlying ethical, legal, and societal challenges and opportunities they create. Encourages critical thinking about these issues.

Prerequisite: COMPSCI 171 and COMPSCI 172B. Recommended: COMPSCI 178

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 274D.

**COMPSCI 175. Project in Artificial Intelligence. 4 Units.**

Construction of a working artificial intelligence system. Evaluation of capabilities of the system including impact of knowledge representation.

Prerequisite: COMPSCI 171 and COMPSCI 178

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 177. Applications of Probability in Computer Science. 4 Units.**

Application of probability to real-world problems in computer science. Typical topics include analysis of algorithms and graphs, probabilistic language models, network traffic modeling, data compression, and reliability modeling.

Prerequisite: MATH 2B and STATS 67 and I&C SCI 6B and I&C SCI 6D and (MATH 3A or I&C SCI 6N)

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.



**COMPSCI 178. Machine Learning and Data-Mining. 4 Units.**

Introduction to principles of machine learning and data-mining applied to real-world datasets. Typical applications include spam filtering, object recognition, and credit scoring.

Prerequisite: I&C SCI 6B and I&C SCI 6D and (I&C SCI 6N or MATH 3A) and MATH 2B and (STATS 67 or (STATS 7 and STATS 120A))

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 179. Algorithms for Probabilistic and Deterministic Graphical Models. 4 Units.**

Graphical model techniques dealing with probabilistic and deterministic knowledge representations. Focuses on graphical models such as constraint networks, Bayesian networks, and Markov networks that have become a central paradigm for knowledge representation and reasoning in AI and general computer science.

Prerequisite: COMPSCI 171

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**COMPSCI 183. Introduction to Computational Biology. 4 Units.**

The use of theories and methods based on computer science, mathematics, and physics in molecular biology and biochemistry. Basics in biomolecular modeling. Analysis of sequence and structural data of biomolecules. Analysis of biomolecular functions.

Prerequisite: MATH 2D or MATH 3A or STATS 7 or STATS 8

Same as BME 132, BIO SCI M123.

Concurrent with MOL BIO 223 and BME 232.

**COMPSCI 184A. Artificial Intelligence in Biology and Medicine. 4 Units.**

Introduction to computational methods in molecular biology, aimed at those interested in learning about this interdisciplinary area. Covers computational approaches to understanding and predicting the structure, function, interactions, and evolution of DNA, RNA, proteins, and related molecules and processes.

Prerequisite: I&C SCI 6N or MATH 3A

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 284A.

**COMPSCI 184C. Computational Systems Biology. 4 Units.**

Computational inference and modeling of gene regulation networks, signal transduction pathways, and the effects of regulatory networks in cellular processes, development, and disease. Introduction of required mathematical, computational, and data handling tools.

Prerequisite: COMPSCI 184A

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

Concurrent with COMPSCI 284C.

**COMPSCI 190. Special Topics in Information and Computer Science. 4 Units.**

Studies in selected areas of Information and Computer Science. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**COMPSCI H198. Honors Research. 4 Units.**

Directed independent research in computer science for honors students.

Repeatability: May be repeated for credit unlimited times.

Restriction: Campuswide Honors Collegium students only. Bren School of ICS Honors students only. Upper-division students only.



**COMPSCI 199. Individual Study. 2-5 Units.**

Individual research or investigation with Computer Science faculty.

Repeatability: May be repeated for credit unlimited times.

**COMPSCI 200S. Seminar in Computer Science Research. 1 Unit.**

Graduate colloquium series. Includes weekly talks by notable computer scientists.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**COMPSCI 201. Foundations of Cryptographic Protocols. 4 Units.**

Explores fundamental cryptographic tools, including encryption, signatures, and identification schemes. Students are introduced to the provable security paradigm of modern cryptography, focusing on understanding of security properties provided by cryptographic tools, and on proving security (or insecurity) of cryptographic constructions.

Prerequisite: COMPSCI 260 or COMPSCI 263

**COMPSCI 201P. Introduction to Computer Security. 4 Units.**

Introduction to computer security, including systems, technology, and management. Topics include authorization, authentication, data integrity, malware, operating systems security, network security, web security, and basic cryptography.

Prerequisite: Knowledge of Python or C++ programming is required.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 202. Applied Cryptography. 4 Units.**

Design and analysis of algorithms for applied cryptography. Topics include symmetric and asymmetric key encryption, digital signatures, one-way hash functions, digital certificates and credentials, and techniques for authorization, non-repudiation, authentication, identification, data integrity, proofs of knowledge, and access control.

Prerequisite: COMPSCI 260 and COMPSCI 263

**COMPSCI 202P. Applied Cryptography . 4 Units.**

Design and analysis of algorithms for applied cryptography. Topics include symmetric and asymmetric key encryption, digital signatures, one-way hash functions, digital certificates and credentials, and techniques for authorization, non-repudiation, authentication, identification, data integrity, proofs of knowledge, and access control.

Restriction: Graduate students only.

**COMPSCI 203. Network and Distributed Systems Security. 4 Units.**

Modern computer and networks security: attacks and countermeasures, authentication, identification, data secrecy, data integrity, authorization, access control, computer viruses, network security. Group communication and multicast security techniques. Covers secure e-commerce and applications of public key methods, digital certificates, and credentials.

Prerequisite: EECS 148 or COMPSCI 132

Same as NET SYS 240.

**COMPSCI 203P. Network Security. 4 Units.**

Introduction to network security, including network threats and attacks, as well as defenses against such attacks. Topics include network infrastructure security, mobile and Wi-Fi security, spam, phishing, firewalls, anonymity, secure email, secure and private cloud computing, and web security.

Prerequisite: COMPSCI 201P or COMPSCI 202P

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 204. Usable Security and Privacy. 4 Units.**

Introduces usability problems in security and privacy methods, tools, and software. Overviews prominent examples of both failures and successes in usable security and privacy. Surveys state-of-the-art techniques and evaluation methodologies.

Same as IN4MATX 237.

Overlaps with IN4MATX 231, COMPSCI 203.

Restriction: Informatics Majors have first consideration for enrollment. Computer Science Majors have first consideration for enrollment. Undergraduate degree in CompSci or Informatics is strongly recommended.

**COMPSCI 205. Computer and Systems Security . 4 Units.**

Lecture and discuss latest security research in software, OS, protocols, mobile devices, machine learning, sensors, and emerging IoT/CPS systems such as smart home and smart transportation. Students perform research projects and gain hands-on experience evaluating and designing secure systems.

Prerequisite: COMPSCI 134 and COMPSCI 142A and COMPSCI 143A

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Graduate students only.

**COMPSCI 206. Principles of Scientific Computing. 4 Units.**

Overview of widely used principles and methods of numerical and scientific computing, including basic concepts and computational methods in linear algebra, optimization, and probability.

Prerequisite: Basic courses in multivariate calculus, linear algebra, and probability.

Overlaps with STATS 230.

**COMPSCI 206P. Principles of Scientific Computing. 4 Units.**

Overview of widely used principles and methods of numerical and scientific computing, including basic concepts and computational methods in floating-point, linear algebra, optimization, simulation, modeling, and probability/statistics as it relates to model evaluation.

Prerequisite: Basic knowledge of multivariate calculus, linear algebra, and familiarity with MATLAB.

Restriction: Graduate students only.

**COMPSCI 210P. Computer Graphics and Visualization . 4 Units.**

Interactive 3D graphics rendering pipeline, illumination and shading, ray tracing, texture-, bump-, mip-mapping, hidden surface removal, anti-aliasing, multiresolution representations, volume rendering techniques, iso-surface extraction.

Prerequisite: Familiarity with linear algebra is required.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 211A. Visual Computing. 4 Units.**

Fundamentals of image processing (convolution, linear filters, spectral analysis), vision geometry (projective geometry, camera models and calibration, stereo reconstruction), radiometry (color, shading, illumination, BRDF), and visual content synthesis (graphics pipeline, texture- bump-, mip-mapping, hidden surface removal, anti-aliasing).

**COMPSCI 211B. Computer Graphics and Visualization. 4 Units.**

Interactive 3D graphics rendering pipeline, illumination and shading, ray tracing, texture-, bump-, mip-mapping, hidden surface removal, anti-aliasing, multiresolution representations, volume rendering techniques, iso-surface extraction.

Prerequisite: COMPSCI 211A

**COMPSCI 211P. Visual Computing . 4 Units.**

Develops a comprehensive understanding of fundamentals of image processing (convolution, linear filters, spectral analysis), vision geometry (projective geometry, camera models and calibration, stereo reconstruction), radiometry (color, shading, illumination, BRDF), visual content synthesis (graphics pipeline, texture- bump-, mip-mapping, hidden surface, anti-aliasing).

Prerequisite: Undergraduate-level familiarity with Linear algebra (matrices and operations), eigenvalue, eigenvectors, linear regression; basic of algorithms; programming in C/C++

Restriction: Graduate students only.

**COMPSCI 212. Multimedia Systems and Applications. 4 Units.**

Organization and structure of modern multimedia systems; audio and video encoding/compression; quality of service concepts; scheduling algorithms for multimedia; resource management in distributed and multimedia systems; multimedia protocols over high-speed networks; synchronization schemes; multimedia applications; and teleservices.

Prerequisite: COMPSCI 143A and COMPSCI 161. B.S. degree in Computer Science is also accepted. Recommended: COMPSCI 131 and COMPSCI 132 and COMPSCI 133.

**COMPSCI 213. Introduction to Visual Perception. 4 Units.**

Introduction to the process of human visual perception. Offers the physiological and psychophysical approach to understand vision, introducing concepts of perception of color, depth, movement. Examples of quantification and application of these models in computer vision, computer graphics, multimedia, HCI.

Prerequisite: MATH 121A

**COMPSCI 216. Image Understanding. 4 Units.**

The goal of image understanding is to extract useful semantic information from image data. Course covers low-level image and video processing techniques, feature descriptors, segmentation, objection recognition, and tracking.

Prerequisite: I&C SCI 6D and (I&C SCI 6N or MATH 6G or MATH 3A) and MATH 2B and I&C SCI 46

**COMPSCI 217. Light and Geometry in Computer Vision. 4 Units.**

Examines the issues of light transport and multiview geometry in computer vision. Applications include camera calibration, 3D understanding, stereo reconstruction, and illumination estimation.

Prerequisite: I&C SCI 6D and (I&C SCI 6N or MATH 6G or MATH 3A) and MATH 2B and I&C SCI 46 and COMPSCI 211A

**COMPSCI 221. Information Retrieval, Filtering, and Classification. 4 Units.**

Algorithms for the storage, retrieval, filtering, and classification of textual and multimedia data. The vector space model, Boolean and probabilistic queries, and relevance feedback. Latent semantic indexing; collaborative filtering; and relationship to machine learning methods.

Prerequisite: COMPSCI 161 and COMPSCI 171 and (I&C SCI 6N or MATH 3A or MATH 6G)

Same as SWE 225.

Restriction: Graduate students only.

**COMPSCI 222. Principles of Data Management. 4 Units.**

Covers fundamental principles underlying data management systems. Content includes key techniques including storage management, buffer management, record-oriented file system, access methods, query optimization, and query processing.

Prerequisite: COMPSCI 122A and (I&C SCI 53 or COMPSCI 143A)

Concurrent with COMPSCI 122C.

**COMPSCI 222P. Principles of Data Management. 4 Units.**

Covers fundamental principles underlying data management systems. Understanding and implementation of key techniques including storage management, buffer management, record-oriented file system, access methods, query optimization, and query processing.

Prerequisite: C++ programming skills, understanding of Data Structures and Algorithms

Restriction: Graduate students only.

**COMPSCI 223. Transaction Processing and Distributed Data Management. 4 Units.**

Covers fundamental principles underlying transaction processing including database consistency, concurrency control, database recovery, and fault-tolerance. Includes transaction processing in centralized, distributed, parallel, and client-server environments.

Prerequisite: COMPSCI 222 and COMPSCI 131

**COMPSCI 225. Next Generation Search Systems. 4 Units.**

Discusses concepts and techniques related to all aspects of search systems. After considering basic search technology and the state-of-art systems, rapidly developing techniques for multimedia search, local search, event-search, and video-on-demand are explored.

Prerequisite: I&C SCI 21 or CSE 21 or IN4MATX 41 or I&C SCI 31 or CSE 41

Restriction: Upper-division students only. Graduate students only.

Concurrent with COMPSCI 125.

**COMPSCI 230. Distributed Computer Systems. 4 Units.**

Principles of distributed computing systems. Topics covered include message-passing, remote procedure calls, distributed shared memory synchronization, resource and process/thread management, distributed file systems, naming and security.

**COMPSCI 230P. Distributed Computer Systems . 4 Units.**

Principles of distributed computing systems. Topics covered include message-passing, remote procedure calls, distributed shared memory synchronization, resource and process/thread management, distributed file systems, naming and security.

Restriction: Graduate students only.

**COMPSCI 231P. Parallel and Distributed Computing for Professionals . 4 Units.**

Covers a wide variety of concepts related to the design and application of high-performance concurrent computing systems, including architectural features, communications networks and models, parallel program development for numerical and non-numerical applications, programming models, and more.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 232. Computer and Communication Networks. 4 Units.**

Network architecture of the Internet, telephone networks, cable networks, and cell phone networks. Network performance models. Network performance models. Advanced concepts and implementations of flow and congestion control, addressing, internetworking, forwarding, routing, multiple access, streaming, and quality-of-service.

Prerequisite: EECS 148 or COMPSCI 132

Same as EECS 248A, NET SYS 201.

Restriction: Graduate students only.

**COMPSCI 232P. Computer and Communication Networks . 4 Units.**

Internet architecture, protocols, and services. Advanced concepts of IP and TCP, including addressing, internetworking, forwarding, routing, and implementations of flow and congestion control. Internet services such as Network Address Translation and Domain Name Servers. Overview of Local Area Networks.

Restriction: Graduate students only.

**COMPSCI 233. Networking Laboratory. 4 Units.**

A laboratory-based introduction to basic networking concepts such as addressing, sub-netting, bridging, ARP, and routing. Network simulation and design. Structured around weekly readings and laboratory assignments.

Prerequisite: EECS 148 or COMPSCI 132

Same as NET SYS 202.

**COMPSCI 234. Advanced Networks. 4 Units.**

Design principles of networked systems, advanced routing and congestion control algorithms, network algorithms, network measurement, management, security, Internet economics, and emerging networks.

Prerequisite: NET SYS 201 or COMPSCI 232 or EECS 248A

Same as NET SYS 210.

**COMPSCI 236. Wireless and Mobile Networking. 4 Units.**

Introduction to wireless networking. The focus is on layers 2 and 3 of the OSI reference model, design, performance analysis, and protocols. Topics covered include: an introduction to wireless networking, digital cellular, next generation cellular, wireless LANs, and mobile IP.

Prerequisite: EECS 148 or COMPSCI 132

Same as NET SYS 230.

**COMPSCI 237. Middleware for Networked and Distributed Systems. 4 Units.**

Discusses concepts, techniques, and issues in developing distributed systems middleware that provides high performance and Quality of Service for emerging applications. Also covers existing standards (e.g., CORBA, DCOM, Jini, Espeak) and their relative advantages and shortcomings.

Prerequisite: An undergraduate-level course in operating systems and networks.

Same as NET SYS 260.

**COMPSCI 238. Advanced Operating Systems. 4 Units.**

Focuses on advanced and graduate-level topics in operating systems. Presents important recent developments in operating systems, topics not covered in undergraduate operating systems courses. This includes novel operating system designs and techniques to improve existing ones.

Prerequisite: COMPSCI 143A

**COMPSCI 238P. Operating Systems. 4 Units.**

In-depth organization of the core operating system abstraction and its implementation (virtual memory, kernel and user mode, system calls, threads, context switches, interrupts, inter-process communication, hardware interface, etc.) and a range of recent developments in de-facto industry standard operating systems.

Prerequisite: Working knowledge of C and the Linux environment.

Restriction: School of Info & Computer Sci students only. Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 241. Advanced Compiler Construction. 4 Units.**

Advanced study of programming language implementation techniques: optimizations such as common sub-expression elimination, register allocation, and instruction scheduling. Implementation of language features such as type-directed dispatch, garbage collection, dynamic linking, and just-in-time code generation.

Prerequisite: COMPSCI 142A

**COMPSCI 242. Parallel Computing. 4 Units.**

Definition of parallel processing systems. Theory and application of arrays, trees, and hypercubes. Computational models, applications: sorting, integer arithmetic, matrix operations, Fast Fourier Transform, and others. Interconnection networks: a framework for the description, analysis, and construction of hypercube-derived networks.

**COMPSCI 242P. Compilers and Interpreters. 4 Units.**

Provides in-depth study of compilers and interpreters which are the primary forms of programming language processing in computing.

Prerequisite: Knowledge of C++ programming is required.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 243. High-Performance Architectures and Their Compilers. 4 Units.**

Emphasis on the development of automatic tools (i.e., compilers/environments) for the efficient exploitation of parallel machines, and the trade-offs between hardware and software in the design of supercomputing and high-performance machines.

**COMPSCI 244. Introduction to Embedded and Ubiquitous Systems. 4 Units.**

Embedded and ubiquitous system technologies including processors, DSP, memory, and software. System interfacing basics; communication strategies; sensors and actuators, mobile and wireless technology. Using pre-designed hardware and software components. Design case studies in wireless, multimedia, and/or networking domains.

Prerequisite: I&C SCI 51 and COMPSCI 152 and COMPSCI 161 and (I&C SCI 6N or MATH 3A or MATH 6G or I&C SCI 6D). B.S. degree in Computer Science is also accepted.

Same as IN4MATX 244.

**COMPSCI 244P. Introduction to the Internet of Things. 4 Units.**

Develops a comprehensive understanding of the hardware and software technology, the communication protocols, and the security and privacy requirements underlying the Internet of Things ecosystem, particularly those using computing elements (processors, DSPs/ ASIPs), sensors, and accessing cloud services.

Prerequisite: Undergraduate-level familiarity with fundamentals of integrated circuit blocks, processors, optimization/algorithm design, and some programming experience.

Restriction: Graduate students only.

**COMPSCI 245. Software for Embedded Systems. 4 Units.**

Embedded computing elements, device interfaces, time-critical IO handling. Embedded software design under size, performance, and reliability constraints. Software timing and functional validation. Programming methods and compilation for embeddable software. Embedded runtime systems. Case studies of real-time software systems.

Prerequisite: I&C SCI 51 and COMPSCI 152 and COMPSCI 161 and (I&C SCI 6N or MATH 3A or MATH 6G or I&C SCI 6D). B.S. degree in Computer Science is also accepted.

**COMPSCI 246. Dependability, Validation, and Testing of Embedded Systems. 4 Units.**

Embedded system building blocks, including IP cores. Dependability and Resilience. Co-simulation. Formal verification using model checking. Verification environments. Test challenges in core integration: compliance, feature, random, and collision testing. Core access and test integration. Interface-based verification and standards.

Prerequisite: B.S. degree in Computer Science or basic courses in algorithms and data structures, calculus, discrete math, linear algebra, symbolic logic.

**COMPSCI 247. Complex Software Systems: Project Course. 4 Units.**

Building complex systems software systems, such as Database Management Systems, Operating Systems, and Optimizing Compilers. Such systems often involve low-level programming and intricate performance optimizations. Students learn how to build such a system.

Prerequisite or corequisite: COMPSCI 222 or COMPSCI 238 or COMPSCI 241

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**COMPSCI 248A. Introduction to Ubiquitous Computing. 4 Units.**

The 'disappearing computer' paradigm. Differences to the desktop computing model: applications, interaction in augmented environments, security, alternate media, small operating systems, sensors, and embedded systems design. Evaluation by project work and class participation.

Same as IN4MATX 241.

**COMPSCI 250A. Computer Systems Architecture. 4 Units.**

Study of architectural issues and their relation to technology and software: design of processor, interconnections, and memory hierarchies.

Prerequisite: COMPSCI 152

**COMPSCI 250B. Modern Computer Systems. 4 Units.**

Fundamental concepts and recent advances in computer systems architecture necessary to achieve high performance and efficiency on systems available today. Topics span modern processor features, accelerators, storage and network architectures, as well as architecture-optimized software.

Prerequisite: Required: Undergraduate-level understanding of computer architecture concepts.

Overlaps with COMPSCI 243.

**COMPSCI 250P. Computer Systems Architecture . 4 Units.**

Study of architectural issues and their relation to technology and software: design of processor, interconnections, and memory hierarchies.

Prerequisite: Undergraduate-level familiarity with fundamentals of integrated circuit blocks, processors, and optimization/algorithm design, and some programming experience.

Restriction: Graduate students only.

**COMPSCI 252. Introduction to Computer Design. 4 Units.**

The methodology and use of CAD tools for computer design, accomplished by a lab in which students practice design using commercially available silicon compilers and other tools.

Prerequisite: COMPSCI 151 and COMPSCI 152

**COMPSCI 253. Analysis of Programming Languages. 4 Units.**

Concepts in modern programming languages, their interaction, and the relationship between programming languages and methods for large-scale, extensible software development. Empirical analysis of programming language usage.

Same as SWE 212.

**COMPSCI 253P. Advanced Programming and Problem Solving. 4 Units.**

Provides in-depth preparation for industry interviews requiring demonstration of problem solving and programming skills. Emphasis is on understanding problem statements, considering edge cases, developing effective test cases, designing correct solutions, explaining these clearly, and implementing a solution correctly.

Corequisite: COMPSCI 260P

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 259S. Seminar in Design Science. 2 Units.**

Current research and research trends in design science. Forum for presentation and criticism by students of research work in progress.

Repeatability: May be taken for credit 18 times.

**COMPSCI 260. Fundamentals of the Design and Analysis of Algorithms. 4 Units.**

Covers fundamental concepts in the design and analysis of algorithms and is geared toward non-specialists in theoretical computer science. Topics include: deterministic and randomized graph algorithms, fundamental algorithmic techniques like divide-and-conquer strategies and dynamic programming, and NP-completeness.

Prerequisite: COMPSCI 161

**COMPSCI 260P. Fundamentals of Algorithms with Applications. 4 Units.**

Covers fundamental concepts in the design and analysis of algorithms and is geared toward practical application and implementation. Topics include greedy algorithms, deterministic and randomized graph algorithms, models of network flow, fundamental algorithmic techniques, and NP-completeness.

Restriction: Graduate students only.

**COMPSCI 261. Data Structures. 4 Units.**

An in-depth treatment of data structures and their associated management algorithms including resource complexity analysis.

Prerequisite: I&C SCI 46 and COMPSCI 161

**COMPSCI 261P. Data Structures with Applications . 4 Units.**

Data structures and their associated management algorithms, including their applications and analysis.

Restriction: Graduate students only.

**COMPSCI 262. Computational Complexity. 4 Units.**

Advanced course in computational models and complexity classes. Covers the fundamentals of Turing Machines, Decidability, and NP-completeness. Includes discussion of more advanced topics including polynomial hierarchy, randomized complexity classes, #P-completeness and hardness of approximation.

Prerequisite: COMPSCI 162

**COMPSCI 262P. Text Processing and Pattern Matching. 4 Units.**

Techniques for pattern matching and parsing character strings. Topics include substring searching, finite state machines, regular expressions, and context-free grammars, as well as applications in lexical analyzers, compilers, word processors, malware detectors, and search engines.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 263. Analysis of Algorithms. 4 Units.**

Analysis of correctness and complexity of various efficient algorithms; discussion of problems for which no efficient solutions are known.

Prerequisite: COMPSCI 161 and COMPSCI 261

**COMPSCI 264. Quantum Computation and Information. 4 Units.**

Basic models for quantum computation and their foundations in quantum mechanics. Quantum complexity classes and quantum algorithms, including algorithms for factoring and quantum simulation. Introduction to quantum information theory and quantum entanglement.

Prerequisite: Basic courses in linear algebra and algorithms.

**COMPSCI 265. Graph Algorithms. 4 Units.**

Graph definitions, representation methods, graph problems, algorithms, approximation methods, and applications.

Prerequisite: COMPSCI 161 and COMPSCI 261

Concurrent with COMPSCI 163.

**COMPSCI 266. Computational Geometry. 4 Units.**

An overview of some of the basic problems in computational geometry and of some algorithmic and data-structuring techniques appropriate to their solution.

Prerequisite: COMPSCI 161 and COMPSCI 261



**COMPSCI 267P. Data Compression. 4 Units.**

An introduction to the theory and practice of modern data compression techniques. Topics include codes, coding, modeling, text compression, lossless and lossy image compression standards and systems, audio compression.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 268. Introduction to Optimization. 4 Units.**

A broad introduction to optimization. Unconstrained and constrained optimization. Equality and inequality constraints. Linear and integer programming. Stochastic dynamic programming.

Prerequisite: STATS 67 or (STATS 7 and STATS 120A) and (I&C SCI 6N or MATH 3A)

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

Concurrent with COMPSCI 169.

**COMPSCI 268P. Introduction to Optimization Modeling . 4 Units.**

A broad introduction to optimization methods and their applications. Unconstrained and constrained optimization. Direct, first, and second order methods. Use of optimization software libraries. Equality and inequality constraints, optimal conditions, and methods. Applications to modeling in computer science, engineering.

Restriction: Graduate students only.

**COMPSCI 269S. Seminar in the Theory of Algorithms and Data Structures. 2 Units.**

Current research and research trends in the Theory of algorithms and data structures.

Repeatability: May be taken for credit 18 times.

**COMPSCI 271. Introduction to Artificial Intelligence. 4 Units.**

The study of theories and computational models for systems which behave and act in an intelligent manner. Fundamental subdisciplines of artificial intelligence including knowledge representation, search, deduction, planning, probabilistic reasoning, natural language parsing and comprehension, knowledge-based systems, and learning.

**COMPSCI 271P. Introduction to Artificial Intelligence. 4 Units.**

The study of theories and computational models for systems which behave and act in an intelligent manner. Fundamental sub-disciplines of artificial intelligence, including knowledge representation, search, deduction, planning, probabilistic reasoning, natural language parsing and comprehension, knowledge-based systems, and learning.

Restriction: Graduate students only.

**COMPSCI 272. Statistical Natural Language Processing. 4 Units.**

Statistical models, machine learning algorithms, and computational tasks involved in natural language processing. Focuses on approaches that learn these models from data, and covers applications such as information extraction, dialog systems, machine translation, and question answering.

Prerequisite: COMPSCI 171 and COMPSCI 178

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Graduate students only.

**COMPSCI 273A. Machine Learning. 4 Units.**

Computational approaches to learning algorithms for classifications, regression, and clustering. Emphasis is on discriminative classification methods such as decision trees, rules, nearest neighbor, linear models, and naive Bayes.

Prerequisite: COMPSCI 271 and COMPSCI 206

**COMPSCI 273P. Machine Learning and Data Mining . 4 Units.**

Introduction to principles of machine learning and data-mining. Learning algorithms for classifications, regression, and clustering. Emphasis is on discriminative classification methods such as decision trees, rules, nearest neighbor, linear models, and naive Bayes.

Prerequisite: Python programming knowledge is required.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 274A. Probabilistic Learning: Theory and Algorithms. 4 Units.**

An introduction to probabilistic and statistical techniques for learning from data, including parameter estimation, density estimation, regression, classification, and mixture modeling.

Prerequisite: COMPSCI 206



**COMPSCI 274B. Learning in Graphical Models. 4 Units.**

Models for data analysis are presented in the unifying framework of graphical models. The emphasis is on learning from data but inference is also covered. Real world examples are used to illustrate the material.

Prerequisite: COMPSCI 274A

**COMPSCI 274C. Neural Networks and Deep Learning. 4 Units.**

Neural network and deep learning from multiple perspectives. Theory of parallel distributed processing systems, algorithmic approaches for learning from data in various manners, applications to difficult problems in AI from computer vision, to natural language understanding, to bioinformatics and chemoinformatics.

Prerequisite: (STATS 120A and STATS 120B) or MATH 121A or COMPSCI 178 or COMPSCI 273A

Overlaps with COMPSCI 274A, COMPSCI 277, COMPSCI 276, COMPSCI 278, COMPSCI 274B, COMPSCI 273A.

Concurrent with COMPSCI 172B.

**COMPSCI 274D. Artificial Intelligence Frontiers: Technical, Ethical, and Societal. 4 Units.**

Explores the frontiers of artificial intelligence and related technologies with a focus on the underlying ethical, legal, and societal challenges and opportunities they create. Encourages critical thinking about these issues.

Prerequisite: Recommended: COMPSCI 172B and COMPSCI 178.

Restriction: Graduate students only.

Concurrent with COMPSCI 172C.

**COMPSCI 274E. Deep Generative Models. 4 Units.**

Discusses probabilistic approaches to deep learning such as generative models and their applications in computer vision, NLP, the natural sciences, and other fields. Coursework may include both homework and project components.

Prerequisite: COMPSCI 178 or COMPSCI 273A or STATS 120B. Recommended: Advanced machine learning or graphical models courses such as COMPSCI 274A or COMPSCI 274B or CS 273C or COMPSCI 276.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Graduate students only.

**COMPSCI 274P. Neural Networks and Deep Learning. 4 Units.**

Introduction to principles of machine learning and neural networks. Architecture design. Feedforward and recurrent networks. Learning models and algorithms. Applications to data analysis and prediction problems in areas such as machine vision, natural language processing, biomed, and finance.

Prerequisite: COMPSCI 271P. COMPSCI 271P with a grade of B or better. Knowledge of Python programming is required.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 276. Reasoning in Probabilistic Graphical Models. 4 Units.**

Focuses on algorithms for probabilistic reasoning using graphical models such as Bayesian Networks and Markov Networks that encode knowledge as local probabilistic relations. Tasks include finding most likely scenarios over a subset of variables, or updating posterior probability, given observations.

Prerequisite: A basic course in probability.

**COMPSCI 278. Probability Models. 4 Units.**

Advanced probability, discrete time Markov chains, Poisson processes, continuous time Markov chains. Queuing or simulation as time permits.

Prerequisite: STATS 120A

Concurrent with STATS 121.

**COMPSCI 284A. Artificial Intelligence in Biology and Medicine. 4 Units.**

Introduction to computational methods in molecular biology, aimed at those interested in learning about this interdisciplinary area. Covers computational approaches to understanding and predicting the structure, function, interactions, and evolution of DNA, RNA, proteins, and related molecules and processes.

Prerequisite: A Basic course in algorithms or a basic course in molecular biology.

Concurrent with COMPSCI 184A.

**COMPSCI 284C. Computational Systems Biology. 4 Units.**

Computational inference and modeling of gene regulation networks, signal transduction pathways, and the effects of regulatory networks in cellular processes, development, and disease. Introduction of required mathematical, computational, and data handling tools.

Prerequisite: COMPSCI 284A or (BIO SCI 99 and MATH 2D)

Concurrent with COMPSCI 184C.

**COMPSCI 285. Mathematical and Computational Biology . 4 Units.**

Analytical and numerical methods for dynamical systems, temporal-spatial dynamics, steady state, stability, stochasticity. Application to life sciences: genetics, tissue growth and patterning, cancers, ion channels gating, signaling networks, morphogen gradients. Probabilistic methods.

Prerequisite: MATH 227A

Same as MATH 227C.

**COMPSCI 290. Research Seminar. 2 Units.**

Forum for presentation and criticism by students of research work in progress. Presentation of problem areas and related work. Specific goals and progress of research.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**COMPSCI 294P. Keystone Professional Writing and Communication for Computer Science Careers. 4 Units.**

Well-developed written and oral communication skills relevant to computer science professionals including oral presentations, short descriptive writing assignments, and one longer writing assignment related to a research replication project.

Restriction: Graduate students only.

**COMPSCI 295. Special Topics in Information and Computer Science . 4 Units.**

Studies in selected areas of Information and Computer Science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**COMPSCI 295P. Keystone Project for Computer Science. 4 Units.**

Design and development of a software system or a hardware component of a system based on knowledge of advanced computer science principles. Students implement at least a working prototype and test this using relevant input data.

Restriction: Graduate students only.

**COMPSCI 296. Elements of Scientific Writing. 4 Units.**

Introduces the concepts and principles of good scientific writing, demonstrates them by examples drawn from the literature, and uses a hands-on approach to apply them to documents being written by the participants.

Grading Option: Satisfactory/unsatisfactory only.

**COMPSCI 296P. Capstone Professional Writing and Communication for Computer Science Careers . 4 Units.**

Written and oral communication for computer science and IT careers. Production of the detailed design and development document for the concurrent capstone design class and refinement of written documents and oral communications skills needed for a successful job search.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 297P. Capstone Design Project for Computer Science . 4 Units.**

Design and development of app, software system, or hardware component of system based on students' prior knowledge of advanced computer science principles. Implement at least a working prototype and test this using relevant use cases and/or input data.

Restriction: Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 298. Thesis Supervision. 2-12 Units.**

Individual research or investigation conducted in preparation for the M.S. thesis option or the dissertation requirements for the Ph.D. program.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Information and Computer Science majors only.

**COMPSCI 298P. Computer Science Practicum. 1-4 Units.**

Internship in which students work individually at an outside organization to gain experience with the challenges involved in technology-related work.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: School of Info & Computer Sci students only. Master of Computer Science Degree students only. Graduate students only.

**COMPSCI 299. Individual Study. 1-12 Units.**

Individual research or investigation with Computer Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Information and Computer Science majors only.

**COMPSCI 299P. Individual Study. 4-8 Units.**

Supervised individual study in computer science.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 4 times.

Restriction: Master of Computer Science Degree students have first consideration for enrollment. Graduate students only.

## Bioinformatics, Minor

The minor provides a focused study of bioinformatics to supplement a student's major program of study and prepares students for a profession, career, or academic pursuit in which biomedical computing is an integral part but is not the primary focus. The Bioinformatics minor contributes to students' competence in computing applied to biomedical problems and data, as well as exposing them to the fundamentals of the life sciences from a computer science perspective. The minor allows students sufficient flexibility to pursue courses that complement their major field or address specific interests.

Students who complete the minor requirements will be able to do the following: synthesize computer science, quantitative methods, and biological science; understand the synergistic set of reciprocal influences between life and computational sciences and technologies; discuss biomedical computing problems and corresponding computer science perspectives; and employ principles, methods, and technologies fundamental to biomedical computing.

A. Complete all of the following:

I&C SCI 31	Introduction to Programming
I&C SCI 32	Programming with Software Libraries
I&C SCI 33	Intermediate Programming
BIO SCI 93	From DNA to Organisms
COMPSCI 184A	Artificial Intelligence in Biology and Medicine
BIO SCI M123/COMPSCI 183	Introduction to Computational Biology
COMPSCI 184C	Computational Systems Biology

NOTE: A maximum of two courses may be taken Pass/Not Pass toward a minor. Bren School majors should refer to the Majors/Minors Restrictions *Catalogue* section before attempting to minor in Bioinformatics. Students who are considering a major in Computer Science or Computer Science and Engineering must complete the major requirements for a letter grade. Visit the ICS Student Affairs Office website for Majors and Minors restrictions ([http://www.ics.uci.edu/ugrad/degrees/MajorMinor\\_Restrictions\\_Chart.pdf](http://www.ics.uci.edu/ugrad/degrees/MajorMinor_Restrictions_Chart.pdf))

## Computer Science, B.S.

The Computer Science major emphasizes the principles of computing that underlie our modern world, and provides a strong foundational education to prepare students for the broad spectrum of careers in computing. This major can serve as preparation for either graduate study or a career in industry. Students receive a solid background in low-level architecture and systems; middle-level infrastructure, algorithms, and mathematical foundations. This

is a highly flexible degree that allows students to explore a broad range of topics in modern computing. In order to achieve some focus in their upper-division studies, students are required to satisfy the requirements for one of the nine specializations described below.

**Algorithms.** This specialization focuses on fundamental computational techniques, including their analysis and applications to topics in computer vision, computer games, graphics, artificial intelligence, and information retrieval. Topics include data structures, graph and network algorithms, computational geometry, probabilistic algorithms, complexity theory, and cryptography.

**Architecture and Embedded Systems.** This specialization integrates principles of embedded systems, software, hardware, computer architecture, distributed systems and networks, and prepares students to design and create efficient hardware/software architectures for emerging application areas. Students in this specialization will build upon a strong foundation in software and hardware and learn how to design networked embedded systems, and efficient computer architectures for a diverse set of application domains such as gaming, visualization, search, databases, transaction processing, data mining, and high-performance and scientific computing.

**Bioinformatics.** This specialization introduces students to the interdisciplinary intersection of biology and medicine with computer science and information technology. Students who complete the specialization will understand biomedical computing problems from the computer science perspectives, and be able to design and develop software that solves computational problems in biology and medicine.

**General Computer Science.** This specialization allows students to acquire a well-rounded knowledge of computer science that may be tailored to their individual interests. Students choose 11 upper-division computer science courses, including two project courses. This specialization will appeal to those who are interested in a broad education in computer science, or who wish to create their own unique specialization not found in the current list of (other) specializations under this major.

**Information.** This specialization is intended to prepare students for working with and developing a wide variety of modern data and information systems. Topics covered by this concentration include database management, information retrieval, Web search, data mining, and data-intensive computing.

**Intelligent Systems.** This specialization will introduce students to the principles underlying intelligent systems, including topics such as representing human knowledge, building automated reasoning systems, developing intelligent search techniques, and designing algorithms that adapt and learn from data. Students in this specialization will use these principles to solve problems across a variety of applications such as computer vision, information retrieval, data mining, automated recommender systems, bioinformatics, as well as individually designed projects.

**Networked Systems.** This specialization focuses on Internet architecture, Internet applications, and network security. It also encourages students to learn about operating systems, databases, search, programming, embedded systems, and performance.

**Systems and Software.** This specialization deals with principles and design of systems and software. It emphasizes the interaction between software and the computing infrastructure on which it runs and the performance impact of design decisions. Core topics include the hardware/software interface, languages and compilers, operating systems, parallel and distributed computing. Elective topics include networking, security, graphics, and databases.

**Visual Computing.** This specialization encompasses the digital capture, processing, synthesis and display of visual data such as images and video. This specialization includes computer vision, image processing, and graphics, and covers such topics as the representation of 3D objects, visual recognition of objects and people, interactive and photo-realistic image rendering, and physics and perception of light and color.

The Department also offers a joint undergraduate degree in Computer Science and Engineering, in conjunction with The Henry Samueli School of Engineering; information is available in the Interdisciplinary Studies section of the *Catalogue*.

**Freshman Applicants:** See the Undergraduate Admissions section.

#### Transfer Applicants:

Transfer applicants who satisfactorily complete course prerequisites will be given preference for admission. All applicants must complete the following required courses: one year of approved calculus, one year of object-oriented programming (python, java, C++), additional courses as specified by the major, and completion of lower-division writing. Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Visit the *UCI Office of Admissions website* for information on transfer requirements for our major.

### Major and Minor Restrictions

Bren School of ICS majors (including shared majors, BIM and CSE) pursuing minors within the Bren School of ICS may not count more than five courses toward both the major and minor. Some ICS majors and minors outside of the School are not permitted due to significant overlap. Visit the ICS Student Affairs Office website for Majors and Minors restrictions. ([http://www.ics.uci.edu/ugrad/degrees/MajorMinor\\_Restrictions\\_Chart.pdf](http://www.ics.uci.edu/ugrad/degrees/MajorMinor_Restrictions_Chart.pdf)) All students should check the Double Major Restrictions Chart ([https://www.ics.uci.edu/ugrad/degrees/Dbl\\_Major\\_Restrictions\\_Chart.pdf](https://www.ics.uci.edu/ugrad/degrees/Dbl_Major_Restrictions_Chart.pdf)) and view our information page ([http://www.ics.uci.edu/ugrad/degrees/Double\\_Majors.php](http://www.ics.uci.edu/ugrad/degrees/Double_Majors.php)) on double majoring to see what degree programs are eligible for double majoring.

## Requirements for the B.S. in Computer Science

All students must meet the University Requirements.

### Major Requirements

#### Lower-division

A. Select one of the following series:

I&C SCI 31- 32- 33	Introduction to Programming and Programming with Software Libraries and Intermediate Programming
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or

I&C SCI 32A- 33	Python Programming and Libraries (Accelerated) and Intermediate Programming
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B. Complete:

I&C SCI 45C	Programming in C/C++ as a Second Language
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I&C SCI 46	Data Structure Implementation and Analysis
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I&C SCI 51	Introductory Computer Organization
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I&C SCI 53	Principles in System Design
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I&C SCI 53L	Principles in System Design Library
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IN4MATX 43	Introduction to Software Engineering
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MATH 2A- 2B	Single-Variable Calculus and Single-Variable Calculus
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I&C SCI 6B	Boolean Logic and Discrete Structures
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I&C SCI 6D	Discrete Mathematics for Computer Science
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I&C SCI 6N or MATH 3A	Computational Linear Algebra Introduction to Linear Algebra
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STATS 67	Introduction to Probability and Statistics for Computer Science
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C. Two courses approved for General Education category II except those offered by CSE, Economics, Engineering, ICS, or Mathematics. University Studies courses can be used with the approval of the CS Vice Chair for Undergraduate Studies.

#### Upper-division

A. Core

COMPSCI 161	Design and Analysis of Algorithms
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I&C SCI 139W	Critical Writing on Information Technology
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B. Upper-division electives: Select 11 upper-division courses from the list below. Sections B-1 and B-2 must be completed as part of the 11 upper-division electives.

COMPSCI 103–160, 162-189

IN4MATX 102	Concepts of Programming Language II
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IN4MATX 113	Requirements Analysis and Engineering
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IN4MATX 115	Software Testing, Analysis, and Quality Assurance
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IN4MATX 117	Project in Software System Design
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IN4MATX 121	Software Design: Applications
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IN4MATX 122	Software Design: Structure and Implementation
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IN4MATX 124	Internet Applications Engineering
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IN4MATX 131	Human Computer Interaction
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IN4MATX 133	User Interaction Software
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IN4MATX 134	Project in User Interaction Software
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I&C SCI 161	Game Engine Lab
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I&C SCI 162	Modeling and World Building
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B-1. Project Courses: Choose at least two projects courses from the following list:

COMPSCI 113	Computer Game Development
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COMPSCI 114	Projects in Advanced 3D Computer Graphics
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COMPSCI 117	Project in Computer Vision
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COMPSCI 122B	Project in Databases and Web Applications
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COMPSCI 122C	Principles of Data Management
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COMPSCI 122D	Beyond SQL Data Management
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COMPSCI 125	Next Generation Search Systems
COMPSCI 133	Advanced Computer Networks
COMPSCI 142B	Language Processor Construction
COMPSCI 143B	Project in Operating System Organization
COMPSCI 145- 145L	Embedded Software and Embedded Software Laboratory
COMPSCI 147	Internet of Things (IoT) Software and Systems
COMPSCI 153	Logic Design Laboratory
COMPSCI 154	Computer Design Laboratory
COMPSCI 165	Project In Algorithms And Data Structures
COMPSCI 175	Project in Artificial Intelligence
IN4MATX 117	Project in Software System Design
IN4MATX 134	Project in User Interaction Software

B-2. Specialization: Select and satisfy the requirements for one of the specializations below. (Note: Students may not pursue more than one specialization.)

Some of the specializations include recommended electives. These are courses related to the specialization and intended to help students choose courses to take toward their upper-division elective requirement.

**Algorithms: Four courses from the following list:**

COMPSCI 162	Formal Languages and Automata
COMPSCI 163	Graph Algorithms
COMPSCI 164	Computational Geometry and Geometric Modeling
COMPSCI 165	Project In Algorithms And Data Structures
COMPSCI 166	Quantum Computation and Information
COMPSCI 167	Introduction to Applied Cryptography
COMPSCI 169	Introduction to Optimization

**Architecture and Embedded Systems: four courses from the following list:**

COMPSCI 145- 145L	Embedded Software and Embedded Software Laboratory
COMPSCI 147	Internet of Things (IoT) Software and Systems
COMPSCI 151	Digital Logic Design
COMPSCI 152	Computer Systems Architecture
COMPSCI 153	Logic Design Laboratory
COMPSCI 154	Computer Design Laboratory

**Bioinformatics: three courses from the following list:**

COMPSCI 184A	Artificial Intelligence in Biology and Medicine
and complete:	
COMPSCI 172B	Neural Networks and Deep Learning
COMPSCI 172C	Artificial Intelligence Frontiers: Technical, Ethical, and Societal
COMPSCI 184C	Computational Systems Biology

**General CS track**

COMPSCI 103-189, except COMPSCI 161

**Information**

COMPSCI 121	Information Retrieval
COMPSCI 122A	Introduction to Data Management
COMPSCI 178	Machine Learning and Data-Mining

and four courses from:

I&C SCI 45J	Programming in Java as a Second Language
COMPSCI 122B	Project in Databases and Web Applications
COMPSCI 122C	Principles of Data Management
COMPSCI 122D	Beyond SQL Data Management
COMPSCI 125	Next Generation Search Systems
COMPSCI 132	Computer Networks
COMPSCI 134	Computer and Network Security

COMPSCI 141	Concepts in Programming Languages I
COMPSCI 142A	Compilers and Interpreters
COMPSCI 143A	Principles of Operating Systems
COMPSCI 163	Graph Algorithms
COMPSCI 165	Project In Algorithms And Data Structures
COMPSCI 167	Introduction to Applied Cryptography
COMPSCI 179	Algorithms for Probabilistic and Deterministic Graphical Models
at least one of which must be:	
COMPSCI 122B	Project in Databases and Web Applications
COMPSCI 122C	Principles of Data Management
COMPSCI 122D	Beyond SQL Data Management
COMPSCI 125	Next Generation Search Systems
COMPSCI 179	Algorithms for Probabilistic and Deterministic Graphical Models
<b>Intelligent Systems</b>	
COMPSCI 171	Introduction to Artificial Intelligence
COMPSCI 175	Project in Artificial Intelligence
COMPSCI 178	Machine Learning and Data-Mining
and at least three courses from:	
COMPSCI 116	Computational Photography and Vision
COMPSCI 121	Information Retrieval
COMPSCI 125	Next Generation Search Systems
COMPSCI 162	Formal Languages and Automata
COMPSCI 163	Graph Algorithms
COMPSCI 164	Computational Geometry and Geometric Modeling
COMPSCI 169	Introduction to Optimization
COMPSCI 177	Applications of Probability in Computer Science
COMPSCI 179	Algorithms for Probabilistic and Deterministic Graphical Models
<b>Networked Systems</b>	
COMPSCI 132	Computer Networks
COMPSCI 133	Advanced Computer Networks
COMPSCI 134	Computer and Network Security
COMPSCI 143A	Principles of Operating Systems
<b>Systems and Software: three courses from the following list:</b>	
COMPSCI 131	Parallel and Distributed Computing
COMPSCI 141	Concepts in Programming Languages I
COMPSCI 142A	Compilers and Interpreters
COMPSCI 142B	Language Processor Construction
COMPSCI 143A	Principles of Operating Systems
COMPSCI 143B	Project in Operating System Organization
<b>Visual Computing: four courses from the following list:</b>	
COMPSCI 111	Digital Image Processing
COMPSCI 112	Computer Graphics
COMPSCI 114	Projects in Advanced 3D Computer Graphics
COMPSCI 116	Computational Photography and Vision
COMPSCI 117	Project in Computer Vision
I&C SCI 162	Modeling and World Building

**Freshman**

Fall	Winter	Spring
I&C SCI 31	I&C SCI 32	I&C SCI 33
MATH 2A	MATH 2B	IN4MATX 43
WRITING 39A	WRITING 39B	I&C SCI 6B
	General Education III	WRITING 39C



Sophomore		
Fall	Winter	Spring
I&C SCI 51	I&C SCI 46	Computer Science Spec./Elective
I&C SCI 6D	I&C SCI 53	STATS 67
I&C SCI 45C	I&C SCI 53L	General Education III
	I&C SCI 6N	
Junior		
Fall	Winter	Spring
COMPSCI 161	Computer Science Spec./Elective	Computer Science Spec./Elective
Science Elective	Computer Science Spec./Elective	Computer Science Spec./Elective
General Education III	I&C SCI 139W	Science Elective
General Education VII	General Education VIII	General Education VI
Senior		
Fall	Winter	Spring
Computer Science Spec./Elective	Computer Science Spec./Elective	Computer Science Spec./Elective
Computer Science Spec./Elective	Computer Science Spec./Elective	Computer Science Spec./Elective
General Education IV	General Education IV	General Education IV

**NOTES:**

1. Students are advised that this sample program lists the minimum requirements; it is possible that students may have to take additional courses to prepare for required courses.
2. The lower-division writing requirement must be completed by the end of the seventh quarter at UCI.
3. This is only a sample plan. Course offerings may be moved due to unforeseen circumstances. It is strongly recommended that students meet with an academic advisor to create an academic plan tailored to meet their specific areas of interest.

## Computer Science, M.S.

Computer Science encompasses both theoretical and practical aspects of design, analysis, and implementation of computer systems, as well as applications of computing to numerous other fields. Core research areas include: (1) artificial intelligence and machine learning, (2) bioinformatics, (3) computer architecture, (4) embedded systems, (5) graphics and computer vision, (6) database systems and information management, (7) multimedia and gaming, (8) networks and distributed systems, (9) programming languages and compilers, (10) security, privacy, and cryptography, (11) design and analysis of algorithms, and (12) scientific computing.

The M.S. degree in Computer Science (CS) is a broad and flexible program, offering students opportunities for in-depth graduate study and cutting-edge research, covering a broad range of topics in Computer Science.

The course requirements for the M.S. are identical to those of the Ph.D., although completion plans differ. M.S. students can choose a thesis option that allows them to undertake a research-based thesis in lieu of two elective courses. For general information about admissions, the M.S. completion plan options, visit the Bren School of ICS Graduate Programs (<http://catalogue.uci.edu/donaldbrenschoolofinformationandcomputersciences/#graduatetext>) section (<http://catalogue.uci.edu/donaldbrenschoolofinformationandcomputersciences/#graduatetext>) of the *Catalogue*.

### Required Courses

Each student must complete at least 47 units of course work. In addition, students must receive at least a B in each course counted toward filling these requirements.

Students must complete three quarters of COMPSCI 200S, four core courses, and seven elective courses. The course requirements are as follows:

Students must select four areas from the list of seven areas given below. From each area, they must select at least one of the courses listed for that area.

#### Data Structures and Algorithms

COMPSCI 260	Fundamentals of the Design and Analysis of Algorithms
COMPSCI 261	Data Structures
COMPSCI 263	Analysis of Algorithms

#### Architecture/Embedded Systems

COMPSCI 250A	Computer Systems Architecture
COMPSCI 244	Introduction to Embedded and Ubiquitous Systems

#### System Software

COMPSCI 241	Advanced Compiler Construction
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COMPSCI 243	High-Performance Architectures and Their Compilers
COMPSCI 230	Distributed Computer Systems
<b>Artificial Intelligence</b>	
COMPSCI 271	Introduction to Artificial Intelligence
COMPSCI 273A	Machine Learning
<b>Networks/Multimedia</b>	
COMPSCI 232	Computer and Communication Networks
COMPSCI 203	Network and Distributed Systems Security
COMPSCI 212	Multimedia Systems and Applications
<b>Database Systems</b>	
COMPSCI 222	Principles of Data Management
COMPSCI 223	Transaction Processing and Distributed Data Management
<b>Scientific and Visual Computing</b>	
COMPSCI 206	Principles of Scientific Computing
COMPSCI 211A	Visual Computing

Seven elective courses selected from any ICS graduate program, except any course with a suffix of "S", "W", or "P" (e.g., 209S), and any non-COMPSCI course with a prefix of '29' (e.g., 295).

### Notes/Restrictions

1. At most two COMPSCI 295 courses are allowed.
2. At most two upper-division undergraduate courses are allowed from the list below:

COMPSCI 111	Digital Image Processing
COMPSCI 112	Computer Graphics
COMPSCI 122A	Introduction to Data Management
COMPSCI 132	Computer Networks
COMPSCI 142A	Compilers and Interpreters
COMPSCI 143A	Principles of Operating Systems
COMPSCI 152	Computer Systems Architecture
COMPSCI 161	Design and Analysis of Algorithms
COMPSCI 171	Introduction to Artificial Intelligence
COMPSCI 178	Machine Learning and Data-Mining
I&C SCI 161	Game Engine Lab
I&C SCI 162	Modeling and World Building
I&C SCI 163	Mobile and Ubiquitous Games
I&C SCI 166	Game Design

3. At most two courses from combined 1 and 2 above are allowed.
4. At most two courses are allowed from non-ICS UCI graduate programs, with written consent of the Vice Chair for Graduate Studies.
5. Any course that was used toward an undergraduate degree cannot be used toward graduate requirements.

## Computer Science, Ph.D.

Computer Science encompasses both theoretical and practical aspects of design, analysis, and implementation of computer systems, as well as applications of computing to numerous other fields. Core research areas include: (1) artificial intelligence and machine learning, (2) bioinformatics, (3) computer architecture, (4) embedded systems, (5) graphics and computer vision, (6) database systems and information management, (7) multimedia and gaming, (8) networks and distributed systems, (9) programming languages and compilers, (10) security, privacy, and cryptography, (11) design and analysis of algorithms, and (12) scientific computing.

The Ph.D. degree in Computer Science (CS) is a broad and flexible program, offering students opportunities for in-depth graduate study and cutting-edge research, covering a broad range of topics in Computer Science.

## Required Courses

Each student must complete at least 47 units of course work with an average GPA of at least 3.5 for Ph.D. students. In addition, students must receive at least a B in each course counted toward filling these requirements. The set of core and elective courses chosen by a student must be approved by the student's research advisor before advancement to candidacy. Faculty associated with each research area will provide suggested curricula for that area to guide students in their selection of courses. These curricula will also help Ph.D. students to prepare for their candidacy examination (see below) which must be taken in a specific research area.

Students must complete three quarters of COMPSCI 200S, four core courses, and seven elective courses. The course requirements are as follows:

Students must select four areas from the list of seven areas given below. From each area, they must select at least one of the courses listed for that area.

### Data Structures and Algorithms

COMPSCI 260	Fundamentals of the Design and Analysis of Algorithms
COMPSCI 261	Data Structures
COMPSCI 263	Analysis of Algorithms

### Architecture/Embedded Systems

COMPSCI 250A	Computer Systems Architecture
COMPSCI 244	Introduction to Embedded and Ubiquitous Systems

### System Software

COMPSCI 241	Advanced Compiler Construction
COMPSCI 243	High-Performance Architectures and Their Compilers
COMPSCI 230	Distributed Computer Systems

### Artificial Intelligence

COMPSCI 271	Introduction to Artificial Intelligence
COMPSCI 273A	Machine Learning

### Networks/Multimedia

COMPSCI 232	Computer and Communication Networks
COMPSCI 203	Network and Distributed Systems Security
COMPSCI 212	Multimedia Systems and Applications

### Database Systems

COMPSCI 222	Principles of Data Management
COMPSCI 223	Transaction Processing and Distributed Data Management

### Scientific and Visual Computing

COMPSCI 206	Principles of Scientific Computing
COMPSCI 211A	Visual Computing

Seven elective courses selected from any ICS graduate program, except any course with a suffix of 'S', 'W', or 'P' (e.g., 209S), and any non-COMPSCI course with a prefix '29' (e.g., 295).

### Notes/Restrictions:

1. At most, two COMPSCI 295 courses are allowed.
2. At most, two upper-division undergraduate courses are allowed, from the list below:

COMPSCI 111	Digital Image Processing
COMPSCI 112	Computer Graphics
COMPSCI 122A	Introduction to Data Management
COMPSCI 132	Computer Networks
COMPSCI 142A	Compilers and Interpreters
COMPSCI 143A	Principles of Operating Systems
COMPSCI 152	Computer Systems Architecture
COMPSCI 161	Design and Analysis of Algorithms
COMPSCI 171	Introduction to Artificial Intelligence
COMPSCI 178	Machine Learning and Data-Mining
I&C SCI 161	Game Engine Lab
I&C SCI 162	Modeling and World Building

I&amp;C SCI 163

Mobile and Ubiquitous Games

I&amp;C SCI 166

Game Design

3. At most, two courses from combined 1 and 2 above are allowed.
4. At most, two courses are allowed from non-ICS UCI graduate programs, with written consent of the advisor.
5. Any course that was used toward an undergraduate degree cannot be used toward graduate requirements.

Ph.D. students are required to serve as teaching assistants for at least two quarters.

### Research Project for the Ph.D.

Doctoral students must find a faculty advisor and successfully complete a research project with that faculty member by the end of their second year. In coordination with this project the student must also take at least one independent studies course (COMPSCI 299) with their faculty advisor. The objective of the research project is to demonstrate early in the program the student's ability to carry out basic research in computer science.

Finally, the student must present the outcome of the research in a technical report, which must be approved by the advisor. The project may or may not be a stepping-stone toward a dissertation, and must be completed by the end of the second year, and prior to advancement to candidacy.

### Advancement to Candidacy Examination

The objective of the candidacy examination is to demonstrate in-depth knowledge of an area of computer science and readiness to carry out independent research at the doctoral level in that area. The student must complete all pre-candidacy course requirements and the research project prior to advancing to candidacy. All requirements for candidacy including the candidacy examination must be completed by the end of the third year (or, for students entering the program with an M.S. in Computer Science, by the end of the second year). If the student does not pass on the first trial, the student will be allowed until the end of the first quarter of the fourth year to advance to candidacy. Consult the ICS Graduate Office for policies regarding committee membership. The format is an oral examination during which the student is tested on knowledge relevant to the chosen area of specialization. Each area is defined by a set of topics and reading list, which are maintained by the Computer Science Department office. New areas or changes to existing areas must be approved by a majority vote of the CS faculty in accordance with the Department's bylaws. The current areas include the following: Algorithms and Data Structures; Computer Architecture and Embedded Systems; Database Systems and Multimedia; Computer Networks; Distributed Systems; Artificial Intelligence and Machine Learning; Informatics in Biology and Medicine; Computer Graphics and Visual Computing; Cryptography and Computer Security; Computational Neuroscience; Scientific Computing; Systems Software.

The examination is graded pass or fail. In order to pass, the Candidacy Committee must unanimously approve the final outcome. In the case of a fail, the examination may be retaken once. Students who fail on the second try will be recommended for disqualification from the doctoral program.

### Doctoral Dissertation Topic Defense

The student must produce a substantial written document representing the dissertation plan. This must include the proposed dissertation abstract, a dissertation outline, and a detailed plan for completing the work. A dissertation defense committee is formed in accordance with UCI Senate regulations. The dissertation committee must unanimously approve the student's proposal. At the discretion of the student's advisor, the student may be required to give an oral presentation of the proposed plan to the committee. This must be completed by the end of the fourth year. It is expected that this will be done at least a year prior to the final examination and before most of the dissertation research and writing are undertaken. The idea is for students to demonstrate that they have a clear plan for carrying out the research for their dissertation. It also gives the student an understanding of what will be expected for final approval of the dissertation.

### Doctoral Dissertation and Final Examination

Ph.D. students are required to complete a Ph.D. dissertation in accordance with Academic Senate regulations. In addition, they must pass an oral dissertation defense which consists of a public seminar presenting results followed by a private examination by the doctoral committee and other interested members of the Computer Science Department faculty.

Students entering the Ph.D. program with an M.S. in Computer Science must advance to candidacy within two years. All others must advance within three years. The normative time for completion of the Ph.D. is six years, and the maximum time permitted is seven years.

## Master of Computer Science

The Master of Computer Science Program prepares students for immediate entry into the technology workforce as well as supports students for enhanced job opportunities and mobility. The program emphasizes computer science that applies to a wide variety of applications and industries where students learn or reinforce key computer science concepts through classroom and project-based learning, and through individual and collaborative assignments.

The program spans four academic quarters - fall, winter, spring, and fall in addition to a summer component that includes either an internship or additional coursework.

A key feature of the program is the capstone design courses. These include design, development, and professional writing components, as well as a capstone showcase event with opportunities to network with tech companies.

Most students come from a computing-related undergraduate program; however, applications from students with other technical backgrounds and sufficient preparation in programming are also welcomed. Applications are also encouraged from students with non-technical academic backgrounds who have sufficient preparation in programming and extensive technical employment experience. Any admitted students who have not taken a course in discrete mathematics and data structures should complete these (at a community college or online) prior to entering the program in the fall.

For specific information regarding admissions requirements and the application process, please refer to the Graduate Division website (<https://grad.uci.edu/>).

A. Complete three of the following core courses:

COMPSCI 222P	Principles of Data Management
COMPSCI 232P	Computer and Communication Networks
COMPSCI 238P	Operating Systems
COMPSCI 250P	Computer Systems Architecture
COMPSCI 260P	Fundamentals of Algorithms with Applications
COMPSCI 261P	Data Structures with Applications
COMPSCI 273P	Machine Learning and Data Mining

B. Complete two capstone courses:

COMPSCI 296P	Capstone Professional Writing and Communication for Computer Science Careers
COMPSCI 297P	Capstone Design Project for Computer Science

C. Select at least six of the following: <sup>1</sup>

COMPSCI 201P	Introduction to Computer Security
COMPSCI 202P	Applied Cryptography
COMPSCI 203P	Network Security
COMPSCI 206P	Principles of Scientific Computing
COMPSCI 210P	Computer Graphics and Visualization
COMPSCI 211P	Visual Computing
COMPSCI 222P	Principles of Data Management
COMPSCI 231P	Parallel and Distributed Computing for Professionals
COMPSCI 232P	Computer and Communication Networks
COMPSCI 238P	Operating Systems
COMPSCI 242P	Compilers and Interpreters
COMPSCI 244P	Introduction to the Internet of Things
COMPSCI 250P	Computer Systems Architecture
COMPSCI 253P	Advanced Programming and Problem Solving
COMPSCI 260P	Fundamentals of Algorithms with Applications
COMPSCI 261P	Data Structures with Applications
COMPSCI 262P	Text Processing and Pattern Matching
COMPSCI 267P	Data Compression
COMPSCI 268P	Introduction to Optimization Modeling
COMPSCI 271P	Introduction to Artificial Intelligence
COMPSCI 273P	Machine Learning and Data Mining
COMPSCI 274P	Neural Networks and Deep Learning

<sup>1</sup> Courses completed as core courses in Section A cannot also be counted toward Section C.

All Master of Computer Science students are expected to maintain a minimum GPA of 3.0 throughout the program, with no individual grade lower than a B-. The normative time to degree is four quarters; the maximum time to degree is three years.

## Department of Informatics

**André van der Hoek, Department Chair**

5019 Donald Bren Hall

949-824-2901

ichair@ics.uci.edu

## Introduction

Our world runs on information, with more and more aspects of daily life having information technologies and digital systems at their core. Topics such as open-source software, virtual organizations, online political campaigns, digital television, social media, and computer games need to be understood and advanced from both a technical and human perspective simultaneously.

This is what Informatics does.

We seek to make a positive difference in how people live, work, and build in a digital world. To that end, we study interactions among information technologies and people, create innovative information technologies that serve the diverse needs of society, and educate our students to be leaders in these endeavors.

## Values

Our work is shaped by four key values:

- **Creativity.** We create new technologies, new experiences, and new ways of understanding. We believe that information technology provides a rich platform for expression, from programming environments to digital media, and creative arts.
- **Engagement.** We focus on real-world concerns, with a strong empirical focus and a commitment to understanding and advancing technology in real life, around the world.
- **Interdisciplinarity.** We use knowledge and methods from multiple disciplines to study and improve the relationships among people, information, and technology from a holistic perspective.
- **Partnership.** We build relationships across campus and beyond, partnering with other schools and educational institutions; with corporations and technology providers; with civic agencies and nonprofits; and with consumers, advocates, and interest groups to locate novel and important contexts for conducting and applying our work.

These values help us deliver results that matter. Our research has, as just a few examples, resulted in technology that improves the early diagnosis of cerebral palsy in preterm babies; in apps that help kids with autism spectrum disorder live fuller lives; and in new tools that assist software developers in locating and fixing bugs — real results that make a difference every day.

Our values similarly define the nature of our teaching. Our students' experience is not confined to campus. Instead, they are constantly exposed to the real world, the issues at play, and the possibilities of information technology making a difference. For instance, students in our capstone design course have designed a customizable Analytics dashboard for Google; a new web portal for the Down Syndrome Foundation; an at-home energy saving recommender for Edison; a mobile application to capture statistical data related to clinical cases for the UC Irvine Medical Center; and a freelance game in which a mystical fish has to protect its aquatic environment.

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- Business Information Management, B.S.
  - Computer Game Science, B.S.
  - Digital Information Systems, Minor
  - Health Informatics, Minor
  - Informatics, B.S.
  - Informatics, M.S.
  - Informatics, Minor
  - Informatics, Ph.D.
  - Master of Human Computer Interaction and Design
  - Master of Software Engineering
  - Software Engineering, B.S.
  - Software Engineering, M.S.
  - Software Engineering, Ph.D.

## Faculty

Iftekhar Ahmed, Ph.D. Oregon State University, *Assistant Professor of Informatics* (data mining, software engineering, software testing and analysis, software maintenance, empirical studies)

Rebecca W. Black, Ph.D. University of Wisconsin-Madison, *Associate Professor of Informatics; Education* (digital media and learning, fan studies)

Geoffrey C. Bowker, Ph.D. University of Melbourne, *Chancellor's and Donald Bren Professor of Informatics; Visual Studies* (values in design, social studies of databases, science and technology studies)

Stacy Branham, Ph.D. Virginia Tech, *Assistant Professor of Informatics* (human-computer interaction, design, assistive technology, safe and brave space, well-being, disability, feminism, marginality, inclusion, interdependence)

Yunan Chen, Ph.D. Drexel University, *Associate Professor of Informatics; Program in Public Health* (medical informatics, human computer interaction)

Roderic N. Crooks, Ph.D. University of California, Los Angeles, *Assistant Professor of Informatics* (science and technology studies, education technology, critical data studies, data visualization, community archives)

Darren Denenberg, Ph.D. University of Maryland, *Lecturer of Informatics*

James P. Dourish, Ph.D. University College London, *Chancellor's Professor of Informatics* (human-computer interaction, computer-supported cooperative work)

Daniel Epstein, Ph.D. University of Washington, *Assistant Professor of Informatics; Computer Science* (human-computer interaction, personal informatics, ubiquitous computing, social computing, health informatics)

Joshua Garcia, Ph.D. University of Southern California, *Assistant Professor of Informatics* (software engineering, software security, software analysis and testing, software architecture, software maintenance)

Gillian Hayes, Ph.D. Georgia Institute of Technology, *Robert A. and Barbara L. Kleist Professor of Informatics; Education* (interactive and collaborative technology, human-computer interaction, computer-supported cooperative work, educational technology, ubiquitous computing)

James Jones, Ph.D. Georgia Institute of Technology, *Associate Professor of Informatics* (software engineering, software testing and analysis, debugging and fault localization, static and dynamic analysis, software visualization)

David G. Kay, J.D. Loyola Marymount University, *Professor Emeritus of Teaching of Informatics; Computer Science* (computer law, computer science education)

Alfred Kobsa, Ph.D. University of Vienna, *Professor Emeritus of Informatics; Computer Science* (user modeling, human-computer interaction, artificial intelligence, cognitive science, interdisciplinary computer science)

Cristina V. Lopes, Ph.D. Northeastern University, *Professor of Informatics* (programming languages, acoustic communications, operating systems, software engineering)

Sam Malek, Ph.D. University of Southern California, *Associate Professor of Informatics* (software engineering, software architecture, software security, software analysis and testing)

Gloria J. Mark, Ph.D. Columbia University, *Professor of Informatics* (computer-supported cooperative work, human-computer interaction)

Melissa Mazmanian, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Informatics* (computer-mediated communication, organization studies, information and communication technologies in practice, social response to emerging technologies, work/non-work negotiations in the information age)

Bonnie A. Nardi, Ph.D. University of California, Irvine, *Professor Emeritus of Informatics* (computer-supported collaborative work, human-computer interaction, computer-mediated communication, user studies methods, activity theory, cultural responses to technology development)

Emily Navarro, Ph.D. University of California, Irvine, *Lecturer of Informatics*

Gary Olson, Ph.D. Stanford University, *Professor Emeritus of Informatics* (interactive and collaborative technology, human-computer interaction, computer-supported cooperative work)

Judith Olson, Ph.D. University of Michigan, *Professor Emeritus of Informatics; Paul Merage School of Business; Urban Planning and Public Policy* (interactive and collaborative technology, human-computer interaction, computer-supported cooperative work)

Richard Pattis, M.S. Stanford University, *Professor of Teaching of Computer Science; Informatics* (MicroWorlds for teaching programming, debugging, computational tools for non-computer scientists)

Kylie Peppler, Ph.D. University of California, Los Angeles, *Associate Professor of Informatics; Education* (learning sciences, design, maker culture, arts, game design, computer programming, wearables)

David F. Redmiles, Ph.D. University of Colorado Boulder, *Professor of Informatics* (computer-supported cooperative work, human computer interaction, software engineering, globally distributed development teams, user interfaces, software tools)

Debra J. Richardson, Ph.D. University of Massachusetts, *Professor Emeritus of Informatics* (software engineering, program testing, life-cycle validation, software environments)



Katie Salen Tekinba#, M.F.A. Rhode Island School of Design, *Professor of Informatics* (game design, connected learning design, human-computer interaction)

Kurt Squire, Ph.D. Indiana University, *Professor of Informatics; Education* (video game design, games for learning, mobile technologies, civic engagement, place-based learning)

Constance Steinkuehler, Ph.D. University of Wisconsin-Madison, *Professor of Informatics; Education* (video games for impact, game-mediated cognition and learning, online social interaction, video games and policy)

Theresa Tanenbaum, Ph.D. Simon Fraser University, *Assistant Professor of Informatics* (digital games and narrative, tangible and wearable interaction, maker and DIY culture, nonverbal communication and virtual worlds)

Richard N. Taylor, Ph.D. University of Colorado Boulder, *Professor Emeritus of Informatics* (software engineering, user interfaces, environments, team support)

William M. Tomlinson, Ph.D. Massachusetts Institute of Technology, *Professor of Informatics; Education* (environmental informatics, educational technology, computer graphics/visualization/digital arts)

André W. Van der Hoek, Ph.D. University of Colorado Boulder, *Professor of Informatics* (software engineering)

Kai Zheng, Ph.D. Carnegie Mellon University, *Associate Professor of Informatics* (health informatics, human factors and human-computer interaction, technology adoption and acceptance, outcomes and evaluation)

Hadar Ziv, Ph.D. University of California, Irvine, *Associate Professor of Teaching of Informatics* (software testing, requirements engineering, Bayesian modeling)

## Affiliate Faculty

Jonathan Alexander, Ph.D. Louisiana State University, *Associate Dean, Division of Undergraduate Education and Campus Writing Coordinator and Chancellor's Professor of English; Culture and Theory; Education; Gender and Sexuality Studies; Informatics* (writing studies, sexuality studies, queer theory, new media studies)

John L. Crawford, Media Artist and Software Designer, *Professor of Dance; Informatics* (screendance, interactive media, telematic performance, motion capture, digital arts)

John Christopher Dobrian, Ph.D. University of California, San Diego, *Professor of Music; Informatics*

Shayan Doroudi, Ph.D. Carnegie Mellon University, *Assistant Professor of Education; Informatics* (learning analytics, learning sciences, educational technology)

Magda S. El Zarki, Ph.D. Columbia University, *Professor of Computer Science; Informatics* (telecommunications, networks, wireless communication, video transmission)

Vijay Gurbaxani, Ph.D. University of Rochester, *Taco Bell Chair in Information Technology Management and Professor of Paul Merage School of Business; Informatics* (economics of information systems management, impact of information technology on organization and market structure)

Jesse C. Jackson, M.A. University of Toronto, *Director of the Minor in Digital Arts and Associate Professor of Art; Informatics* (digital art, informatics, design, architecture)

Peter O. Krapp, Ph.D. University of California, Santa Barbara, *Professor of Film and Media Studies; English; European Languages and Studies; Informatics; Music; Visual Studies* (digital culture, media history, cultural memory)

Simon G. Penny, M.F.A. Sydney College of the Arts, *Professor of Art; Informatics* (informatics, robotic sculpture, interactive environments, electronic media)

Kavita S. Philip, Ph.D. Cornell University, *Professor of History; Informatics* (history of modern South Asia, science and technology, political ecology, critical theoretical studies of race, gender, colonialism, new media, and globalization)

Stephanie Reich, Ph.D. Vanderbilt University, *Associate Professor of Education; Informatics; Psychological Science* (child development, parenting, peer interactions, media, program evaluation)

Patricia Seed, Ph.D. University of Wisconsin-Madison, *Professor of History; Informatics* (mapping: history and design, game design, navigation)

Mark J. Warschauer, Ph.D. University of Hawaii at Manoa, *Professor of Education; Informatics* (language, literacy, technology, STEM)

## Informatics Courses

### **IN4MATX 12. Barter to Bitcoin: Society, Technology and the Future of Money. 4 Units.**

Digital money has captured the broad imagination of speculators, coders, regulators, criminals and the mass media. Course puts this change in context: how do we understand money as a social, political and technological phenomenon?.

Same as SOC SCI 11A.

(II and III ).

### **IN4MATX 43. Introduction to Software Engineering. 4 Units.**

Concepts, methods, and current practice of software engineering. Large-scale software production, software life cycle models, principles and techniques for each stage of development.

Prerequisite: I&C SCI 32 or I&C SCI 32A

Overlaps with I&C SCI 105.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

### **IN4MATX H81. Ethics, Technology, and Design. 4 Units.**

Provides a critical framework for how and why biases of many kinds are built into everyday digital tools. Reflections on ethics, technology, and design through case studies drawn from machine learning, CS education, engineering, social media, and criminal justice.

Restriction: Campuswide Honors Collegium students only.

(III)

### **IN4MATX 101. Concepts in Programming Languages I. 4 Units.**

In-depth study of several contemporary programming languages stressing variety in data structures, operations, notation, and control. Examination of different programming paradigms, such as logic programming, functional programming and object-oriented programming; implementation strategies, programming environments, and programming style.

Prerequisite: (I&C SCI 51 or CSE 31 or EECS 31) and (I&C SCI 46 or CSE 46). I&C SCI 51 with a grade of C or better. CSE 31 with a grade of C or better. EECS 31 with a grade of C or better. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better

Same as COMPSCI 141.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

### **IN4MATX 102. Concepts of Programming Language II. 4 Units.**

In-depth study of major programming paradigms: imperative, functional, declarative, object-oriented, and aspect-oriented. Understanding the role of programming languages in software development and the suitability of languages in context. Domain-specific languages. Designing new languages for better software development support.

Prerequisite: IN4MATX 101 or COMPSCI 141 or CSE 141

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

### **IN4MATX 113. Requirements Analysis and Engineering. 4 Units.**

Equips students to develop techniques of software-intensive systems through successful requirements analysis techniques and requirements engineering. Students learn systematic process of developing requirements through cooperative problem analysis, representation, and validation.

Prerequisite: (I&C SCI 33 or CSE 43) and IN4MATX 43. I&C SCI 33 with a grade of C or better. CSE 43 with a grade of C or better. IN4MATX 43 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.



**IN4MATX 115. Software Testing, Analysis, and Quality Assurance. 4 Units.**

Preparation for developing high-quality software through successful verification and validation techniques. Fundamental principles of software testing, implementing software testing practices, ensuring the thoroughness of testing to gain confidence in the correctness of the software.

Prerequisite: (I&C SCI 45J or I&C SCI 45C or I&C SCI 46 or CSE 46) and IN4MATX 43. I&C SCI 45J with a grade of C or better. I&C SCI 45C with a grade of C or better. I&C SCI 46 with a grade of C or better. CSE 46 with a grade of C or better. IN4MATX 43 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 117. Project in Software System Design. 4 Units.**

Specification, design, construction, testing, and documentation of a complete software system. Special emphasis on the need for and use of teamwork, careful planning, and other techniques for working with large systems.

Prerequisite: (IN4MATX 43 and I&C SCI 33) or CSE 43

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 121. Software Design: Applications. 4 Units.**

Introduction to application design: designing the overall functionality of a software application. Topics include general design theory, software design theory, and software architecture. Includes practice in designing and case studies of existing designs.

Prerequisite: I&C SCI 33 or CSE 43. I&C SCI 33 with a grade of C or better. CSE 43 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 122. Software Design: Structure and Implementation. 4 Units.**

Introduction to implementation design: designing the internals of a software application. Topics include design aesthetics, design implementation, design recovery, design patterns, and component reuse. Includes practice in designing and case studies of existing designs.

Prerequisite: (I&C SCI 45J or I&C SCI 46 or IN4MATX 45) and (IN4MATX 101 or COMPSCI 141 or CSE 141)

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 124. Internet Applications Engineering. 4 Units.**

Concepts in Internet applications engineering with emphasis on the Web. Peer-to-Peer and Interoperability. Topics include HTTP and REST, Remote Procedure/Method Calls, Web Services, data representations, content distribution networks, identity management, relevant W3C/IETF standards, and relevant new large-scale computing styles.

Prerequisite: (COMPSCI 132 or EECS 148) and I&C SCI 45J

Same as COMPSCI 137.

Overlaps with COMPSCI 122B.

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 125. Computer Game Development. 4 Units.**

Introduction to the principles of interactive 2D and 3D computer game development. Concepts in computer graphics, algorithms, software engineering, art and graphics, music and sound, story analysis, and artificial intelligence are presented and are the basis for student work.

Prerequisite: COMPSCI 112 or COMPSCI 171 or IN4MATX 121 or ART 106B or I&C SCI 163 or I&C SCI 166

Same as COMPSCI 113.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 131. Human Computer Interaction. 4 Units.**

Basic principles of human-computer interaction (HCI). Introduces students to user interface design techniques, design guidelines, and usability testing. Students gain the ability to design and evaluate user interfaces and become familiar with some of the outstanding research problems in HCI.

Prerequisite: I&C SCI 10 or I&C SCI 31 or I&C SCI 32A or CSE 41 or ENGR 10 or ENGRMAE 10 or EECS 10. I&C SCI 10 with a grade of C or better. I&C SCI 31 with a grade of C or better. I&C SCI 32A with a grade of C or better. CSE 41 with a grade of C or better. ENGR 10 with a grade of C or better. ENGRMAE 10 with a grade of C or better. EECS 10 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 132. Project in Human-Computer Interaction Requirements and Evaluation. 4 Units.**

Students undertake significant projects in the elicitation and specification of HCI requirements and the thorough evaluation of user interfaces.

Prerequisite: IN4MATX 131

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 133. User Interaction Software. 4 Units.**

Introduction to human-computer interaction programming. Emphasis on current tools, standards, methodologies for implementing effective interaction designs. Widget toolkits, Web interface programming, geo-spatial and map interfaces, mobile phone interfaces.

Prerequisite: I&C SCI 45J or I&C SCI 45C. I&C SCI 45J with a grade of C or better. I&C SCI 45C with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 134. Project in User Interaction Software. 4 Units.**

Students complete an end-to-end user interface programming project based on an iterative design paradigm. Topics may include requirements brainstorming, paper prototyping, iterative development, cognitive walk-through, quantitative evaluation, and acceptance testing. Materials fee.

Prerequisite: IN4MATX 131 and IN4MATX 133

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**IN4MATX 141. Information Retrieval. 4 Units.**

An introduction to information retrieval including indexing, retrieval, classifying, and clustering text and multimedia documents.

Prerequisite: (I&C SCI 45C or I&C SCI 45J) and (STATS 7 or STATS 67). I&C SCI 45C with a grade of C or better. I&C SCI 45J with a grade of C or better

Same as COMPSCI 121.

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**IN4MATX 143. Information Visualization. 4 Units.**

Introduction to interactive visual interfaces for large datasets, and to principles of human visual perception and human computer interaction that inform their design. Various applications for data analysis and monitoring are discussed.

Prerequisite: (IN4MATX 131 or IN4MATX 43) and (I&C SCI 31 or I&C SCI 32A or CSE 41). IN4MATX 131 with a grade of C or better. IN4MATX 43 with a grade of C or better. I&C SCI 31 with a grade of C or better. I&C SCI 32A with a grade of C or better. CSE 41 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**IN4MATX 148. Project in Ubiquitous Computing. 4 Units.**

Introduction to ubiquitous computing research methods, tools, and techniques. Prototyping, design, and evaluation of physical computing applications, smart environments, embedded systems, and future computing scenarios. Includes hands-on in-class laboratory exercises. Materials fee.

Prerequisite: I&C SCI 10 or I&C SCI 31 or CSE 41 or I&C SCI 32A. I&C SCI 10 with a grade of C or better. I&C SCI 31 with a grade of C or better. CSE 41 with a grade of C or better. I&C SCI 32A with a grade of C or better

Restriction: Upper-division students only. School of Info & Computer Sci students have first consideration for enrollment.

**IN4MATX 151. Project Management. 4 Units.**

Introduces theoretical and practical aspects of project management. Topics include organizational theory, group behavior, project management skills, case studies, personal and group productivity tools, management of distributed work, stakeholders, consultants, and knowledge management. Students do a project exercise.

Prerequisite: IN4MATX 43

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**IN4MATX 153. Computer Supported Cooperative Work. 4 Units.**

Introduces concepts and principles of collaborative systems. Topics may include shared workspaces, group interaction, workflow, architectures, interaction between social and technical features of group work, and examples of collaborative systems used in real-world settings. Students develop a simple collaborative application.

Prerequisite: (IN4MATX 161 or IN4MATX 43) and (I&C SCI 31 or I&C SCI 32A or CSE 41). I&C SCI 31 with a grade of C or better. I&C SCI 32A with a grade of C or better. CSE 41 with a grade of C or better

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**IN4MATX 161. Social Analysis of Computing. 4 Units.**

Introduction of computing as a social process. Examines the social opportunities and problems raised by new information technologies, and the consequences of different ways of organizing. Topics include computing and work life, privacy, virtual communities, productivity paradox, systems risks.

Prerequisite: I&C SCI 10 or I&C SCI 31 or I&C SCI 32A or CSE 41 or ENGR 10 or EECS 10 or ENGRMAE 10. I&C SCI 10 with a grade of C or better. I&C SCI 31 with a grade of C or better. I&C SCI 32A with a grade of C or better. CSE 41 with a grade of C or better. ENGR 10 with a grade of C or better. EECS 10 with a grade of C or better. ENGRMAE 10 with a grade of C or better. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: School of Info & Computer Sci students have first consideration for enrollment.

**IN4MATX 162W. Organizational Information Systems. 4 Units.**

Introduction to role of information systems in organizations, components and structure of organizational information systems, and techniques used in information systems analysis, design, and implementation.

Prerequisite: IN4MATX 161. Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**IN4MATX 163. Project in the Social and Organizational Impacts of Computing . 4 Units.**

Students undertake projects intended to gather and analyze data from situations in which computers are used, organize and conduct experiments intended to test hypotheses about impacts, and explore the application of concepts learned in previous courses.

Prerequisite: IN4MATX 162W

**IN4MATX 164. Children's Learning and Media. 4 Units.**

Examines how popular media may impact how young people learn, develop, and communicate by looking at research related to the impacts of a wide range of popular media including television, video games, digital environments, mobile devices, and other multimedia.

Same as EDUC 130.

Restriction: Education Sciences Majors only. Informatics Majors only. Informatics Minors only.

**IN4MATX 171. Introduction to Medical Informatics. 4 Units.**

Broad overview of medical informatics for students with varied backgrounds. Electronic medical records, online resources, mobile technologies, patient safety, and computational design. Legal, ethical, and public policy issues. Health systems management. Evaluation and fieldwork for health systems.

Prerequisite: WRITING 39C or WRITING 30 or WRITING 31 or HUMAN 1C or HUMAN H1C. WRITING 39C with a grade of C or better. WRITING 30 with a grade of C or better. WRITING 31 with a grade of C or better. HUMAN 1C with a grade of C or better. HUMAN H1C with a grade of C or better

Same as PUBHLTH 105.

Restriction: Upper-division students only. Satisfactory completion of the Lower-Division Writing requirement.

**IN4MATX 172. Project in Health Informatics. 4 Units.**

Students undertake significant quarter-long projects related to health informatics. Topics may include field evaluations of health care technologies, prototypes, iterative design, and system implementations.

Prerequisite: PUBHLTH 105 or IN4MATX 171

Same as PUBHLTH 106.

**IN4MATX 190. Special Topics in Informatics. 4 Units.**

Studies in selected areas of informatics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**IN4MATX 191A. Senior Design Project. 4 Units.**

Group supervised project in which students analyze, specify, design, construct, evaluate, and adapt a significant information processing system. Topics include team management, professional ethics, and systems analysis.

Prerequisite: IN4MATX 113 and IN4MATX 121 and IN4MATX 131 and IN4MATX 151

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Seniors only. Software Engineering Majors have first consideration for enrollment. Informatics Majors have first consideration for enrollment.

**IN4MATX 191B. Senior Design Project. 4 Units.**

Group supervised project in which students analyze, specify, design, construct, evaluate, and adapt a significant information processing system. Topics include team management, professional ethics, and systems analysis.

Prerequisite: IN4MATX 191A. In Progress (IP) grade for IN4MATX 191A is also accepted.

Restriction: Seniors only.

**IN4MATX H198. Honors Research. 4 Units.**

Directed independent research in Informatics for honors students.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be repeated for credit unlimited times.

Restriction: Bren School of ICS Honors students only. Campuswide Honors Collegium students only.

**IN4MATX 199. Individual Study. 2-5 Units.**

Individual research or investigation under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

**IN4MATX 201. Research Methodology for Informatics. 4 Units.**

Introduction to strategies and idioms of research in Informatics. Includes examination of issues in scientific inquiry, qualitative and quantitative methods, and research design. Both classic texts and contemporary research literature are read and analyzed.

**IN4MATX 203. Qualitative Research Methods in Information Systems. 4 Units.**

Introduction to qualitative research methods used to study computerization and information systems, such as open-ended interviewing, participant observation, and ethnography. Studies of the methods in practice through examination of research literature.

Prerequisite: IN4MATX 261 or IN4MATX 251

**IN4MATX 205. Quantitative Research Methods in Information Systems. 4 Units.**

Quantitative research methods used to study computerization and information systems. Design of instruments, sampling, sample sizes, and data analysis. Validity and reliability. Longitudinal versus cross-sectional designs. Analysis of secondary data. Studies of the methods through examination of research literature.

Prerequisite: IN4MATX 251 or IN4MATX 261. Basic knowledge of elementary statistics is also required.

**IN4MATX 207S. Doctoral Seminar on Research and Writing. 2 Units.**

Doctoral seminar centered on original research and writing. Provides a chance for doctoral students at all levels to present original work, brainstorm ongoing issues, and learn to provide and receive critical feedback from peers.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**IN4MATX 209S. Seminar in Informatics. 2 Units.**

Current research and research trends in informatics. Forum for presentation and criticism by students of research work in progress.

Repeatability: Unlimited as topics vary.

**IN4MATX 231. User Interface Design and Evaluation. 4 Units.**

Introduction to the design and evaluation of user interfaces, with an emphasis on methodology. Cognitive principles, design life cycle, on-line and off-line prototyping techniques. Toolkits and architectures for interactive systems. Evaluation techniques, including heuristic and laboratory methods.

**IN4MATX 232. Research in Human-Centered Computing. 4 Units.**

Introduction to contemporary topics in human-computer interaction, including methods, technologies, design, and evaluation. Emerging application domains and their challenges to traditional research methods. Advanced architectures and technologies. Critical issues.

Prerequisite: Some familiarity with HCI principles.

**IN4MATX 237. Usable Security and Privacy. 4 Units.**

Introduces usability problems in security and privacy methods, tools, and software. Overviews prominent examples of both failures and successes in usable security and privacy. Surveys state-of-the-art techniques and evaluation methodologies.

Same as COMPSCI 204.

Overlaps with IN4MATX 231, COMPSCI 203.

Restriction: Informatics Majors have first consideration for enrollment. Computer Science Majors have first consideration for enrollment. Undergraduate degree in CompSci or Informatics is strongly recommended.

**IN4MATX 241. Introduction to Ubiquitous Computing. 4 Units.**

The 'disappearing computer' paradigm. Differences to the desktop computing model: applications, interaction in augmented environments, security, alternate media, small operating systems, sensors, and embedded systems design. Evaluation by project work and class participation.

Same as COMPSCI 248A.

**IN4MATX 244. Introduction to Embedded and Ubiquitous Systems. 4 Units.**

Embedded and ubiquitous system technologies including processors, DSP, memory, and software. System interfacing basics; communication strategies; sensors and actuators, mobile and wireless technology. Using pre-designed hardware and software components. Design case studies in wireless, multimedia, and/or networking domains.

Prerequisite: I&C SCI 51 and COMPSCI 152 and COMPSCI 161 and (I&C SCI 6N or MATH 3A or MATH 6G or I&C SCI 6D). B.S. degree in Computer Science is also accepted.

Same as COMPSCI 244.

**IN4MATX 251. Computer-Supported Cooperative Work. 4 Units.**

The role of information systems in supporting work in groups and organizations. Examines various technologies designed to support communication, information sharing, and coordination. Focuses on behavioral and social aspects of designing and using group support technologies.

**IN4MATX 261. Social Analysis of Computing. 4 Units.**

The social and economic impacts of computing and information technologies on groups, organizations, and society. Topics include computerization and changes in the character of work, social control and privacy, electronic communities, and risks of safety-critical systems to people.

**IN4MATX 263. Computerization, Work, and Organizations. 4 Units.**

Selected topics in the influence of computerization and information systems in transforming work and organizations. Theories of organization and organizational change. Processes by which diverse information technologies influence changes in work and organizations over short and long time periods.

Prerequisite: IN4MATX 251 or IN4MATX 261

**IN4MATX 265. Theories of Information Society . 4 Units.**

Social and economic conceptions of information technology. Macrosocial and economic conditions that foster changes in information technologies. Social construction of information and computer technology in professional worlds. Theories of information technology and large-scale social change.

Prerequisite: IN4MATX 251 or IN4MATX 261

**IN4MATX 267. Digital Media and Society. 4 Units.**

Selected topics in the technological and social aspects of online interactions, and policy including online games, social media, electronic activism, e-commerce, and digital libraries. Media-theoretic approaches to digital technology. Architectures, infrastructure considerations, and their consequences.

Prerequisite: IN4MATX 251 or IN4MATX 261

**IN4MATX 273. Information Technology in Global Sustainability. 4 Units.**

Explores the relationship between recent developments in information technology and the global transition to sustainability. Topics include the role of IT systems in the provision of human needs and wants (e.g., smart grids, food systems, and other IT-enabled infrastructure).

Restriction: Graduate students only.

**IN4MATX 280. Overview of Human-Computer Interaction and Design . 4 Units.**

Introduction to human-computer interaction and user-centered design. The material is focused on laying the groundwork for understanding the history, importance, and methods of human-computer interaction and design.

**IN4MATX 281. User Needs Analysis . 4 Units.**

Understanding the user's context, needs, and preferences. Topics include interviews and observations, modeling the context, flow, culture, space and artifacts involved in an endeavor, ways of aggregating what is found, and presenting these findings to others.

Prerequisite: IN4MATX 280

**IN4MATX 282. Design and Prototyping . 4 Units.**

Introduction to user-centered design and prototyping. Focused on practical methods for interaction design. Topics include the nature of design and the challenges to creating and evaluating good designs, as well specific skills for designing interactive systems.

Prerequisite: IN4MATX 280

**IN4MATX 283. User Experience Evaluation . 4 Units.**

Evaluating prototypes and completed systems. Topics include comparative analysis, laboratory experiments, heuristic evaluation, cognitive walkthroughs, surveys, clickstreams, and help-desk.

Prerequisite: IN4MATX 280

**IN4MATX 284. Advanced Design and Prototyping . 4 Units.**

Develop and communicate interactive technology design prototypes. Moving concepts from brainstorming and paper prototypes to wireframe and limited functionality mock-ups.

Prerequisite: IN4MATX 282

**IN4MATX 285. Interactive Technology Studio . 4 Units.**

Technologies, languages, and skills required for creating prototypes to communicate interactive technology concepts. Topics include HTTP, CSS, CSS scripting, AJAX, Design Patterns, Javascript, Javascript libraries such as jQuery, SQL, MVC, and cloud architectures.

Prerequisite: IN4MATX 280

**IN4MATX 286. Innovations in HCI and Design . 4 Units.**

Recent social and technological developments in human-computer interaction and design. Topics will vary as the field progresses but include novel input techniques, novel platforms, and innovations in theory and methods of design.

Prerequisite: IN4MATX 280

**IN4MATX 287. Capstone Project in HCI and Design . 4 Units.**

Group project that reinforces all concepts learned in this program, including knowing where user experience work is most appropriate and essential, and executing the appropriate steps.

Prerequisite: IN4MATX 283 and IN4MATX 284

**IN4MATX 288. Capstone Project and Portfolio . 4 Units.**

Completion of capstone projects and development of portfolios. Ideation, critique, development, and critique.

Prerequisite: IN4MATX 287

**IN4MATX 290. Research Seminar. 2 Units.**

Forum for presentation and criticism by students of research work in progress. Presentation of problem areas and related work. Specific goals and progress of research.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IN4MATX 291S. Literature Survey in Software Engineering. 2 Units.**

Reading and analysis of relevant literature in Software Engineering under the direction of a faculty member.

Repeatability: May be repeated for credit unlimited times.

**IN4MATX 295. Special Topics in Informatics. 4 Units.**

Studies in selected areas of informatics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**IN4MATX 298. Thesis Supervision. 2-12 Units.**

Individual research or investigation conducted in preparation for the M.S. thesis option or the dissertation requirements for the Ph.D. program.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IN4MATX 299. Individual Study. 1-12 Units.**

Individual research or investigation under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Software Engineering Courses

**SWE 211. Software Engineering. 4 Units.**

Study of the concepts, methods, and tools for the analysis, design, construction, and measurement of complex software-intensive systems. Underlying principles emphasized. State-of-the-art software engineering and promising research areas covered, including project management.

**SWE 212. Analysis of Programming Languages. 4 Units.**

Concepts in modern programming languages, their interaction, and the relationship between programming languages and methods for large-scale, extensible software development. Empirical analysis of programming language usage.

Same as CS 253.

**SWE 213. Requirements Engineering and Specification. 4 Units.**

Rigorous techniques in requirements engineering - the requirements definition phase of software development - with a focus on modeling and specification. Topics include notations and models for requirements specification; and methods, tools, and processes for software requirements elicitation, representation, analysis.

Restriction: Graduate students only.

**SWE 214. Program Analysis. 4 Units.**

Covers principles and concepts of automated program analysis. Topics include program representations; intra-procedural data-flow analysis; call-graph construction; pointer analysis; alias analysis; inter-procedural analysis; inter-procedural finite distributive subset problems; inter-procedural distributive environment problems; symbolic execution; and program-analysis applications.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Graduate students only.



**SWE 215. Software Analysis and Testing. 4 Units.**

Studies techniques for developing confidence in software from traditional testing schemes to integrated, multitechnique analytic approaches. Considers strengths and weaknesses and explores opportunities for synergistic technique application. Emphasis is on approaches integrated into the software process.

Restriction: Graduate students only.

**SWE 221. Software Architecture. 4 Units.**

Study of the concepts, representation techniques, development methods, and tools for architecture-centric software engineering. Topics include domain-specific software architectures, architectural styles, architecture description languages, software connectors, and dynamism in architectures.

Restriction: Graduate students only.

**SWE 225. Information Retrieval, Filtering, and Classification. 4 Units.**

Algorithms for the storage, retrieval, filtering, and classification of textual and multimedia data. The vector space model, Boolean and probabilistic queries, and relevance feedback. Latent semantic indexing; collaborative filtering; and relationship to machine learning methods.

Prerequisite: CS 161 and CS 171 and (ICS 6N or MATH 3A or MATH 6G)

Same as CS 221.

Restriction: Graduate students only.

**SWE 233. Intelligent User Interfaces. 4 Units.**

Explores example software systems and their underlying concepts that leverage computing to empower and augment human individuals in their activities. Topics span the fields of user interface design, human-computer interaction, software engineering, and cognitive computing.

Prerequisite: CS 171

Restriction: Graduate students only.

**SWE 234. Human Aspects of Software Engineering. 4 Units.**

Selected topics about the cooperative and human aspects of software engineering from the perspective that software engineering is inherently an endeavor involving human stakeholders. Topics may include but are not limited to collaboration, trust, emotion, language, gender, and software tools.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Graduate students only.

**SWE 241P. Applied Data Structures and Algorithms. 2 Units.**

Exploration of strategies to tackle computational problems whose solutions include well-known algorithms and data structures. Topics include sorting, searching, indexing, among others.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only.

**SWE 242P. Network Programming. 2 Units.**

Exploration of networking principles and concepts for the development of distributed software. Topics include programming against well-known network protocols, ports and sockets, and network APIs.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only.

**SWE 243P. Database Programming . 2 Units.**

Exploration of software development with substantial reliance on a database for storage and retrieval of data. Topics include relational databases, structured query language, relational database management systems, APIs and libraries for database programming, among others.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only.

**SWE 244P. Concurrent Programming. 2 Units.**

Exploration of concepts and mechanisms for the development of concurrent software. Topics include threads, locks, race conditions, and deadlocks, among others.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only. Graduate students only.



**SWE 245P. GUI Programming . 2 Units.**

Exploration of interactive software with substantial graphical user interface elements. Topics include libraries and frameworks for GUI programming, layout design and alternatives, event-driven programming, among others.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 246P. Mobile Programming. 2 Units.**

Exploration of contemporary libraries and frameworks for construction of mobile applications. Topics include emulators, mobile development standards and patterns, energy consumption issues, screen layout, among others.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 247P. Applied Information Retrieval. 2 Units.**

Exploration of principles and concepts for textual information retrieval. Topics include tokenization, inverted indexes, scored retrieval, and precision and recall.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 248P. Neural Network Programming . 2 Units.**

Exploration of the concepts, terminology, and processes for training and using deep neural networks for classification problems. Topics include tensors and tensor operations, gradient-based optimization, feature engineering and learning, and workflow of learning systems.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 249P. Applied Data Analytics. 2 Units.**

Exploration of the concepts, terminology, and processes used in supervised and unsupervised learning for classification and clustering, from a software engineering perspective. Topics include K-Nearest Neighbors, Logistic Regression, Random Forests, Support Vector Machines, K-Means, and model assessment.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only.

**SWE 250P. Web Programming. 2 Units.**

Exploration of the concepts, terminology, and popular frameworks for developing full-stack web applications. Students develop simple applications using multiple development stacks, and deploy them on the cloud.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Software Engineering Degree students only.

**SWE 261P. Software Testing and Debugging. 4 Units.**

Designed to teach students how to ensure high-quality software by means of testing, debugging, and other quality assurance activities. Students learn a combination of both theoretical and practical skills, including hands-on experience with modern tools and approaches.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 262P. Programming Styles. 4 Units.**

Designed to teach students the various ways software can be decomposed and put back together. Students are exposed to a variety of different programming styles and composition mechanisms.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 263P. User Experience and Interaction. 4 Units.**

Provides an introduction to the basic principles of human-computer interaction (HCI) and the pragmatic aspects of usability engineering. Topics include the fundamentals of interaction, user experience, design for usability, and evaluation of products for their usability.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 264P. Distributed Software Architecture. 4 Units.**

Study of software system architectures and architectural styles for large-scale distributed applications, and contemporary technologies and standards for their construction. Topics include client-server, peer-to-peer, publish-subscribe, REST, cloud computing, content distribution networks, scalability, latency, caching, and security, among others.

Restriction: Master of Software Engineering Degree students only.

**SWE 265P. Reverse Engineering and Modeling. 4 Units.**

Introduces theories, concepts, representations, techniques, and case studies in understanding large-scale, complex software systems. Topics include static and dynamic modeling notations, manual and (semi-)automated reverse engineering techniques, APIs, patterns, and styles. A significant, hands-on project is included.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 266P. Software Security and Dependability . 4 Units.**

Principles and concepts for the design and construction of secure software. Topics include common types of software security vulnerabilities, methods for detecting vulnerabilities, design and process methodologies to improve security of software, and techniques for assessing security properties of software.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 271P. Career and Entrepreneurship. 4 Units.**

Teaches practical skills for spoken, written, and electronic communication in a range of business and technical contexts, including promoting project ideas and portfolio development. Students practice their skills in classroom presentations and written exercises.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 272P. Project Management. 4 Units.**

Provides an introduction to project management in software engineering from several perspectives. Topics include team behavior; globally distributed work; resource estimation, scheduling, and budgeting. Students apply their knowledge in an ongoing class project.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 275P. Curricular Practical Training. 1 Unit.**

Mandatory internship in which students individually work at an outside organization to gain experience with the challenges involved in the practice of software engineering.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 276P. Capstone Project in Software Engineering. 4 Units.**

Quarter-long software-intensive project focusing on the design and implementation of a novel software system. Students are expected to bring to bear the concepts acquired during the program.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 290. Research Seminar. 2 Units.**

Forum for presentation and criticism by students of research work in progress. Presentation of problem areas and related work. Specific goals and progress of research.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**SWE 290P. Advisement. 0.3 Units.**

Mandatory weekly meetings with a faculty advisor.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Master of Software Engineering Degree students only. Graduate students only.

**SWE 295. Special Topics in Software Engineering. 4 Units.**

Studies in selected areas of software engineering. Topics addressed vary each quarter.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**SWE 298. Thesis Supervision. 2-12 Units.**

Individual research or investigation conducted in preparation for the M.S. thesis option or the dissertation requirements for the Ph.D. program.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**SWE 299. Individual Study. 1-12 Units.**

Individual research or investigation under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Digital Information Systems, Minor

The minor in digital information systems is designed for students who want to learn about information systems and their role in business, without preparing to be computer programmers. Many businesses, whether commerce- or service-oriented, are now driven by the information their IT systems capture about customers, their habits, and relevant aspects of the business. Students completing the digital information systems minor learn about the "why" of digital information systems, the technological underpinnings of these systems, and constraints on their design and use.

The minor is ideally suited for students in programs such as business administration, economics, civil engineering or urban studies, where digital information systems are essential to the primary task at hand.

The minor includes course work covering the opportunities and limitations of digital information systems, their design and advanced topics such as information retrieval and visualization. Students completing the minor will gain practical experience designing digital information systems and their interfaces in a variety of different domains.

The minor offers flexibility in the courses that students choose to take, and does not require prior programming experience. While it is possible to enroll in more technical classes, it is also possible to complete the minor without taking courses in programming.

A. Select one of the following:

I&C SCI 10	How Computers Work
I&C SCI 20	Invitation to Computing
I&C SCI 31	Introduction to Programming

B. Select two of the following:

I&C SCI 3	Internet Technologies and their Social Impact
I&C SCI 4	Human Factors for the Web
I&C SCI 5	Global Disruption and Information Technology
I&C SCI 11	The Internet and Public Policy
I&C SCI 32	Programming with Software Libraries
I&C SCI 32A	Python Programming and Libraries (Accelerated)
IN4MATX 43	Introduction to Software Engineering <sup>1</sup>
I&C SCI 61	Game Systems and Design

C. Select four of the following:

I&C SCI 105	Digital Information Systems <sup>1</sup>
IN4MATX 131	Human Computer Interaction
IN4MATX 132	Project in Human-Computer Interaction Requirements and Evaluation
IN4MATX 143	Information Visualization
IN4MATX 148	Project in Ubiquitous Computing
IN4MATX 151	Project Management
IN4MATX 161	Social Analysis of Computing
IN4MATX 162W	Organizational Information Systems
IN4MATX 163	Project in the Social and Organizational Impacts of Computing

IN4MATX 171	Introduction to Medical Informatics
IN4MATX 172	Project in Health Informatics

<sup>1</sup> Students cannot take both IN4MATX 43 and I&C SCI 105.

NOTE: Bren School of ICS majors may not minor in Digital Information Systems. Courses used to complete the minor in Digital Information Systems may not also count toward the requirements for the Information and Computer Science minor or the Informatics minor.

## Health Informatics, Minor

The minor in health informatics prepares students to understand the expanding role of information technology in health care. Doctors, nurses, public health officials, and administrators all interact with information technology and, at times, are intimately involved in the design of information technology solutions to health care issues. Students in the minor learn about the possibilities and limitations of information technology, how its use is changing the health care profession, and how the design of information technology must be performed principally with the users and a range of domain considerations in mind.

The minor is ideally suited for students in programs such as nursing science, public health sciences, and pharmaceutical sciences, as well as students in Bren School majors who wish to gain strong exposure to the domain of health informatics.

The minor includes course work and fieldwork covering a variety of health care settings, including the hospital, doctor's office, and home care. Students completing the minor will gain practical experience in understanding the health care needs of communities and individuals, and in designing information technology solutions that serve them better.

The minor offers flexibility in the courses that students choose to take, and does not require prior programming experience. While it is possible to enroll in more technical classes, it is also possible to complete the minor without taking courses in programming.

### A. Complete:

IN4MATX 171	Introduction to Medical Informatics
IN4MATX 172	Project in Health Informatics

### B. Select two of the following:

I&C SCI 4	Human Factors for the Web <sup>1</sup>
I&C SCI 10	How Computers Work <sup>1</sup>
I&C SCI 20	Invitation to Computing
I&C SCI 31	Introduction to Programming <sup>1</sup>
I&C SCI 32	Programming with Software Libraries <sup>1</sup>
I&C SCI 32A	Python Programming and Libraries (Accelerated)
IN4MATX 121	Software Design: Applications
IN4MATX 131	Human Computer Interaction
IN4MATX 133	User Interaction Software
IN4MATX 143	Information Visualization
COMPSCI 111	Digital Image Processing
COMPSCI 121/IN4MATX 141	Information Retrieval
COMPSCI 122A	Introduction to Data Management
COMPSCI 131	Parallel and Distributed Computing
COMPSCI 134	Computer and Network Security
COMPSCI 145	Embedded Software
COMPSCI 171	Introduction to Artificial Intelligence
COMPSCI 178	Machine Learning and Data-Mining

### C. Select two of the following:

NUR SCI 110W	Frameworks for Professional Nursing Practice
PUBHLTH 101	Introduction to Epidemiology
PUBHLTH 122	Health Policy

### D. Select one of the following:

IN4MATX 151	Project Management
IN4MATX 161	Social Analysis of Computing
IN4MATX 162W	Organizational Information Systems
STATS 7	Basic Statistics

STATS 8

Introduction to Biological Statistics

STATS 67

Introduction to Probability and Statistics for Computer Science

<sup>1</sup> This course may only be counted by majors outside of the Bren School of ICS.

NOTE: A student must earn a grade of C or better in all courses used to satisfy the requirements of this minor.

## Informatics, B.S.

Want to learn how to design better user interfaces? Curious to learn how to observe people when they use information technology and how to turn your findings into innovative products? Wondering how evolving privacy laws affect the design of software worldwide? Care about helping people in need with smart apps? Interested in learning how organizations work and how information technology can support their practices?

If you answered yes to one or more of these questions, UC Irvine's Informatics major just might be the choice for you.

The B.S. in Informatics is designed around a small set of core courses that introduce the fundamentals of Informatics (human computer interaction, design), software (programming, requirements analysis), and human behavior (social analysis of computerization). From there, three specializations — human-computer interaction, health informatics, and organizations and information technology — enable students to focus their learning with more than three dozen courses from which they can choose. The major is inherently interdisciplinary, with courses ranging from sociology and psychology to management and public health, depending on the specialization chosen.

Throughout the major, a variety of project courses offer students hands-on experiences in creative design practices, app development, ethnography, information management, business IT, and other topics. You learn how to apply your skills in different domains and work in different teams, culminating in a two-quarter capstone course in which you engage in a real-world project sponsored by a company or organization outside the university.

Overall, the major strongly emphasizes people and design; building an understanding of how existing technologies shape human behavior, society, and culture; and how we can design future technologies that better fit human and organizational practices. Given the fluid nature of people's expectations for information technology and what tomorrow's technology can offer, students learn how to adapt to the continuous new circumstances of the profession — whether it is a new client and their habits, an emerging new device or software capability, or a new team and its practices.

Informatics majors complete one of four specializations: Human-Computer Interaction (HCI), Organizations and Information Technology (OIT), Health Informatics (HI), or Specialization in Individual Studies. More information is available at the Department of Informatics website (<http://www.informatics.uci.edu/undergrad/bs-informatics/>).

Freshmen Applicants: See the Undergraduate Admissions section.

### Transfer Applicants:

Transfer applicants who satisfactorily complete course prerequisites will be given preference for admission. All applicants must complete the following required courses: one course in statistics or boolean algebra, one year of object-oriented programming (python, java, C++), and completion of lower-division writing. Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Visit the *UCI Office of Admissions website* for information on transfer requirements for our major.

Bren School of ICS majors (including shared majors, BIM, and CSE) pursuing minors within the Bren School of ICS may not count more than five courses toward both the major and minor. Some ICS majors and minors outside of the School are not permitted due to significant overlap. Visit the ICS Student Affairs Office website for Majors and Minors restrictions. ([http://www.ics.uci.edu/ugrad/degrees/MajorMinor\\_Restrictions\\_Chart.pdf](http://www.ics.uci.edu/ugrad/degrees/MajorMinor_Restrictions_Chart.pdf)) All students should check the Double Major Restrictions Chart ([http://www.ics.uci.edu/ugrad/degrees/DbI\\_Major\\_Restr\\_Chart.pdf](http://www.ics.uci.edu/ugrad/degrees/DbI_Major_Restr_Chart.pdf)) and view our information page ([http://www.ics.uci.edu/ugrad/degrees/Double\\_Majors.php](http://www.ics.uci.edu/ugrad/degrees/Double_Majors.php)) on double majoring to see what degree programs are eligible for double majoring.

**All students must meet the University Requirements.**

### Major Requirements

#### Lower-division

A. Select one of the following series:

I&C SCI 31- 32- 33

Introduction to Programming  
and Programming with Software Libraries  
and Intermediate Programming

or

I&C SCI 32A- 33

Python Programming and Libraries (Accelerated)  
and Intermediate Programming

B. Complete:

I&C SCI 45J

Programming in Java as a Second Language

IN4MATX 43

Introduction to Software Engineering

I&C SCI 6B	Boolean Logic and Discrete Structures
STATS 7	Basic Statistics
or STATS 67	Introduction to Probability and Statistics for Computer Science

**Upper-division****A. Informatics Core Requirements:**

IN4MATX 113	Requirements Analysis and Engineering
IN4MATX 121	Software Design: Applications
IN4MATX 131	Human Computer Interaction
IN4MATX 151	Project Management
IN4MATX 161	Social Analysis of Computing
IN4MATX 191A- 191B	Senior Design Project and Senior Design Project

**B. One of the following specializations:****1. Specialization in Human-Computer Interaction**

Complete:

IN4MATX 132	Project in Human-Computer Interaction Requirements and Evaluation
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and select three of the following:

IN4MATX 133	User Interaction Software
IN4MATX 141	Information Retrieval
IN4MATX 143	Information Visualization
IN4MATX 153	Computer Supported Cooperative Work
IN4MATX 162W	Organizational Information Systems
IN4MATX 171	Introduction to Medical Informatics

and select two project courses from the following:

IN4MATX 125	Computer Game Development
IN4MATX 134	Project in User Interaction Software
IN4MATX 148	Project in Ubiquitous Computing
IN4MATX 163	Project in the Social and Organizational Impacts of Computing
IN4MATX 172	Project in Health Informatics

and select two additional courses from the following:

IN4MATX 100–190

**2. Specialization in Organizations and Information Technology**

Complete:

IN4MATX 141	Information Retrieval
IN4MATX 162W	Organizational Information Systems
IN4MATX 163	Project in the Social and Organizational Impacts of Computing
MGMT 5	Management of Contemporary Organizations
MGMT 102	Managing Organizational Behavior

and select four of the following:

MGMT 107	Introduction to Management Information Systems
MGMT 173	Business Intelligence for Analytical Decisions
MGMT 178	Management of Information Technology
PSCI 9	Introduction to Psychology
PSCI 104S	Social Animal: An Introduction to Social Psychology
PSCI 176S	Motivation
SOCIOL 41	Small Group Dynamics
SOCIOL 135	Social Psychology of Networks
SOCIOL 141	Organizations
SOCIOL 143	Social Networks and Social Support
SOCIOL 145	Occupations and Professions

IN4MATX 100–190

and select two additional courses from the following:

IN4MATX 100–190

COMPSCI 100–199

**3. Specialization in Health Informatics**

Complete the following:

IN4MATX 171 Introduction to Medical Informatics

IN4MATX 172 Project in Health Informatics

Select four from the following:

IN4MATX 124	Internet Applications Engineering
IN4MATX 132	Project in Human-Computer Interaction Requirements and Evaluation
IN4MATX 133	User Interaction Software
IN4MATX 134	Project in User Interaction Software
IN4MATX 141	Information Retrieval
IN4MATX 143	Information Visualization
IN4MATX 148	Project in Ubiquitous Computing
IN4MATX 153	Computer Supported Cooperative Work
IN4MATX 162W	Organizational Information Systems
IN4MATX 163	Project in the Social and Organizational Impacts of Computing
COMPSCI 111	Digital Image Processing
COMPSCI 122A	Introduction to Data Management
COMPSCI 131	Parallel and Distributed Computing
COMPSCI 134	Computer and Network Security
COMPSCI 145- 145L	Embedded Software and Embedded Software Laboratory
COMPSCI 171	Introduction to Artificial Intelligence
COMPSCI 178	Machine Learning and Data-Mining

and select two courses from the following:

NUR SCI 110W	Frameworks for Professional Nursing Practice
PUBHLTH 101	Introduction to Epidemiology
PUBHLTH 122	Health Policy

and select two additional courses from the following:

IN4MATX 100-199
COMPSCI 100-199
PUBHLTH 100-199

**4. Specialization in Individual Studies <sup>1</sup>**

<sup>1</sup> Informatics majors must complete a detailed proposal to apply for this specialization. All candidates must meet the following minimum qualifications for consideration:

- UCI transcript demonstrating at least 3.0 UC GPA.
- Completion of at least 46 units or sophomore standing at UC Irvine.

Proposals must include the following:

- Syllabi and/or course descriptions of intended coursework.
- Academic plan demonstrating completion of 40 units of credit that significantly complements the core Informatics courses to create a coherent curriculum focused on studying some aspect of living, working, and building in a digital world.
- Students entering as freshmen should plan to submit their proposals no later than the beginning of spring quarter of the freshman year. Students entering as transfers must submit their proposals no later than the beginning of spring quarter of their first year at UCI.
- Students must submit their approval proposals to the ICS Student Affairs no later than two weeks after receiving a signature.

All proposals are to be submitted to the Department of Informatics' Undergraduate Vice Chair for approval. Failure to receive approval will require majors to choose another specialization for the major. Information about the Department of Informatics can be found at [informatics.uci.edu](http://informatics.uci.edu) (<http://www.informatics.uci.edu>).

**Sample Program of Study — Informatics: Health Informatics (HI)****Freshman**

Fall	Winter	Spring
I&C SCI 31	I&C SCI 32	I&C SCI 33
I&C SCI 90	I&C SCI 6B	IN4MATX 43

STATS 7	WRITING 39B	WRITING 39C
WRITING 39A		
<b>Sophomore</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
I&C SCI 45J	IN4MATX 113	Specialization
IN4MATX 121	IN4MATX 131	General Education III
IN4MATX 161	U-D Writing	General Education IV
	General Education III	
<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
Specialization	IN4MATX 151	Specialization
Specialization	Specialization	Specialization
General Education III	General Education IV	General Education VI
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
IN4MATX 191A	IN4MATX 191B	Specialization
Specialization	Specialization	Specialization
General Education IV	General Education VII	General Education VIII

### Sample Program of Study — Informatics: Human-Computer Interaction (HCI)

<b>Freshman</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
I&C SCI 31	I&C SCI 32	I&C SCI 33
STATS 7	I&C SCI 6B	IN4MATX 43
WRITING 39A	WRITING 39B	WRITING 39C
I&C SCI 90		
<b>Sophomore</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
I&C SCI 45J	IN4MATX 113	Specialization
IN4MATX 161	IN4MATX 131	General Education III
Specialization	General Education IV	General Education IV
<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
IN4MATX 121	IN4MATX 151	Specialization
Specialization	Specialization	General Education III
General Education III	U-D Writing	General Education VI
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
IN4MATX 191A	IN4MATX 191B	Specialization
Specialization	Specialization	Specialization
General Education IV	General Education VII	General Education VIII

### Sample Program of Study — Informatics: Organizations and Information Technology (OIT)

<b>Freshman</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
I&C SCI 31	I&C SCI 32	I&C SCI 33
STATS 7	I&C SCI 6B	IN4MATX 43
WRITING 39A	WRITING 39B	WRITING 39C
I&C SCI 90		
<b>Sophomore</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
I&C SCI 45J	IN4MATX 113	Specialization
IN4MATX 161	IN4MATX 131	General Education III
Specialization	General Education III	General Education IV
	General Education IV	
<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
IN4MATX 121	IN4MATX 151	Specialization
Specialization	Specialization	Specialization
General Education III	U-D Writing	General Education VI



Senior		
Fall	Winter	Spring
IN4MATX 191A	IN4MATX 191B	Specialization
Specialization	Specialization	General Education IV
General Education VII	Specialization	General Education VIII

## Informatics, M.S.

Information technology is transforming the world around us, from electronic medical records, to games for learning and social change, from information systems that help us live together more sustainably to devices and applications that allow us to track the body in unprecedented ways. The M.S. program in informatics at UC Irvine helps position students to understand the relationship between people and computing: How do existing technologies shape human behavior, society and culture, and how can we design future technologies to better serve humanity?

The M.S. in Informatics is a heavily research oriented program aimed at students with bachelor's degrees in a variety of disciplines (e.g. computer science, social science, the arts) who may or may not have been part of the full time workforce already. In particular, this program is aimed toward students who seek to develop a deeper understanding of the relationship between people and technology. While not all M.S. students will choose to do a Ph.D. following their Master's, the research focus of this program makes it ideal for those considering a Ph.D. (such as our Ph.D. Informatics (<https://www.informatics.uci.edu/grad/phd-informatics/>) program).

For students interested in pursuing a professionally-oriented degree, looking to find a position or advance their careers within a corporate context, and working directly with industry mentors and clients around questions of user experience and design, we encourage you to consider our MHCID program (<https://www.informatics.uci.edu/grad/mhcid/>).

The research oriented M.S. in Informatics is organized around a set of core courses that introduces the fundamentals of informatics, followed by a broader range of potential elective courses through which students can choose to focus their learning. Throughout, students are exposed to the theory, tools, methods, approaches and practicalities of informatics research, including topics such as social computing, human-computer interaction and collaborative work. Many of the courses include project work, typically performed in teams, and frequently leading to concrete outcomes in the form of papers that may be developed into scholarly publications.

Most students in this program write a Master's thesis to explore a particular research topic in depth. For two (or more if you wish) quarters, students writing theses will join a research group, contribute to a research project, and write a thesis summarizing your efforts. There is an alternate pathway in which students take a comprehensive examination instead of completing a thesis. With one of the largest and most diverse faculty in the world dedicated to the topic of informatics, UCI offers a broad range of projects from which to choose.

For additional information about this degree program, please see: <https://www.informatics.uci.edu/grad/ms-informatics/>

### Requirements

Students must complete courses, including a research methods core, and research experience courses related to their final thesis. Students must maintain satisfactory academic progress according to the requirements of the program as maintained by the faculty and posted publicly.

A. Complete the following:

#### Core Courses

IN4MATX 261	Social Analysis of Computing
IN4MATX 232	Research in Human-Centered Computing
IN4MATX 209S	Seminar in Informatics (twice, usually in the first year)

B. Complete the following:

#### Research Methods Core

IN4MATX 201	Research Methodology for Informatics
IN4MATX 203	Qualitative Research Methods in Information Systems
IN4MATX 205	Quantitative Research Methods in Information Systems

C. Complete two quarters of IN4MATX 298.<sup>1</sup>

D. Select six graduate-level electives.<sup>2</sup>

<sup>1</sup> To coincide with the completion of the M.S. thesis.

<sup>2</sup> The selection of courses should form a coherent educational plan to be approved by the student's faculty advisor. Although the courses may be chosen from any graduate-level courses on campus, it is recommended that at least three be chosen from within the School of Information and Computer Sciences. At most, 12 units of IN4MATX 298 and IN4MATX 299 may be used as electives.

### Final Examination

#### Plan One

The M.S. thesis defense committee is formed in accordance to UCI Senate regulations. This committee must approve the following for the student to pass the final examination:

**Thesis document:** The student must prepare the written dissertation in accordance with Academic Senate regulations and present this document to the committee with enough advance notice for appropriate review and critique prior to an oral defense. Following an oral defense of this document, any changes required must be approved by the entire committee.

**Oral defense:** The student must pass an oral dissertation defense that consists of a public presentation of the student's research followed by an oral examination by the student's doctoral committee. To ensure the public has an opportunity to participate in this examination, the student must announce the defense title, date, and time at least two weeks prior to the event to all faculty and doctoral students in the department.

## Plan Two

In the final quarter of study, the student must take a comprehensive examination given by Informatics faculty. The examination covers the core requirements.

Students transferring from the Ph.D. program in Informatics to the M.S. program in Informatics who pass the Ph.D. Advancement exam at a Master's level may substitute that exam for the comprehensive exam.

## Informatics, Minor

The minor in informatics prepares students to understand the relationship between information technology and people. The finance, movie, journalism, and pharmaceutical industries are just a few examples of where the use of innovative information technology has radically changed our world, in terms of what is now possible, how humans perform their jobs, and how society has critically reacted and adapted to new realities brought forth by information technology use. Students in the minor learn how existing technologies shape human behavior, society and culture, and are introduced to techniques that will enable them to design future technologies that better fit human and organizational practices.

The minor is ideally suited for students in programs such as film and media studies, education sciences or social policy, and public service, where information technology is an integral part of the profession, but not necessarily the primary focus.

The minor includes course work covering a variety of topics, including programming, software engineering, human computer interaction, and social analysis of computerization. Students completing the minor will gain practical experience in designing and building small software systems, creating novel user interfaces, and examining how information technology affects those around it.

The minor offers flexibility in the courses that students choose to take, and does not require prior programming experience. The minor does have a technical underpinning, however, with core courses that teach students how to program software.

A. Select one of the following series:

I&C SCI 31- 32- 33	Introduction to Programming and Programming with Software Libraries and Intermediate Programming
or	
I&C SCI 32A- 33	Python Programming and Libraries (Accelerated) and Intermediate Programming

B. Complete:

IN4MATX 43	Introduction to Software Engineering
IN4MATX 131	Human Computer Interaction
IN4MATX 161	Social Analysis of Computing

and at least two additional upper-division courses in Informatics.

**NOTE:** A maximum of two courses can be taken Pass/Not Pass toward a minor. Bren School majors should refer to the Majors/Minors Restrictions *Catalogue* section before attempting to minor in Digital Information Systems, Health Informatics, or Informatics. Students who are considering a major in Informatics must complete the major requirements for a letter grade.

## Informatics, Ph.D.

A new app assisting kids with autism spectrum disorder. New insights on creativity and how it develops in tech startups in the U.S. and abroad. New techniques for balancing privacy versus personalization in web apps. New lessons about the impact of multitasking on our health. A new tool that helps people design sustainable gardens.

These are just some examples of the wide variety of projects being worked on by current Ph.D. students in the Informatics Ph.D. program at UC Irvine.

With information technology redefining our personal and work lives everywhere, it is critical that it be designed to fit human needs and capabilities. Whether in medicine, entertainment, science, education, environmental sustainability, family life or crisis management, much work needs to be done to improve our understanding of the role information technology can play, how it should be designed, and what its true impact really can be.

The Informatics Ph.D. program offers students the opportunity to study all aspects of living, working and building in a digital world, including: developing an understanding of human needs by going into the field; designing new technology; putting technology to use in laboratory experiments and trial deployment; or devising theories about information technology and its role in society. With one of the largest and most diverse faculty in the world dedicated to the topic of informatics, the program offers opportunities for everyone, whether you prefer to work directly with people, are more technically inclined, or both.

A strong core of classes introduces students to classic material and recent innovations. At the same time, we focus on research from the beginning. New students are encouraged to work with multiple faculty members in their first two years to gain a broad exposure to the many aspects of informatics. It is crucial for early-career scholars to become familiar with the varied nature of research, write papers, attend conferences and begin to be a part of the broader community. The focus on research continues throughout, with an emphasis on publishing novel results in the appropriate venues in order to help students position themselves well for the competitive job market.

For additional information about this degree program, please see: <https://www.informatics.uci.edu/grad/phd-informatics/>

## Program of Study

### Pre-Candidacy Course Requirements

#### 1. Required Core Courses

IN4MATX 209S	Seminar in Informatics (twice, usually in the first year)
IN4MATX 232	Research in Human-Centered Computing
IN4MATX 261	Social Analysis of Computing

#### 2. Research Methods Core

IN4MATX 201	Research Methodology for Informatics
IN4MATX 203	Qualitative Research Methods in Information Systems
IN4MATX 205	Quantitative Research Methods in Information Systems
IN4MATX 207S	Doctoral Seminar on Research and Writing (once, usually after first year)

#### 3. Research Experience

IN4MATX 299	Individual Study (four quarters required pre-advancement, recommended at least two quarters per year in each of the first two years)
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#### 4. Electives in Informatics (6 Ph.D. level classes, all four units)

A set of six elective courses. The selection of courses should form a coherent educational plan to be approved by the student's faculty advisor and by the Informatics Ph.D. program director. A written record of this plan and its approval must be filed with the Ph.D. program director prior to advancement. Although the courses may be chosen from any Ph.D. level courses on campus, it is recommended that at least three be chosen from within the School of ICS.

## Teaching Requirements

To enhance their education and experience in teaching, all students will be required to work as readers or TAs for at least two quarters. Additionally, before or during the first quarter in which they are working in this capacity, all students will enroll in I&C SCI 398A, a two-unit seminar. Those students wishing to gain more instruction around their teaching may also enroll in I&C SCI 398B, the advanced teaching seminar, which is also a two-unit seminar.

## Field Examinations

There will be no formal field evaluations. However, each year, students will be evaluated individually and given written feedback about their progress (for first year students, this evaluation will take place before the end of Spring quarter; for continuing students, it will take place before the end of Fall quarter.) In preparation, students will write a statement about their progress and meet with their advisors who give some feedback and complete a form reporting their assessment of the student's progress. The program faculty as a whole will then meet to discuss all the students, with a letter written to the student summarizing the assessment and, if necessary, deadlines for specific activities to be finished or goals to be achieved. This evaluation letter will state either that the student is making good progress or has been given cautionary status. The students who have certain activities to finish will be reviewed again six months after this evaluation. A second cautionary review constitutes formal failure to make adequate progress within the program.

## Qualifying Exam

*At the end of the student's second year.* The student develops an appropriate reading list to fit his/her areas of interest within Informatics, co-developed with the advisor. The student then writes a paper synthesizing this literature and noting the areas that are currently interesting and under-researched. The paper serves as the basis for an oral examination, generally in the Spring quarter of the second year.

*At the end of the third year.* The student will be evaluated by an assessment of a research portfolio. A portfolio should comprise three papers of publishable quality, as judged by the faculty. These papers might well be expansions or developments from term papers developed in class; the goal

is to determine the student's capacity to produce research writing of publishable quality. Student may work on papers collaboratively, but the portfolio as a whole must demonstrate writing ability through single-authored or lead-authored work. (Collaboratively written papers will be accompanied by a statement of contributions signed by all authors.)

The students are encouraged to report on projects conducted with at least two different faculty members. Advancement to candidacy is on the basis of an oral defense of the research portfolio, normally in the Spring of the third year. The advancement committee is formed in accordance with UCI campus regulations.

### Doctoral Dissertation

Students are required to complete a doctoral dissertation in accordance with Academic Senate regulations. In addition, they must pass an oral dissertation defense that consists of a public presentation of the student's research followed by an oral examination by the student's doctoral committee. The dissertation must be approved unanimously by the committee.

### Final Examination

The dissertation defense committee is formed in accordance to UCI Senate regulations. This committee must approve the following for the student to pass the final examination:

**Dissertation topic:** The student must present a substantial written document representing the student's dissertation plan. This document must include the proposed dissertation abstract, a dissertation outline, a comprehensive survey of related work, and a detailed plan for completing the work. The student must present this dissertation plan to the dissertation committee, who must unanimously approve the student's proposal.

**Dissertation document:** The student must prepare the written dissertation in accordance with Academic Senate regulations and present this document to the committee with enough advance notice for appropriate review and critique prior to an oral defense. Following an oral defense of this document, any changes required must be approved by the entire committee.

**Oral defense:** The student must pass an oral dissertation defense that consists of a public presentation of the student's research followed by an oral examination by the student's doctoral committee. To ensure the public has an opportunity to participate in this examination, the student must announce the defense title, date, and time at least two weeks prior to the event to all faculty and doctoral students in the department.

### Normative Time from Matriculation to Degree

Students making normal progress are expected to complete their coursework and produce 2-3 research papers of publishable quality in three years. The dissertation proposal is expected midway through the fourth year, with completion in the sixth.

## Master of Human Computer Interaction and Design

This is a professional degree that prepares students to be the leaders of the future in human-computer interaction, user experience design and research, product management, and more. This degree should be undertaken by early and mid-career professionals and executives looking to take the next step in their careers. For additional information about this degree program, please see: <https://www.informatics.uci.edu/grad/mhcid/>

Applicants are evaluated on the basis of their prior academic record and letters of reference from people either in the student's academic history or work settings. Students applying to the program may have degrees in any field, though preference is generally given to those with a technical, social science, or design background and those with work experience. All applicants are evaluated on the materials submitted: letters of recommendation, official college transcripts, and personal statement. Applicants are strongly encouraged to additionally submit either official GRE test scores or a relevant work portfolio. For more information, contact the ICS graduate counselor at 949-824-5156 or [mhcid@ics.uci.edu](mailto:mhcid@ics.uci.edu). For additional information about this degree program, please see: <https://mhcid.ics.uci.edu/>

All Master of Human Computer Interaction and Design students are expected to maintain a minimum GPA of 3.0 throughout the program, with no individual grade lower than a B-.

A. Complete the following:

IN4MATX 280	Overview of Human-Computer Interaction and Design
IN4MATX 281	User Needs Analysis
IN4MATX 282	Design and Prototyping
IN4MATX 283	User Experience Evaluation
IN4MATX 284	Advanced Design and Prototyping
IN4MATX 285	Interactive Technology Studio
IN4MATX 286	Innovations in HCI and Design
IN4MATX 287	Capstone Project in HCI and Design
IN4MATX 288	Capstone Project and Portfolio

The final examination for the M.H.C.I.D. includes three components: 1) Performance on a capstone project that incorporates skills and knowledge from the entire program; 2) Individual and peer evaluations of performance within the capstone project team; and 3) Assessment of a completed portfolio.

Students making normal progress are expected to complete the degree program in approximately 12 months. A guide to sensible program completion in two years is provided, but the 12-month completion time is recommended.

## Master of Software Engineering

The Master of Software Engineering (MSWE) program is a highly focused degree program that prepares students to acquire deep knowledge of software engineering – both in terms of foundational skills and in terms of application of that foundation to practice.

At the completion of the program, students will be knowledgeable in the underlying principles of software engineering and will have acquired solid practical skills. They will be able to effectively participate in large-scale software development efforts by applying a range of techniques for design, development, validation, and verification of high-quality software.

The program consists of four thrusts: (1) programming breadth, provided by a set of courses whose purpose is to solidify and broaden the students' knowledge of the computing landscape through programming; (2) software engineering principles, introduced via a set of courses covering the fundamental technical knowledge in software engineering; (3) professional development, covered by a pair of courses discussing topics related to career and professional development; and (4) practice, included pervasively throughout the program and emphasized strongly by two courses focused on practical applications of the principled material in the program.

Applicants must have a bachelor's degree or equivalent.

Applicants are evaluated on the following:

- Demonstrated interest in pursuing a career as a software engineer (evidence of this may be in the form of contributions to open source projects, extra-curricular activities at the undergraduate level involving software development, current or past employment as a software developer, course selections as an undergraduate, or having been involved as a programmer in at least one non-trivial software application).
- Proficiency in at least two programming languages
- Knowledge of algorithms and data structures
- Proficiency in written and spoken English
- (Optional, but strongly encouraged) Additional material that enriches the application and speaks to the applicant's strengths (e.g., design portfolio, link to GitHub profile, GRE test scores, scholarly papers submitted and/or published, writing samples).

For more information, contact the MSWE Program Director at 949-824-8956 or email [mswe@ics.uci.edu](mailto:mswe@ics.uci.edu) (%20mswe@ics.uci.edu).

### Program Requirements

All MSWE students must maintain a minimum 3.0 GPA throughout the program with no individual grade lower than a B-. In order to stay in the program past the first quarter, students must complete two-thirds of the programming breadth courses for which they are enrolled with a grade of B or higher. Students who do not meet this special requirement will be considered for dismissal from the program.

A. Complete:

SWE 261P	Software Testing and Debugging
SWE 262P	Programming Styles
SWE 263P	User Experience and Interaction
SWE 264P	Distributed Software Architecture
SWE 265P	Reverse Engineering and Modeling
SWE 266P	Software Security and Dependability
SWE 271P	Career and Entrepreneurship
SWE 272P	Project Management
SWE 275P	Curricular Practical Training
SWE 276P	Capstone Project in Software Engineering
SWE 290P	Advisement

B. Select six courses from SWE 240P to SWE 259P

### Final Examination

For the final examination, students are required to write a technical report and prepare an oral presentation describing their capstone project. The final examination takes place in the final quarter of the program and is conducted by the faculty teaching the Capstone Project in Software Engineering course.

## Normative Time to Degree

Full-time MSWE students are expected to complete the degree requirements within one year and one quarter (15 months). A maximum one-year extension may be granted to students who, due to unforeseen circumstances, are unable to fulfill the program's requirements within 15 months. As such, the normative time to degree for full-time students is 15 months, with 27 months as maximum time to degree.

Part-time MSWE students are expected to complete the degree requirements within two years and one quarter (27 months). A maximum one-year extension may be granted to students who, due to unforeseen circumstances, are unable to fulfill the program's requirements within 27 months. As such, the normative time to degree for part-time students is 27 months, with 39 months as maximum time to degree.

## Software Engineering, M.S.

Software engineering is the application of a systematic, disciplined, quantifiable approach to development, operation, and maintenance of software; that is, the application of engineering to software. It is an interdisciplinary field of study that bridges the boundaries of computer science, engineering, mathematics, and behavioral science.

The M.S. Software Engineering (MSSE) program at UC Irvine is a heavily research-oriented program aimed at students with a computer science (or related) bachelor's degree, who may or may not have been out in the workforce already, and who seek to build a strong background in software engineering. In particular, this program is aimed toward students who seek to develop a deeper understanding of the processes, tools, and techniques involved in the creation of dependable, large-scale software systems. While not all M.S. students will choose to do a Ph.D. following their Master's, the research focus of this program makes it ideal for those considering a Ph.D. (such as our Ph.D. Software Engineering (<https://www.informatics.uci.edu/grad/phd-software-engineering/>) program).

For students interested in pursuing a professionally-oriented degree, working directly with industry mentors and clients on software engineering projects, and looking to find a position or advance their career within a corporate context, we encourage you to consider our MSWE (<https://www.informatics.uci.edu/grad/mswe/>) program.

The MSSE program is designed around a set of core courses that introduces the fundamentals of software engineering, followed by a broader range of courses through which students can choose to focus their learning. Students could choose to augment their core with more computer science-oriented courses (e.g., network and distributed systems security, next generation search systems), data science courses (e.g., machine learning, data mining), end-user oriented courses (e.g., user interface design and evaluation, ubiquitous computing and interaction), or advanced software engineering courses (e.g., software architecture, software analysis and testing).

Throughout, students are exposed to the theory, tools, methods, approaches and practicalities of software engineering. Many of the courses include project work, often performed in teams, and frequently culminating in a system, prototype or conceptual design.

The students are required to complete and defend an M.S. thesis under the direction of a faculty advisor. For at least three quarters, the student will join a research group, contribute to a research project, and write a thesis summarizing the outcome of their research. With no fewer than seven faculty members running software engineering research groups, you will have a diverse range of projects from which to choose. The M.S. thesis provides an excellent experience for students interested in continuing toward a Ph.D. program or to pursue a career as a researcher in corporate or government laboratories.

For additional information about this degree program, please see: <https://www.informatics.uci.edu/grad/ms-software-engineering/>

## Course Requirements

A. Complete

SWE 211	Software Engineering
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B. Complete five elective courses <sup>1</sup>

C. Complete at least three quarters of individual study and/or thesis supervision courses

D. Select additional courses in order to fulfill 48 units <sup>2</sup>

<sup>1</sup> All five elective courses must be regular, 4-unit courses from the School of Information and Computer Sciences. At least three of the elective courses should be from the SWE 2XX series. Individual study, thesis supervision, and seminars do not qualify as electives.

<sup>2</sup> The selection of courses should form a coherent educational plan that is approved by the student's faculty advisor.

Additionally, students are expected to attend at least 20 talks from within the several seminar series in ICS. Attendance bears no course credit, but it is required for advancement to candidacy. The student's faculty advisor is responsible for ensuring this requirement is met.

## Capstone Requirement

**Thesis:** Students must take and pass the Research Assessment examination. Additionally, students are required to defend their thesis in a public exam according to UCI Senate Policy. This requirement must be completed by the end of the second year.



## Restriction

The M.S. will not be awarded to students who currently hold a M.S. in Software Engineering or a related field from the same or another university.

## Requirements Beyond Graduate Division Minimum Requirements

All M.S. students are expected to maintain a minimum GPA of 3.0 throughout the program. Failure to maintain this minimum will result in a recommendation that the student be disqualified. In addition, no grade lower than a B is counted toward satisfying any course requirements.

# Software Engineering, Ph.D.

A new code search engine. New insights into how trust emerges (or doesn't) in distributed software development organizations. New visualizations to aid developers in debugging code. New lessons about the quality of open-source components. A new Internet infrastructure that enables secure computational exchange.

These are just some examples of the wide variety of projects being worked on by current Ph.D. students in the software engineering Ph.D. program at UC Irvine.

As software continues to transform society in dramatic and powerful ways, we must improve our ability to reliably develop high-quality systems. From early incarnations as just an idea or set of requirements to when software is actually built, deployed and customized in the field, many challenges exist across the lifecycle that make creating software still a non-trivial endeavor today.

The software engineering Ph.D. program offers students the opportunity to tackle these challenges, whether it is through designing new tools, performing studies of developers and teams at work, creating new infrastructures or developing new theories about software and how it is developed. No fewer than six faculty members bring a broad range of expertise and perspectives to the program, guaranteeing a diverse yet deep education in the topic.

A strong core of classes introduces students to classic material and recent innovations. At the same time, we focus on research from the beginning. New students are required to identify and experiment with one or more research topics early, so that they can become familiar with the nature of research, write papers, attend conferences and begin to become part of the broader software engineering community. This focus on research naturally continues throughout the program, with an emphasis on publishing novel results in the appropriate venues.

For additional information about this degree program, please see: <https://www.informatics.uci.edu/grad/phd-software-engineering/>

## Program of Study

### Pre-Candidacy Course Requirements

Students must complete a software engineering core course, five elective courses, and at least three quarters of individual study and/or thesis supervision courses. Students must take additional courses of their own choosing or additional individual studies, in order to fulfill 48 units before advancement to candidacy. The selection of courses should form a coherent educational plan to be approved by the student's faculty advisor.

1. Software Engineering Core Courses:

SWE 211	Software Engineering
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2. Complete five Software Engineering electives. <sup>1</sup>

3. Complete at least three quarters of individual study and/or thesis supervision courses.

4. Students must complete additional courses of their own choosing or additional individual studies, in order to fulfill 48 units before advancement to candidacy. <sup>2</sup>

Additionally, students are expected to attend at least 20 talks from within the several seminar series in ICS. Attendance bears no course credit, but it is required for advancement to candidacy. <sup>3</sup>

<sup>1</sup> All five elective courses must be regular, 4-unit courses from the School of Information and Computer Sciences. At least three of the elective courses should be from the SWE 2XX series. Individual study, thesis supervision, and seminars do not qualify as electives.

<sup>2</sup> The selection of courses should form a coherent educational plan to be approved by the student's faculty advisor.

<sup>3</sup> The student's faculty advisor is responsible for ensuring this requirement is met.

## Qualifying Examinations

### Research Assessment

Students must find a faculty advisor and successfully complete a research project with that faculty member. The research project should be done over at least two quarters of independent study with that faculty member. The goal of this research assessment is to introduce the student to the practice of scientific publication.

Based on the project, the student must produce a research paper of publishable quality. This research paper must be reviewed by three faculty members in a peer-review process, revised by the student, and approved by the three faculty members.

The research assessment is graded Ph.D. PASS, M.S. PASS, or FAIL. In case of M.S. PASS or FAIL, the student can re-submit the paper at most one more time within the maximum period of six months. A second M.S. PASS or FAIL results in disqualification from the doctoral program.

### **Advancement to Candidacy Examination**

Each Ph.D. student must pass the oral advancement to candidacy exam, which assesses the student's ability to conduct, present, and orally defend research work at the doctoral level. The research project and paper are the basis for the student's oral advancement to candidacy exam. The oral candidacy exam consists of the research presentation by the student, followed by questions from the candidacy committee.

The student must complete the course requirements, and pass the research assessment prior to advancing to candidacy. The candidacy committee will consist of five faculty members, the majority of whom must be members of the student's program, and is conducted in accordance with UCI Senate regulations.

### **Dissertation Topic Defense**

The student must present a carefully articulated document representing the student's dissertation plan. This document must include the proposed dissertation abstract, a discussion of the approach, a comprehensive survey of related work, and a plan for completing the work. The dissertation plan is presented by the student to the dissertation committee, who must unanimously approve the student's proposal. The dissertation defense committee is formed in accordance to UCI Senate regulations.

### **Doctoral Dissertation and Final Examination**

Students are required to complete a doctoral dissertation in accordance with Academic Senate regulations. In addition, they must pass an oral thesis defense which consists of a public presentation of the student's research followed by an oral examination by the student's doctoral committee. The committee must approve the thesis unanimously.

The normative time for advancement to candidacy is three years. The normative time for completion of the Ph.D. is six years, and the maximum time permitted is seven years.

### **Requirements Beyond Graduate Division Minimum Requirements**

All Ph.D. students are expected to maintain a minimum GPA of 3.5 throughout the program. Failure to maintain this minimum will result in a recommendation that the student be disqualified. In addition, no grade lower than a B is counted toward satisfying any course requirements.

## **Department of Statistics**

### **Daniel L. Gillen, Department Chair**

2038 Donald Bren Hall

949-824-9862

Fax: 949-824-9863

<http://www.stat.uci.edu/>

Statistics is the science concerned with developing and studying methods for collecting, analyzing, interpreting, and presenting empirical data. Statistical principles and methods are important for addressing questions in public policy, medicine, industry, and virtually every branch of science. Interest in statistical methods has increased dramatically with the abundance of large databases in fields like computer science (Internet and Web traffic), business and marketing (transaction records), and biology (the human genome and related data). It is the substantive questions in such areas of application that drive the development of new statistical methods and motivate the mathematical study of the properties of these methods.

- Data Science, B.S.
- Statistics, M.S.
- Statistics, Minor
- Statistics, Ph.D.

## **Faculty**

Brigitte Baldi, Ph.D. Massachusetts Institute of Technology, *Lecturer of Statistics*

Scott Bartell, Ph.D. University of California, Davis, *Associate Professor of Program in Public Health; Environmental Health Sciences; Statistics*

Veronica Berrocal, Ph.D. University of Washington, *Associate Professor of Statistics*

Carter Butts, Ph.D. Carnegie Mellon University, *Professor of Sociology; Computer Science; Electrical Engineering and Computer Science; Statistics* (mathematical sociology, social networks, quantitative methodology, human judgment and decision making, economic sociology)

Mine Dogucu, Ph.D. Ohio State University, *Assistant Professor of Teaching of Statistics*



Daniel L. Gillen, Ph.D. University of Washington, *Department Chair and Professor of Statistics; Program in Public Health*

Michele Guindani, Ph.D. Università Luigi Bocconi, *Professor of Statistics*

Matthew Harding, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Economics; Statistics*

Ivan G. Jeliaskov, Ph.D. Washington University, *Associate Professor of Economics; Statistics*

Wesley O. Johnson, Ph.D. University of Minnesota, *Professor Emeritus of Statistics*

Volodymyr Minin, Ph.D. University of California, Los Angeles, *Professor of Statistics*

Bin Nan, Ph.D. University of Washington, *Professor of Statistics*

Annie Qu, Ph.D. The Pennsylvania State University, *Professor of Statistics*

Babak Shahbaba, Ph.D. University of Toronto, *Professor of Statistics; Computer Science*

Weining Shen, Ph.D. North Carolina State University, *Assistant Professor of Statistics*

Padhraic J. Smyth, Ph.D. California Institute of Technology, *Professor of Computer Science; Education; Statistics* (artificial intelligence and machine learning, pattern recognition, applied statistics, data mining, information theory)

Hal S. Stern, Ph.D. Stanford University, *UCI Chancellor's Professor of Statistics; Cognitive Sciences*

Erik B. Sudderth, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Computer Science; Statistics* (artificial intelligence and machine learning, computer vision, statistics and statistical theory)

Jessica Utts, Ph.D. Pennsylvania State University, *Professor Emeritus of Statistics*

Joachim S. Vandekerckhove, Ph.D. University of Leuven, *Associate Professor of Cognitive Sciences; Statistics* (response time modeling, model fitting, computational statistics, psychometrics, bayesian statistics)

Yaming Yu, Ph.D. Harvard University, *Associate Professor of Statistics*

Zhaoxia Yu, Ph.D. William Marsh Rice University, *Associate Professor of Statistics*

## Courses

### **STATS 5. Seminar in Data Science. 1 Unit.**

An introduction to the field of Data Science; intended for entering freshman and transfers.

Grading Option: Pass/no pass only.

Restriction: Information Computer Science Majors only.

### **STATS 7. Basic Statistics. 4 Units.**

Introduces basic inferential statistics including confidence intervals and hypothesis testing on means and proportions, t-distribution, Chi Square, regression and correlation. F-distribution and nonparametric statistics included if time permits.

Overlaps with STATS 8, MGMT 7, SOCECOL 13.

Restriction: STATS 7 may not be taken for credit concurrently with or after STATS 110, STATS 111, STATS 112.

**(Va)**

### **STATS 8. Introduction to Biological Statistics . 4 Units.**

Introductory statistical techniques used to collect and analyze experimental and observational data from health sciences and biology. Includes exploration of data, probability and sampling distributions, basic statistical inference for means and proportions, linear regression, and analysis of variance.

Overlaps with SOCECOL 13, MGMT 7, STATS 7.

Restriction: STATS 8 may not be taken for credit concurrently with or after STATS 110, STATS 111, STATS 112.

**(Va)**

**STATS 67. Introduction to Probability and Statistics for Computer Science. 4 Units.**

Introduction to the basic concepts of probability and statistics with discussion of applications to computer science.

Prerequisite: MATH 2B

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment. STATS 67 may not be taken for credit concurrently with or after STATS 120B.

(Va)

**STATS 68. Statistical Computing and Exploratory Data Analysis. 4 Units.**

Introduces key concepts in statistical computing. Techniques such as exploratory data analysis, data visualization, simulation, and optimization methods, will be presented in the context of data analysis within a statistical computing environment.

Prerequisite: STATS 7 and I&C SCI 31

**STATS 110. Statistical Methods for Data Analysis I. 4 Units.**

Introduction to statistical methods for analyzing data from experiments and surveys. Methods covered include two-sample procedures, analysis of variance, simple and multiple linear regression.

Prerequisite: STATS 7 or STATS 8 or AP90 or (STATS 120A and STATS 120B and STATS 120C). AP90 with a minimum score of 3

Restriction: School of Info & Computer Sci students only.

**STATS 111. Statistical Methods for Data Analysis II. 4 Units.**

Introduction to statistical methods for analyzing data from surveys or experiments. Emphasizes application and understanding of methods for categorical data including contingency tables, logistic and Poisson regression, loglinear models.

Prerequisite: STATS 110

Concurrent with STATS 202.

**STATS 112. Statistical Methods for Data Analysis III. 4 Units.**

Introduction to statistical methods for analyzing longitudinal data from experiments and cohort studies. Topics covered include survival methods for censored time-to-event data, linear mixed models, non-linear mixed effects models, and generalized estimating equations.

Prerequisite: STATS 111

Concurrent with STATS 203.

**STATS 115. Introduction to Bayesian Data Analysis. 4 Units.**

Basic Bayesian concepts and methods with emphasis on data analysis. Special emphasis on specification of prior distributions. Development for one-two samples and on to binary, Poisson, and linear regression. Analyses performed using free OpenBugs software.

Prerequisite: STATS 120C. Recommended: STATS 110.

**STATS 120A. Introduction to Probability and Statistics I. 4 Units.**

Introduction to basic principles of probability and statistical inference. Axiomatic definition of probability, random variables, probability distributions, expectation.

Prerequisite: MATH 2A and MATH 2B and (MATH 2D or MATH 4)

Restriction: Data Science Majors have first consideration for enrollment. Quantitative Economics majors have second consideration.

Concurrent with STATS 281A.

**STATS 120B. Introduction to Probability and Statistics II. 4 Units.**

Introduction to basic principles of probability and statistical inference. Point estimation, interval estimating, and testing hypotheses, Bayesian approaches to inference.

Prerequisite: STATS 120A

Restriction: Data Science Majors have first consideration for enrollment. Quantitative Economics majors have second consideration.

Concurrent with STATS 281B.

**STATS 120C. Introduction to Probability and Statistics III. 4 Units.**

Introduction to basic principles of probability and statistical inference. Linear regression, analysis of variance, model checking.

Prerequisite: STATS 120B and (MATH 3A or MATH 6G or I&C SCI 6N)

Restriction: Data Science Majors have first consideration for enrollment. Quantitative Economics majors have second consideration.

Concurrent with STATS 281C.

**STATS 140. Multivariate Statistical Methods. 4 Units.**

Theory and application of multivariate statistical methods. Topics include statistical inference for the multivariate normal model and its extensions to multiple samples and regression, use of statistical packages for data visualization and reduction, discriminant analysis, cluster analysis, and factor analysis.

Prerequisite: STATS 120C and (MATH 3A or I&C SCI 6N)

Concurrent with STATS 240.

**STATS 170A. Project in Data Science I. 4 Units.**

Problem definition and analysis, data representation, algorithm selection, solution validation, and results presentation. Students do team projects and lectures cover analysis alternatives, project planning, and data analysis issues. First quarter emphasizes approach selection, project planning, and experimental design.

Prerequisite: STATS 68 and STATS 112 and IN4MATX 43 and COMPSCI 122A and COMPSCI 161 and COMPSCI 178

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Seniors only. Data Science Majors have first consideration for enrollment.

**STATS 170B. Project in Data Science II. 4 Units.**

Problem definition and analysis, data representation, algorithm selection, solution validation, and results presentation. Students do team projects and lectures cover analysis alternatives, project planning, and data analysis issues. Second quarter emphasizes project execution and analysis, and presentation of results.

Prerequisite: STATS 170A. In Progress (IP) grade for STATS 170A is also accepted.

Restriction: Seniors only. Data Science Majors have first consideration for enrollment.

**STATS 199. Individual Study. 2-5 Units.**

Individual research or investigations under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

**STATS 200A. Intermediate Probability and Statistical Theory. 4 Units.**

Basics of probability theory, random variables and basic transformations, univariate distributions—discrete and continuous, multivariate distributions.

Prerequisite: STATS 120C

**STATS 200B. Intermediate Probability and Statistical Theory. 4 Units.**

Random samples, transformations, limit laws, normal distribution theory, introduction to stochastic processes, data reduction, point estimation (maximum likelihood).

Prerequisite: STATS 200A

**STATS 200C. Intermediate Probability and Statistical Theory. 4 Units.**

Interval estimation, hypothesis testing, decision theory and Bayesian inference, basic linear model theory.

Prerequisite: STATS 200B

**STATS 201. Statistical Methods for Data Analysis I. 4 Units.**

Introduction to statistical methods for analyzing data from experiments and surveys. Methods covered include two-sample procedures, analysis of variance, simple and multiple linear regression.

Prerequisite: STATS 7 or STATS 8

Restriction: STATS 201 cannot be taken for credit after taking STATS 210.

**STATS 202. Statistical Methods for Data Analysis II. 4 Units.**

Introduction to statistical methods for analyzing data from surveys or experiments. Emphasizes application and understanding of methods for categorical data including contingency tables, logistic and Poisson regression, loglinear models.

Prerequisite: STATS 201 or STATS 210

Concurrent with STATS 111.

**STATS 203. Statistical Methods for Data Analysis III. 4 Units.**

Introduction to statistical methods for analyzing longitudinal data from experiments and cohort studies. Topics covered include survival methods for censored time-to-event data, linear mixed models, non-linear mixed effects models, and generalized estimating equations.

Prerequisite: STATS 202

Concurrent with STATS 112.

**STATS 205. Introduction to Bayesian Data Analysis. 4 Units.**

Basic Bayesian concepts and methods with emphasis on data analysis. Special emphasis on specification of prior distributions. Development for one-two samples and on to binary, Poisson and linear regression. Analyses performed using free OpenBugs software.

Prerequisite: STATS 120C. Recommended: STATS 201 or STATS 210.

**STATS 210. Statistical Methods I: Linear Models. 4 Units.**

Statistical methods for analyzing data from surveys and experiments. Topics include randomization and model-based inference, two-sample methods, analysis of variance, linear regression and model diagnostics.

Prerequisite: Knowledge of basic statistics, calculus, linear algebra.

**STATS 210A. Statistical Methods I: Linear Models. 4 Units.**

Statistical methods for analyzing data from surveys and experiments. Topics include randomization and model-based inference, two-sample methods, analysis of variance, linear regression, and model diagnostics.

Prerequisite: Knowledge of basic statistics (at the level of STATS 7), calculus, and linear algebra.

Restriction: Graduate students only.

**STATS 210B. Statistical Methods II: Categorical Data. 4 Units.**

Introduction to statistical methods for analyzing discrete and non-normal outcomes. Emphasizes the development and application of methods for categorical data, including contingency tables, logistic and Poisson regression, loglinear models.

Prerequisite: STATS 210. May not be taken for graduate credit by Ph.D. students in Statistics.

Restriction: Graduate students only.

**STATS 210C. Statistical Methods III: Longitudinal Data. 4 Units.**

Introduction to statistical methods for analyzing longitudinal outcomes. Emphasizes the development and application of regression methods for correlated and censored outcomes. Methods for continuous and discrete correlated outcomes, as well as censored outcomes, are covered.

Prerequisite: STATS 210B. May not be taken for graduate credit by Ph.D. students in Statistics.

Restriction: Graduate students only.

**STATS 211. Statistical Methods II: Generalized Linear Models. 4 Units.**

Development of the theory and application of generalized linear models. Topics include likelihood estimation and asymptotic distributional theory for exponential families, quasi-likelihood and mixed model development. Emphasizes methodological development and application to real scientific problems.

Prerequisite or corequisite: STATS 210

**STATS 212. Statistical Methods III: Methods for Correlated Data. 4 Units.**

Development and application of statistical methods for analyzing corrected data. Topics covered include repeated measures ANOVA, linear mixed models, non-linear mixed effects models, and generalized estimating equations. Emphasizes both theoretical development and application of the presented methodology.

Prerequisite: STATS 211

**STATS 220A. Advanced Probability and Statistics Topics. 4 Units.**

Advanced topics in probability and statistical inference including measure theoretic probability, large sample theory, decision theory, resampling and Monte Carlo methods, nonparametric methods.

Prerequisite: STATS 200C

**STATS 220B. Advanced Probability and Statistics Topics. 4 Units.**

Advanced topics in probability and statistical inference, including measure theoretic probability, large sample theory, decision theory, resampling and Monte Carlo methods, nonparametric methods.

Prerequisite: STATS 220A and MATH 140B

**STATS 225. Bayesian Statistical Analysis. 4 Units.**

Introduction to the Bayesian approach to statistical inference. Topics include univariate and multivariate models, choice of prior distributions, hierarchical models, computation including Markov chain Monte Carlo, model checking, and model selection.

Prerequisite: STATS 205 and STATS 230

**STATS 226. Advanced Topics in Modern Bayesian Statistical Inference. 4 Units.**

Modern Bayesian Statistics: selected topics from theory of Markov chains, application of theory to modern methods of Markov chain Monte Carlo sampling; Bayesian non-parametric and semiparametric modeling, including Dirichlet Process Mixtures; Mixtures of Polya Trees.

Prerequisite: STATS 200C and STATS 225

**STATS 230. Statistical Computing Methods. 4 Units.**

Numerical computations and algorithms with applications in statistics. Topics include optimization methods including the EM algorithm, random number generation and simulation, Markov chain simulation tools, and numerical integration.

Prerequisite: Two quarters of upper-division or graduate training in probability and statistics.

Overlaps with COMPSI 206.

**STATS 235. Modern Data Analysis Methods . 4 Units.**

Introduces selected modern tools for data analysis. Emphasizes use of computational and resampling techniques for data analyses when the data do not conform to standard toolbox of regression models and/or complexity of modeling problem threatens validity of standard methods.

Prerequisite: STATS 120C and STATS 205 and (STATS 201 or STATS 210)

Restriction: Graduate students only.

**STATS 240. Multivariate Statistical Methods. 4 Units.**

Theory and application of multivariate statistical methods. Topics include statistical inference for the multivariate normal model and its extensions to multiple samples and regression, use of statistical packages for data visualization and reduction, discriminant analysis, cluster analysis, and factor analysis.

Prerequisite: STATS 120C and (MATH 3A or I&C SCI 6N)

Concurrent with STATS 140.

**STATS 245. Time Series Analysis. 4 Units.**

Statistical models for analysis of time series from time and frequency domain perspectives. Emphasizes theory and application of time series data analysis methods. Topics include ARMA/ARIMA models, model identification/estimation, linear operators, Fourier analysis, spectral estimation, state space models, Kalman filter.

Corequisite: STATS 200C

Prerequisite or corequisite: STATS 201 or STATS 210

**STATS 250. Biostatistics. 4 Units.**

Statistical methods commonly used to analyze data arising from clinical studies. Topics include analysis of observational studies and randomized clinical trials, techniques in the analysis of survival and longitudinal data, approaches to handling missing data, meta-analysis, nonparametric methods.

Prerequisite: STATS 210

**STATS 255. Statistical Methods for Survival Data. 4 Units.**

Statistical methods for analyzing survival data from cohort studies. Topics include parametric and nonparametric methods, the Kaplan-Meier estimator, log-rank tests, regression models, the Cox proportional hazards model and accelerated failure time models, efficient sampling designs, discrete survival models.

Corequisite: STATS 202 or STATS 211.

Prerequisite: STATS 210

Restriction: Graduate students only.

**STATS 257. Introduction to Statistical Genetics. 4 Units.**

Provides students with knowledge of the basic principles, concepts, and methods used in statistical genetic research. Topics include principles of population genetics, and statistical methods for family- and population-based studies.

Prerequisite: Two quarters of upper-division or graduate training in statistical methods.

Same as EPIDEM 215.

**STATS 260. Inference with Missing Data. 4 Units.**

Statistical methods and theory useful for analysis of multivariate data with partially observed variables. Bayesian and likelihood-based methods developed. Topics include EM-type algorithms, MCMC samplers, multiple imputation, and general location model. Applications from economics, education, and medicine are discussed.

Prerequisite or corequisite: STATS 210 or STATS 200C. STATS 230.

**STATS 262. Theory and Practice of Sample Surveys. 4 Units.**

Basic techniques and statistical methods used in designing surveys and analyzing collected survey data. Topics include simple random sampling, ratio and regression estimates, stratified sampling, cluster sampling, sampling with unequal probabilities, multistage sampling, and methods to handle nonresponse.

Prerequisite: STATS 120C

**STATS 265. Causal Inference. 4 Units.**

Various approaches to causal inference focusing on the Rubin causal model and propensity-score methods. Topics include randomized experiments, observational studies, non-compliance, ignorable and non-ignorable treatment assignment, instrumental variables, and sensitivity analysis. Applications from economics, politics, education, and medicine.

Prerequisite: STATS 200C and STATS 210

**STATS 270. Stochastic Processes. 4 Units.**

Introduction to the theory and application of stochastic processes. Topics include Markov chains, continuous-time Markov processes, Poisson processes, and Brownian motion. Applications include Markov chain Monte Carlo methods and financial modeling (for example, option pricing).

Prerequisite: STATS 120C

Overlaps with MATH 271A, MATH 271B, MATH 271C.

**STATS 275. Statistical Consulting. 4 Units.**

Training in collaborative research and practical application of statistics. Emphasis on effective communication as it relates to identifying scientific objectives, formulating a statistical analysis plan, choice of statistical methods, and interpretation of results and their limitations to non-statisticians.

Prerequisite: STATS 203 or STATS 212 or STATS 210C. STATS 203 with a grade of B or better. STATS 212 with a grade of B or better. STATS 210C with a grade of B or better

Restriction: Graduate students only.

**STATS 280. Seminar in Statistics. 0.5 Units.**

Periodic seminar series covering topics of current research in statistics and its application.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**STATS 281A. Introduction to Probability and Statistics I. 4 Units.**

Introduction to basic principles of probability and statistical inference. Axiomatic definition of probability, random variables, probability distributions, expectation.

Restriction: Graduate students only.

Concurrent with STATS 120A.

**STATS 281B. Introduction to Probability and Statistics II. 4 Units.**

Introduction to basic principles of probability and statistical inference. Point estimation, interval estimating, and testing hypotheses, Bayesian approaches to inference.

Restriction: Graduate students only.

Concurrent with STATS 120B.

**STATS 281C. Introduction to Probability and Statistics III. 4 Units.**

Introduction to basic principles of probability and statistical inference. Contingency table analysis, linear regression, analysis of variance, model checking.

Restriction: Graduate students only.

Concurrent with STATS 120C.

**STATS 295. Special Topics in Statistics. 4 Units.**

Studies in selected areas of statistics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**STATS 298. Thesis Supervision. 2-12 Units.**

Individual research or investigation conducted in preparation for the M.S. thesis option or the dissertation requirements for the Ph.D. program.

Repeatability: May be repeated for credit unlimited times.

**STATS 299. Individual Study. 2-12 Units.**

Individual research or investigation under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

## Data Science, B.S.

The Data Science Major prepares students for a career in data analysis, combining foundational statistical concepts with computational principles from computer science. In the first two years of the program students will take core courses in both the Statistics and Computer Science Departments, providing a strong foundation in the principles of each field. In the 3rd and 4th years of the program, students will take more specialized courses, on topics such as design of algorithms, machine learning, information visualization, and Bayesian statistics. A major component of this degree is the final year capstone project course, a 2-quarter course that teaches students how to apply statistical and computational principles to solve large-scale real-world data analysis problems.

**Freshman Applicants:** See the Undergraduate Admissions section.

**Transfer Applicants:** See the Undergraduate Admissions section.

Bren School of ICS majors (including shared majors, BIM and CSE) pursuing minors within the Bren School of ICS may not count more than five courses toward both the major and minor. Some ICS majors and minors outside of the School are not permitted due to significant overlap. Visit the ICS Student Affairs Office website for Majors and Minors restrictions. ([http://www.ics.uci.edu/ugrad/degrees/MajorMinor\\_Restrictions\\_Chart.pdf](http://www.ics.uci.edu/ugrad/degrees/MajorMinor_Restrictions_Chart.pdf)) All students should check the Double Major Restrictions Chart ([http://www.ics.uci.edu/ugrad/degrees/DbI\\_Major\\_Restr\\_Chart.pdf](http://www.ics.uci.edu/ugrad/degrees/DbI_Major_Restr_Chart.pdf)) and view our information page ([http://www.ics.uci.edu/ugrad/degrees/Double\\_Majors.php](http://www.ics.uci.edu/ugrad/degrees/Double_Majors.php)) on double majoring to see what degree programs are eligible for double majoring.

**All students must meet the University Requirements.**

### Data Science Major Requirements

Lower-division:

A. Select one of the following series:

I&C SCI 31- 32- 33

Introduction to Programming  
and Programming with Software Libraries  
and Intermediate Programming

or	
I&C SCI 32A- 33	Python Programming and Libraries (Accelerated) and Intermediate Programming
B. Complete:	
I&C SCI 45C	Programming in C/C++ as a Second Language
I&C SCI 46	Data Structure Implementation and Analysis
I&C SCI 51	Introductory Computer Organization
IN4MATX 43	Introduction to Software Engineering
C. Complete:	
MATH 2A	Single-Variable Calculus
MATH 2B	Single-Variable Calculus
MATH 2D	Multivariable Calculus
MATH 3A	Introduction to Linear Algebra
or I&C SCI 6N	Computational Linear Algebra
I&C SCI 6B	Boolean Logic and Discrete Structures
I&C SCI 6D	Discrete Mathematics for Computer Science
STATS 5	Seminar in Data Science
STATS 7	Basic Statistics
STATS 68	Statistical Computing and Exploratory Data Analysis
Upper-division:	
A. Data Science core requirements:	
STATS 110	Statistical Methods for Data Analysis I
STATS 111	Statistical Methods for Data Analysis II
STATS 112	Statistical Methods for Data Analysis III
STATS 115	Introduction to Bayesian Data Analysis
STATS 120A	Introduction to Probability and Statistics I
STATS 120B	Introduction to Probability and Statistics II
STATS 120C	Introduction to Probability and Statistics III
I&C SCI 139W	Critical Writing on Information Technology
COMPSCI 122A	Introduction to Data Management
COMPSCI 161	Design and Analysis of Algorithms
COMPSCI 178	Machine Learning and Data-Mining
IN4MATX 143	Information Visualization
B. Three elective courses from the list below:	
MATH 130B	Probability II
MATH 130C	Stochastic Processes
STATS 140	Multivariate Statistical Methods
I&C SCI 53	Principles in System Design
COMPSCI 111	Digital Image Processing
COMPSCI 115	Computer Simulation
COMPSCI 121	Information Retrieval
COMPSCI 122B	Project in Databases and Web Applications
COMPSCI 122C	Principles of Data Management
COMPSCI 125	Next Generation Search Systems
COMPSCI 131	Parallel and Distributed Computing
COMPSCI 134	Computer and Network Security
COMPSCI 163	Graph Algorithms
COMPSCI 165	Project In Algorithms And Data Structures
COMPSCI 169	Introduction to Optimization
COMPSCI 171	Introduction to Artificial Intelligence
COMPSCI 172B	Neural Networks and Deep Learning
IN4MATX 131	Human Computer Interaction



IN4MATX 141	Information Retrieval
IN4MATX 161	Social Analysis of Computing
C. Data Science capstone team-based project courses: STATS 170A and STATS 170B	

<b>Freshman</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
I&C SCI 31	I&C SCI 32	I&C SCI 33
MATH 2A	MATH 2B	MATH 2D
WRITING 39A	STATS 5	STATS 7
	WRITING 39B	WRITING 39C
<b>Sophomore</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
I&C SCI 45C	I&C SCI 46	I&C SCI 51
I&C SCI 6B	I&C SCI 6D	STATS 68
STATS 120A	MATH 3A	STATS 120C
General Education III	STATS 120B	General Education VI
<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
COMPSCI 122A, 161, or 178	COMPSCI 122A, 161, or 178	COMPSCI 122A, 161, or 178
IN4MATX 43	I&C SCI 139W	IN4MATX 143
STATS 110	STATS 111	STATS 112
General Education IV/VIII	General Education III/VII	
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
STATS 115	STATS 170A	STATS 170B
Data Science Major Elective	Data Science Major Elective	Data Science Major Elective
General Education III	General Education IV	General Education IV

A wide variety of careers and graduate programs are open to graduates of the Data Science major. Demand for graduates with skills in both statistics and computer science currently outpaces supply - thus, students with these skills typically find employment quickly, across a wide variety of sectors, including internet companies, finance, engineering, business, medicine, and more. Data Science graduates are well-qualified for job titles such as "data scientist," "data analyst," or "statistician," both in the public and private sectors. Graduate school in area such as Computer Science or Statistics is also a possible career path.

## Statistics, M.S.

Research in statistics can range from mathematical studies of the theoretical underpinnings of a statistical model or method to the development of novel statistical models and methods and a thorough study of their properties. Frequently, statistics research is motivated and informed by collaborations with experts in a particular substantive field. Their scientific studies and data collection efforts may yield complex data that cannot be adequately handled using standard statistical methodology. Statisticians aim to develop methods that address the scientific or policy questions of the researcher. In doing so, statisticians must consider how efficiently and effectively the proposed methodology can be implemented and what guarantees can be provided as to the performance of the proposed methods. Such questions can often be answered using a combination of mathematical, analytical, and computational techniques.

**Background:** Individuals from a variety of backgrounds can make significant contributions to the field of statistics as long as they have sufficient background in statistics, mathematics, and computing. Undergraduate preparation in statistics, mathematics, and computing should include multivariate calculus (the equivalent of UCI courses MATH 2A-MATH 2B, MATH 2D-MATH 2E), linear algebra (MATH 121A), elementary analysis (MATH 140A-MATH 140B), introductory probability and statistics (STATS 120A-STATS 120B-STATS 120C), and basic computing (I&C SCI 31). For students with undergraduate majors outside of mathematics and statistics, it is possible to make up one or two missing courses during the first year in the program.

For additional information about the Bren School of ICS's graduate programs and admissions information, [click here](#).

A. Complete:

STATS 200A- 200B- 200C	Intermediate Probability and Statistical Theory and Intermediate Probability and Statistical Theory and Intermediate Probability and Statistical Theory
STATS 210	Statistical Methods I: Linear Models
STATS 210B	Statistical Methods II: Categorical Data <sup>1</sup>
STATS 210C	Statistical Methods III: Longitudinal Data <sup>1</sup>
STATS 205	Introduction to Bayesian Data Analysis

B. Complete three quarters of seminar in STATS 280.

C. Select five additional graduate courses in or related to statistics, at least two of which are offered by the Department of Statistics.<sup>2</sup>

<sup>1</sup> STATS 211 and STATS 212 may be substituted for STATS 210B and STATS 210C.

<sup>2</sup> At most one of the five elective courses may be an Individual Study (STATS 299), and only with prior approval of the Department Graduate Committee. STATS 281A-STATS 281B-STATS 281C may not be taken as an elective.

The entire program of courses must be approved by the Statistics Department Graduate Committee. Students with previous graduate training in statistics may petition the Committee to substitute other courses for a subset of the required courses. Students are required to pass a written comprehensive examination ordinarily at the end of the first year, covering the material from STATS 200A-STATS 200B-STATS 200C, and either STATS 210, STATS 210B, and STATS 210C, *or* STATS 210, STATS 211, and STATS 212.

## Statistics, Minor

The minor in Statistics is designed to provide students with exposure to both statistical theory and practice. The minor requires a total of seven courses. These include a mathematics course, five core statistics courses, and an elective that may be taken from among several departments. Some of the courses used to complete the minor may include prerequisites that may or may not be part of a student's course requirements for their major. Because of this, the minor is somewhat intensive, but it is a useful complement to a variety of undergraduate fields for mathematically inclined students. The minor, supplemented with a few additional courses (mathematics and computing), would provide sufficient background for graduate study in statistics. Students considering a minor in Statistics should meet with the academic counselor of their major as early as possible to plan their course work and incorporate the required courses into their four-year academic plan.

NOTE: Students may not receive both a minor in Statistics and a specialization in Statistics within the Mathematics major.

### Required Courses

MATH 3A or I&C SCI 6N	Introduction to Linear Algebra Computational Linear Algebra
STATS 110- 111	Statistical Methods for Data Analysis I and Statistical Methods for Data Analysis II
STATS 120A- 120B- 120C	Introduction to Probability and Statistics I and Introduction to Probability and Statistics II and Introduction to Probability and Statistics III

Select one elective from the following: <sup>1</sup>

I&C SCI 31	Introduction to Programming
MATH 130B or MATH 130C	Probability II Stochastic Processes
STATS 7	Basic Statistics (or equivalent course) <sup>2</sup>
STATS 112	Statistical Methods for Data Analysis III
STATS 115	Introduction to Bayesian Data Analysis
STATS 140	Multivariate Statistical Methods

<sup>1</sup> Or can substitute another course with approval of the Director of Undergraduate Studies.

<sup>2</sup> Only if taken prior to STATS 110

NOTE: A maximum of two courses can be taken Pass/Not Pass toward a minor. Visit the ICS Student Affairs Office website for Majors and Minors restrictions. ([http://www.ics.uci.edu/ugrad/degrees/MajorMinor\\_Restrictions\\_Chart.pdf](http://www.ics.uci.edu/ugrad/degrees/MajorMinor_Restrictions_Chart.pdf))

## Statistics, Ph.D.

Research in statistics can range from mathematical studies of the theoretical underpinnings of a statistical model or method to the development of novel statistical models and methods and a thorough study of their properties. Frequently, statistics research is motivated and informed by collaborations with experts in a particular substantive field. Their scientific studies and data collection efforts may yield complex data that cannot be adequately handled using standard statistical methodology. Statisticians aim to develop methods that address the scientific or policy questions of the researcher. In doing so, statisticians must consider how efficiently and effectively the proposed methodology can be implemented and what guarantees can be provided as to the performance of the proposed methods. Such questions can often be answered using a combination of mathematical, analytical, and computational techniques.

*Background:* Individuals from a variety of backgrounds can make significant contributions to the field of statistics as long as they have sufficient background in statistics, mathematics, and computing. Undergraduate preparation in statistics, mathematics, and computing should include multivariate calculus (the equivalent of UCI courses MATH 2A-MATH 2B, MATH 2D-MATH 2E), linear algebra (MATH 121A), elementary analysis

(MATH 140A-MATH 140B), introductory probability and statistics (STATS 120A-STATS 120B-STATS 120C), and basic computing (I&C SCI 31). For students with undergraduate majors outside of mathematics and statistics, it is possible to make up one or two missing courses during the first year in the program.

For additional information about the Bren School of ICS's graduate programs and admissions information, click [here](#).

### Statistics Course Requirements

A. Complete:

STATS 200A- 200B- 200C	Intermediate Probability and Statistical Theory and Intermediate Probability and Statistical Theory and Intermediate Probability and Statistical Theory
STATS 210	Statistical Methods I: Linear Models
STATS 211	Statistical Methods II: Generalized Linear Models
STATS 212	Statistical Methods III: Methods for Correlated Data
STATS 220A- 220B	Advanced Probability and Statistics Topics and Advanced Probability and Statistics Topics
STATS 225	Bayesian Statistical Analysis
STATS 230	Statistical Computing Methods
STATS 275	Statistical Consulting

B. Select four additional graduate courses in or related to statistics, at least two of which are offered by the Department of Statistics.<sup>1</sup>

C. In addition, continual enrollment in STATS 280 is required in all quarters.

<sup>1</sup> STATS 202, STATS 203, and STATS 281A-STATS 281B-STATS 281C may not be taken as electives. These courses must be completed prior to candidacy.

### Additional Ph.D. requirements

Each Ph.D. student is required to take a written comprehensive examination, ordinarily at the end of the first year, covering the material from STATS 200A-STATS 200B-STATS 200C, STATS 210, STATS 211, and STATS 212. In addition, each student is required to take a written comprehensive examination after completion of the second year course work, covering material from STATS 220A-STATS 220B.

Ph.D. students who have passed the written comprehensive examinations are required to give a post-comprehensive research presentation each year.

Ph.D. students are required to serve as teaching assistants for at least two quarters.

Ph.D. students are required to demonstrate substantive knowledge of an application area outside of statistics (e.g., computer science, economics, cognitive sciences, biology, or medicine). Such knowledge can be demonstrated by course work in the application area (three quarter courses), co-authorship of publishable research in the application area, or other evidence of supervised collaborative work that is substantiated by an expert in the field. In the case of a theoretically oriented student, the outside application area may be mathematics.

The normative time for advancement to candidacy is three years. The normative time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

## Engineering and Computer Science in the Global Context, Concentration

The globalization of the marketplace for information technology services and products makes it likely that ICS graduates will work in multicultural settings or be employed by companies with extensive international operations or customer bases. The goal of the concentration is to help students develop and integrate knowledge of the history, language, and culture of a country or geographic region outside the United States, through course work both at UCI and an international host campus, followed by a technology-related internship in the host country.

All ICS majors in good standing may propose an academic plan that demonstrates the ability to complete the concentration (a minimum of eight courses) and other requirements for graduation in a reasonable time frame. It is expected that a student's proposal will reflect a high degree of planning that includes the guidance of academic counselors and those at the UCI Study Abroad Center regarding course selection, as well as considerations related to internship opportunities, housing, and financial aid. Each student's proposed program of study must be approved by the ICS Associate Dean for Student Affairs. The Associate Dean will be available to assist qualified students with the development of a satisfactory academic plan, as needed.

The concentration consists of the following components:

1. A minimum of eight courses at UCI or at the international campus with an emphasis on the culture, language (if applicable and necessary), history, literature of the country that corresponds to the international portion of the program, international law, international labor policy, global issues, global institutions, global conflict and negotiation, and global economics;

2. A one- or two-semester sequence of technical courses related to the major and, possibly, culture, history, and literature courses taken at an international university;
3. A two-month or longer technical internship experience in the same country as the international educational experience.

More information about the requirements for the concentration is available in the ICS Student Affairs Office.

## Information and Computer Science, B.S.

The Information and Computer Science major is intended for highly motivated students who are currently enrolled at UCI, who find that their academic and career interests are not well served by any of the existing ICS majors, and would be better served by a uniquely designed course of study.

New students are not admitted directly to the Information and Computer Science major. Continuing students can apply to change their major to Information and Computer Science no earlier than the fall quarter of their sophomore year. Students must submit a proposal for a four-year plan of study, along with rationale explaining why the proposed plan is a well-motivated and coherent set of courses that does not fit into any of the existing ICS majors. Students submitting proposals are strongly encouraged to follow the lower-division requirements for one of the ICS majors (or provide a rationale for why this is not appropriate) and should include at least 48 units of upper-division ICS, Computer Science, Informatics, or Statistics courses. Proposals must be approved by the ICS Associate Dean for Student Affairs. See the ICS Student Affairs Office for more details. Complete information about changing majors to ICS is available at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>).

New students are not admitted directly to the Information and Computer Science major.

### Transfer Applicants:

Students are strongly encouraged to follow the transfer preparation guidelines for any of the other Bren ICS majors.

**All students must meet the University Requirements.**

**Major Requirements: See the ICS Student Affairs Office.**

## Information and Computer Science, M.S.

Students pursuing the M.S. in Information and Computer Science must complete a concentration in Embedded Systems.

M.S. students may select one of two options, the thesis plan or the comprehensive examination plan, as described below. The normative time for completion of the M.S. is two years. All study must be completed within four calendar years from the date of admission.

### Plan I: Thesis Plan

The thesis option is available for graduate students who may wish to continue on to a Ph.D. program or those who wish to concentrate on a specific problem. To qualify for this option, students must be in good academic standing with their Department. The student must enroll in at least two quarters of Thesis Supervision (COMPSCI 298 or IN4MATX 298) that will substitute for two required courses as specified under the concentration area or specialization of choice. All required courses must be completed with a grade of B or better, and the student must write a research or thesis project. A committee of three faculty members (voting members of the Academic Senate) will guide the student and give final approval of the thesis. The committee will consist of an advisor (faculty member from the student's department) who is willing to supervise the thesis project, and two other faculty members (one of which must be from the student's department) who are willing to serve on the committee as readers of the thesis. An oral presentation of the thesis to the committee will be required. Seminar courses that have an "S" suffix (e.g., 209S) do not count toward degree requirements.

### Plan II: Comprehensive Examination Plan

The student completes the required units as specified under the concentration area. Each course must be completed with a grade of B or better. Seminar courses that have an "S" suffix (e.g., 209S) do not count toward degree requirements. The student must take a comprehensive examination given by ICS faculty. The examination covers the core requirements.

## ICS Concentration in Embedded Systems—M.S.

The goal of this program is to prepare students for challenges in developing future embedded systems. These future systems will further integrate communications, multimedia, and advanced processors with complex embedded and real-time software for automotive, medical, telecommunications, and many other application domains. Furthermore, embedded systems are becoming parallel, deploying multiprocessor systems-on-a-chip and parallel application software. An in-depth knowledge of the underlying scientific and engineering principles is required to understand these advances and to contribute productively to development of such systems. This program helps students master embedded system fundamentals, advanced computer architecture and compilers, networking, security, embedded, parallel and distributed software, and computer graphics in a sequence of courses and labs. Students also complete a large embedded systems project and may choose to write a Master's thesis.

### Required Courses

The following courses must be completed with a grade of B or better.

Select six of the following:

**List A**

COMPSCI 244	Introduction to Embedded and Ubiquitous Systems
COMPSCI 250A	Computer Systems Architecture
COMPSCI 232	Computer and Communication Networks
COMPSCI 203	Network and Distributed Systems Security
COMPSCI 242	Parallel Computing
COMPSCI 250B	Modern Computer Systems
COMPSCI 230	Distributed Computer Systems
COMPSCI 243	High-Performance Architectures and Their Compilers

Select six additional courses in one of the following two ways:

1. For students pursuing the M.S. thesis option, two four-unit courses in Thesis Supervision (COMPSCI 298) plus four graduate courses taken from List A or the following List B
2. For all other students, six graduate courses taken from List A or the following List B

**List B**

COMPSCI 241	Advanced Compiler Construction
COMPSCI 245	Software for Embedded Systems
COMPSCI 252	Introduction to Computer Design
EECS 211	Advanced System Software
COMPSCI 211A	Visual Computing
COMPSCI 248A/IN4MATX 241	Introduction to Ubiquitous Computing
SWE 211	Software Engineering
COMPSCI 236	Wireless and Mobile Networking
COMPSCI 265	Graph Algorithms
EECS 223	Real-Time Computer Systems

M.S. Students who do not have an undergraduate degree in Computer Science or equivalent must also take COMPSCI 260.

### Comprehensive Examination or Thesis

Each student must either (1) pass a comprehensive examination administered by the Embedded Systems faculty; or (2) submit a thesis for approval by a three-person committee consisting of an advisor (who is an ICS Embedded Systems full-time faculty member) and two other full-time faculty members (one of which must be from ICS).

## Information and Computer Science, Minor

Students outside the School may also pursue a minor in Information and Computer Science. The minor provides a focused study of Information and Computer Science to supplement a student's major program of study and prepares students for a profession, career, or academic pursuit in which computer science is an integral part but is not the primary focus. The ICS minor contributes to students' competence in computing technology and proficiency in programming as well as exposing them to the fundamentals of computer science. The minor allows students sufficient flexibility to pursue courses that complement their major field or address specific interests.

A. Complete:

I&C SCI 31- 32- 33- 45C- 46	Introduction to Programming and Programming with Software Libraries and Intermediate Programming and Programming in C/C++ as a Second Language and Data Structure Implementation and Analysis
I&C SCI 6D	Discrete Mathematics for Computer Science

B. Select one of the following:

I&C SCI 51	Introductory Computer Organization
or IN4MATX 43	Introduction to Software Engineering

C. Select two upper-division from the following: <sup>1</sup>

COMPSCI 111-144
COMPSCI 151-177
IN4MATX 101-102
IN4MATX 111-119

IN4MATX 125	Computer Game Development
IN4MATX 131	Human Computer Interaction
IN4MATX 132–134	
IN4MATX 141	Information Retrieval
IN4MATX 148	Project in Ubiquitous Computing
IN4MATX 153	Computer Supported Cooperative Work
IN4MATX 161–163	
IN4MATX 171	Introduction to Medical Informatics

<sup>1</sup> COMPSCI 190–199 and IN4MATX 190–199 may not be applied to the minor.

#### NOTES:

1. Visit the ICS Student Affairs Office website for Majors and Minors restrictions ([http://www.ics.uci.edu/ugrad/degrees/MajorMinor\\_Restrictions\\_Chart.pdf](http://www.ics.uci.edu/ugrad/degrees/MajorMinor_Restrictions_Chart.pdf)).
2. A maximum of two courses may be taken for the Pass/Not Pass grade option toward any minor
3. There are no applications for an ICS minor. Students must have a peer advisor or academic counselor of their major add the minor to their Degree Audit once they begin pursuing the minor.
4. To ensure you are certified for the minor at graduation, the minor must be on your Degree Audit and Application for Graduation. Your Student Affairs Office can add the minor to your Degree Audit and will certify your minor at time of graduation, so it is important to keep them updated on your academic progress.
5. Some ICS majors may not minor in Information and Computer Science. For those who may, 5 courses cannot overlap between your major and minor.

## Software Engineering, B.S.

The Software Engineering major gives students a strong foundation in software engineering as well as a solid basis in computer science. Students who complete the major will be able to be productive members of software engineering teams in a variety of application domains including, but not restricted to, Web and mobile applications. The acquired technical knowledge and appreciation for life-long learning, combined with the ability to place software in the social context in which it is developed, empowers students to create novel applications that have the potential to bring social change.

Freshman Applicants: See the Undergraduate Admissions section.

#### Transfer Applicants:

Transfer applicants who satisfactorily complete course prerequisites will be given preference for admission. All applicants must complete the following required courses: one year of approved calculus, one year of object-oriented programming (python, java, C++), additional courses as specified by the major, and completion of lower-division writing. Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Visit the *UCI Office of Admissions website* for information on transfer requirements for our major.

**All students must meet the University Requirements.**

#### Lower-division

A. Select one of the following series:

I&C SCI 31- 32- 33	Introduction to Programming and Programming with Software Libraries and Intermediate Programming
or	
I&C SCI 32A- 33	Python Programming and Libraries (Accelerated) and Intermediate Programming

B. Complete:

I&C SCI 45C	Programming in C/C++ as a Second Language
I&C SCI 45J	Programming in Java as a Second Language
I&C SCI 46	Data Structure Implementation and Analysis
I&C SCI 51	Introductory Computer Organization
IN4MATX 43	Introduction to Software Engineering
MATH 2A- 2B	Single-Variable Calculus and Single-Variable Calculus
I&C SCI 6B	Boolean Logic and Discrete Structures

I&C SCI 6D	Discrete Mathematics for Computer Science
I&C SCI 6N	Computational Linear Algebra
or MATH 3A	Introduction to Linear Algebra
STATS 67	Introduction to Probability and Statistics for Computer Science
<b>Upper-division</b>	
<b>A. Core Requirements</b>	
COMPSCI 122A	Introduction to Data Management
COMPSCI 143A	Principles of Operating Systems
COMPSCI 132	Computer Networks
COMPSCI 161	Design and Analysis of Algorithms
IN4MATX 101/COMPSCI 141	Concepts in Programming Languages I
IN4MATX 113	Requirements Analysis and Engineering
IN4MATX 115	Software Testing, Analysis, and Quality Assurance
IN4MATX 131	Human Computer Interaction
IN4MATX 121	Software Design: Applications
IN4MATX 122	Software Design: Structure and Implementation
IN4MATX 124	Internet Applications Engineering
IN4MATX 151	Project Management
IN4MATX 191A	Senior Design Project
IN4MATX 191B	Senior Design Project
I&C SCI 139W	Critical Writing on Information Technology
<b>B. Select four of the following:</b>	
IN4MATX 102	Concepts of Programming Language II
IN4MATX 125/COMPSCI 113	Computer Game Development
IN4MATX 132	Project in Human-Computer Interaction Requirements and Evaluation
IN4MATX 133	User Interaction Software
IN4MATX 134	Project in User Interaction Software
IN4MATX 141/COMPSCI 121	Information Retrieval
IN4MATX 143	Information Visualization
IN4MATX 148	Project in Ubiquitous Computing
IN4MATX 161	Social Analysis of Computing
COMPSCI 133	Advanced Computer Networks
COMPSCI 134	Computer and Network Security
COMPSCI 142A	Compilers and Interpreters
COMPSCI 142B	Language Processor Construction
COMPSCI 145- 145L	Embedded Software and Embedded Software Laboratory
COMPSCI 146	Programming in Multitasking Operating Systems
COMPSCI 165	Project In Algorithms And Data Structures
I&C SCI 167	Multiplayer Game Systems
I&C SCI 168	Multiplayer Game Project

Software Engineering elective courses may not be counted as part of the Management minor.

**Freshman**

Fall	Winter	Spring
I&C SCI 31	I&C SCI 32	I&C SCI 33
MATH 2A	MATH 2B	IN4MATX 43
WRITING 39A	WRITING 39B	I&C SCI 6B
	General Education III	WRITING 39C

**Sophomore**

Fall	Winter	Spring
I&C SCI 45C	I&C SCI 46	COMPSCI 143A
I&C SCI 51	IN4MATX 113	STATS 67
I&C SCI 6D	I&C SCI 6N	General Education III
General Education III/VII	IN4MATX 131	General Education IV/VIII



<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
I&C SCI 45J	COMPSCI 132	COMPSCI 161
IN4MATX 115	IN4MATX 101	IN4MATX 124
IN4MATX 121	IN4MATX 122	General Education IV
General Education IV	IN4MATX 151	
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
COMPSCI 122A	IN4MATX 191B	Software Engineering Elective
IN4MATX 191A	I&C SCI 139W	Software Engineering Elective
Software Engineering Elective	Software Engineering Elective	General Education VI
General Education III		

**NOTES:**

1. Students are advised that this sample program lists the minimum requirements; it is possible that students may have to take additional courses to prepare for required courses.
2. The lower-division writing requirement must be completed by the end of the seventh quarter at UCI.
3. This is only a sample plan. Course offerings may be moved due to unforeseen circumstances. It is strongly recommended that students meet with an academic advisor to create an academic plan tailored to meet their specific areas of interest. Please pay close attention to course prerequisites while creating your academic plan. For example, IN4MATX 124 requires CS 132 and CS 132 requires Stats 67.



# Graduate Degrees

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## GRADUATE DEGREES (organized alphabetically)

### A

- Accountancy, M.P.Ac.
- Anthropology, M.A.
- Anthropology, Ph.D.
- Art, M.F.A.
- Art History, M.A.
- Asian American Studies, M.A.

### B

- Biological Sciences, M.S.
- Biological Sciences, Ph.D.
- Biomedical and Translational Science, M.S.
- Biomedical Engineering, M.S.
- Biomedical Engineering, Ph.D.
- Biomedical Sciences, M.S.
- Biomedical Sciences, Ph.D.
- Biotechnology Management, M.S.
- Business Administration, M.B.A. (also: Fully Employed program or Executive program)
- Business Analytics, M.S.

### C

- Chemical and Biomolecular Engineering, M.S.
- Chemical and Biomolecular Engineering, Ph.D.
- Chemistry, M.S.
- Chemistry, Ph.D.
- Civil and Environmental Engineering, M.S.
- Civil and Environmental Engineering, Ph.D.
- Classics, M.A.
- Classics, Ph.D.
- Cognitive Sciences, M.S.
- Cognitive Sciences, Ph.D.
- Cognitive Neuroscience, M.S.
- Comparative Literature, M.A.
- Comparative Literature, Ph.D.
- Computational Science, M.S.
- Computational Science, Ph.D.
- Computer Science, M.C.S.
- Computer Science, M.S.
- Computer Science, Ph.D.
- Conservation and Restoration Science, M.C.R.S.
- Criminology, Law and Society, M.A.S.
- Criminology, Law and Society, Ph.D.
- Culture and Theory, M.A.
- Culture and Theory, Ph.D.

**D**

- Dance, M.F.A.
- Drama, M.F.A.
- Drama and Theatre, Ph.D.

**E**

- Earth System Science, M.S.
- Earth System Science, Ph.D.
- East Asian Studies, M.A.
- East Asian Studies, Ph.D.
- Economics, M.A.
- Economics, Ph.D.
- Education, Credential Programs
- Education, M.A.
- Education, Ph.D.
- Electrical and Computer Engineering, M.S.
- Electrical and Computer Engineering, Ph.D.
- Elementary and Secondary Education, M.A.T.
- Embedded and Cyber-Physical Systems, M.E.C.P.S.
- Engineering, M.Engr.
- Engineering, M.S.
- Engineering, Ph.D.
- Engineering Management, M.S.
- English, M.E.
- English, M.F.A.
- English, Ph.D.
- Environmental Health Sciences, M.S.
- Environmental Health Sciences, Ph.D.
- Epidemiology, M.S.
- Epidemiology, Ph.D.
- European Thought and Culture, M.A.

**F**

- Finance, M.Fin.

**G**

- Genetic Counseling, M.S.
- German, M.A.
- German, Ph.D.
- Global Studies, M.A.
- Global Studies, Ph.D.

**H**

- History, M.A.
- History, Ph.D.
- History and Theory of Music, M.A.
- History and Theory of Music, Ph.D.
- Human Computer Interaction and Design, M.H.C.I.D.

**I**

- Informatics, M.S.
- Informatics, Ph.D.
- Information and Computer Science, M.S.

- Innovation and Entrepreneurship, M.I.E.
- Integrated Composition, Improvisation, and Technology, M.A.
- Integrated Composition, Improvisation, and Technology, Ph.D.

## L

- Language Science, M.A.
- Language Science, Ph.D.
- Law, J.D.
- Laws, LL.M.
- Legal and Forensic Psychology, M.L.F.P.

## M

- Management, M.S.
- Management, Ph.D.
- Materials Science and Engineering, M.S.
- Materials Science and Engineering, Ph.D.
- Mathematical, Computational, and Systems Biology, M.S.
- Mathematical, Computational, and Systems Biology, Ph.D.
- Mathematics, M.S.
- Mathematics, Ph.D.
- Mechanical and Aerospace Engineering, M.S.
- Mechanical and Aerospace Engineering, Ph.D.
- Medical Science, M.S.
- Medicine, M.D.
- Music, M.F.A.

## N

- Networked Systems, M.S.
- Networked Systems, Ph.D.
- Nursing, D.N.P.
- Nursing Science, M.S.
- Nursing Science, Ph.D.

## P

- Pharmacological Sciences, M.S.
- Pharmacological Sciences, Ph.D.
- Pharmacology, M.S.
- Philosophy, M.A.
- Philosophy, Ph.D. (Humanities)
- Philosophy, Ph.D. (Social Sciences)
- Philosophy, Political Science, and Economics, M.A.
- Physics, M.S.
- Physics, Ph.D.
- Political Science, M.A.
- Political Science, Ph.D.
- Psychological Science, Ph.D.
- Public Health, M.P.H.
- Public Health, M.S.
- Public Health, Ph.D.
- Public Policy, M.P.P.

**S**

- Social Ecology, M.A.
- Social Ecology, Ph.D.
- Social Science, M.A.
- Social Science, Ph.D.
- Sociology, M.A.
- Sociology, Ph.D.
- Software Engineering, M.S.
- Software Engineering, M.S.E.
- Software Engineering, Ph.D.
- Spanish, M.A.
- Spanish, Ph.D.
- Statistics, M.S.
- Statistics, Ph.D.

**T**

- Transportation Science, M.S.
- Transportation Science, Ph.D.

**U**

- Urban and Environmental Planning and Policy, Ph.D.
- Urban and Regional Planning, M.U.R.P.

**V**

- Visual Studies, M.A.
- Visual Studies, Ph.D.

## **GRADUATE CONCENTRATIONS, EMPHASES, and SPECIALIZATIONS (organized alphabetically)**

**A**

- Acting, Graduate Emphasis
- Analytics in Digital Leadership, Concentration
- Ancient Iran and the Premodern Persianate World, Specialization
- Asian American Studies, Graduate Emphasis
- Astronomy and Astrophysics, Concentration

**B**

- Biotechnology, Concentration

**C**

- Chemical and Materials Physics, Concentration (Physics and Chemistry)
- Chicano/Latino Literature, Specialization
- Chinese, Specialization
- Choral Conducting, Graduate Emphasis
- Cognitive Neuroscience, Concentration
- Collaborative Piano, Graduate Emphasis
- Community and Population Health Nursing, Concentration
- Computer Engineering, Concentration (M.S. and Ph.D.)
- Creative Nonfiction, Graduate Emphasis
- Critical Theory, Graduate Emphasis

**D**

- Demographic and Social Analysis, Concentration
- Design, Graduate Emphasis
- Developmental and Cell Biology, Concentration
- Directing, Graduate Emphasis
- Dramaturgy, Graduate Emphasis

**E**

- East Asian Cultural Studies, Specialization
- Ecology and Evolutionary Biology, Concentration
- Educational Policy and Social Context, Specialization
- Electrical Engineering, Concentration (M.S. and Ph.D.)
- Embedded Systems, Concentration

**F**

- Feminist Studies, Graduate Emphasis

**G**

- Games, Decisions, and Dynamical Systems, Graduate Emphasis
- Global Studies, Graduate Emphasis
- Guitar/Lute Performance, Graduate Emphasis

**H**

- Human Development in Context, Specialization

**I**

- Instrumental Performance, Graduate Emphasis

**J**

- Japanese, Specialization

**L**

- Latin American Studies, Graduate Emphasis

**M**

- Materials and Manufacturing Technology, Concentration
- Mathematical Behavioral Sciences, Concentration
- Medical Humanities, Graduate Emphasis
- Medicine, Science, and Technology Studies, Concentration
- Molecular Biology and Biochemistry, Concentration
- Monetary Policy and Central Banking, Concentration
- Music Direction, Graduate Emphasis
- Musicology, Graduate Emphasis

**N**

- Neurobiology and Behavior, Concentration

**P**

- Piano Performance, Graduate Emphasis
- Public Choice, Concentration
- Public Choice/Political Economy, Concentration

**S**

- Social Networks, Graduate Emphasis
- Spanish Literature, Specialization
- Spanish-American Literature, Specialization
- Stage Management, Graduate Emphasis

**T**

- Teaching, Learning, and Educational Improvement, Specialization
- Transportation, Concentration

**V**

- Visual Studies, Graduate Emphasis
- Vocal Arts, Graduate Emphasis

# Graduate Division

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## Gillian R. Hayes, Vice Provost for Graduate Education and Dean of the Graduate Division

With the exception of programs conducted by the School of Medicine for the training of physicians, and the J.D. program in the School of Law, the Vice Provost for Graduate Education, and Dean of the Graduate Division administers graduate education in accordance with academic policies established by the University of California, the Irvine Division of the Academic Senate, and the UCI Graduate Council, a standing committee of the Irvine Division of the Academic Senate. Graduate education includes those students engaged in the pursuit of a master's degree, a doctoral degree, or a teaching credential, as well as individuals engaged in postdoctoral training at UCI. There is no separate graduate faculty at UCI; all graduate work is supervised by academic units and faculty members who have concurrent responsibility for undergraduate education.

Information about graduate education at UCI is published here in the *UCI General Catalogue*, on the Graduate Division website, and in individual graduate program publications. The staff of the Graduate Division and departmental academic advisors are prepared to answer questions about admission, academic policies and procedures, graduate programs and degrees, financial assistance, student services, and other matters of concern to applicants or graduate students. The Graduate Division is located in 120 Aldrich Hall; 949-824-4611; or visit the Graduate Division website (<http://www.grad.uci.edu/>).

The University of California believes that a diverse student and faculty population is integral to the advancement of academic excellence and is critical to promoting the lively intellectual exchange and the variety of ideas and perspectives that are essential to advanced scholarly research and debate. The University is committed to expand student outreach, recruitment, and retention efforts. Through the Graduate Division's diversity programs, steps are taken to increase the participation of diverse groups of U.S. citizens and permanent residents who have been educationally or socioeconomically disadvantaged.

It is the goal of UCI's Graduate Division to award fellowships to many admitted students based upon merit or financial need. In addition, diversity fellowships for new and continuing Ph.D. and M.F.A. students are based on demonstrated scholastic achievement, full-time status, U.S. citizenship or permanent residency, and socioeconomic and educational limitations. Each academic department identifies those students whose scholarship, background, and life experiences can best enhance the level of diversity within a department or discipline.

### On This Page:

- Admission to Graduate Standing
  - Application Procedures
    - How to Apply
    - When to Apply
  - Required Supporting Documents
    - Letters of Recommendation
    - Graduate Record Examination (GRE) Scores
    - Domestic Academic Records
    - Foreign Academic Records
    - Demonstration of English Language Proficiency for Admission
    - Demonstration of Oral English Proficiency for International Teaching Assistant/Associate Employment
    - Special Note to Foreign Applicants

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## Admission to Graduate Standing

Applicants for admission to graduate study at UCI must apply for acceptance into a specific graduate program to work toward a specific advanced degree. A general requirement for admission is that the applicant hold the degree of Bachelor of Arts, Letters, Philosophy, or Science (or an acceptable equivalent) from an **accredited academic institution with degree standards equivalent to those of the University of California**. A minimum undergraduate grade point average of at least B (3.0 on a 4.0 scale) is required.

Each applicant's file is comprehensively evaluated by the faculty admissions committee of the applicant's specific graduate program on the basis of such factors as academic subject preparation, scholarship, letters of recommendation, test scores, and examples of previous work. One critical evaluative question is whether the applicant's academic objectives can reasonably be satisfied by a particular graduate program on this campus. Please note that the University of California does not have the capacity to accommodate/admit all applicants who meet the minimum admission requirements.

## Application Procedures

### How to Apply

Prospective students should apply online using the *Application for Graduate Study* available at Graduate Division website (<http://www.grad.uci.edu/>). Detailed instructions are included in the electronic application. For additional information, send email to [grad@uci.edu](mailto:grad@uci.edu) or call 949-824-4611.

The mandatory application fee is \$120 (\$140 for international students) and is not refundable under any circumstances. (Please note, however, that the application fee for M.B.A. programs offered by The Paul Merage School of Business is \$150.) Payment instructions are provided in the electronic application as well as on the Graduate Division website (<http://www.grad.uci.edu/>). Diversity program and/or financial-need-based application fee waivers may be available for a few **domestic** (U.S. Citizen or U.S. Permanent Resident) applicants.

### When to Apply

For all graduate programs, applications should be completed and submitted by the respective program's stated deadline. Some programs have deadlines as early as December 1; others have deadlines of January 15, and still others may accept applications until March or thereafter. In order to process applications in time for the applicant to receive full consideration, letters of recommendation, unofficial transcripts, and official test scores must be received before the published deadlines. Some schools and departments have earlier or later deadlines for filing the application. Applicants should consult their prospective department or school for more detailed information. Contact information for the schools and departments may be obtained by visiting their individual websites or via the list of department and school contacts on the Graduate Division website (<http://www.grad.uci.edu/academics/degree-programs/>).

## Required Supporting Documents

### Letters of Recommendation

Applicants should arrange to have three letters of recommendation uploaded to the application system. Instructions for contacting recommenders and for uploading letters of recommendation are available on the application. Only one set of three recommendation letters needs to be submitted in support of an application for admission and fellowship or assistantship consideration, although additional letters are allowed. It is important that letters of recommendation be completed primarily by professors or instructors in disciplines related to the proposed course of study who are in a position to analyze an applicant's abilities and academic promise.

### Graduate Record Examination (GRE) Scores

Many programs require applicants to take the Graduate Record Examination (GRE) General Test; however, many do not. Many programs in the Paul Merage School of Business require that M.B.A. applicants take either the Graduate Management Admission Test (GMAT) or the GRE; applicants to the Master of Finance must also take either the GMAT or the GRE. However, several other master's programs in the Paul Merage School of Business may exempt some or all applicants from the test requirement. **Applicants must check with their program of interest to determine specific requirements.**

**All** applicants are strongly encouraged to check the testing requirements of their program of interest, as they may have changed. Several programs also require, or strongly recommend, that an applicant report the score of a GRE Subject Test. There is no minimum GRE score. Applicants should register for either the October or December test dates to ensure the timely receipt of their score results for admission consideration. The GRE is administered by the Educational Testing Service (<http://www.ets.org>). GRE scores that are more than five years old are not acceptable.

### Academic Records

For application review purposes only, applicants must scan and upload copies of transcripts for all institutions attended since high school. In the online application, applicants will be prompted to upload their scanned documents. Unofficial transcripts must also be submitted by applicants who attended or graduated from any University of California campus, including UC Irvine. Applicants must upload both the front and back sides of the transcript. Uploaded transcripts should be recent and include the following: applicant name, dates of attendance, grades/marks received, credits, and grading legend. UCI reserves the right to require official transcripts at any time during the admission process, and rescind any offer of admission made if discrepancies between uploaded and official transcript(s) are found. Official transcripts will be requested at such time that an applicant is admitted and decides to attend UCI. Applicants should not send official transcripts until this time, unless requested to do so. Applicants with academic work in progress must expect to complete their undergraduate degree programs before the intended date of enrollment at UCI and must submit evidence of degree conferral before officially enrolling.

### Foreign Academic Records

If a student who has attended a foreign institution is admitted and decides to attend UCI, official academic records from any foreign institutions attended will be required. Records of academic study from foreign institutions must be official, bearing the original signature of the registrar and the seal of the issuing institution. Applicants should not send the original of an academic record which cannot be replaced; they should obtain instead properly certified copies. Unless academic records and diplomas are issued in English by the institution, the official records in their original language must be submitted with an authorized, complete, and exact English translation. Foreign academic records must include all subjects or courses taken on a yearly basis, together with the units of credit or time allotted to each subject each term or year and the marks or ratings in each subject or examination passed. In all cases the institutional grading scale or other standard of evaluation, including maximal passing and failing marks and definition of grades between them, should appear on official records or as an official attachment. Official evidence of degree conferral must also be supplied, together with evidence of rank in class if available.

### Demonstration of English Language Proficiency for Admission

Applicants whose primary language is not English are required to demonstrate proficiency in English for admission consideration. A student may receive a waiver to the Test of English as a Foreign Language (TOEFL or TOEFL iBT) requirement **only for purposes of admission** to a UCI graduate program if the student completed all of the requirements for their high school diploma, bachelor's degree, or an advanced degree in a country where the primary and/or dominant language is English, **and** where English was the language of instruction of the school where the requirements were completed. The TOEFL/TOEFL iBT requirement may be waived for **admissions purposes only**. In addition, this policy pertains to the minimum UCI campus



admission policy for English Language proficiency. **Individual departments may have stricter requirements than the minimum campus standard.** Applicants should always consult the department in which they are interested for specific requirements.

Proficiency in English may be demonstrated by passing one of two standardized, internationally administered tests: TOEFL (the Test of English as a Foreign Language), or IELTS (International English Language Testing System). The applicant should take one of these tests at the earliest available date to ensure that the scores are reported in time to meet application deadlines. Applicants will not be admitted provisionally if they lack an acceptable proficiency score or have not yet taken an acceptable proficiency examination.

The TOEFL is administered by Educational Testing Service (<http://www.ets.org>) (ETS). For the TOEFL iBT, the minimum required overall score for admissions consideration is 80; the minimum score required for admissions consideration is 550 for the paper-based test. TOEFL and TOEFL iBT scores that are two years old or older are not acceptable. Results of institutional (non-ETS) administrations of the TOEFL or TOEFL iBT are not acceptable.

English language proficiency may also be demonstrated by passing the Academic Modules of the International English Language Testing System (<http://www.ielts.org>) (IELTS) examination. The minimum requirements for admissions consideration are an overall score of 7, with a score of no less than 6 on any individual module. IELTS test scores that are two years old or older are not acceptable.

### Demonstration of Oral English Proficiency for International Teaching Assistant/Associate Employment

Many UCI degree programs require students to serve as a Teaching Assistant for training purposes, as a graduation requirement and to provide students with financial support. UCI encourages **(and some individual graduate programs require)** prospective international students to take and pass one of the accepted oral English proficiency examinations prior to application/admission. International and U.S. Permanent Resident graduate students who are not citizens of countries where English is either the primary or dominant language as approved by the UCI Graduate Council, who wish to be considered for appointment as a Teaching Assistant/Associate, must pass one of the following English proficiency examinations: Test of English as a Foreign Language Internet-based Test (TOEFL iBT), International English Language Testing System (IELTS), or UCI campus Speaking Proficiency English Assessment Kit (SPEAK) test. TOEFL iBT is administered by the Educational Testing Service (ETS). IELTS, on the other hand, is administered through the partnership of the British Council, IDP: IELTS Australia and the University of Cambridge ESOL Examinations. Once a student is admitted to UCI, the SPEAK test, which is administered by the UCI Humanities Studio for Academic Resources and Technology, is an option to satisfy this requirement. Achieving a minimum score of 26 on the speaking portion of the TOEFL iBT, a score of 8 on the speaking module of the IELTS, or a score of 50 on the SPEAK test satisfies the oral proficiency requirement and *may* establish eligibility for a Teaching Assistant/Associate appointment. Graduate students are responsible for ensuring that the UCI Graduate Division is notified directly of their scores by the testing centers. There is no exception to this requirement.

A full discussion of English proficiency options and links to the agency sites offering these examinations are available at the Graduate Division's English Proficiency website (<http://www.grad.uci.edu/admissions/applying-to-uci/english-proficiency.html>).

Students who are citizens of the United States (regardless of country of origin) and citizens of countries where English is either the primary or dominant language as approved by the UCI Graduate Council are exempt from the requirement of taking and passing the English language proficiency examinations for admission purposes only. Non-U.S. citizens who are U.S. Permanent Residents or hold other non-citizen status and are residing in the United States, who have completed their undergraduate education in the United States, or have attended American schools abroad are *still* required to pass one of the English language proficiency examinations noted above in order to be eligible for an appointment as a Teaching Assistant/Associate.

Any student who was waived of the English proficiency requirement for admissions purposes will still be required to take a campus-based test. No student is permitted to begin an appointment as a Teaching Assistant/Associate until an English proficiency test has been taken and the student has passed.

### Special Note to Foreign Applicants

If admitted, foreign applicants will be required to certify that they possess sufficient funds to cover all tuition, fees, transportation, and living expenses for the first year of their studies at UCI. A Visa Request Form which contains a section for verification of financial resources will be forwarded to foreign applicants by the admitting academic program upon admission to graduate study. The required financial verification must be provided before a visa can be issued.

## Admission and Registration

A formal notice of the admission decision is sent to each applicant as soon as possible after the application and complete records are received, and after the department has made a recommendation. The official notification will be mailed well in advance of the beginning of the quarter for which application has been made.

Admission to graduate standing does not constitute registration for classes. A student is not officially registered for classes until the entire registration procedure is completed each quarter, including payment of Tuition, Student Services Fee, and other University fees, and enrollment in courses. Information on registration dates and procedures will be sent to newly admitted students prior to the registration cycle. Extensive information for newly admitted students is available at the Admitted Students website (<https://grad.uci.edu/admissions/admitted-students/>).

If an applicant wishes to defer admission to a later academic quarter (up to a maximum of three quarters after the original quarter of admission), the Graduate Division must be notified of the request in writing. After formal admission has been offered, the request for deferral must first be approved by the academic program to which the applicant was admitted.

## Campuswide New Graduate Student Orientations

Incoming graduate students are strongly encouraged to attend the Campuswide New Graduate Student Welcome and Orientation, and all international students are encouraged to also attend the International Graduate Student Welcome and Orientation, both held during the third week of September each fall. The Campuswide New Graduate Student Welcome and Orientation covers all aspects of navigating graduate education at UC Irvine, including graduate student services. It augments school/department-based orientations, and students should attend both. The International Graduate Student Welcome and Orientation covers unique aspects of the international graduate student experience, and provides information on campus support services; international students are encouraged to attend both campuswide orientation events. Information about the Campuswide New Graduate Student Welcome and Orientation is e-mailed to incoming graduate students the summer prior to the event; information about the International Graduate Student Welcome and Orientation is also provided at that time to incoming international students. Inquiries may be directed to [gradorientation@uci.edu](mailto:gradorientation@uci.edu), and details are available at the Graduate Welcome and Orientation website (<https://grad.uci.edu/services/campus-orientation/>).

## Academic Advising

In each academic unit with an advanced degree program, there is at least one formally appointed faculty graduate advisor or director of graduate studies. The graduate program advisor is a regular faculty member responsible for supervising graduate study in that unit, for monitoring the academic progress of graduate students, and for seeing that each graduate student is assigned a faculty advisor. The graduate student's faculty research advisor is responsible for mentoring the student, which includes meeting with the student at least once during each quarter of enrollment and providing an annual assessment of each student's timely academic progress. The graduate program advisor plays a key role in the academic lives of graduate students, advising students and other faculty members about program requirements and the academic policies pertaining to graduate students, approving study lists, and evaluating academic petitions. In many academic units the graduate program advisor is instrumental in the nomination of students for fellowship support, the selection of students for assistantships and fellowship appointments, and in the supervision of graduate student teachers. In most schools there also is an associate dean for graduate studies who coordinates many of the functions which affect graduate students within that school. Both graduate advisors as well as deans are important links between the student and the Dean of the Graduate Division.

Most graduate students also will have an individual faculty advisor or advising committee after the first year of graduate study and in order to progress to the Ph.D. degree a student must work with an advisor. When a student is advanced to candidacy for the Ph.D., the doctoral committee becomes the primary source of academic guidance; however, student academic petitions still must be approved by the faculty graduate program advisor. It is the student's responsibility to secure a faculty advisor with whom they will work on their progress to the degree.

## Academic Policies

The academic policies described here apply to students enrolled in study leading to graduate degrees and California education credentials. Other regulations and procedures are covered in the Academic Regulations and Procedures sections, and in the description of each graduate program.

### Academic Honesty

It is essential that all members of the academic community subscribe to the ideal of academic honesty and integrity and accept individual responsibility for their work. Students are urged to become familiar with the UCI Academic Senate Policies on Academic Honesty, available at the Academic Senate website ([http://www.senate.uci.edu/senatweb/default2.asp?active\\_page\\_id=754](http://www.senate.uci.edu/senatweb/default2.asp?active_page_id=754)) and in the *Catalogue's* Appendix. The policies apply equally to electronic media and print, and involve text, images, and ideas.

### Scholastic Requirements

A graduate student is expected to make satisfactory progress toward an approved academic objective, as defined by the faculty of the program in accordance with policies of the Graduate Council, to maintain a satisfactory grade point average for all work undertaken while enrolled in graduate study, and to maintain academic progress within the required time to degree as established by the respective academic program. Satisfactory progress is determined on the basis of both the recent academic record and overall performance. A graduate student normally is expected to complete satisfactorily at least eight units of academic credit applicable to the graduate program in each regular academic session (unless on an approved leave of absence), and satisfy all requirements of the academic program according to an approved schedule. For a graduate student, only the grades A+, A, A-, B+, B, and S represent satisfactory scholarship and may be applied toward advanced degree requirements. However, a UCI course in which a grade of B- is earned may be accepted one time only, via a formal petition process, in partial satisfaction of the degree requirements if the student has a grade point average of at least 3.0 in all courses applicable to the degree. Graduate students may not apply courses graded Pass/Not Pass toward any degree or satisfactory progress requirements. A grade point average below the B level (3.0 on a 4.0 scale) is not satisfactory, and a student whose grade point average is below that level is subject to academic disqualification.

A student's academic progress ordinarily is evaluated on the basis of the academic record, time-to-degree, and the professional judgment of the faculty. A few weeks after the end of a quarter, an updated copy of each enrolled student's permanent academic record is available from the Registrar. This record lists all UCI courses for which a graduate student was enrolled (including courses taken through the Intercampus Exchange Program), the grades

assigned, and the cumulative grade point average. This record also includes formal candidacy for an advanced degree, degrees conferred, certain examinations passed, unit credit accepted from other institutions, and other important academic information.

A graduate student who has not demonstrated satisfactory academic progress is not eligible for any academic appointment such as Reader, Tutor, Graduate Student Researcher, Teaching Associate, or Teaching Assistant, and may not hold a fellowship or other award which is based upon academic merit.

## Satisfaction of Degree Requirements

To graduate, students must satisfy the degree requirements outlined in the *Catalogue* that is in effect for the quarter in which they are registering for a graduate program. If the degree requirements are subsequently revised, the academic unit may, where appropriate, give students the option to meet the new requirements instead. If degree requirements are revised between the time a student is admitted and the time a student registers, the unit should notify the student of the modifications in writing. A student who withdraws from a program, or loses student status for other reasons for one or more quarters, will be bound by the degree requirements in effect at the time of readmission unless otherwise stipulated and agreed to in writing by the academic unit and approved by the Dean of the Graduate Division. A student who defers admission or who changes to another program will be held to the requirements in effect at the time of first registration.

## Grading

With the consent of the academic units involved, and upon approval by the Graduate Council, individual study and research courses at the graduate level may be graded Satisfactory or Unsatisfactory (S/U). Also, with the approval of the Graduate Council certain graduate courses are graded S/U only. A grade of S is assumed equivalent to a grade of B (3.0) or better. No course credit is given to a student for a course in which a grade of U is received.

Graduate students may take one undergraduate course (up to four units) per quarter on a Pass/Not Pass basis. However, such courses are not considered part of the student's graduate program and are not applied toward the requirements for an advanced degree.

The grade Incomplete (I) is assigned when a student's work is of passing quality but is incomplete for good cause. The I grade may be replaced by a permanent grade, provided the student completes the course work in a way authorized by the instructor and within the time limits expressed. The student must complete the course work within the period set by the instructor, or within 12 months following the quarter in which the grade Incomplete was originally awarded, or prior to the end of the quarter immediately preceding award of the degree, whichever comes first. The instructor is not obligated to allow the maximum time period. When the course work is completed within the time allowed, the student must ask the instructor of the course to submit an Academic Record Change Request to the Dean of the School in which the course is taught. During the time allowed for replacing an I grade, the I grade will not be used in computation of a student's grade point average. However, if the incomplete course work is not completed in the manner authorized by the instructor and within the time limits stated above, the I grade shall automatically be replaced with the permanent grade of F, NP, or U, as appropriate in accordance to the grading option selected when the student enrolled in the course, and will be used in computation of the student's grade point average. Graduate students who have not been continuously enrolled should contact their graduate advisor for information about completion of incomplete grades.

IP (In Progress) is a transcript notation restricted to sequential courses extending over two or more quarters for which use of the IP notation has been approved. When the last quarter of the sequence is completed, the grade for the final quarter is assigned for all quarters of the sequence. No credit is given until the student has completed the entire sequence.

A student who received an NR (No Report) transcript notation must immediately contact the instructor and arrange for the removal or replacement of the NR. If no action is taken by the end of the first quarter following the quarter in which the NR was assigned, or by the end of the quarter immediately preceding award of the degree, whichever comes first, the NR becomes an F, U, or NP and will remain permanently on the student's record.

A graduate student may repeat once a course in which a grade below B (3.0) or a grade of U was received. Only the most recently earned grade is used in computing the student's grade point average for the first eight units of repeated work; thereafter both the earlier and the later grades are used. Additional information about grading may be found in the Academic Regulations section.

## Language Policy for Examinations and Theses/Dissertations

English is the language of instruction and examination for graduate courses at UCI, unless the subject matter includes foreign language content. Similarly, examinations that satisfy specific degree requirements, such as preliminary, comprehensive, qualifying/candidacy examinations and thesis/dissertation defenses shall be conducted in English, except for the portions of the examination where the subject matter makes a different language specifically appropriate. (Examples include foreign language literature, linguistics, and others.)

Students must seek permission to write their thesis/dissertation in a language other than English. To do so, immediately after advancement to candidacy, the candidate must submit to the Dean of the Graduate Division a letter approved by the thesis/dissertation chair, committee, and department chair. All members of the candidate's thesis/dissertation committee must have a reading knowledge of the language presented in the thesis/dissertation. There must be legitimate reasons for substituting English with a foreign language such as subject matter, special primary audience, publication arrangements, academic position in a foreign country, historical or literary value, or principal language(s) used in the documents to be analyzed and interpreted. **Inability to write in English is not a valid reason.** If the thesis or dissertation is approved to be written in a foreign language, the candidate must submit two abstracts. One must be in English. The other must be written in the language of the thesis or dissertation. Moreover, the

thesis/dissertation defense will be conducted in English, except as determined by subject matter. See the UCI Thesis and Dissertation Manual ([http://special.lib.uci.edu/dissertations/uci\\_td.html](http://special.lib.uci.edu/dissertations/uci_td.html)) for information about the preparation of manuscripts.

## Academic Disqualification

After consultation with the student's academic unit, the Dean of the Graduate Division may disqualify a student for academic reasons, including, but not limited to, having a grade point average in graduate and upper-division courses below 3.0 for two or more successive quarters; or failing to pass (or not taking) a required examination or course within the time specified for that graduate program; or not maintaining satisfactory academic progress toward completion of an approved program of study. Beginning with students entering in fall 2010, the Graduate Dean will not permit students to enroll past their programs' maximum time to degree (MTTD). Any exception request must be made in writing directly to the Graduate Dean and will be considered in cases involving extenuating circumstances beyond the student's control. The exception request must include a plan and timeline for completion of the degree, must be signed by the student's program advisor and Associate Dean, and must be submitted at least one quarter in advance of maximum time to degree. Note that leaves of absence of up to three quarters and time allotted for parental leave are not counted toward a student's normative or maximum time to degree.

Unsatisfactory academic progress may be determined on the basis of explicit requirements (as described above), but the professional judgment of the faculty upon review of all graduate work undertaken by the student is paramount and the faculty of a particular academic unit may establish more restrictive criteria for satisfactory academic progress. Unsatisfactory progress will also result when a Ph.D. student is unable to secure a faculty advisor or if the student's advisor/advisee relationship is terminated and the student is unable to secure a new faculty advisor within a specified period of time. Ordinarily, a student whose work does not meet academic standards may be given written notice and a reasonable period of time in which to make up all deficiencies.

Prior to taking final action to disqualify, the Dean of the Graduate Division ordinarily will notify a student who is subject to academic disqualification and will provide reasonable opportunity for the student to correct erroneous or outdated academic records, and to submit other information or comments in writing to be included in the Dean's review.

Upon final written notice of academic disqualification by the Dean of the Graduate Division, disqualification will be noted on the formal academic record of that student.

## Academic Residence

A graduate student is considered to be in residence during an academic quarter if at least four units of academic credit are earned in regular upper-division or graduate courses. Credit for one academic quarter of residence may also be earned by completing at least two units of credit in approved courses in each of two six-week summer sessions, or four units of credit in an eight- or ten-week summer session. In the case of Ph.D. students, these must be consecutive sessions.

## Enrollment Policy

Full-time academic enrollment is expected of graduate students at the University of California. Study for the Ph.D. requires a full-time commitment from the doctoral student. Full-time study is defined as enrollment in at least 12 units of upper-division or graduate academic credit per quarter, including credit for supervised research or teaching. Graduate students may enroll in lower-division courses with the approval of their academic advisors, but such courses are not considered to be part of any graduate program.

Graduate students ordinarily may not receive credit for more than 12 units per quarter in graduate courses, or 16 units in upper-division courses, or a proportionate number in combination. Course loads in excess of 16 units must be approved in advance by the student's Graduate Advisor.

Although in most instances completion of an advanced degree at UCI requires full-time study, the University recognizes the legitimate need for part-time study opportunities and is committed to providing those opportunities wherever possible. Graduate degree programs may be opened to part-time students wherever good educational reasons exist for so doing. In general, part-time status is available in master's and credential programs where part-time study has been judged academically feasible by faculty and approved by the Graduate Council. However, on the recommendation of the academic unit, students admitted to a Ph.D. program *may* be approved by the Dean of the Graduate Division for part-time status on an *ad hoc* basis. Under this policy, part-time enrollment at the graduate level is defined as enrollment for eight units or less. Within the guidelines and limitations noted on the application form available on the Graduate Division website (<http://www.grad.uci.edu/>), graduate students may petition for part-time status for a maximum of three consecutive quarters and, if the petition is approved, shall pay the full Student Services Fee and student activities fees, one-half the Tuition, and if applicable, one-half the Nonresident Supplemental Tuition and one-half the Professional Degree Supplemental Tuition. Part-time enrollment and the corresponding fee reduction are generally not available to students enrolled in self-supporting programs in which they pay a program fee.

## Continuous Registration

A graduate student is expected to register for each regular academic session (fall, winter, and spring quarters) until all requirements for an advanced degree or credential have been completed, including final examinations and the submission of an approved thesis or dissertation. Registration is not official or complete until all required tuition and fees have been paid and the student has enrolled in classes. Students are responsible for ensuring that their course enrollment is correct and that their fees and tuition have been paid by the applicable deadlines.

A student engaged in study or research outside the state of California for an entire quarter ordinarily will be required to register *in absentia*. Unless an official leave of absence has been granted, or a petition to pay the Filing Fee in lieu of registration has been approved by the Dean of the Graduate

Division, a student who does not register by the final deadline for any regular quarter will lose graduate standing (i.e., the individual's status as a graduate student will lapse), and candidacy for any advanced degree will lapse. Prior to resuming graduate study in the University, a former student must successfully apply for readmission. If readmitted, the student must satisfy the academic requirements in effect at the time of readmission and may be required to satisfy certain requirements a second time, including those for formal advancement to candidacy. A readmitted student must register and then be advanced to candidacy at least one quarter before receiving an advanced degree. A degree cannot be conferred earlier than the second quarter following readmission. Students must be registered or on approved Filing Fee status for the academic term in which the degree is conferred.

A graduate student who decides to leave the University after enrolling and paying tuition and fees for a quarter must file an official Withdrawal form with the Dean of the Graduate Division. A graduate student in good academic standing who wishes to withdraw temporarily from graduate study and intends to return within one year may submit an application for a leave of absence. A graduate student who wishes to apply for a leave of absence after enrolling and paying tuition and fees for a quarter must file both a Withdrawal form and an application for a leave of absence. If the leave is approved, the student remains in good standing and need not apply for readmission in order to enroll at the expiration of the leave period. Students who file a withdrawal for any reason, including leave of absence, after enrolling and paying tuition and fees are subject to the Schedule of Refunds policy (<http://www.reg.uci.edu/enrollment/withdrawals/#refunds>).

## In Absentia

*In absentia* status is a form of registration available to academic and professional degree graduate students undertaking necessary course work or research related to their degree programs outside of California. The Fee Policy for Graduate Student *in Absentia* Registration promotes continuous enrollment of graduate and professional degree students by providing an appropriate enrollment incentive. Research leaves for work outside of the state of California have been eliminated. Students registered *in absentia* are assessed 15 percent of the Student Services Fee and Tuition, the full health insurance fees, and the Associated Graduate Students fee. If applicable, students are also assessed nonresident supplemental tuition and/or professional degree supplemental tuition. All students pursuing doctoral or master's degrees in academic disciplines as well as those pursuing professional master's or doctoral degrees are eligible for the fee reduction. Students must be enrolled full-time in regular University of California units to be eligible for the reduced *in absentia* fee. Students in self-supporting graduate programs, exchange programs, or programs paying only a program fee are not covered by this policy and are not eligible for *in absentia* registration.

**The research or course work** must be directly related to the student's degree program as evidenced by UC faculty approval; must be of a nature that makes it necessary to be completed outside of California for at least one full academic term; must involve only indirect supervision appropriate to evaluating the student's academic progress and performance by UC faculty during the *in absentia* period; must involve no significant studying or in-person collaboration with UC faculty during the *in absentia* period. Under no circumstances can students participate in coursework, exams or research at UC Irvine for any part of a term in which the student is on *in-absentia* status. Students should be advanced to candidacy before applying for *in-absentia* status.

Students who will be engaged in necessary degree-related course work or research off campus but within the state of California may be eligible to apply for *in-absentia* status by exception, depending on the location of their research. Students shall not use any University of California resources while on *in-absentia* status.

## Leave of Absence

A graduate student who withdraws from the University with the intention of returning within one year and wishes to avoid a lapse of student status should request a leave of absence. A leave of absence of up to one year's duration may be granted by the Dean of the Graduate Division upon the recommendation of the student's academic unit, subject to the following guidelines:

1. The student must have **completed** satisfactorily **at least one** quarter in residence and be in good academic standing. The leave must be consistent with the student's academic objectives.
2. Leave ordinarily is approved in cases of serious illness or other temporary disability, or temporary interruption of the student's academic program for other appropriate reasons.
3. A student on leave is not eligible for assistance from a University fellowship, research grant, or financial aid program, and may not hold an academic appointment or be employed by the University in any capacity. During a period of leave, a student may not take comprehensive or qualifying examinations or earn academic credit (except by a transfer of credit from another institution approved in advance by the Dean of the Graduate Division). University resources and facilities, including housing, are ordinarily unavailable to students on leave.
4. A student failing to register for the next regular academic session following the expiration of leave will lose graduate standing and will be subject to the following readmission policy.

## Readmission

A student who previously withdrew from the University, or whose student status has lapsed, may request readmission to graduate study by submitting online a new *Application for Graduate Study* with the nonrefundable \$120 fee (\$140 for international students). The Dean of the Graduate Division may grant readmission when recommended by the academic unit. If readmitted, a student's previous academic work will be applied toward the requirements for an advanced degree only with the approval of the graduate advisor and the Dean of the Graduate Division. A readmitted student must satisfy the academic requirements in effect at the time of readmission and may be required to satisfy certain requirements a second time, including those for formal advancement to candidacy. A readmitted student must register and then be advanced or reinstated to candidacy at least one quarter before receiving an advanced degree, which will be conferred no earlier than the second quarter following readmission. In exceptional circumstances, a student who has not



registered by the end of the third week of classes may file a Readmission Petition with the Graduate Division during that academic term upon approval of the student's department chair and the respective school's associate dean, and payment of a \$120 readmission fee.

## Intercampus Exchange Program

A graduate student in good standing who wishes to take advantage of educational opportunities available only at another campus of the University of California may do so through the Intercampus Exchange Program. Ordinarily, an exchange student will have demonstrated a high level of scholarship during at least one quarter of graduate study at the home campus and will have well-defined academic objectives. Approval of the faculty advisor, the host department(s), and the respective Deans of Graduate Studies is required. Direct arrangements between faculty members on the two campuses are encouraged so as to ensure that courses, seminars, or facilities will be available to meet the participating student's needs. Students may take courses on more than one campus of the University in the same academic session.

The exchange student enrolls and pays tuition and fees on the home campus and then enrolls at the host campus, following the procedures of that Registrar's Office. A report of academic work completed will be transferred to the student's academic record on the home campus after the term has ended. Although eligible for all normal student services, the exchange student is a visitor and is not formally admitted to graduate study at the host campus. Application forms for the Intercampus Exchange Program may be downloaded from the Graduate Division website (<https://grad.uci.edu/>) and should be filed with the Office at least four weeks before the beginning of the quarter in order to avoid penalties.

## Transfers of Credit

At least one-half of the course requirement for a master's degree must be completed while in residence as a graduate student at UCI. Credit for up to one-fifth of the minimum number of units required for a master's degree may be allowed for graduate-level work completed at another institution (or courses from University of California Extension that are not regularly offered UC courses). Such courses do not count toward the required number of units in 200-series courses. Up to one-half the units required may be accepted from another graduate division of the University of California, from graduate courses taken with University of California Extension through concurrent enrollment (Concurrent enrollment means that the student took regularly offered UCI courses but registered and paid for them through UC Division of Continuing Education), or from graduate courses taken as an undergraduate at UCI that were not applied to another degree, which may reduce the number of required 200-level units. However, it does not reduce the residence requirement.

A student currently enrolled in a master's degree program or on a leave of absence may receive unit credit (not grade credit) for graduate-level work completed at another institution or through UCI Division of Continuing Education only with the prior approval of the departmental graduate advisor and the Dean of the Graduate Division. No transfer credit will be given for any course in which a grade below B or equivalent is received.

A student who begins graduate study at UCI in the fall quarter will receive appropriate credit for courses taken in preceding UCI summer sessions, provided that the formal date of admission precedes summer session enrollment. Continuing graduate students will receive credit for courses taken in intervening UCI summer sessions.

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## Graduate Degrees

### Master's Degrees

The master's degree is conferred at the end of the academic quarter in which all requirements have been satisfied, subject to the final approval of the Graduate Council. The student must be advanced to candidacy for the degree prior to the beginning of the final quarter of enrollment. Therefore, an application for advancement to candidacy, initiated by the student and approved by the academic unit, should be submitted to the Dean of the Graduate Division at least 30 days before the opening of the quarter in which the degree is expected.

The Master of Arts (M.A.) or Master of Science (M.S.) degree normally is attained by one of two routes: Plan I, the thesis option; or Plan II, the comprehensive examination option. Both require a minimum of one year in residence, satisfactory completion of prescribed course work, and an appropriate demonstration of achievement. Plan I includes a minimum of seven courses (28 units), 20 units or more of which must be at the graduate level; a thesis; and a general examination. Plan II requires at least nine courses (36 units), including 24 units or more at the graduate level, and a comprehensive examination covering a broad range of subject matter in the discipline. Only approved 200-series courses completed while in residence at the University satisfy the minimum graduate course requirement. Some programs will have course requirements exceeding the minimums cited above and may have additional or alternative degree requirements. Please refer to the description of the specific program for more information.

Master of Fine Arts (M.F.A.) degrees are awarded by the Claire Trevor School of the Arts (M.F.A. in Dance, Drama, Fine Arts, or Music) and by the Program in Creative Writing (M.F.A. in English) upon successful completion of the equivalent of two years or more of full-time study with an emphasis upon creative expression and professional development. Special thesis or comprehensive examination requirements are established for these programs.

Master of Arts in Teaching (M.A.T.) degrees are awarded upon successful completion of programs designed for the professional development of elementary and secondary school teachers. A minimum of one year in residence is required, usually including summer session course work. A thesis project or other comparable evidence of professional attainment is part of each M.A.T. program.

Master of Business Administration (M.B.A.) degrees are awarded by The Paul Merage School of Business upon successful completion of the equivalent of two years of full-time study in the development of professional managerial skills.

Master of Computer Science (M.C.S.) professional degrees are awarded by the Donald Bren School of Information and Computer Science upon successful completion of 11 courses (44 units) to be completed in four quarters. Coursework includes five core courses, including two capstones, six elective courses, and a one-quarter optional summer internship component. Nearly all courses have a lab component that will allow for a more supervised hands-on learning environment with a stronger emphasis on practical applications and implementation.

Master of Advanced Study (M.A.S.) degrees are awarded by the School of Social Ecology in Criminology, Law and Society upon successful completion of 52 units of course work in the broad areas of criminal justice, including corrections, probation, criminal prosecution, defense, and civil law. The program is fully online with the exception of a required one-week in-residence course during the first fall quarter.

Master of Science in Business Analytics prepares students for a wide range of high-demand opportunities in big data and business analytics across a variety of industries throughout California and beyond.

Master in Embedded and Cyber-Physical Systems (M.E.C.P.S.) is an interdisciplinary program offered by the Henry Samueli School of Engineering and the Donald Bren School of Information and Computer Science. The curriculum focuses on Embedded and Cyber-Physical Systems. This program is designed as a one-year, full-time program. Coursework includes seven foundational courses with lectures and laboratory, and two project courses leading to a final project.

Master of Finance (M.Fin.) is awarded by the Paul Merage School of Business upon successful completion of a 12-month, full-time program consisting of six required courses and seven electives (for a total of 52 units). Students have the opportunity to specialize in areas including corporate finance, investment management, wealth management, or real estate.

Master of Human-Computer Interaction and Design (M.H.C.I.D.) is a mixed format, low-residency one year degree is awarded by the Donald Bren School of Information and Computer Science upon successful completion of eight courses, a capstone project and portfolio, and a summer presentation.

Master of Innovation and Entrepreneurship (MIE) is now available in a one-year or two-year format, is the only program of its kind in the UC System, and provides extensive integrated and immersive academic and practical experience for students.

The Master of Legal and Forensic Psychology (M.L.F.P.) degrees are awarded by the School of Social Ecology upon successful completion of 52 units of course work in a broad area that integrates facets of psychology, forensics and the law, and the intersection of psychology and legal issues. The program is a two-year professional degree program that is fully online with the exception of a one-week, in-residence course prior to the first fall quarter of instruction.

Master of Professional Accountancy (M.P.Ac.) degrees are awarded by The Paul Merage School of Business upon successful completion of 44 units of course work including core courses and electives.

Master of Public Health (M.P.H.) degrees are awarded by the Program in Public Health upon successful completion of 60 units of course work including core courses, electives, and courses in the student's emphasis.

Master of Public Policy (M.P.P.) degrees are awarded by the School of Social Ecology upon successful completion of 72 units of course work including core courses and electives. Students also participate in a policy-relevant internship in an appropriate government, business, or nonprofit setting.

Master of Science (M.S.) in Nursing Science degrees are awarded by the Sue and Bill Gross School of Nursing upon successful completion of 68–71 units of course work, depending on the student's chosen area of specialization, as well as 720 hours of clinical practice in the student's area of emphasis to be eligible for certification.

Master of Urban and Regional Planning (M.U.R.P.) degrees are awarded by the School of Social Ecology upon successful completion of the equivalent of two years of full-time study in contemporary methods of planning and policy analysis.

## Doctor of Nursing Practice

The Doctor of Nursing Practice (DNP) degree is a terminal practice-doctoral degree designed to develop competencies for advanced clinical and leadership roles, equipping graduates with the skills and knowledge to be effective contributors to the translation of science and research into healthcare practice.

The Sue and Bill Gross School of Nursing offers two DNP foci: the post-masters Doctor of Nursing Practice degree and the Doctor of Nursing Practice degree with a Family Nurse Practitioner concentration.

## Doctor of Philosophy Degree

The Doctor of Philosophy (Ph.D.) degree is awarded on the basis of evidence that the recipient possesses knowledge of a broad field of learning and expert mastery of a particular area of concentration within it. The research dissertation is expected to demonstrate critical judgment, intellectual synthesis, creativity, and skill in written communication.

Students are required to advance to candidacy for the doctorate, and to complete all requirements for the doctoral degree, within the normative time specified by the individual graduate program. Students who fail to complete the degree within the normative time limit for their program shall be deemed as not making satisfactory academic progress, and may be ineligible to continue to receive non-instructional University resources (e.g., financial aid, teaching assistantships, student housing). Normative time-to-degree parameters for each doctoral program are indicated in the academic unit sections of this *Catalogue*. Students who fail to complete the degree within the maximum time-to-degree limit for their program shall not be permitted to enroll. For details see the section on Academic Disqualification.

The candidate for the Ph.D. is expected to be in full-time residence for at least six regular academic quarters. Four to six years of full-time academic work beyond the bachelor's degree typically is required to complete the degree. At the end of the first year or so of full-time study, many programs administer a preliminary examination on the student's mastery of fundamental knowledge in the discipline. Upon successfully demonstrating a high level of scholarship on this examination and after further study, the student will continue to a series of qualifying examinations which lead to formal advancement to candidacy for the Ph.D.

Graduate students ordinarily attain candidacy status for the Ph.D. degree when all preparatory work has been completed, when qualifying examinations have been passed, and when they are ready for the dissertation phase. Students are recommended for advancement to candidacy by unanimous vote of the candidacy committee nominated by the academic unit and appointed by the Dean of the Graduate Division on behalf of the Graduate Council. The Report of the Ph.D. Candidacy Committee (Form I) must be signed by the committee at the time the candidacy examination is concluded and submitted to the Dean of the Graduate Division. Following a unanimous favorable vote of the committee, the student will be advanced to candidacy upon payment of the \$90 Candidacy Fee. Candidacy for the Ph.D. will lapse automatically if the student loses graduate standing by academic disqualification or failure to comply with the University policy on continuous registration. A readmitted student who was a candidate for the Ph.D. must again advance to candidacy and thereafter enroll as a candidate for at least one academic quarter before the Ph.D. may be conferred.

Following advancement to candidacy for the Ph.D., a doctoral committee nominated by the academic unit chair and appointed by the Dean of the Graduate Division on behalf of the Graduate Council, supervises the student's program, approves the dissertation, and conducts the final oral examination if required. The chair of the doctoral committee is the member of the faculty responsible for providing primary guidance of the student's dissertation. Ordinarily, the final examination will be given just prior to completion of the dissertation and while the student is in residence during a regular academic session. The final examination, or defense, is open to all members of the academic community. All student committees must conform to policy approved by the Graduate Council in effect at the time of examination. Ph.D. degrees are conferred, subject to the final approval of the Graduate Council, as of the last day of the regular academic quarter in which all requirements have been satisfied.

## Theses and Dissertations

Candidates for the Ph.D., Ed.D., and certain master's degrees must conduct an extensive research project and submit a dissertation or thesis in order to fulfill degree requirements. Research expenses are not supported by the University, and the cost of preparing the dissertation or thesis ordinarily ranges from \$200 to \$1,000, but may be considerably more.

After approval by the doctoral or thesis committee appointed for each candidate by the Dean of the Graduate Division, on behalf of the Graduate Council, doctoral and master's students must file their dissertation or thesis with the UC Irvine Library Special Collections and Archives, via the electronic dissertation or thesis submission process (a paper process is also available). Generally, dissertations and theses are made available for public access unless an embargo has been requested for a specific period of time. The final copy must meet the University's requirements for style, format, and appearance before the degree can be conferred. See the *UCI Thesis and Dissertation Manual* for information about the preparation of manuscripts. All doctoral students are required to submit an Exit Survey and a Survey of Earned Doctorates prior to the awarding of their degree.

Dissertations and theses must be filed by the deadline published on the Graduate Division website (<http://www.grad.uci.edu/academics/filing%20deadlines/>) in order for them to be reviewed and accepted in time for the degree to be conferred in that quarter.

Those students who complete requirements and submit theses/dissertations after the end of the tenth week of classes and prior to the start of the subsequent quarter will earn a degree for the following quarter, but *will not* be required to pay tuition and fees for that quarter. Please note that in order to avoid payment of tuition and fees, manuscripts, all forms, and degree paperwork must be submitted prior to the first day of the quarter in which the degree is to be earned. Students should note that this does not apply if the thesis/dissertation is submitted after the deadline for spring quarter degrees. Students who submit after the spring deadline are required to either enroll in Summer Session or pay the Filing Fee if they have not done so previously.

## The Filing Fee

Under certain circumstances, a student who has advanced to candidacy for a graduate degree may be eligible to pay a Filing Fee equal to half of the Student Services Fee in lieu of registration for any academic term including summer, subject to the approval of the Dean of the Graduate Division. International students who wish to go on Filing Fee status must, in addition, secure approval to do so from UCI's International Center. In general, all



requirements for a degree must have been satisfied prior to the start of the quarter, except for the submission of the final version of the dissertation or thesis, or the completion of a final oral or comprehensive examination. A student on Filing Fee status may not make use of any University resource, hold any academic appointment, receive any fellowship, or receive any student service for which official registration and payment of regular tuition and fees is a requirement. A Filing Fee will not be accepted immediately following readmission nor immediately following a leave of absence. The date for payment of the Filing Fee is the same as that for the payment of other student fees. If all degree requirements are not completed during the academic term in which the Filing Fee is paid, the student must subsequently register and pay all applicable tuition and fees. Students may only utilize the filing fee option for one academic quarter during their graduate studies. Additional quarters are not allowed regardless of whether the student changes academic programs.

## Nonresident Supplemental Tuition

Nonresident doctoral students who have advanced to candidacy are eligible for a 100 percent reduction in the annual Nonresident Supplemental Tuition for a maximum of three consecutive calendar years including time on leave of absence. Reduced Nonresident Supplemental Tuition begins with the first academic term following advancement to candidacy. Any nonresident student who continues to be enrolled, or who re-enrolls following the three-year maximum allowance, will be charged the full Nonresident Supplemental Tuition rate that is in effect at that time of enrollment.

## Conferral of Graduate Degrees

Prior to the beginning of the quarter in which an advanced degree is to be conferred, the student must have advanced to candidacy for that degree and should have received formal notice confirming candidacy from the Dean of the Graduate Division. The student should consult the departmental faculty graduate advisor to determine which degree requirements, if any, have not yet been satisfied.

Students are advised by mail when their diplomas are available, which is approximately six months after the quarter in which the degrees are awarded.

**Graduate Hooding Ceremony.** Students completing a Ph.D. or M.F.A. are eligible to walk in the Graduate Hooding Ceremony. Students are required to meet all filing deadlines (<https://grad.uci.edu/academics/filing-deadlines.php>) and satisfy degree requirements (<https://grad.uci.edu/academics/degree-completion/>) in order to participate in the ceremony. Registration for eligible students opens in February. Inquiries about and details regarding the Graduate Hooding Ceremony may be directed to the Commencement Office (<https://commencement.uci.edu/>).

## Financial Assistance for Graduate Students

Several types of financial assistance are available to graduate students at UCI. These include fellowships, teaching and research assistantships, tuition fellowships for nonresident students, grants-in-aid, and student loans. Financial support in the form of fellowships or assistantships is typically only offered to students admitted to the Ph.D., however, some programs may offer such support to students pursuing the master's degree at their discretion.

All domestic graduate students are encouraged to submit the *Free Application for Federal Student Aid* (FAFSA) each year to access state and federal grants and loans. It is available at the FAFSA website (<https://fafsa.ed.gov/>) or in the Office of Financial Aid and Scholarships after January 1, with a submission deadline of March 2 each year. The Financial Aid section in this *Catalogue* and the Office of Financial Aid and Scholarships website (<http://www.ofas.uci.edu/content/>) contain information about assistance based upon financial need that is administered by the Office of Financial Aid and Scholarships.

Applicants interested in assistantships or fellowships should so indicate on their application when applying for admission. Many graduate programs have a deadline for completed graduate applications of January 15; however, many graduate programs have earlier, or later, deadlines. Students should contact the academic program to which they are applying for accurate deadlines, particularly to receive full consideration for fellowship and assistantship awards. Continuing students interested in an assistantship or fellowship should contact the graduate advisor for their academic program. The awarding of fellowships to incoming students for the following academic year begins in the winter quarter.

UCI subscribes to the agreement of the Council of Graduate Schools of the United States, under which successful applicants for awards of financial support are given until April 15 to accept or decline such awards. An award accepted from one of the member universities may be resigned at any time through April 15. However, an acceptance given or left in force after that date commits the student to not accepting another appointment without first obtaining formal release for that purpose from the awarding institution.

Regents', UCI Chancellor's Fellowships, and other merit-based fellowships are awarded by some schools to a number of promising students entering graduate study at UCI leading to the Doctor of Philosophy or Master of Fine Arts degree. Awards may include a stipend, all required tuition and student fees, and, if applicable, Nonresident Supplemental Tuition. Other fellowships are offered, including tuition awards for outstanding applicants who are not residents of California. In many cases, fellowship stipends may be supplemented by partial assistantship appointments. Fellowship awards are typically made by the student's academic unit.

Entering or continuing graduate students may be awarded research or teaching assistantships for all or part of the academic year. The types of assistantships, number available, and required duties vary according to the activities of the academic unit. A graduate assistant who is not a California resident also may receive a tuition fellowship. While enrolled as a graduate student at UCI, students are limited in their employment with the University to no more than 50 percent time during each academic quarter. Fellowship support as well as research or teaching assistantships all require students to maintain satisfactory academic progress as defined by UC and UCI policy as well as by their academic units.

Through the Graduate Division's diversity programs, a number of diversity fellowships are awarded to entering and continuing domestic graduate students who may have been disadvantaged in higher education. Departments nominate candidates on the basis of their merit and contribution to the

diversity of the department or discipline, as well as demonstrated scholastic achievement, full-time status, and U.S. citizenship or permanent residency. Individuals from diverse cultural, geographic, and socioeconomic backgrounds are especially encouraged to apply to UCI's graduate programs. In conformance with State law, applicants may not be given preferential treatment on the basis of race, ethnicity, gender, religion, or national origin.

# Graduate Information

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- Graduate Degrees
- Graduate Division
- Life on Campus

## **ALSO:**

Degrees and Graduate Programs

Schools and Programs

Admissions

Financial Assistance

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About UCI

Academic Policies

Academic Calendar

Principles, Policies, and Other Information

Office of Research

Life on Campus

# Information for Admitted Students

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## In this section:

- Academic Regulations and Procedures
  - Intercollegiate Athletics
  - Life on Campus
  - Registration and Other Procedures
  - Requirements for a Bachelor's Degree
  - Supplementary Educational Programs
  - Undergraduate Academic Advising
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- Orientation and Welcome Week
  - New Graduate Student Orientation
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## Orientation

### Undergraduate Students

Information about UCI's Orientation Programs (<https://orientation.uci.edu/>), sponsored by Student Life & Leadership (<http://www.studentlife.uci.edu/>), is made available in mid-June to admitted students who plan to enroll in the fall. Note that due to complications surrounding the COVID-19 pandemic, all orientation programs for summer 2020 will be offered remotely through various tools.

### Summer Programs

**Student Parent Orientation Program (SPOP).** All freshmen (international and domestic) are required to participate in their orientation program. SPOP provides the opportunity for freshmen to engage with a comprehensive orientation program remotely. Each program includes 5-modules in Canvas that will be made available to students as the summer progresses, starting on July 15. It also includes academic advising and registration for fall classes for domestic students. International students will be contacted directly by their schools for information on how and when they will receive academic advising, and register for fall classes. In addition, information on housing, financial aid, campus resources, student life and more is included. Students will also have lots of opportunities to meet other students, have fun and build their social and support networks. SPOP is designed for all domestic and international freshmen.

**Transfer Student Parent Orientation Program (TSPOP)** is an optional orientation for transfer students looking for a comprehensive introduction to life at UCI. Each program includes 5-modules in Canvas that will be made available to students as the summer progresses, starting on July 15. It offers transfer students a thorough overview of what to expect during their transition to a research university as well as information on housing, financial aid, undergraduate research, campus resources, student life and more. TSPOP also gives new transfer students a leg up in building networks with peers, finding a home on campus and building friendships that can last throughout their time at UCI and beyond.

For more information about all of the orientation programs, visit the Orientation Programs website (<https://orientation.uci.edu/>), telephone 949-824-5182, or email [orientation@uci.edu](mailto:orientation@uci.edu).

### Welcome Week

**Welcome Week** is held each fall a few days prior to the beginning of classes. A variety of academic and social activities for new and returning students are held during this time. For more information, visit the Welcome Week website (<https://www.welcomeweek.uci.edu/>).

### Graduate Students

Incoming graduate students are strongly encouraged to attend the Campuswide New Graduate Student Orientation, held during the third week of September each fall. This orientation covers all aspects of navigating graduate education at UC Irvine, including graduate student services. It augments school/department-based orientations, and students should attend both. Information about the Campuswide New Graduate Student Orientation is emailed to incoming graduate students the summer prior to the event. Inquiries may be directed to [gradorientation@uci.edu](mailto:gradorientation@uci.edu), and details are available at the Campuswide New Graduate Student Orientation website (<https://www.grad.uci.edu/services/campus-orientation/>).

There is an additional orientation event specifically for international graduate students, which focuses specifically on topics that impact international graduate students and building community with fellow students and Peer Mentors. Details are available here (<https://www.grad.uci.edu/services/graduate-interconnect-program.php>). International graduate students should also attend Campuswide Graduate Welcome and Orientation.

# Academic Regulations and Procedures

Except where noted, all information applies to both undergraduate and graduate students. Additional information concerning academic regulations applying only to graduate students is included in the Graduate Division section.

## Declaration of Major

All students are required to declare a major by the time they reach junior status (90 units, excluding college work completed prior to high school graduation) or they will become subject to disqualification from further registration in the University.

## Undergraduate Scholarship Requirements

Requirements for a bachelor's degree include the accumulation of credit for a minimum of 180 quarter units with an average of at least C (grade point average of at least 2.0).

## Class Level

Undergraduate students are classified as freshman, sophomore, junior, or senior students, based on the total number of units completed, as follows:

Class	Units Completed
Freshman	0 - 44.9
Sophomore	45.0 - 89.9
Junior	90.0 - 134.9
Senior	135+

## Course Load Limits

An undergraduate may enroll in as few as 12 units or as many as 20 units. To enroll for more than 20 units or fewer than 12 units, students must obtain the authorization of their dean or, for undecided/undeclared students, the Dean of the Division of Undergraduate Education. Information about the Reduced-Fee Part-Time Study Program is available in the Expenses, Tuition, and Fees section of the *Catalogue*.

## Academic Standing

To remain in good academic standing a student must maintain a grade point average of at least 2.0 and make progress toward the degree at a satisfactory rate.

An undergraduate student normally is subject to academic probation if at the end of any quarter the grade point average for that quarter, or the cumulative grade point average, is less than 2.0.

A student whose grade point average falls below a 1.5 for any quarter, or who after two consecutive quarters on probation has not achieved a cumulative grade point average of 2.0 or a satisfactory rate of progress, is subject to disqualification.

## Normal Progress Requirement

Regular undergraduate students will become subject to probation or to disqualification from further registration in the University if they fail to make normal progress toward the baccalaureate degree, if they fail to declare a major by the time they reach junior status (90 units, excluding college work completed prior to high school graduation), or after declaring a major, if they fail to follow the program of study required by the academic unit of their major. Students who have selected undeclared status within a School may be subject to probation or to disqualification if they fail to follow a program of study leading to completion of lower-division School requirements.

A. Normal progress for all regular undergraduate students is defined in the following table, in terms of quarter units completed at the end of quarters enrolled.

Quarter	Normal Progress	Subject to Probation	Subject to Disqualification
1	12-15	8-11	7
2	26-30	18-25	17
3	41-45	27-40	26
4	56-60	41-55	40
5	71-75	56-70	55
6	86-90	72-85	71
7	101-105	88-100	87
8	116-120	105-115	104
9	132-135	124-131	123
10	148-150	141-147	140

11	164-165	159-163	158
12	180	-----	-----

**B. Status Determination:**

1. Undeclared students who have completed the number of units specified in the given quarter of their enrollment, as shown in the table above, and are following a course of study prescribed by their School are making "Normal Progress."

2. Students who have declared a major must follow the program of study required for their major, as well as complete the units specified in the given quarter of their enrollment, as shown in the table above, in order to make "Normal Progress." Students must declare a major by the time they reach junior status (90 units, excluding college work completed prior to high school graduation).

3. Students who fail to make 'Normal Progress' as defined in (1) or (2) above are subject to being placed on probation by the faculty of their academic unit or its designated agent, or for first-year undecided/undeclared students, by the Faculty Board for Undecided/Undeclared Students or its designated agent.

C. Students who have completed two consecutive quarters on academic probation without having achieved at the end of that period at least the normal rate of progress specified under (A) and (B) above are subject to disqualification.

D. For purposes of calculating "Normal Progress," "Subject to Probation," and "Subject to Disqualification," students admitted to the University with advanced standing will be classified with respect to quarter of enrollment at entrance in accordance with the following table:

Quarter at Entrance	Advanced Standing Quarter Units at Entrance
1	0-14
2	15-29
3	30-44
4	45-59
5	60-74
6	75-89
7	90-104
8	105-119
9	120-134
10	135-149

E. Units earned under the following two circumstances are not to be counted toward determination of the quarter at entrance under (D) above: (1) Advanced Placement Examination; (2) concurrent enrollment in college courses while in high school.

F. UCI students will have the units and grade points of courses taken through Concurrent Enrollment transferred to their record when they have been admitted or readmitted to regular student status. Units taken through Concurrent Enrollment will not be counted toward determination of Advanced Standing Quarter Units at Entrance if they are taken under the circumstances cited in sub-section E.

G. The quarter of enrollment at entrance of students (including baccalaureate degree candidates who already hold a baccalaureate degree) seeking admission to the University with 150 or more advanced standing units will be determined by the faculty offering the curriculum in which such students seek to enroll. This determination will be made consistent with the program required for such students to obtain the desired degree and with University residence requirements.

H. For purposes of this regulation students will be understood to have declared a major when they have been formally accepted by the faculty of a degree-granting program or its designated agent to pursue a defined course of study leading to a baccalaureate degree.

I. All undergraduate students are expected to graduate when they have completed the baccalaureate requirements of their declared major or majors.

*The Normal Progress requirement described above is not to be confused with the Normal Academic Progress requirement for Financial Aid. The former has to do with academic standing, the latter with receipt of financial aid.*

Probation is not a necessary step before disqualification. If a student becomes subject to disqualification, the complete record of grades and other accomplishments will be carefully reviewed by the responsible faculty authorities of the student's School or, for undecided/undeclared students, by a faculty authority designated by the Faculty Board for Undecided/Undeclared Students. If the record indicates little probability that the student will be able to meet the academic standards of the University of California, the student will be disqualified from further enrollment. Faculties of undergraduate degree-granting units and the Faculty Board for Undecided/Undeclared Students are obliged by Academic Senate regulations to maintain a procedure under which a student may contest disqualification actions.

In order to transfer from one campus to another in the University of California or from one UCI School to another, a student who has been disqualified or who is on academic probation must obtain the approval of the appropriate faculty, or its designated agent, into whose jurisdiction the student seeks to transfer.

### Credit Hour Unit Limit (Undergraduate)

A maximum of 216 units is permitted for all students in non-Engineering majors after their 12th quarter of study at UCI. For students in Engineering majors, the maximum number may not exceed 236 units after their 12th quarter of study at UCI. Students with Advanced Placement (AP) or International Baccalaureate (IB) credit may exceed the unit maximum by the amount of that credit.

After completing the maximum number of units, students may not normally continue their enrollment. Students wishing to exceed their unit or quarter maximums, including students pursuing multiple majors, may petition the associate deans of the impacted units (or their delegates) to continue work required to complete their degree.

Full-time transfer students admitted at the junior level are allowed no more than the equivalent of nine quarters (10 quarters for Engineering majors), regardless of units.

Individual Schools may impose additional requirements.

The maximum number of units or quarters does not include units completed at another institution prior to matriculation. After matriculation, work completed over the summer at any institution counts toward the specified unit limit but not the specified quarter count.

This regulation is effective for students who matriculate fall 2011.

### Graduate Scholarship Requirements

For a graduate student, only the grades A+, A, A-, B+, B, and S represent satisfactory scholarship and are accepted toward the graduate degree. Students are expected to maintain satisfactory academic progress at all times. Information concerning graduate student course load requirements and satisfactory academic progress is given in the Graduate Division section.

### Grading System

Grade	Description
A <sup>1</sup>	Excellent (4.0 grade points per unit)
B <sup>1</sup>	Good (3.0 grade points per unit)
C <sup>1</sup>	Fair (2.0 grade points per unit)
D <sup>1</sup>	Lowest passing grade (1.0 grade point per unit)
F	Not passing (no grade points)
I	Incomplete
P	Pass (equal to grade C or better)
NP	Not Pass (equal to grade C- or below)
S	Satisfactory (equal to grade B or better; graduate students only in courses designated by the Graduate Council)
U	Unsatisfactory (graduate students only in courses so designated by the Graduate Council)
IP	In Progress (restricted to certain sequential courses, so designated by the Subcommittee on Courses or Graduate Council, for which the final quarter grade of a multiquarter course is assigned to the previous quarter(s) of the sequence)
NR	No Report (given when an instructor does not submit final grades for a class or individual grades for students whose names appear on the official class roster; NR becomes an "F" (Fail), "NP" (Not Pass), or "U" (Unsatisfactory), whichever is appropriate, after one quarter of subsequent enrollment or at the end of the quarter immediately preceding award of the degree, whichever comes first. The instructor may replace an NR with a grade within one quarter of subsequent enrollment or may authorize the student to drop the class, which would result in the NR becoming a W)
UR	Unauthorized Repeat. A UR notation is recorded for the grade when a student already has a passing grade for a nonrepeatable course and has taken it again.

W	Withdrawal. A W grade is recorded on a student's permanent record for each course a student drops after the end of the sixth week of instruction in a quarter. Courses in which a W has been entered on a student's record carry no grade points, are not calculated in the UC GPA, and will not be considered as courses attempted in assessing the student's satisfaction of the normal progress requirement.
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<sup>1</sup> Plus and minus suffixes may be attached to the grades A, B, C, and D.

The academic record may not be altered except in those cases where a documented procedural or clerical error has occurred.

## Grade Points and Grade Point Average

Grade points are assigned on a four point basis:

Grade	Grade Points
A	4 points per unit
B	3 points per unit
C	2 points per unit
D	1 point per unit
F and I	0 points per unit

Plus or minus suffixes modify the above by plus or minus 0.3 grade point per unit, with the exception of the A+ grade which is assigned 4 points per unit.

Requirements for a bachelor's degree include the accumulation of baccalaureate credit for a minimum of 180 quarter units with an average of at least C (grade point average of at least 2.0). A course at UCI normally offers four quarter units of credit, and, in the following text, the term "course" may be understood to carry four units. The grade point average is the sum of all accumulated grade points (grade points earned in a course taken for a letter grade times the unit value of the course) divided by the sum of all units attempted. P, NP, S, U, NR, IP, and I grades, as well as workload credit, are excluded in computing grade point average.

Baccalaureate credit counts toward degree requirements and is used to compute the grade point average. Workload credit is used to determine full-time status for financial aid, housing, student loans, and other purposes. For most courses at UCI, baccalaureate credit and workload credit are identical. Courses differing in this credit or "workload credit only" courses are identified in the course description.

It should be noted that final grades as reported by instructors are normally permanent and final. An instructor may not change a final grade except to correct a clerical or procedural error. Clerical or procedural errors should be corrected within one regular academic quarter after the grade is assigned. No grade may be revised by reexamination or, with the exception of I and IP grades, by completing additional work. If a student is dissatisfied with a grade, the student should review their work with the instructor and receive an explanation of the grade assigned. A grade may be appealed on any reasonable grounds to the instructor, the chair of the department, and the dean of the School. If the matter is not resolved, the student may go for counsel to the Office of the University Ombudsman.

Under circumstances explained in *The Manual of the Irvine Division of the Academic Senate* (Appendix II: Student Academic Grievance Procedures Relating to Nondiscrimination), a grade may be changed if the Academic Grievance Panel has determined that the grade was assigned on the basis of discrimination.

## Incomplete Grades

The grade Incomplete (I) is assigned when a student's work is of passing quality but is incomplete for good cause. The I grade may be replaced by a permanent grade, provided the student completes the course work in a way authorized by the instructor and within the time limits expressed. During the time allowed for replacing an I grade, the I grade will not be used in computation of a student's grade point average.

Beginning fall 2010, students assigned an I grade must complete the course work within the period set by the instructor, or within 12 months following the quarter in which the I grade was originally awarded, or prior to the end of the quarter immediately preceding award of the degree, whichever comes first. The instructor is not obligated to allow the maximum time period. The student must consult with the instructor to determine how the Incomplete may be made up. It is strongly recommended that the student and the instructor prepare a written agreement specifying how the Incomplete can be made up and the deadline for doing so. Once the work is completed within the time agreed upon by the instructor, the student should ask the instructor to submit an Academic Record Change Request to the advising office of the School in which the course was offered. The student should not re-enroll in the course to make up the Incomplete. If the incomplete course work is not completed in the manner authorized by the instructor and within the time limits stated above, the I grade shall automatically be replaced with the permanent grade of F (Fail), NP (Not Pass), or U (Unsatisfactory), as appropriate in accordance to the grading option selected when the student enrolled in the course, and will be used in computation of the student's grade point average.

Students who have been assigned an I grade prior to fall 2010 have a maximum of 12 months following the quarter in which the grade Incomplete was originally assigned to complete the course work. However, in exceptional individual cases involving the student's prolonged inability to pursue a course of study, extensions of up to two additional years may be granted by the instructor with the approval of the dean of the unit offering the course; students



must petition for such an extension within 12 months following award of the I grade. The I grade assigned prior to fall 2010 will remain permanently on the student's record if the required course work is not completed in the manner authorized by the instructor and within the time limits stated above.

## Pass/Not Pass

The Pass/Not Pass option is available to encourage students to enroll in courses outside their major field. Courses graded Pass/Not Pass are not included in computation of the grade point average which appears on a student's permanent record. However, if a student receives a Pass in a class, course and unit credit for the class is received, except as provided below. If a Not Pass is received, the student receives no credit for the class.

Some courses are designated by academic units as Pass/Not Pass Only. Students do not have the option of taking these courses for a letter grade.

### The use of Pass/Not Pass is governed by all of the following provisions:

1. A student in good standing may take up to an average of four units per quarter on a Pass/Not Pass basis.
2. In addition, students may count a total of 12 units of courses designated Pass/Not Pass Only toward their graduation requirements.
3. A student who earns a grade of C (2.0) or better will have a Pass/Not Pass grade recorded as Pass. If the student earns a grade of C- or below, the grade will be recorded as a Not Pass, and no unit credit will be received for the course. In both cases, the student's grade will not be computed into the grade point average.
4. Courses taken under the Pass/Not Pass option may count toward the unit requirement for the bachelor's degree and toward the general education requirement. With the exception of courses designated Pass/Not Pass Only, courses taken Pass/Not Pass may not be used to satisfy specific course requirements of the student's School and major, unless authorized by the appropriate dean. No more than two courses applied to a minor may be taken Pass/Not Pass.

Graduate students may take one course (up to four units) per quarter on a Pass/Not Pass basis. However, such courses are not considered part of the student's graduate program, may not be applied to the requirements for an advanced degree, and do not count toward the minimum number of units for which a graduate student must enroll.

5. Changes to or from the Pass/Not Pass option can be made during the enrollment period. No changes can be made after the first two weeks of classes without the approval of the dean of the student's School. No changes in the Pass/Not Pass option can be made after the last day of instruction of the quarter.
6. A student on academic probation may not enroll in a course with the Pass/Not Pass option unless the course is offered on that basis only.

## Satisfactory/Unsatisfactory Grades (Graduate Students Only)

Satisfactory/Unsatisfactory grading, unlike Pass/Not Pass, is not a student option. With the consent of the academic units involved, and upon approval of the Graduate Council, individual study and research or other individual graduate work undertaken by a graduate student may be evaluated by means of the grades S or U. Also, with the approval of the Graduate Council, certain graduate courses are graded S/U Only. Additionally, the grade S or U may be assigned provisionally in each but the last quarter of a graduate course extending over more than one quarter. Upon completion of the last quarter, letter grades (A to F) replace such provisional grades. When a grade of S or U has been assigned on a provisional basis and the student does not complete all quarters of the course sequence, the instructor may assign a final letter grade or the grade of I to replace the S or U, or let the grade of S or U stand as a final grade. The grade S is defined as equivalent to a grade of B (3.0) or better. No credit will be allowed for work graded Unsatisfactory.

NOTE: When adding a course via WebReg, there is no option for S/U. In order to select S/U, students must first select the grade option and then, once the course has started, inform the instructor of their preference for the S/U option, not a letter grade. (The Pass/Not Pass option does not correlate to the S/U option and should not be selected.)

## Grades In Progress

IP is a transcript notation, restricted to sequential courses which extend over two or more quarters, indicating that the final grade for the individual quarters will not be assigned until the last quarter of the sequence is completed. The grade for the final quarter is then assigned for all of the previous quarters of the sequence. No credit is given until the student has completed the entire sequence. IP notations may be given only for courses designated by the Academic Senate Subcommittee on Courses or Graduate Council for use of this notation. IP notations are not included in computations of the student's grade point average and do not contribute to the number of quarter units completed.

## Grades Not Reported

A No Report (NR) is assigned when the student's name was on the official class roster but the instructor did not submit a final grade. A student who receives an NR must immediately contact the instructor and arrange for the removal or replacement of the NR. An NR becomes an "F" (Fail), "NP" (Not Pass), or "U" (Unsatisfactory), whichever is appropriate, after one quarter of subsequent enrollment or at the end of the quarter immediately preceding award of the degree, whichever comes first. NR transcript notations are not included in computations of the grade point average and do not contribute to the number of quarter units completed.

## Repetition of Courses

**Undergraduate.** Repetition of courses by undergraduate students not authorized by the Subcommittee on Courses to be taken more than once for credit is subject to the following provisions. Undergraduates may repeat courses only when grades of C-, D+, D, D-, F, or NP were received. (A

C- earned before fall quarter, 1984, is not repeatable.) Unit credit for courses so repeated will be given only once, but the grade assigned at each enrollment shall be permanently recorded. In computing the grade point average of an undergraduate with repeated courses in which a C-, D+, D, D-, F, or NP (if repeated for a letter grade) was received, only the most recently received grades and grade points shall be used for the first 16 units repeated. In case of further repetitions, the grade point average shall be based on all additional grades assigned. Repetition of a course more than once requires approval in all instances of the School (or equivalent) in which the student is enrolled.

All courses which were originally taken for a letter grade must be repeated for a letter grade. Courses originally taken on a Pass/Not Pass basis may be repeated for a Pass/Not Pass, or for a letter grade if the course is so offered.

Information regarding the repetition of language other than English courses is available in the School of Humanities section.

**Graduate.** A graduate student may repeat a course only once in which a grade below B or a grade of U was received. Only the most recently earned grade shall be used in computing the student's grade point average for the first eight units of repeated work; thereafter, both the earlier and the later grades will be used.

**Duplicate Credit Prohibited.** Other than the exceptions related to the repeat of deficient grades as noted above, and the exceptions related to Advanced Placement and International Baccalaureate Credit, undergraduate and graduate students may not receive unit credit or earn grade points for college courses in which the content duplicates material of a previously completed course or examination for which the student has been granted college credit.

If a student repeats a course for which a passing grade has already been received and the course is not approved as repeatable for credit, the student will receive a UR and no credit will be given.

## Student Copies of Quarterly Grades

After each quarter, a complimentary copy of the student's permanent record is available from the University Registrar's Office. On the copy, the student will find grades for all the quarters taken at UCI, a computation of grade point average at the University of California, and a list of the University requirements completed (UC Entry Level Writing, American History and Institutions).

## Satisfaction of the Writing Requirement

Students enrolled at UCI may take only UCI courses in satisfaction of the lower-division and upper-division writing requirements. Continuing UCI students may not take summer courses at another institution to satisfy lower-division or upper-division writing requirements. The two courses taken to fulfill the lower-division writing requirement must be completed with a grade of C or better (or a Pass or Credit grade equivalent to C).

1. Students who fail to attain a letter grade of C or better in WRITING 37 must repeat the course or enroll in the equivalent. It is recommended that these students enroll in WRITING 39A - WRITING 39B - WRITING 39C to assure completion of this requirement. Students who fail to attain a grade of C or better in WRITING 39C must repeat the course.
2. Students who fail to attain a grade of C or better in one or both courses of the WRITING 39B - WRITING 39C sequence must repeat the course or courses in question.
3. Students who fail to attain a grade of C or better in at least two quarters of the writing component of the Humanities Core Course after satisfying the UC Entry Level Writing requirement by attaining a grade of C or better in HUMAN 1AES, should substitute WRITING 39C if they need one quarter of additional work to complete the requirement, or WRITING 39B - WRITING 39C if they need two quarters to complete the requirement. Students who fail to attain a grade of C or better in HUMAN 1AES, enroll in HUMAN 1BES and attain a grade of C or better, but fail to attain a grade of C or better in the writing component of HUMAN 1C, should substitute WRITING 39C to complete the requirement.
4. Students who fail to attain a grade of C or better in either HUMAN 1AES or HUMAN 1BES, should substitute WRITING 39A - WRITING 39B - WRITING 39C to complete the requirement.
5. Students who fail to attain a grade of C (or Pass) or better in each quarter of a First-Year Integrated Program (FIP) sequence should see their academic counselor.

The course taken to fulfill the upper-division writing requirement must be completed with a grade of C or better (or a Pass or Credit grade equivalent to C). See the UCI Requirements section for further information. Majors in the School of Biological Sciences, Physics majors, and Pharmaceutical Sciences majors who fail to attain a grade of C or better in each of the courses taken to satisfy upper-division writing should see their academic counselor.

Students who have not completed the lower-division writing requirement before the beginning of their seventh quarter at UCI will be subject to probation. Students transferring to UCI normally should have satisfied the lower-division writing requirement before entering UCI; if, however, they have not, they must complete it within their first three quarters of enrollment or they will be subject to probation. Academic English/English as a Second Language students must complete the lower-division writing requirement before the beginning of the seventh quarter following the completion of their AE/ESL courses or they will be subject to probation.

## Credit by Examination

An enrolled student may obtain credit for course material previously mastered by taking a special examination administered by a faculty member who normally teaches that course. Detailed procedures for obtaining credit by examination may be obtained from the advising office of the School which

offers the course. Approval of any petition for credit by examination must be obtained from the dean or designee of that School *before* the examination can be administered. After the dean has signed the petition, the student must have it validated by paying a \$5 Credit by Examination service charge at the Cashier's Office.

The instructor giving the examination retains the prerogative: (1) to decide whether the course can be taken by examination, (2) to determine the form such an examination may take, and (3) to stipulate whether the grade will be reported as Pass/Not Pass or as a letter grade (e.g., A, B, C, etc.).

A student may take the examination for a particular course only one time. After receiving the grade, the student may accept it or reject it. If the student is not satisfied with the grade received on the examination, the student may choose not to receive credit or a grade. If the student does choose to accept the results of the examination, grades and grade points (if applicable) will be entered on the record in the same manner as those for regular courses of instruction.

Because of the nature of graduate degree requirements, the credit by examination option is not normally used by graduate students. Graduate level courses cannot be completed through the credit by examination option.

## Final Examinations

Final examinations, or their equivalent, are obligatory in all undergraduate courses except laboratory and studio courses, as individually determined by the Subcommittee on Courses. Normally each such examination shall be conducted in writing and must be completed by all participants by the time scheduled by the University Registrar for the quarter in question. These examinations may not exceed three hours' duration. Special arrangements may be made for disabled students.

Examinations normally are not required in laboratory and studio courses. At its option, the department concerned may require a final examination subject to prior announcement in the *Schedule of Classes* for the term.

Final grades from professors are due in the University Registrar's Office within 72 hours after the final examination.

## Independent Study: Undergraduates Only

A unique class option is available primarily to upper-division students at UCI. The independent-study option allows the student to plan with the instructor a course having a clear relationship to the student's academic program. The plan for the course will include a reading list, a group of assignments, examinations, papers, or similar evidence of intellectual achievement on which academic credit will be based. A description of the course and of its requirements must be approved by the instructor responsible for it and by the department chair or dean.

## Credits From Other Institutions or UCI Division of Continuing Education: Undergraduate Students

UCI undergraduate students who plan to enroll in courses at another institution or UCI Division of Continuing Education in either a summer or regular session, and to use such courses to satisfy any UCI requirements, should first consult with and secure prior approval from the academic dean or chair of their major who will determine if the credits are applicable to major and general education requirements.

UCI undergraduate students *must* submit an official transcript of all course work earned at another institution or college to the Office of Admissions and Relations with Schools (<http://www.admissions.uci.edu/>). If such courses are determined by the Office of Admissions and Relations with Schools to be transferable, do not duplicate other credit granted, and do not exceed limitations of credit, then the units earned may be applied toward the total required for graduation.

As of winter 2009, matriculated UCI undergraduate students can elect to have the full course record included on their academic transcript for all courses taken through UCI Division of Continuing Education. The full course record contains course title, academic department, course number, grade, and grade points earned. This option also pertains to Concurrent Enrollment courses taken by students who are applying for readmission. The full course record can be transferred to their academic record when they have been admitted or readmitted to regular student status.

## Credits From Other Institutions or UCI Division of Continuing Education: Graduate Students

In accordance with UC Academic Senate policy, graduate students may be granted unit credit (not grade credit) toward a master's degree for a limited number of acceptable graduate-level courses completed at another institution or through UCI Division of Continuing Education before enrollment in graduate study at UCI. To receive such credit, the student must submit a formal petition, including an original transcript, after enrollment in graduate study. Approval of the student's graduate advisor and the Dean of the Graduate Division is required. The petition may be downloaded at the Graduate Division website (<https://www.grad.uci.edu/forms/>).

While enrolled at UCI, a graduate student may receive unit credit for graduate-level courses completed at another institution or through UCI Division of Continuing Education only with the prior approval of the student's graduate advisor and the Dean of the Graduate Division.

See the Graduate Division section for further information about graduate transfer credit and the University's Intercampus Exchange Program.

# Intercollegiate Athletics

## UCI Intercollegiate Athletics Program

UCI's Intercollegiate Athletics Program features 18 sports, with nine men's teams and nine women's teams. Men's sports include baseball, basketball, cross country, golf, soccer, tennis, outdoor track and field, volleyball, and water polo. UCI's men's teams compete in the National Collegiate Athletic Association (NCAA) Division I, and the University is a member of the Big West Conference. UCI also competes in the Golden Coast Conference in men's water polo. The UCI women's teams also are members of NCAA Division I and the Big West Conference, competing in basketball, cross country, golf, soccer, tennis, outdoor track and field, volleyball, and water polo. Women's indoor track and field competes in the Mountain Pacific Sports Federation.

UCI, since opening in 1965, has captured 28 national team championships in nine different sports, including men's volleyball in 2012 and 2013, with 64 individuals winning national titles. The Anteaters have claimed 91 conference championships and have amassed 556 All-Americans across 20 different sports, including six in 2019-20. Men's basketball captured its second consecutive Big West title, while three other teams ended the year nationally ranked in 2020.

Since 1981, UCI has garnered 109 conference Players of the Year, 95 Coaches of the Year as well as over 1,700 scholar-athletes.

The Anteaters' success has also been evident on the international level with at least four UCI athletes selected to various national teams for each of the last 11 Summer Olympic Games. Women's water polo head coach Dan Klatt, an Olympian himself, is an assistant coach for the U.S. women's water polo team helping the squad to back-to-back gold medals.

The mission of UCI Intercollegiate Athletics is to facilitate and enrich the education and personal growth of its students through their participation in competitive NCAA Division I athletics. Intercollegiate Athletics is committed to the welfare of student-athletes and staff, and advocates an environment that promotes excellence in athletic and academic performance, sportsmanship, diversity, and gender equity. Intercollegiate Athletics also supports the University of California's mission of public service and serves to generate a unifying spirit among students, faculty, staff, and alumni that transcends communities, cultures, and generations.

The Intercollegiate Athletic offices are located in the Intercollegiate Athletics Building (IAB); UC Irvine Sports website (<https://ucirvinesports.com/>); telephone 949-824-6931.

## Athletic Facilities

On-campus facilities include the Bren Events Center, which seats 5,000 for intercollegiate basketball and volleyball. The Crawford Hall complex also includes the Santora Elite Training Center, Al Irwin Academic Center, and sports medicine. Crawford Court gymnasium has 760 chair-back seats for volleyball. Outdoor facilities include Anteater Stadium, a 2,500-seat facility for soccer and track; the 500-seat Anteater Tennis Stadium; Cicerone Field at Anteater Ballpark, home to the baseball program; and a five-acre multipurpose field complex.

UCI's Anteater Aquatics Complex houses the intercollegiate water polo teams. This 64-meter aquatics facility is designed with a movable bulkhead and is large enough to accommodate multiple activities simultaneously.

## Life on Campus

Whether it is meeting new friends in the residence halls, learning about campus life through student-initiated programs, or securing an internship, the Division of Student Affairs (<https://studentaffairs.uci.edu>) is dedicated to creating a rich experience for the Anteater community. Comprehensive programs and services attract the best, brightest and most diverse students, promote learning and leadership development, foster engagement, cultivate community service and cultural awareness, support physical and mental health and wellness, and enhance the quality of student life.

Auxiliary Services, (<https://studentaffairs.uci.edu/auxiliary-services/>) Student Life & Leadership (<http://studentlife.uci.edu/>), and Wellness, Health & Counseling Services (<https://whcs.uci.edu/>) – all within the Division of Student Affairs – serve to ensure that UCI's learning and living environment positively contributes to students attaining their academic goals and being prepared for the next stage in their lives, be it attending graduate school or pursuing a fulfilling career.

## Student Life & Leadership

The departments within Student Life & Leadership offer diverse programs and services which complement and enrich the educational and beyond-the-classroom life of UCI students. This is achieved through a comprehensive range of cultural, social, wellness and intellectual opportunities that promote student learning and development. For additional information, visit the Student Life & Leadership website (<http://studentlife.uci.edu/>) or contact [sll@uci.edu](mailto:sll@uci.edu), 949-824-5181.

## Office of the Dean of Students

To assist students in becoming more effective leaders, the Office of the Dean of Students (<https://dos.uci.edu/>) offers leadership programs while engaging student issues and concerns. Additionally, the Dean of Students is responsible for upholding the student conduct process and hears student conduct appeals.

The **Randy Lewis All-University Leadership Conference** is the cornerstone of UCI's leadership offerings bringing together students, faculty, staff and administrators. This annual weekend conference involves more than 220 emerging and established student leaders representing the full diversity of campus interest groups.

The **UC Student Regent Recruitment Luncheon** is held during winter quarter prior to the application deadline. The current UC Student Regent informs interested candidates of the issues of the day and is available for questions and answers. The application for the UC Student Regent position is available at UC Board of Regents website (<http://regents.universityofcalifornia.edu/>).

The **University Affairs for Credit Course** (UNI AFF 1A-UNI AFF 1B-UNI AFF 1C) offers students an opportunity to work on campus projects with a UCI department to enrich their academic growth and development. Each student spends a minimum of 30 hours per quarter working on a proposed project under the supervision of a designated faculty or staff member. Students are required to write a three to five page paper at the end of the course addressing the following: (1) description of the experience or project; (2) the impact of the experience or project upon the campus; and (3) the effectiveness (personally and externally) of the experience or project. Students may enroll in University Affairs for Credit a maximum of three times (or 3.9 units), and the course is graded Pass/Not Pass only.

## Campus Organizations & Volunteer Programs

The office of Campus Organizations (<http://www.campusorgs.uci.edu/>) & **Volunteer Programs** (<http://www.studentlife.uci.edu/COVP>) provides opportunities for students to pursue personal and professional goals through involvement with registered campus organizations and community service activities. We promote leadership development by providing resources, innovative programming and advising for Campus Organizations and the campus community. We aspire to provide transformative leadership experiences that foster a community of engagement and campus spirit.

COVP works with over 600 registered campus organizations with a combined membership exceeding 18,000 students. The organizations address a wide range of interests including academic, environmental, faculty/staff, international, multicultural, political, recreational, religious and spiritual, community service, social, performance/entertainment, wellness and sports. In addition, students can create new organizations to fulfill a campus need. Students can learn about organization fundamentals by attending workshops and events or visiting the office of Campus Organizations & Volunteer Programs at the **UCI Student Center, G308**. COVP also sponsors campuswide traditional events like the Anteater Involvement Fair, Anteater Leadership Summit and the Anteater Awards.

In addition to providing campus organization support, COVP also serves as the hub for student activities related to community service and volunteer projects. Community service initiatives include Alternative Break, where students engage in a week of service during their winter and/or spring break, the Community Service & Leadership Fair and the MLK Jr. Day of Service. Through mutually beneficial campus and community partnerships, students explore social issues by engaging in direct service, reflection and critical dialogue.

Involvement opportunities also exist through internship positions with COVP. Students serve as peer advisors and/or Alternative Break site leaders through the Student Life & Leadership internship program.

For additional information visit the Campus Organizations & Volunteer Programs websites:  
 Campus Organizations (<http://www.campusorgs.uci.edu/>) » (<http://www.campusorgs.uci.edu>)  
 Volunteer Programs (<http://volunteer.uci.edu/>) » (<http://volunteer.uci.edu>)

## Center for Black Cultures, Resources & Research

The Center for Black Cultures, Resources & Research (CBCRR) (<http://blackcultures.uci.edu>), established at UCI in 2016, is the first cultural center of its kind instituted at the university. The guiding vision of the CBCRR is anchored in the notion of the greatest good for the greatest number of students, faculty and staff of African ancestry as well as the broader campus community. The CBCRR offers a safe, vibrant, inclusive, supportive and communal atmosphere for UCI's diverse Black student body. Our guiding ethos is Ubuntu ("human-ness") which speaks to the notion that there is a universal bond that connects all African (Black) people, and that there is a common humanity that unites all peoples everywhere. The center provides a space for students that serves as a "home away from home" – a community. The CBCRR's facilities include a conference room for group meetings and/or studying, a lounge for socializing, a virtual computer lab and a host of services including psychological support, tutorial assistance and academic advising. The CBCRR's four pillars – Vitality, Prosperity, Health and Balance – recognize and reinforce our commitment to social justice, health and wellness, interpersonal growth, talent development, transpersonal awareness, community service, academic success and career development.

For additional information contact the Center for Black Cultures, Resources & Research, Student Center Annex, 949-824-7196, or visit the CBCRR website (<http://blackcultures.uci.edu>).



## Center for Student Leadership

The Center for Student Leadership (CSL) (<https://studentlife.uci.edu/leadership/>) is the central hub of student leadership at UCI and new students' first stop as the center that runs new student orientation. The CSL has been designed to support student leadership programming across the campus by serving as a connection point between students seeking opportunities to develop and apply leadership skills and faculty and staff who oversee leadership and development opportunities. The CSL is committed to supporting every student in their leadership development from orientation through graduation.

Through a variety of orientation programs (<https://orientation.uci.edu/>), the CSL provides assistance and information to students who are in the process of transitioning to UCI from high school or transferring from another college. Continuing students can benefit from a wide range of leadership programs (<http://studentlife.uci.edu/leadership/>) offered throughout each academic year. The Center for Student Leadership is located in the Anteater Community Resource Center (ACRC). For additional information contact 949-824-5182 or visit the CSL website (<https://studentleadership.uci.edu/>).

## Cross-Cultural Center

The Cross-Cultural Center (CCC) (<http://www.ccc.uci.edu/>), established at UCI in 1974, was the first multicultural center instituted at any of the UC campuses. The CCC offers an inclusive atmosphere and supportive environment for UCI's diverse student body. It provides meeting space and serves as a "home" for over 70 affiliated student organizations. Center facilities include two conference rooms and an executive boardroom for group meetings, as well as lounges for studying and socializing. Our values-based programs fall into the following areas: Activism & Social Justice, Education & Empowerment and Community & Diversity. For upcoming programs follow us on Instagram (@ucicrossculturalcenter (<https://www.instagram.com/ucicrossculturalcenter/>)) and Facebook (@UCICrossCulturalCenter (<https://www.facebook.com/UCICrossCulturalCenter/>)), and visit the Cross-Cultural Center website (<http://www.ccc.uci.edu/>).

## DREAM Center

The UCI DREAM Center (<https://dream.uci.edu>) stands with and serves those impacted by immigration policy through advancing systemic change, deconstructing oppressive policies and fostering community. We work toward personal growth, collective healing and visible change. The center offers general consultations with students and dedicated programs focused on areas such as first-year experiences, entrepreneurship, graduate school preparations, art and wellness.

Services include referrals to legal services, academic consultations, financial aid guidance, housing relocations and emotional support. The center is located in the Anteater Community Resource Center (ACRC).

For additional information visit the UCI DREAM Center website (<https://dream.uci.edu>).

## FRESH Basic Needs Hub

The FRESH Basic Needs Hub (<http://basicneeds.uci.edu>) is a student-initiated effort that promotes equitable access to basic needs through student empowerment, community collaboration and institutional integration. Our aim is to shift cultural consciousness toward understanding the fulfillment of basic needs which include food and housing security – a guaranteed right for every person. We are committed to making UCI a basic needs-secure campus. We understand that meeting the basic needs of our students greatly impacts their mental and physical health, academic performance, work productivity and holistic success. FRESH offers emergency food and toiletries, connects students to critical on- and off-campus resources and provides educational opportunities for students to take personal responsibility for their wellness and the well-being of their communities. We are a home for all students, a collaborative space for innovative solutions and an advocate for social justice and equity.

Programs and resources offered at FRESH include: A **food pantry** stocked with fresh and non-perishable food as well as toiletries; **CalFresh (or EBT) application assistance**; the **Emergency Meal Swipe Program** – where students can get 10 or more meal swipes uploaded to their ID cards to dine at UCI campus eateries; the **Economic Crisis Response Grant** – a case-specific grant that provides up to \$1,000 to students experiencing an emergency for basic needs purposes; **confidential consultations** with the Director of the FRESH Basic Needs Hub; **Life Skills Workshops & Programs** – a set of workshops intended to provide nutrition, cooking, financial and other life skills to students; and year-round volunteer opportunities.

Additional information can be found on the FRESH Basic Needs website (<https://basicneeds.uci.edu>).

## International Center

The International Center (<http://www.ic.uci.edu/>) contributes to the development of campus diversity and internationalization by providing services and programs to the UCI international population and the campus community. Core functions of the International Center include the following:

- Providing expert immigration services, including visa documentation, interpreting immigration regulations and related advising, and SEVIS and immigration compliance;
- Advising services to academic departments on issues related to the enrollment and visa selection for the employment of international students and scholars;

- Serving as advocates for international students and scholars and as their liaison with institutional, local, state and federal agencies;
- Providing pre-arrival advising, orientation and adjustment assistance for international students and scholars and their families.

The International Center provides all UCI students, scholars, staff and faculty the opportunity to engage in programs, events and services surrounding international education and intercultural learning.

International students and scholars at UCI with F-1 and J-1 visas and UCI-sponsored employment visas are required to complete the check-in process with the International Center upon arrival. The check-in process requires the reporting of a valid address of residence in the United States, submitting a copy of the most recent I-94 document, and for F-1 and J-1 visa holders, completion of the International Center online immigration orientation. **Failure to complete the check-in process puts the student's or scholar's visa status in jeopardy.**

All international students and scholars must be informed on the specific visa status requirements and responsibility of maintaining valid visa status. Immigration regulations require that students and scholars maintain updated records at the International Center and follow all visa status requirements. These include submitting copies of visa documents to the International Center, maintaining valid I-20 or DS-2019, passport and I-94 at all times while in the U.S, reporting changes in name, address and major to the International Center and reporting early completion of the program or when the student is planning to withdraw or otherwise no longer will be enrolled at UCI.

For additional information contact the International Center, G302 Student Center, 949-824-7249, or visit the International Center website (<http://www.ic.uci.edu/>).

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## Latinx Resource Center

The Latinx Resource Center (LRC) was founded to raise awareness of social, political, economic, historical and cultural realities of the Latinx and Chicanx communities. We accomplish this mission by offering resources, programs and a space where cultura, arte and academia are interconnected. Our vision is that these efforts will broaden access, increase retention and ensure a clear pathway to graduation through the empowerment of Latinx and Chicanx students.

For additional information contact the Latinx Resource Center located at G458 Student Center, 949-824-8045, or visit the Latinx Resource Center website (<https://studentlife.uci.edu/lrc/>).

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## Lesbian Gay Bisexual Transgender Resource Center

The UCI Lesbian Gay Bisexual Transgender Resource Center (LGBTRC) (<http://lgbtrc.uci.edu>) provides a wide range of education and advocacy services supporting intersectional identity development. We foster community, wellness and an open and inclusive environment for lesbian, gay, bisexual, intersex, transgender, queer, asexual, ally and questioning students, faculty, staff and the larger campus community. We strive to develop an atmosphere of acceptance and well-being in which the campus community can support the academic mission of the university.

LGBTRC sponsors campuswide events, student activities, student volunteer and leadership opportunities, ally development programs, workshops and seminars for campus courses and organizations, and consultation regarding matters of policy related to sexual orientation and gender identity.

The LGBTRC is open Monday through Friday, 9 a.m. to 5 p.m., and is located in G301 Student Center. Contact 949-824-3277, [lgbtrc@uci.edu](mailto:lgbtrc@uci.edu), or visit the LGBTRC website (<http://lgbtrc.uci.edu>).

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## Office of Academic Integrity & Student Conduct

The Office of Academic Integrity & Student Conduct (<https://aisc.uci.edu/index/>) is responsible for the campuswide administration of academic and student conduct for both graduate and undergraduate students. Please visit the Office of Academic Integrity & Student Conduct website (<https://aisc.uci.edu/index/>) for more detailed information.

Information is also provided in the University of California Policies Applying (<http://ucop.edu/student-affairs/policies/student-life-policies/pacaos.html>) to Campus Activities, Organizations and Students (<http://ucop.edu/student-affairs/policies/student-life-policies/pacaos.html>), available from the Office of Academic Integrity & Student Conduct (<https://aisc.uci.edu/index/>), 949-824-1479, [conduct@uci.edu](mailto:conduct@uci.edu) or [academicintegrity@uci.edu](mailto:academicintegrity@uci.edu).

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## Sorority & Fraternity Life

The UCI Sorority & Fraternity Life (SFL) (<https://sororityfraternity.uci.edu/>) community is a diverse, ambitious and electrifying student population comprised of over 47 fraternities and sororities that strive to uphold the oaths, values and commitments they were founded upon. Over 2,000 undergraduates make up the SFL population on campus and are active members in UCI community. Students who join sororities and fraternities gain experience and skills in leadership development, communication, networking and leading change. For many undergraduate students, fraternities/sororities become their home away from home.

SFL members strive for high academic achievement and are honored by Order of Omega, UCI's Greek leadership honor society. Three governing councils – Interfraternity Council, Panhellenic Association and Multicultural Greek Council – represent the fraternities and sororities to the UCI campus and surrounding community.

Since 1973, the Sorority & Fraternity Life community remains a great way to be involved, engage on campus and make lifelong friends. Membership in a fraternity or sorority lasts a lifetime and is an experience unlike any other.

For additional information, visit the Sorority & Fraternity Life website (<https://sororityfraternity.uci.edu/>).

## Student Government Student Media

### Associated Students (ASUCI)

All UCI undergraduate students are members of the Associated Students, UC Irvine (ASUCI) (<https://www.asuci.uci.edu/>). ASUCI is the student representative body that advocates to and is liaison between the UCI administration, faculty and staff.

ASUCI is comprised of three branches of government: The Executive Branch (five elected members and over 60 appointed officer positions), The Senate (28 elected members) and The Judicial Board (seven appointed members). Guided by their constitution and by-laws, these student representatives manage the undergraduate quarterly fee (less summer) that supports student life activities, advocacy programs, academic programs, publications/communication and professional support staff as well as essential campus services. For more information contact the Student Government Student Media offices at 949-824-2400, [asuci@uci.edu](mailto:asuci@uci.edu) or visit the ASUCI website (<http://www.asuci.uci.edu/>).

**ASUCI Student Life Activities** include annual events such as Welcome Week, Homecoming, Soulstice and Summerlands. Ongoing events include such programs as major concerts, "Rally Alley" spirit events before athletic games, spirit days and weekly movie screenings. This organization also sponsors student educational programs such as the Visions Leadership class (1.3 units), Speakers & Debate series, a host of Awareness weeks and programming, various small initiative boothing events and the Anteater Mentorship class (1.3 units).

**ASUCI Advocacy programs** include elections (campus and local/state/federal), academic resources and internal initiatives throughout the campus to decrease various insecurity issues while working alongside various departments to enact them, and External Affairs, where students travel to Sacramento to represent student issues. The ASUCI Senate nominates undergraduate students for positions on UCI administrative, Academic Senate and ad-hoc committees, and ensures undergraduate students have a voice in policy and decision-making on the UCI campus.

**ASUCI Services** include the following:

**Club and Organization Accounting:** The ASUCI Business Office provides banking and accounting services to registered campus organizations (RCO).

**Anteater Express:** The Anteater Express shuttle program provides a "pure electric" alternative transportation service to all students, staff, and affiliated members of the UCI community, with fixed shuttle routes to 60 designated stops on- and off-campus. The Anteater Express Shuttle carried more than two million passengers last year and facilitates campus-wide efforts to reduce traffic and improve air quality while helping the UCI community access the services available on campus. For detailed information regarding services, routes and schedules, visit the Anteater Express website (<https://www.shuttle.uci.edu/>).

**Vendor Fair:** The Vendor Fair program is a student-run and managed program where students select local vendors and invite them to the UCI campus for one week approximately four times each year.

**The Green Initiative Fund (T.G.I.F.):** The Green Initiative Fund (T.G.I.F.) is a funding board that allocates money toward sustainable projects and educational programs on campus. Students voted to enact a \$3.50 per quarter T.G.I.F. fee in spring 2009 to support this program.

**The Student Programming Funding Board:** The goal of this board is to provide funding to campus-wide programs coordinated by registered undergraduate organizations that enhance the quality of life, encourage school spirit and promote social, cultural and educational development.

**Discount Ticket Program:** ASUCI offers discount tickets to local attractions including AMC theaters, Edwards/Regal cinemas, Universal Studios, Magic Mountain, Knott's Berry Farm and more. The program is located in the Student Government Student Media offices near the ATMs and is open Monday through Friday from 8:30 a.m. to 5 p.m.; telephone 949-824-2400. Tickets can also be purchased online 24-7 at the ASUCI Discount Tickets website (<https://www.asuci.uci.edu/tickets/>) for attractions including Legoland and Universal Studios.

### Associated Graduate Students

All graduate and professional school students are members of the Associated Graduate Students (AGS) (<https://www.ags.uci.edu/>). AGS works to improve the graduate student quality of life and functions as a liaison between graduate students and the UCI administration, faculty and staff by addressing concerns and working to resolve grievances.

Guided by their constitution and by-laws, these student representatives manage the graduate quarterly fee (less summer) that provides graduate students with numerous social and cultural events of benefit to the graduate community and designed to create a sense of community as well as funds toward graduate student development, special projects and grants.



The AGS Council nominates graduate students for positions on UCI administrative, Academic Senate and ad-hoc committees, and ensures graduate students have a voice in policy and decision-making on the UCI campus. AGS also works on systemwide issues affecting graduate and professional students by membership in the UC Student Association (UCSA).

For more information visit the Associated Graduate Students website (<http://www.ags.uci.edu/>).

### **Associated Medical Student Government**

The Associated Medical Student Government (AMSG) represents the medical student body in all matters relating to the UCI campus, the UC Office of the President and the community, specifically within the School of Medicine. Medical students are members of the Associated Medical Student Government and have access to those services. In addition, the Association utilizes a portion of the quarterly AGS fee, along with their own unique fee, to provide funding for medical student activities that benefit the School of Medicine community.

For more information, visit the Associated Medical Student Government website (<https://www.meded.uci.edu/student-affairs/student-government.asp>).

### **The Merage Student Association**

The Merage Student Association (MSA) (<https://merage.uci.edu/msa/>) represents the graduate Business student body in all matters relating to the UCI campus, the UC Office of the President and the community, specifically within the Paul Merage School of Business. Graduate business students are members of the MSA and have access to those services. In addition, the Association uses a portion of the quarterly AGS fee, along with their own unique fee, to provide funding for student activities that benefit the Paul Merage School of Business community.

For more information, visit the Merage Student Association website (<https://merage.uci.edu/msa/>).

### **The Student Bar Association**

All UCI Law students are members of the Student Bar Association (<http://www.law.uci.edu/campus-life/student-organizations/orgs/sba.html>) (SBA) at the University of California, Irvine School of Law. The Student Bar Association serves as a primary conduit for students to deliver concerns and contribute ideas to the administration. The Student Bar Association distributes their own student fees to fund student groups to help members pursue their passions within the study of law. As the students, faculty and administration work to build the law school of the 21st century, the Student Bar Association works to ensure that all students have the support and resources they need to excel.

### **Student-Produced Media**

UCI students manage five student media products on campus including

- publishing the weekly online campus newspaper entitled the New University (<http://www.newuniversity.org/>);
- operating the radio station, KUCI (<http://www.kuci.org/>) (88.9 FM);
- producing Anthology (<http://www.yearbook.uci.edu/>), the award-winning UCI yearbook;
- operating AnteaterTV (<http://www.anteater.tv/>);
- and produce several Alternative Media newsletters and magazines.

### **Student Outreach and Retention Center (SOAR)**

The mission of the Student Outreach and Retention (SOAR) Center (<https://soar.uci.edu>) is to cultivate a community of authentic student leaders that aspire to develop innovative, student-initiated outreach and retention programs that foster critical dialogue, mentorship and shift the educational paradigm to improve college access, readiness and retention rates for historically marginalized communities in higher education.

SOAR is a dynamic space that empowers student scholars through praxis to advocate and develop a transformative and equitable educational environment where students can use their education as a vehicle for social impact.

For more information, visit the SOAR office at 106 Gateway Study Center, call 949-824-5762, or visit [soar.uci.edu](https://soar.uci.edu) (<https://soar.uci.edu>).

### **Veteran Services Center**

The Veteran Services Center (<http://www.veteran.uci.edu/>) provides active duty, reservists, National Guard, veterans and dependents assistance in obtaining the federal and state educational benefits to which they are entitled. The Veteran Services Center is responsible for submitting entitlement requests for new and continuing students, answering any questions military-connected students may have concerning their educational benefits, and providing resources and services to assist these students in navigating their transition to student life.

The Veteran Services Center is open Monday through Friday from 9:00 a.m. to 5:00 p.m. and is located at the Student Center Building (Room G306). The Veteran Services Center can be reached by phone at 949-824-3500 or email at [veteran@uci.edu](mailto:veteran@uci.edu) (%20veteran@uci.edu). For more information, please visit the Veteran Services Center website (<http://www.veteran.uci.edu>).

- **Readmission due to military orders.** If a student is called on military orders, the readmission fee will be waived. When readmitting, students should meet with their academic counselor to initiate the process and submit proof of their military orders.
- **CalVet College Fee Waiver for Veteran Dependents.** Dependents of veterans eligible for the CalVet College Fee Waiver must submit their eligibility letter from a County Veteran Service Office to the Veteran Services Center. Once the letter is submitted, the student's tuition (including professional school fees) and the student services fee will be waived; *all remaining UCI fees are the responsibility of the student*. This benefit does not apply to self-supporting programs, such as the MAS in Criminology, Law, and Society and the part-time MBA programs. Eligibility must be re-established for each subsequent academic year. The student must meet the UCI California residency requirements to receive this benefit.
- **U.S. Department of Veterans Affairs (VA) Education Benefits.** Students must submit a *Request for Certification* form before tuition and fees are due. Failure to do so may not allow enough time for UCI to place a Financial Aid award on a student's financial aid account while waiting for the VA payment. This is currently a courtesy award and is subject to change at any time. If at any time the VA fails to pay any portion of the estimated amount placed into the student's account, the student will be held liable for the unpaid portion. The student must take the following actions in order for the Veteran Services Center to certify a student for VA education benefits.
  1. **Submit a Certificate of Eligibility (COE)** letter noting entitlement to VA educational assistance no later than the first day of a course of education.
  2. **Submit a Request for Certification (RFC)** form to the Veteran Services Center to use such entitlement. The form can be completed by following this webpage: <https://veteran.uci.edu>.
  3. **Provide additional information necessary** to verify enrollment and that courses will make progress towards chosen degree.

Students requesting to use VA education benefits will be allowed to attend or participate in courses during the period beginning on the date on which the individual provides to the Veteran Services Center a Certificate of Eligibility, Authorization Form (for Chapter 31 beneficiaries), or Statement of Benefits obtained from the VA website and ending on the earlier of the following dates:

1. The date on which payment from VA is made to UCI.
2. 90 days after the date the institution certified tuition and fees following the receipt of the Certificate of Eligibility.

*UCI will not impose any penalty, including the assessment of late fees, the denial of access to classes, libraries or other institutional facilities, or the requirement that a covered individual borrow additional funds, on any covered individual because of the individual's inability to meet his or her financial obligations to the institution due to the delayed disbursement funding from VA.*

- **U.S. Department of Veterans Affairs (VA) Academic Standing.** All students receiving VA educational benefits must be in good academic standing. An undergraduate student with a cumulative GPA below 2.0 or a graduate student with a cumulative GPA below 3.0 for two consecutive academic terms will have their VA benefits terminated. Benefits will be reinstated if and when the undergraduate student's cumulative GPA is 2.0 or above or the graduate student's cumulative GPA is 3.0 or above. *Please note this policy is separate and distinct from the UCI Normal Progress Requirement and the UCI Academic Standing Requirement. The VA Academic Standing Requirement is related to the receipt of VA education benefits.*
- **Readmission for Disqualified Graduate Students.** Graduate students who are academically disqualified may be readmitted to the university with a recommendation from their academic unit and the Dean of the Graduate Division. See Academic Disqualification in the Graduate Division section of this *UCI General Catalogue* for more information.

## Womxn's Hub (W-Hub)

The Womxn's Hub (W-Hub) (<https://womenshub.uci.edu>) aims to advance equality and access to resources for members of the UCI community across lines of ethnicity, gender identity, religion, orientation and social class. This is accomplished by promoting community consciousness, social justice initiatives and individual growth.

The center focuses on womxn-specific needs and ideas through workshops, trainings and space interaction in ways that promote personal empowerment. The space is open and affirming to all who believe in the strength of womxn, womxn-identified persons and all allies. Stop in for a piece of chocolate, a cup of tea, or respite from our chaotic world.

For more information call 949-824-6000, email [womenshub@uci.edu](mailto:womenshub@uci.edu) #or visit the Womxn's Hub website (<https://womenshub.uci.edu>).

## Wellness, Health & Counseling Services

### CARE (Campus Assault Resources & Education)

UCI CARE (<http://www.care.uci.edu/>) provides free and confidential support services to members of the UCI community impacted by sexual assault, relationship abuse, family violence and/or stalking. UCI CARE aims to end these forms of power-based personal violence by engaging the campus community in education, programming and transformative action.

CARE is located at G320 Student Center. All services are confidential and free of charge.

For more information call 949-824-7273 or visit the CARE website (<http://www.care.uci.edu/>).

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## Campus Recreation

UCI's Department of Campus Recreation (<http://www.campusrec.uci.edu/>) provides programs and facilities for students, faculty and staff to maintain a healthy lifestyle. Campus Recreation is comprised of seven department areas including Facilities, Fitness & Wellness, Intramural Sports, Club Sports, Recreation Activity Classes, Team Challenge and Outdoor Adventure & Boating.

The Anteater Recreation Center (ARC) (<http://www.campusrec.uci.edu/arc/>) is a 115,000 square foot sports and fitness facility featuring 20,000 square feet of strength and cardio space with 282 cardiovascular and weight machines, and more than 30 tons of free weights. In addition, there is a three-court gym, a rounded corner multi-use gym, an elevated running track, three racquetball courts, a rock climbing wall, lap and leisure pool, exercise testing, five multipurpose rooms and a demonstration kitchen and classroom. The ARC Sports Field Complex includes 21 acres of lighted fields that accommodate softball, soccer and flag football. There are six lighted tennis courts, two outdoor lighted basketball courts and a roller rink available for Campus Recreation programs and drop-in use.

Fitness & Wellness (<http://www.campusrec.uci.edu/fitness/>) encompasses programs for participants to begin or improve their personal fitness levels including group exercise classes such as yoga and aerobics as well as comprehensive health services such as personal training, fitness testing and massage therapy. Campus Recreation staff are available to provide assistance with gym equipment and fitness goals in the strength and cardio rooms.

Intramural Sports (<http://www.campusrec.uci.edu/im/>) are structured leagues which are designed for the "everyday athlete." All activities feature skill and competitiveness. Sports leagues include basketball, dodgeball, flag football, floor hockey, indoor and outdoor soccer, softball, volleyball and many more. Special events and tournaments range from badminton, bowling, racquetball and swimming to ping pong, tennis, track and wrestling.

UCI Club Sports (<http://www.campusrec.uci.edu/club/>) comprise a wide variety of student-managed competitive sports. Clubs travel to compete against other universities across the local area, and some travel nationally. Current UCI Club Sports teams include archery, badminton, baseball, basketball, biking, boxing, climbing, cricket, dragon boat, fencing, figure skating, lacrosse, Brazilian Jiu Jitsu, Japanese karate, Kendo, Taekwondo, Wushu, powerlifting, roller hockey, rowing, rugby, running, sailing, soccer, softball, swimming, table tennis, tennis, triathlon, ultimate, volleyball, water polo and wrestling.

Recreation Activity Classes (<http://www.campusrec.uci.edu/classes/>) consist of non-credit activity classes for students and the UCI community. Classes range from sports clinics to the more unique styles of martial arts like Jiu Jitsu and Muay Thai. An array of dance classes such as hip hop, salsa and ballroom are also available. Cooking classes held at the ARC Kitchen classroom are also part of the Recreation Activity Classes department area. Students can also earn their CPR or Wilderness First Aid certification.

Team Challenge (<http://www.campusrec.uci.edu/teamup/>) is a team building and leadership program. Program participants can experience the Odyssey, a high ropes challenge course located at the ARC fields. Customized and facilitated team programs are available on a reservation basis. Team Up! programs led by trained facilitators teach communication, trust and teamwork while providing groups the chance to test their limits and have fun.

Outdoor Adventure & Boating (<http://www.campusrec.uci.edu/outdoor/>) includes a mixture of outdoor activities and water sports like sailing, kayaking, paddleboarding, rock climbing and outdoor adventure trips. The sailing program includes both classes and rentals. Classes range from beginner to advanced and are offered quarterly. The rock climbing programs take place on the 35 foot indoor rock climbing wall at the ARC and include classes and climbing memberships. Boating activities take place at UCI's Crew Base in the Newport Back Bay. Annual outdoor adventure trips include a summer Pacific Crest Trail backpacking trip and the Spring Break Service trip.

More information is available on the Campus Recreation website (<https://www.campusrec.uci.edu>).

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## Campus Social Worker

The UCI Campus Social Worker (CSW) (<http://www.whcs.uci.edu/CSW/>) is a member of the Wellness, Health & Counseling Services (WH&CS) team and reports to the Associate Vice Chancellor of WH&CS. The CSW provides private support, primarily for students to access and manage services during a medical, physical, familial, financial or emotional crisis. This position helps clients navigate their relationships and responsibilities with UCI academic and administrative departments and, when necessary, with outside community agencies. The CSW serves as the point of contact for individuals when coordinating and monitoring the delivery of services so that they can meet their academic and personal goals. As a liaison, the CSW interfaces with a full range of academic and student affairs units that are involved in the intervention or care of the client population.

### Areas of focus include:

**Respondent Services** – Respondent Services provides assistance for students, faculty or staff navigating personal, academic and disciplinary impacts of being alleged respondents in sexual assault, sexual harassment, stalking and dating/domestic violence cases.

**Basic Needs** – Basic Needs services provides expertise in working with housing and food insecure students, their needs and resources available to them.

**Rapid Rehousing** – Rapid Rehousing supports homeless and housing-insecure students by securing long-term, permanent housing through: housing search and move-in support, rental subsidies and case management to support housing stability.

**Services and responsibilities of the CSW include:** consultation and resource referral, web resources, case management, and coordination of resources upon student death.

Referral to the Campus Social Worker can be made by UCI faculty or staff only. Generally, students may not self-refer. Please call 949-824-0101 or visit the CSW website (<http://www.whcs.uci.edu/CSW/>) for more information.

## Center for Student Wellness & Health Promotion

The Center for Student Wellness & Health Promotion (CSWHP) (<http://www.studentwellness.uci.edu/>) strives to be a leader in collegiate health promotion by focusing on the unique and relevant health needs and concerns of UCI students to support their academic success. CSWHP staff educate and empower students to make informed decisions that support their individual health, as well as support and maintain a healthy campus environment.

CSWHP staff promote healthy choices and behaviors by

- identifying the specific health needs of the campus;
- utilizing evidence-based wellness and health promotion strategies;
- disseminating current and accurate health information;
- facilitating student development and leadership opportunities;
- and offering innovative campus programming.

CSWHP employs several student staff and trained peer educators, advises/supports health-related student organizations and supervises students participating in field study/practicum hours.

CSWHP staff and students present workshops, conduct trainings and classes and consult with students on their health needs and concerns. Services also include a wellness room (massage chairs, bean bags and relaxation/stress-management activities), distribution of free condoms, guided Wednesday Wellness Walks, a lactation station for nursing parents and a gender-neutral restroom. For additional information visit the CSWHP website (<http://www.studentwellness.uci.edu/>).

## Child Care Services

Child Care Services (<http://www.childcare.uci.edu/>) includes five on-campus centers offering early care and education services for children from three months to 12 years of age. The programs are open to children of UCI undergraduate students, graduate students, faculty and staff. Tuition subsidies are available to qualifying undergraduate and graduate students. For information contact 949-824-2100 or visit the Child Care Services website (<http://www.childcare.uci.edu/>).

## Counseling Center

The mission of the Counseling Center (<http://www.counseling.uci.edu>) is to help students achieve optimal mental health and academic success, personal growth and increased capacity to cope with the stresses of being a university student. The Counseling Center also strives to contribute to the overall excellence and well-being of the UC Irvine community. The services offered by the Counseling Center fall into four categories: time-limited clinical treatment; prevention and outreach programs including workshops and courses; mental health consultation and mental health training. Services are primarily directed to enrolled UCI students, though our delivery of services includes students' partners and family members.

In order to optimally serve all of the campus community, the Counseling Center operates from a time-limited contemporary counseling model. The Counseling Center is proud to have a multiculturally diverse and interdisciplinary staff which includes psychologists, psychiatrists, social workers, post-doctoral fellows, doctoral interns and student volunteers who serve as peer educators and mentors. The Counseling Center's services are free of charge to currently registered students. Students with chronic or complex mental health issues needing long-term or extensive services are referred to other appropriate community providers.

The Counseling Center is located on the second floor of Student Services I, and the Counseling Center Annex is located on the fourth floor of the Student Center directly across from the elevator. Contact 949-824-6457 or visit the Counseling Center website (<http://www.counseling.uci.edu/>).

## Disability Services Center

The Disability Services Center (DSC) (<http://disability.uci.edu>) determines, provides and coordinates disability-related accommodations to ensure access for all UCI students with disabilities. Students with varying disabilities – including those with mobility, visual, hearing, learning and chronic and mental health conditions – may be eligible for disability-related accommodations, academic adjustments and auxiliary services through this resource center. Staff assists students from the point of their admission to UCI through graduation. Specialized services may include testing accommodations, priority registration, document conversion, adaptive equipment, assistive technology, notes, interpreters, real time captioning, liaisons with faculty and campus departments and information regarding disability advocacy in the university setting. The DSC provides assistive/adaptive computer technology and training. There is no cost to the student for the services or accommodations provided by the DSC. Students are responsible for

acquainting themselves with the procedures for use of accommodations. These procedures are available on the Disability Services Center website (<http://www.disability.uci.edu/>).

Students with disabilities may qualify for reasonable accommodations based on disability-related needs. Students must provide appropriate documentation about their disabilities to the Disability Services Center. Documentation provided to the DSC is confidential. It is the responsibility of the applicant or student to provide this documentation and, if necessary, to cover the cost for such documentation. This includes the cost for learning disability and attention deficit disorder assessments and mental health evaluations. Contact the Disability Services Center or visit the website (<http://disability.uci.edu>) for more information about disability documentation requirements or to download documentation forms. In most cases there is need for recent documentation about the disability and/or periodic documentation updates. UCI reserves the right to determine the most effective and timely accommodations after consultation with the student about the disability and previous use of accommodations. The provision or use of a disability accommodation does not guarantee or ensure a certain level of achievement for the student. Students with disabilities must meet the same academic standards as all other students. Some academic adjustments or accommodations require approval of the chair or dean of the student's academic unit.

Students with disabilities who need accommodations (in particular reading assistance, textbook conversion including e-text and Braille, American Sign Language interpreting services, real-time captioning services and adaptive computing technology in campus laboratories) that must be planned or arranged in advance of the start of classes should contact the Disability Services Center as quickly as possible after admission to UCI. Failure to do so may delay or in some cases preclude the DSC's ability to provide certain accommodations. This advance notice also allows the DSC to document needs, discuss service procedures and student responsibilities and determine the appropriate accommodations.

Additional information is available by phone: 949-824-7494 (voice), email: [dsc@uci.edu](mailto:dsc@uci.edu) or web: Disability Services Center website. (<http://www.disability.uci.edu/>)

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## **Student Health Center, UC Student Health Insurance Plan, TB Screening/Immunization Requirements for Incoming Students**

All matriculated students registered in a degree program and continuing education students are eligible to access services at the Student Health Center (<http://www.shc.uci.edu/>) (SHC). Located at the corner of East Peltason Dr. and Pereira Dr. (building 5 on the campus map (<https://uci.edu/visit/maps.php>)), SHC also includes a state-of-the-art dental clinic located in building 6 across the street at the same intersection. The SHC is accredited by the Accreditation Association for Ambulatory Health Care (AAAHC). SHC also administers the UC Student Health Insurance Plan (UC SHIP). In addition, SHC administers and oversees compliance by incoming students with UC's mandatory TB Screening and Immunization requirements.

### **Student Health Center**

SHC includes ambulatory care clinics staffed by board certified and licensed medical, mental health and dental professionals and licensed nurses; a clinical laboratory; radiology; pharmacy; and insurance services office to assist students in navigating UC SHIP and in obtaining referrals to outside specialists. The SHC is open from 8 a.m. to 5 p.m., Monday through Friday. Extended hours may be available during the academic year and will be posted on the Student Health Center website (<https://shc.uci.edu/>). General medical services are offered at the SHC by appointment only and include primary care and women's health. Urgent conditions are triaged and care is provided immediately. If a student with an urgent condition cannot be seen by a provider or nurse immediately, then the student would be referred to a local urgent care center, hospital emergency department or, for less urgent conditions, to an online telemedicine service or nurse advice line. Specialty services are also available by appointment and include psychiatry, dermatology, gynecology, orthopedics, sports medicine, ear/nose/throat, chiropractic services, nutrition therapy services and minor surgical procedures. The Nurse Clinic provides immunizations, health screening/clearances, travel consultation and basic health, wellness and preventive care education. The Dental Clinic offers routine dental examination and cleaning, restorative procedures (fillings and crowns) and certain specialty services. SHC fees are generally lower than those of comparable services in the community. SHC only submits claims to the UC SHIP insurance plan. SHC does not bill third-party insurance plans. Therefore, students not enrolled in the University of California Student Health Insurance Plan (UC SHIP) will pay fees for services through their ZotAccount (Campus Billing System) and may submit a claim to their insurance plans for reimbursement. Students who are enrolled in UC SHIP will pay any required co-pays and/or coinsurance through their ZotAccount (Campus Billing System) after SHC receives payment from the UC SHIP carrier (Anthem).

### **University of California Student Health Insurance Plan (UC SHIP)**

All registered undergraduate, graduate, law and medical students are required to carry health insurance that complies with waiver criteria established by UC. All students are automatically enrolled in and assessed the fees associated with UC SHIP prior to the start of the Fall term of each academic year. Those students with other health insurance that meets the waiver criteria may waive enrollment in UC SHIP during the established waiver periods that occur prior to the start of each quarter (or semester for Law students). A new online waiver application must be submitted at the beginning of each academic year. If approved, the waiver is in effect for the current term and the remainder of the academic year. A waiver approved for the Fall term is in effect for the entire academic year unless a student wishes to "reverse" the waiver and become enrolled in the plan. Following waiver approval, a refund of the fees will appear on the student's ZotAccount typically within ten business days. Additional information regarding health insurance premiums and related fees that are charged to students who are enrolled in UC SHIP is available in the Expenses, Tuition and Fees section of this *Catalogue* and on the Student Health Center website (<https://shc.uci.edu/>).

### **University of California Mandatory TB Screening and Immunization Requirements**

UCI is committed to protecting the health and well-being of our students, the campus community, and beyond. In order to protect the campus from outbreaks of vaccine-preventable diseases, ALL incoming undergraduate and graduate students are REQUIRED to obtain four (4) specific vaccines



and undergo screening for Tuberculosis or provide documentation demonstrating compliance with these requirements. (Medical students have additional admission health requirements that are established by the School of Medicine.) Students who do not comply with these admission health requirements by the published deadlines (<https://shc.uci.edu/new-student-information/immunization-requirements/>) will be subject to a Type 2 academic hold that will be applied for the subsequent term. Students must enter their immunization and TB screening information and upload copies of their immunization records directly into their secured SHC electronic health record through the Wellness, Health & Counseling Services Student Portal (<https://osh.shs.uci.edu/>). Students will be able to access the portal once they have obtained their UCINetID and once their student status has been changed from “applicant” to “student”. This status change typically occurs around the third week of May for incoming undergraduate students, and the third week of June for incoming transfer and graduate students.

Although not mandatory, all students are encouraged to have an annual flu vaccine, dental examination and cleaning and physical examination to screen for health problems. Students enrolled in UC SHIP are covered 100% for any preventive care service whether performed at the SHC or by an in-network provider. SHC is the designated primary care medical provider for all students enrolled in UC SHIP. If the student is enrolled in UC SHIP and has had a recent physical examination or other medical services, they are encouraged to submit copies to SHC for inclusion in their SHC electronic medical record. Students transferring from another UC campus where their medical records are on file should have the records transferred to the UCI Student Health Center.

For the most up to date information about the Student Health Center, TB Screening/Immunization requirements and the UC Student Health Insurance Plan visit the Student Health Center website (<https://shc.uci.edu/>).

## Auxiliary Services

### The Hill (Bookstore)

Come by and visit The Hill (<http://uci.bncollege.com/webapp/wcs/stores/servlet/BNCBHomePage/?storeId=88256&catalogId=10001&langId=-1>), located in the UCI Student Center next to Starbucks. We carry all required and recommended course materials including new, used, rentals and ebook options. We price match textbooks with Amazon and BN.com.

The Hill offers a wide selection of UCI clothing and school spirit gifts and accessories. We carry popular brands such as Adidas, Champion and Under Armour. We also have a general reading section and showcase a variety of UCI faculty authors.

Within the store, you will find **TechHub**, an Apple authorized campus dealer. In addition to Apple you will find various other laptop and tablet brands and accessories. **AntTech**, The Hill's technical services center, is staffed by Apple Certified Mac Technicians who service Macs for customers' hardware and software support needs.

The Hill is open Monday through Thursday, 8 a.m. to 6 p.m., Friday 8 a.m. to 5 p.m. and Saturday 11 a.m. to 5 p.m. Store hours may vary during the holiday breaks and extend for the first week of classes.

For additional information contact 949-UCI-Hill (824-4455) or visit Shopuci.com (<http://uci.bncollege.com/webapp/wcs/stores/servlet/BNCBHomePage/?storeId=88256&catalogId=10001&langId=-1>).

## Hospitality & Dining Services

From a quick bite to eat to an elegantly served catered meal, UCI Dining Services (<http://www.food.uci.edu/>) is here to serve the campus community's dining needs, serving a variety of locations and flavors to fit one's palette. UCI Dining offers over 25 fast and casual retail dining locations throughout the campus, two all-you-care-to-eat residential dining halls and options for catering from both UCI Catering and various retail locations. Please visit the UCI Dining Services website (<http://www.food.uci.edu/>) to see a list of the dining locations, menus, and operating hours.

UCI Dining Services is located in G318 Student Center and can be reached at 949-824-4182.

### Retail Dining Locations

Retail dining locations are conveniently situated throughout the campus to serve your dining needs. Please use the interactive map on our website (<https://map.uci.edu/?id=463#!ce/8396>) for a list of the dining locations on campus.

### Residential Dining

In Middle Earth Housing, we welcome our newest all-you-care-to-eat dining hall, Brandywine, located directly off ring mall. In a hurry? You can also grab a quick snack at Side Door, our newest convenience store located right next to Brandywine. On the other side of campus at Mesa Court Housing is the other all-you-care-to-eat dining hall, The Anteater and the Taza Café. Both dining hall locations offer theme nights, award-winning chefs, made-to-order meals, vegetarian and vegan options and late night meals.

### Catering

UCI Catering (<https://ucicatering.catertrax.com/#Catertrax>) provides a comprehensive list of menu items to choose from or the option to design your own menu; both can be designed to fit your budget or needs. Retail (<https://uci.campusdish.com/Catering.aspx>) locations like Wahoo's, Subway and Panda Express also offer additional catering options.

## Student Center & Event Services

The UCI Student Center (<https://www.studentcenter.uci.edu/>) should be the first stop for prospective students and their parents, alumni and all campus guests who want to learn more about UCI or our Anteater community. Recognized globally by the International Association of Conference Centres as a venue of excellence, it's a place to study and lounge, relax and belong. Services include free art exhibits, a 425-seat theater with 7.1 Dolby Surround Sound, a first-ever Esports arena, name-brand food court franchises, convenience store, campus bookstore (The Hill), The UPS Store, UCI Medical Center Blood Donor Center, banks and ATMs, the Anthill Pub & Grille, world-renowned conferences and professional event services.

The Student Center is also home to campus offices including Student Government Student Media, Student Life & Leadership, the Center for Black Cultures, Resources & Research, the Center for Student Wellness & Health Promotion, Dining Services, UCI CARE (Campus Assault Resources and Education), the Lesbian Gay Bisexual Transgender Resource Center (LGBTRC), the International Center, Veteran Services and a satellite office for the Counseling Center.

All campus visitors are encouraged to explore and experience UCI's Student Center firsthand. Whether you are looking for a place to read while grabbing something to eat or planning an exciting and memorable event, you will find the Student Center a welcoming and inclusive gathering place for all Anteaters to interact, learn and enjoy. Visit the website regularly for a calendar of events, to book study space online, apply for student employment opportunities and so much more.

### A311 Student Center, Irvine CA 92697

**Hours:** Sunday through Saturday, 7:00 a.m. until midnight (Open 24/7 during finals)

Closed on university holidays

**Phone:** 949-824-5252

## Student Housing

### On-Campus Housing

Housing Administrative Services coordinates application and contract processes for on-campus housing. Approximately 43 percent of UCI's student body are housed on campus. For more information including housing rates for the current academic year, visit the Student Housing website (<http://www.housing.uci.edu/>).

### Undergraduate Housing

Three on-campus communities serve full-time single undergraduate students under age 25. Each community offers a group living environment, recreation rooms, a fitness center and outdoor recreation space. Student rooms are furnished, feature cable television and internet connections.

**Residence Halls.** Mesa Court and Middle Earth are two residence hall communities, housing approximately 5,282 single undergraduates who are primarily freshmen and sophomores between 17-20 years of age. Both communities are within walking distance from the center of campus. Most of the halls (a.k.a., "classic halls") are co-ed buildings, each housing between 50-117 residents in suite-style layouts. Each hall has group study rooms, a living room for meetings or informal gatherings, a small kitchen and card-operated laundry facilities. The Mesa Court and Middle Earth towers house approximately 1,521 students on five residential floors, with access to amenities on each floor.

Mesa Court and Middle Earth have complete food service and dining commons. Students who live in the residence halls participate in a prepaid meal plan. Meals are served three times daily on weekdays (with late night hours) and twice daily (brunch and dinner) on weekends. Menus offer a wide selection of foods served cafeteria style at cook-to-order serving stations featuring cuisines from all over the world as well as self-serve cereal, deli and salad bars. For more information about meal plan options, visit the UCI Dining website (<https://uci.campusdish.com/>). The halls remain open during the Thanksgiving holiday, winter recess and the spring recess, but no meals are served during these break periods.

Both Mesa Court and Middle Earth maintain a comprehensive residence life program designed to help freshmen transition to college. Each hall has a live-in Resident Advisor (RA) who provides resources and support to residents. (Larger "tower" halls have multiple RAs.) In each community, special interest halls or hall clusters provide educational programs and informal opportunities to get together with other students who hold similar interests. Community-wide social programs are also offered.

Rates for rooms in the classic halls during the 2019-20 academic year (late September through mid-June) were \$13,817-\$14,297 for a triple room; \$15,866-\$16,346 for a double room; and \$18,155-\$18,635 for a single room. The rates for rooms in the Towers were \$13,655-\$14,135 for a tower quadruple; \$15,593-\$16,073 for a tower triple; and \$17,798-\$18,278 for a tower double. (Rates include room and board and vary by the meal plan selected.) Charges are paid in quarterly payments. Rates for 2020-21 will reflect an increase.

**Arroyo Vista** is a community of 30 sponsored academic themed houses and 12 sorority and fraternity chapter houses. Each house contains 8, 12 or 16 furnished double-occupancy rooms (bed, desk and wardrobe closet for each resident). Residents share bathroom facilities on each floor, a spacious living room with fireplace, a study room, a fully equipped kitchen with dishwasher and microwaves and laundry facilities. Some houses also offer a two-person suite with a private bathroom located on the first floor. All bedrooms in Arroyo Vista feature cable television and internet connections. No meal plan is included in the housing contract. Students make their own meal arrangements, choosing to cook for themselves or to purchase a voluntary meal plan through the UCI Dining website (<http://uci.campusdish.com/>).

Theme houses offer educational programs that advance both a student's academic interests and overall university experience. Members of Greek chapters should consult their Greek chapter for information. The rate for the 2019-20 academic year was \$7,271 for a double-occupancy room and \$9,089 for the two-person suite. Rates for 2020-21 will reflect an increase.

### **Graduate/Family Housing**

Three on-campus apartment communities serve full-time graduate students, medical students and students with families (married, in a domestic partnership and/or with custody of minor children). All apartments have carpeting, draperies, a stove and a refrigerator, and provide cable television and internet connections. Rental rates in all three communities tend to be lower than for comparable units in the local rental market. Rates for 2020-21 will reflect an increase.

**Verano Place** offers 1062 one-, two- and three-bedroom apartments. Monthly rents for 2019-20 ranged from \$411-\$834 for each single student sharing an apartment, and from \$1,057-\$1,668 for families.

**Palo Verde** offers 652 one-, two- and three-bedroom apartments. Monthly rents for 2019-20 ranged from \$643-\$1,187 for each single student sharing an apartment, and from \$901-\$2,169 for families.

**Campus Village** is a community of 400 two-bedroom apartments serving single graduate students (no children). Apartments include bedroom furniture (bed, dresser, desk, lamp and chair for each student) and common space furniture (sofa, coffee table, end tables, lamp and dining room set). Campus Village is located in the campus core adjacent to the Science Library. The 2019-20 monthly rental rate for graduate students living in Campus Village was \$818.

### **To Apply**

Housing information and application instructions are available on the UCI Student Housing website (<http://www.housing.uci.edu/>). Undergraduates apply for housing online via the UCI Admissions website (<http://www.admissions.uci.edu/>) after receiving admissions notification and submitting their *Statement of Intent to Register* (SIR). Graduate applicants can also find housing information and a link to the online application on the UCI Student Housing website (<http://www.housing.uci.edu/>). A \$20 nonrefundable processing fee must accompany the housing application when it is submitted.

Freshmen and transfer undergraduate students enrolling for fall quarter may be eligible for two years of on-campus housing. To qualify for this guarantee, students must apply for housing and submit their *Statement of Intent to Register* (SIR) by May 1, 2020 for freshmen and June 1, 2020 for transfer students, and meet all contract offer deadlines. Applications received after these dates will be handled in the order received, as space becomes available.

The University of California, Irvine guarantees an offer of on-campus housing to every newly-admitted, full-time Ph.D., M.F.A., J.D. and Prime-LC, LEAD-ABC and MSTP M.D. student. Guaranteed housing offers will be made for enrollment in fall only and cannot be deferred. Ph.D. and Prime-LC, LEAD-ABC and MSTP M.D. students who accept this housing offer will be guaranteed placement in on-campus housing for one year less than normal time to degree (NTTD-1) for their academic program. M.F.A. and J.D. students will be provided with housing for their academic programs' normal times to degree, up to three years (NTTD). Students must maintain good academic standing to continue to qualify for the guarantee. Newly admitted students must submit their *Statement of Intent to Register* (SIR) 24 hours before they apply for housing online. The housing application for fall opens March 1, 2020 and guaranteed students must apply by 4:00 p.m. (Pacific Time) May 1, 2020 to receive a guaranteed housing offer. Non-guaranteed students can apply at any time after March 1, 2020 to get on the housing waitlist.

Students who are eligible service members, reservists and veterans are guaranteed an offer of on-campus housing. Visit the UCI Veteran Services Center website (<http://www.veteran.uci.edu/>) for information or call 949-824-3500.

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### **Alternative Housing on the UCI Campus**

Vista del Campo, Vista del Campo Norte, Camino del Sol, Puerta del Sol and Plaza Verde Apartments are on-campus housing complexes privately owned and managed by American Campus Communities. Vista del Campo, Vista del Campo Norte and Puerta del Sol offer furnished apartments with individual leases for UCI undergraduate and graduate students who are single or married/domestic partners (but without children).

Camino del Sol and Plaza Verde Apartments serve single UCI undergraduate students only. Freshmen are not eligible to live in the American Campus Communities. Community information can be found online (<http://housing.uci.edu/acc/>) (go to [housing.uci.edu/acc](http://housing.uci.edu/acc/) (<http://housing.uci.edu/acc/>) for links) or call 949-326-5600 for more information.

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### **Housing Administrative Services**

Services are available to assist students during the application and contracting process, as well as those looking for off-campus housing. The Anteater Housing Network, an online housing and roommate finder, provides easy access to listings of local rental properties as well as message boards to find roommates, sublets, buy/sell furniture and more. Students must log in with their UCI NetID and password to view listings. For more information, contact a Housing Advisor at 949-824-6811, send email to [housing@uci.edu](mailto:housing@uci.edu) or visit the Off Campus Housing website (<http://www.housing.uci.edu/och/>).



## Registration and Other Procedures

Except where noted, all information applies to both undergraduate and graduate students. Additional information concerning registration and academic policies applying only to graduate students is presented in the Graduate Division section of the *Catalogue*.

### Schedule of Classes and Registration Information

The *Schedule of Classes* contains current class offerings including time, room, instructor, capacity, number of enrolled students, number of students on the waitlist, Web links, status (open, waitlisted, full), and more. Access the *Schedule of Classes* on the University Registrar's website (<http://www.reg.uci.edu/>). The *Schedule of Classes* is available just prior to the beginning of each quarter's registration period (six weeks before the end of the current quarter).

The University Registrar's website (<http://www.reg.uci.edu/>) also includes registration and related information such as quarterly academic calendars, final examination schedules, and the Academic Honesty policy. The University Registrar's website (<http://www.reg.uci.edu/>) is the most timely source of information on new or changed policies, procedures, tuition and fees that could not be included in the *Catalogue* because of the latter's annual publication schedule.

### Registration Procedures

To receive academic credit for regular courses and other supervised instruction or research, a student must be officially registered prior to undertaking such activities. **The registration process consists of two steps: payment of tuition and fees and enrollment in classes.**

A Quarterly Academic Calendar of dates for enrollment and payment of tuition and fees is available on the University Registrar's website (<http://www.reg.uci.edu/>).

The general procedures for registration are:

1. Consult the appropriate academic advisor to develop an approved program of study. Secure necessary authorizations for courses that require special approval. New undergraduate students entering in the fall should attend one of the Student-Parent Orientation Program (SPOP) (<http://www.orientation.uci.edu/schedules.php?type=spop>) sessions during the summer for academic advising and enrollment.
2. Enroll in classes during the published registration period.
3. Pay required tuition and fees online or to the Central Cashier on or before the published deadline. Other outstanding obligations must be satisfied at this time also.

### Enrolling in Classes

Using WebReg, students may add and drop classes, inquire about open sections, change their grading option or unit value for a variable unit course, put themselves on an official waiting list, and list their confirmed class schedule. Immediate feedback on the availability of a class and a student's eligibility to enroll is provided. This includes course restrictions that may be placed or removed at any time throughout the enrollment periods by the department offering the course. Complete information about WebReg is available on the University Registrar's website (<http://www.reg.uci.edu/>).

Students must enroll in classes before the end of the second week of instruction. Students enrolled in zero (0) units at the close of business at the end of the second week of instruction are assessed a \$50 late enrollment charge.

### Payment of Tuition and Fees

Tuition and fees are assessed quarterly and appear on ZOT Account Online (<https://zotaccount.uci.edu/>). Students who do not pay all required tuition and fees online or to the Central Cashier by the published fee payment deadline are subject to a \$50 late payment charge.

### Late Registration

The student is subject to *both* late charges if tuition and fees are not paid online or to the Central Cashier and the student does not enroll in classes by the registration deadlines, published in the Quarterly Academic Calendar on the University Registrar's website. (<http://www.reg.uci.edu/>)

Students who have not paid tuition and fees and/or have not enrolled in classes by 4 p.m. at the end of the third week of instruction will lose their student status. Visit the University Registrar's website (<http://www.reg.uci.edu/>) for more information on the loss of student status.

To avoid the expense and inconvenience of late registration, students are urged to enroll and pay tuition and fees well before the published registration deadlines. Students with financial need should make advance arrangements with the Office of Financial Aid and Scholarships, or another source, to have funds available when tuition and fees are due.

Late registration (payment of tuition and fees and/or enrollment in classes) is permitted only in exceptional circumstances with the authorization of the student's dean. A student who is allowed to apply late and, as a result, must pay tuition and fees and enroll late, is required to pay both late charges.

### Change of Class Enrollment

Once instruction begins, a student may add or drop classes, change the unit value of a variable unit course, or change the grading option via WebReg.

Generally, an undergraduate student may not enroll in more than 20 units or fewer than 12 units of course work during a given quarter without the permission of the student's academic dean or, for undecided/undeclared students, the Dean of the Division of Undergraduate Education. However, during initial enrollment, undergraduate enrollment will be limited to 18 units. The maximum returns to 20 units during Open Enrollment. Changes to Pass/Not Pass grading must not cause the student to exceed the limitations to Pass/Not Pass enrollment. See the Pass/Not Pass section.

Graduate students may not enroll in more than 16 or fewer than eight units of graduate or upper-division credit without prior approval of the departmental graduate advisor.

Students may add courses through the end of the second week of instruction via WebReg. After the second week of instruction, an Enrollment Exception request is required.

Students may drop courses through the end of the second week of instruction via WebReg. After the second week of instruction through the end of the sixth week of instruction, an Enrollment Exception request is required.

Beginning the seventh week of instruction through the end of instruction, withdrawing from a course will result in the student receiving a W grade. W grades carry no grade points and are not calculated in the UC GPA.

Students may change the grading option and/or unit value of a course through the end of the second week of instruction via WebReg. After the second week of instruction through the end of the sixth week of instruction, an Enrollment Exception request is required.

An Enrollment Exception request requires the authorization of the dean or equivalent of the school or academic unit offering the course and the dean or equivalent of the student's major. The authorization of the instructor may also be required when adding a course or changing the unit value of a variable unit course. Detailed information on Enrollment Exception requests is available on the University Registrar's website (<http://www.reg.uci.edu/>).

Individual courses may occasionally have unique deadlines due to course impaction or instructional needs. Students should refer to the *Schedule of Classes* for information on specific courses.

Students are responsible for their enrollments. They must officially drop or withdraw from classes they have ceased attending. Students cannot simply discontinue attendance in a class. Adds, withdrawals, and changes to class enrollment are not permitted after the last day of instruction.

## Withdrawal from the University

Undergraduate students who pay tuition and fees for a regular academic quarter and then decide to withdraw from the University must submit a Withdrawal form to the University Registrar's Office after obtaining the signatures of their academic dean (or the Dean of the Division of Undergraduate Education, for undecided/undeclared students). Medical students should submit the form to the Student Affairs Office in the School of Medicine. Law students must visit the School of Law Registrar's Office to obtain and submit the withdrawal form. This form serves two purposes: (1) a refund of tuition and fees, if applicable (see the Tuition and Fee Refund section); and (2) automatic withdrawal from classes.

The effective date of withdrawal is used in determining the percentage of tuition and fees to be refunded. This date is normally the date that the student submits the form to the appropriate dean for approval.

A W grade, indicating "withdrawal," will be recorded for each course in which enrollment is withdrawn, if the student's effective date of withdrawal is after the end of the sixth week of classes. (See W grade in the Grading System section.)

A graduate student in good academic standing who wishes to withdraw and intends to return within one year should submit both the Withdrawal form and an application for a Leave of Absence. Further information appears in the Graduate Division section.

New undergraduate students are encouraged to seek advice from their admissions or academic counselor to understand the consequences of withdrawal and their eligibility to return.

If an undergraduate student plans to leave the University after completing all academic work for the latest quarter of enrollment and has not paid tuition and fees for the next quarter, a formal notice of withdrawal is not necessary.

## Lapse of Status

A student's status may lapse for the following reasons: Failure to pay required tuition and fees by the prescribed deadline; failure to respond to official notices; failure to settle financial obligations when due or to make satisfactory arrangements with Campus Billing Services; failure to complete the admission health requirements; or failure to comply with admission conditions.

Each student who becomes subject to lapse of status is given advance notice and ample time to deal with the situation. However, if the student fails to respond to initial notices, action will be taken without further notice. A "hold" will be placed on all of the student's records and the student will be entitled to no further services of the University except assistance toward clearing the hold. A student must satisfy the conditions which caused the lapse of status before the hold can be cleared.

## Enrollment at Other Institutions

Various programs exist that enable currently registered UCI students in good standing to take courses at other UC campuses, as well as at California State University and California Community College campuses. More information is available on the University Registrar's website (<http://www.reg.uci.edu/>) and from the academic advising offices.

## Enrollment in UCI Division of Continuing Education

If a UCI student wishes to enroll in a UCI Division of Continuing Education course concurrently with enrollment in regular courses, the entire program of study must be approved in advance by the dean of the student's school (the Dean of the Division of Undergraduate Education, for undecided/undeclared students; the Dean of the Graduate Division, for graduate students). Fee information is available from the UCI Division of Continuing Education Registration Office.

## Change of Major

Each School or program has its own standards for change of major. Once a student selects a major, or decides to change majors, the student should visit the academic advising office for their prospective major to obtain current information about prerequisites, program planning, and policies and procedures. For most majors, students may request a change of major by submitting an online application through StudentAccess. Further information and a list of excluded majors is available on the University Registrar's website (<http://www.reg.uci.edu/>).

All Schools with exceptional requirements have major-change criteria approved by the Academic Senate and published on the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>). Students changing majors may meet the approved major-change criteria of the unit they wish to enter that are in place at the time of their change of major or those in effect up to one year before.

## Transcripts and Verifications

### Retention of Student Records

The University Registrar's Office maintains a permanent record of academic work completed by each student. Support documents for the academic record are kept for one year.

Students are strongly advised to carefully check their academic record quarterly. (Student copies of the academic record are available from the University Registrar's Office shortly after the close of each quarter.) Discrepancies in the academic record should be reported to the University Registrar immediately. After one year, it is assumed that the student accepts the accuracy of their academic record, and supporting source documents are destroyed.

Student academic records may not be changed after one year or, in some cases, in less than one year if Academic Senate regulations specify a shorter time limit. For example, the notation "NR," which means that no grade has been reported, must be removed within one quarter of subsequent enrollment or it will automatically be converted to the grade "F" (Fail), "NP" (Not Pass), or "U" (Unsatisfactory), whichever is appropriate. Similarly, an "I" grade (Incomplete) will convert to either an "F" (Fail), "NP" (Not Pass), or "U" (Unsatisfactory), whichever is appropriate, after remaining on the student's record for 12 months. Both policies are defined under Senate Regulation IR A345.

### Transcript of Records

The official transcript of a student's academic record will be released only upon receipt of a signed request from the student authorizing the release. All outstanding debts to the University (with the exception of long-term financial aid loans not yet due and payable) must be paid in full before a transcript will be released.

Requests for transcripts by anyone other than the student whose transcript is being sought can be honored only (1) if the request is accompanied by a written authorization signed by the student whose transcript is sought; and (2) upon approval of the University Registrar.

For students subject to the one-time document fee, there is no additional cost for official transcripts. This includes current students, alumni, and former students. For students in self-supporting graduate programs, who are not subject to the one-time document fee, there is a \$17 fee for each official transcript. For transcript orders placed online by all students, a \$2.25 service charge is assessed by the National Student Clearinghouse for each unique order. See the instructions on the University Registrar's website (<http://www.reg.uci.edu/>).

Unofficial transcripts are available, free of charge, at the University Registrar's Office, to students who present photo identification. Currently enrolled students can view their unofficial transcript in StudentAccess at the University Registrar's website (<http://www.reg.uci.edu/>).

### Verification of Student Status

The University Registrar's Office provides verifications of student status. Verifications may be needed for reference checks, bank loans, applications for good-student-driver insurance rates, and Social Security payments. There is a \$17 fee for each verification, however verifications for the purpose of student loan deferments are free of charge. Instructions are available on the University Registrar's website (<http://www.reg.uci.edu/>). For verification purposes, enrollment in 12 units or more in regular sessions is considered full-time status; enrollment in 6.0–11.9 units is considered half-time status; enrollment in 5.9 units or less is considered less than half-time status. Enrollment in six units between all three summer sessions will be considered full-time.

## Readmission

### Undergraduate Student Readmission

Students are strongly urged to consider the readmission policy in formulating plans for leaving or returning to UCI. Every effort will be made to readmit UCI students who were in good academic standing at the time they ceased attending and who have filed readmission applications by the deadline.

Former UCI students seeking readmission must contact the academic advising office of the School or program which offers their intended major to initiate an electronic readmission application. A nonrefundable \$70 Application Fee will be applied to the student's ZOTBill.

Readmission is subject to dean's approval and campus deadlines (Aug. 1 for fall quarter, Nov. 1 for winter quarter, and Feb. 1 for spring quarter).

New undergraduate students who cancel registration prior to the first day of the quarter must reapply to UCI; they are not eligible to file for readmission as described above.

If a student has been academically disqualified from the University or has left the University while on probation or is subject to disqualification, or has lost their student status, the student must apply for readmission.

Transcripts for courses taken at other institutions must be submitted to both the Office of Admissions and the academic advising office of the School or program which offers the intended major of the student applying for readmission.

### Graduate Student Readmission

A graduate student who withdraws and has not been granted a leave of absence approved by the Dean of the Graduate Division is considered to have lapsed student status (i.e., no longer has student status). A student whose status has lapsed must re-apply to a graduate program and can resume graduate study only if readmitted; readmission is not guaranteed. The online *Application for Graduate Study*, including the nonrefundable application fee, must be submitted by the published deadline for graduate admission applications. Refer to the statement on readmission which appears in the Graduate Division section for additional information.

## Commencement

UCI Commencement (<http://www.commencement.uci.edu/>) ceremonies are held each June for all students who graduate any quarter of that academic year. The School of Law ceremony (<http://www.law.uci.edu/events/commencement/>) is held in May. The School of Medicine (<http://www.meded.uci.edu/student-life/commencement.asp>) ceremony is held on the Saturday following Memorial Day. Additional information is available on the Commencement website (<http://www.commencement.uci.edu/#/>).

**Application for Graduation.** In order to receive a degree, an undergraduate student must submit an online Application for Graduation via the StudentAccess link on the University Registrar's website (<http://www.reg.uci.edu/>) no later than the published deadline. Graduate students must submit their advancement to Graduate Division. Specific deadline dates for filing the application and advancement are established quarterly so that candidates' academic records can be reviewed to verify that all graduation requirements have been met. Students should contact their academic advising office for deadline and degree audit information.

**Graduation *in Absentia*.** Undergraduate students planning to graduate after a period of absence from the University must graduate *in absentia*. To graduate *in absentia*, the student must apply to graduate via the StudentAccess link on the University Registrar's website (<http://www.reg.uci.edu/>). Upon degree certification, which takes place six weeks after the end of the quarter, a Graduation *in absentia* filing will be submitted on behalf of the student. The student will not be subject to tuition and fees. The student will be required to pay the readmission fee only if the period of absence was for more than one certifying term.

**Graduate Hooding Ceremony.** Students completing a Ph.D. or M.F.A. are eligible to walk in the Graduate Hooding Ceremony. Students are required to meet all filing deadlines (<https://grad.uci.edu/academics/filing-deadlines.php>) and satisfy degree requirements in order to participate in the ceremony. Registration for eligible students opens in late March or early April; specific dates are listed on the Commencement website. (<http://www.commencement.uci.edu>)

**Diplomas.** Students are advised by email when their diplomas are available, which is typically three months after the quarter in which the student graduated ends. Students may pick up their diplomas at the University Registrar's Office or authorize the University Registrar to send their diplomas by USPS certified mail to domestic addresses, or USPS registered mail to addresses outside the United States. All outstanding debts due to the university, with the exception of long-term financial aid loans, must be paid in full before a student's diploma will be released.

## Requirements for a Bachelor's Degree

### On This Page:

- Catalogue Rights
- First-Year Integrated Program (FIP)

- Minor Programs
- Application for Graduation

There are four groups of requirements that must be met to earn a baccalaureate degree from UCI: general UC requirements; UCI requirements, including the General Education (GE) requirement; school or program requirements; and degree-specific requirements.

School or program and major-specific requirements are described in full in the academic unit sections.

Students with identified learning and/or physical disabilities, including language-acquisition problems, are eligible to receive support through the Disability Services Center; telephone 949-824-7494 (voice), 824-6272 (TTY), email: dsc@uci.edu. Staff can assist students from the time they are admitted to UCI until they graduate.

## Catalogue Rights

Students enrolled at UCI from their freshman year may elect to meet as graduation requirements (UC, UCI, school, and major): (1) those in effect at the time of entrance, or (2) those subsequently established after entrance.

A readmitted student who has not been enrolled at UCI for three or more consecutive quarters (excluding summer sessions) must adhere to the graduation requirements: (1) in effect for the quarter in which the student is readmitted; or (2) those subsequently established.

Students transferring from other collegiate institutions may elect to meet as graduation requirements either: (1) those in effect at the time of enrollment at UCI; (2) those subsequently established; or (3) those in effect at UCI when the student first entered a previous, accredited collegiate institution, provided that the student has been continuously enrolled in a collegiate institution and that entry was not more than four years prior to the time of enrollment at UCI.

A transfer student who has had a break of enrollment of two consecutive semesters or three consecutive quarters (excluding summer sessions) may follow the requirements in effect at UCI: (1) at the time of enrollment at UCI; (2) those subsequently established; or (3) those in effect at the time of reentry into a previous, accredited collegiate institution, provided that reentry was not more than four years prior to enrollment at UCI.

A transfer student who has been continuously enrolled in college for more than four years prior to transfer may use: (1) the requirements in effect at the time of enrollment at UCI; (2) those subsequently established; or (3) those in effect at UCI four years prior to enrollment at UCI.

All students, whether enrolled at UCI from their freshman year, readmitted, or transfer, may elect to fulfill general education requirements as specified above, independent of how they choose to meet all other graduation requirements (UC, UCI [with the exception of general education], school, and major).

Students choosing to complete a minor, whether enrolled at UCI from their freshman year, readmitted, or transfer, may elect to fulfill minor requirements as specified above, independent of how they choose to meet all other graduation requirements (UC, UCI, school, and major).

Transfer students who complete one of the following options will be considered to have met the total UCI general education requirement except the upper-division writing requirement: (1) students who transfer from a four-year institution and who have completed the general education requirements of that college, upon approval of petition; (2) students who transfer from another UC campus and provide official documentation that they have met the general education requirements of that campus; (3) students who transfer from another UC campus and are in the process of completing the general education requirements of that campus, upon approval of petition, and who subsequently complete the remaining requirements of that campus at UCI; or (4) California Community College transfer students who have completed the Intersegmental General Education Transfer Curriculum. Transfer students may also elect to complete the UCI general education requirement.

## First-Year Integrated Program (FIP)

University Studies 13–17 are three-quarter multidisciplinary sequences for freshmen or lower-division students only. These integrated courses are designed to introduce students to the ways different disciplines approach similar problems and to provide a freshman learning community experience. Successful completion of all three quarters will satisfy several courses toward partial fulfillment of different general education (GE) requirement categories. Additional information is available in the First-Year Integrated Program section of this *Catalogue*.

## Minor Programs

For certification in a minor, a student must obtain a minimum overall grade point average of at least C (2.0) in all courses required for the minor program. No more than two courses applied to a minor may be taken Pass/Not Pass. Completion of the minor is noted on a student's transcript. (Students are *not* required to minor in a program in order to graduate from UCI.)

## Application for Graduation

In order to receive a degree, an undergraduate student must submit an online Application for Graduation via the Student Access link at the University Registrar's Office website (<http://www.reg.uci.edu/>) no later than the published deadline. Specific deadline dates for filing are established quarterly so

that candidates' academic records can be reviewed to verify that all graduation requirements have been met. These dates vary among academic units. Students should contact their academic counseling office for deadline and degree audit information.

## General Education (GE) Requirement

UCI is committed to the values of a liberal education. One component of that commitment is the requirement that all undergraduates complete a set of general education (GE) requirements. General education courses introduce students to a range of ideas and intellectual activities that engage UCI scholars, providing both scope and balance to a University degree beyond the study of a specific major.

The general education requirements are intended to help undergraduates place the specialized study undertaken in the major within a broader context. They are designed to cultivate the skills, knowledge, and understanding that will make students effective contributors to society and the world. The general education requirements should enable UCI undergraduates to apply the abilities developed in their studies to identify significant issues, gather and evaluate available evidence, analyze alternatives, reach conclusions, communicate the results effectively, and take considered actions.

The general education requirement is a *graduation* requirement and, with the exception of the lower-division writing requirement, need *not* be satisfied during only the lower-division years. To satisfy the general education requirement, courses are required in each of the following categories:

- I. Writing (two lower-division plus one upper-division course)
- II. Science and Technology (three courses)
- III. Social and Behavioral Sciences (three courses)
- IV. Arts and Humanities (three courses)
- V. Quantitative, Symbolic, and Computational Reasoning, **with subcategories Va and Vb** (three courses that may also satisfy another GE category)
- VI. Language Other Than English (one course)
- VII. Multicultural Studies (one course that may also satisfy another GE category)
- VIII. International/Global Issues (one course that may also satisfy another GE category)

The specific courses in each area that students may use to satisfy the requirements are listed below. When a general education course is cross-listed with another course, that course also is available for fulfillment of the requirement. Students should refer to the *Catalogue* descriptions of the courses to determine which are cross-listed.

A course qualifies for a particular GE category based on its content rather than on the academic unit that offers it. However, to increase students' exposure to a variety of disciplinary approaches, students are encouraged to choose GE courses from a wide range of schools and departments outside of the student's major.

NOTE: The following list of courses approved for GE is effective for the 2020-21 academic year only. Because changes occur each year, students should consult the GE list annually to ensure that the courses they enroll in are on the list. GE credit is awarded for a course only if it appears on the list during the academic year when it is taken. To check the GE course offerings in a particular quarter, consult the *Schedule of Classes* on the University Registrar's website (<http://www.reg.uci.edu/>).

## General Education Categories

### I. Writing

Because of the importance of visual, oral, electronic, and written communication in every academic discipline, in the professions, and in public life, the University is committed to developing a variety of communication abilities in students at all levels and in all areas. The Writing Requirement expresses this broad commitment, but the concern for and attention to rhetorically effective, accurate writing is expected in all courses.

The Writing Requirement consists of two courses at the lower-division level beyond the UC Entry Level Writing requirement and one upper-division course in a discipline.

Except where otherwise noted below, students must satisfy the UC Entry Level Writing requirement prior to fulfilling the UCI writing requirement.

Students who have not completed the lower-division writing requirement before the beginning of their seventh quarter at UCI will be subject to probation. Students transferring to UCI normally should have satisfied the lower-division writing requirement before entering UCI; if, however, they have not, they must complete it within their first three quarters of enrollment or they will be subject to probation. Academic English/English as a Second Language students must complete the lower-division writing requirement before the beginning of the seventh quarter following the completion of their AE/ESL courses or they will be subject to probation.

The third course must be an upper-division writing course, and it must be taken only after the successful completion of the lower-division requirement.



Students enrolled at UCI may take only UCI courses in satisfaction of the lower-division and upper-division writing requirements. Continuing UCI students may not take summer courses at another institution to satisfy lower-division or upper-division writing requirements.

After completing this GE requirement, successful students should be able to do the following:

### Lower-division writing

- demonstrate rhetorically effective, accurate academic writing and communication across a variety of contexts, purposes, audiences, and media using appropriate stance, genre, style, and organization;
- develop flexible strategies for generating, revising, editing, and proofreading texts;
- develop abilities in critical reading across a variety of genres and media;
- and demonstrate information literacy skills by locating, evaluating, and integrating information gathered from multiple sources into a research project.

### Upper-division writing

- demonstrate rhetorically effective, discipline-specific writing for appropriate academic, professional, and public audiences;
- demonstrate, at an advanced level of competence, use of discipline-specific research methods, genres, modes of development, and formal conventions;
- and demonstrate advanced information literacy skills by locating, evaluating, and integrating information gathered from multiple sources into discipline-specific writing.

### Ia. Lower-Division Requirement

The two courses taken to fulfill the lower-division requirement must be completed with a minimum grade of C (or a Pass or Credit grade equivalent to C). Students may select from the courses specified below:

1. WRITING 39B Critical Reading and Rhetoric and WRITING 39C Argument and Research.
2. WRITING 37 Intensive Writing and WRITING 39C Argument and Research. Recommended students only.
3. Completion of the writing component of Humanities Core with a grade of C or better in (HUMAN 1AS or HUMAN H1AS or HUMAN 1BS or HUMAN H1BS or HUMAN 1BES), and in HUMAN 1CS or HUMAN H1CS.
4. Students who complete WRITING 37 or WRITING 39B with a grade of B (3.0) or better may substitute as the second course of the lower-division writing requirement one of the following courses in creative writing: WRITING 30 or WRITING 31.
5. WRITING 39B and completion of a First-Year Integrated Program (FIP) sequence, with a grade of C (or Pass) or better in the third quarter of the sequence.

### Ib. Upper-Division Requirement

The course taken to fulfill the upper-division requirement must be completed with a minimum grade of C (or a Pass or Credit grade equivalent to C). The requirement may be satisfied by completing one of the following options:

1. An upper-division course designated on a list of approved courses in the quarterly *Schedule of Classes* on the University Registrar's website (<http://www.reg.uci.edu/>). NOTE: All courses approved to fulfill the upper-division writing requirement should have a "W" suffix. Students are encouraged to consult the *Schedule of Classes* or their advisor to determine the current upper-division writing requirement course offerings. If a course on the approved list is offered without the "W" suffix, it does not satisfy the upper-division writing requirement.
2. Majors in the School of Biological Sciences, Physics majors, and Pharmaceutical Sciences majors satisfy the upper-division writing requirement in the manner specified in those academic unit sections of the *Catalogue*.

Students who fail to attain the required grades in the courses taken in fulfillment of the writing requirement should refer to the Academic Regulations and Procedures section for further information.

Courses with an asterisk (\*) can meet one or more GE requirement. Click on the course for more information.

### Ib. Upper-Division Requirement

#### Academic English (AC ENG)

AC ENG 139W

Advanced Academic Writing Across the Curriculum

#### African American Studies (AFAM)

AFAM 162W

The Black Protest Tradition

#### Anthropology (ANTHRO)

ANTHRO 121AW

Kinship and Social Organization

ANTHRO 164A

21st Century Africa

ANTHRO 180AW

Anthropology Majors Writing Seminar

ANTHRO H190W

Honors Thesis Writing

#### Art (ART)

ART 101W

ART 115W

**Art History (ART HIS)**

ART HIS 190W

**Asian American Studies (ASIANAM)**

ASIANAM 100W

**Biological Sciences (BIO SCI)**

BIO SCI E106L

BIO SCI D111L

BIO SCI E112L

BIO SCI N113L

BIO SCI M114L

BIO SCI E115L

BIO SCI M116L

BIO SCI M118L

BIO SCI M121L

BIO SCI N123L

BIO SCI M130L

BIO SCI E131L

BIO SCI E140L

BIO SCI E142W

BIO SCI E160L

BIO SCI E166L

BIO SCI E179L

BIO SCI E186L

BIO SCI 191CW

**Chicano/Latino Studies (CHC/LAT)**

CHC/LAT 102W

CHC/LAT 124W

CHC/LAT 148W

CHC/LAT 156W

CHC/LAT H190W

**Chemistry (CHEM)**

CHEM 101W

CHEM 177L

CHEM 180W

CHEM H181W

**Classics (CLASSIC)**

CLASSIC 160W

**Comparative Literature (COM LIT)**

COM LIT 101W

COM LIT 102W

COM LIT 190W

**Criminology, Law and Society (CRM/LAW)**

CRM/LAW C169W

**Dance (DANCE)**

DANCE 185W

**Drama (DRAMA)**

DRAMA 109W

DRAMA 110W

DRAMA 112W

DRAMA 116W

Artists as Writers

Writing Nearby

Art History Methods

Research Methodologies for Asian American Studies

Habitats and Organisms

Developmental and Cell Biology Laboratory

Physiology Laboratory

Neurobiology Laboratory

Biochemistry Laboratory

Evolution Laboratory

Molecular Biology Laboratory

Experimental Microbiology Laboratory

Advanced Immunology Laboratory

Human Neuroimaging Lab

Advanced Molecular Lab Techniques

Image Analysis in Biological Research

Evolution and the Environment Laboratory

Writing/Philosophy of Biology

Biology of Birds Lab

Field Biology

Field Freshwater Ecology

Population and Community Ecology Lab

Writing/Senior Seminar on Global Sustainability III

Chicano/Latino Research Seminar

Immigrant Emotionality

Racial and Ethnic Relations in the United States

Chicano/Latinos and Labor

Honors Thesis

Writing in Chemical Sciences

Medicinal Chemistry Laboratory

Senior Thesis in Chemistry

Honors Seminar in Chemistry

Topics in Classical Literature in English Translation

An Introduction to Translation Studies

Comparative Studies in Literature and Theory

Advanced Seminar in Comparative Literature and Theory

Advanced Research Methods

Critical Issues in Dance

Special Topics in Theory and Criticism

Special Topics in Classical Dramas

Special Topics in Early Modern and Neoclassical Theatre

Special Topics in Nineteenth-Century Dramas



DRAMA 118W

DRAMA 126W

DRAMA 129W

DRAMA 180W

**Earth System Science (EARTHSS)**

EARTHSS 176W

EARTHSS 177W

EARTHSS 190CW

EARTHSS 198W

EARTHSS H198

**East Asian Studies (EAS)**

EAS 192W

**Economics (ECON)**

ECON 122CW

ECON 123CW

ECON 137W

ECON 142CW

ECON 145FW

ECON 149W

ECON 164AW

ECON 190BW

**School of Education (EDUC)**

EDUC 143AW

EDUC 143BW

EDUC 179W

**English (ENGLISH)**

ENGLISH 101W

**Engineering (ENGR)**

ENGR 190W

ENGR 196W

ENGR H196W

**European Languages and Studies (EURO ST)**

EURO ST 190W

**Film and Media Studies (FLM&MDA)**

FLM&MDA 139W

**French (FRENCH)**

FRENCH 139W

**German (GERMAN)**

GERMAN 140W

GERMAN 150W

GERMAN 160W

GERMAN 170W

**Global Middle East Studies (GLBL ME)**

GLBL ME 100W

**History (HISTORY)**

HISTORY 100W

**Humanities (HUMAN)**

HUMAN H142W

**Information and Computer Sci (I&C SCI)**

I&C SCI 139W

**Informatics (IN4MATX)**

IN4MATX 162W

Special Topics in Modern and Contemporary Drama

African American Film and Drama

Advanced Topics in Performance

Contemporary Dramatic Criticism and Theory

Marine Conservation, Policy, and Society

Documenting and Understanding Earth System Change

Writing/Senior Seminar on Global Sustainability III

Senior Thesis in Earth System Science

Honors Thesis in Earth System Science

Junior-Senior Seminar

Data Analysis Writing

Econometrics III

Financial Markets and the Macroeconomy

Industrial Organization III

Economics of the Environment II

Special Topics in Economics of Public and Private Organizations

The Industrial Revolution in Western Europe

Economics Honors Colloquium II

Classroom Interactions I

Classroom Interactions II\*

Advanced Writing for Education Sciences

Undergraduate Seminar in Critical Writing: Topics in Literary History

Communications in the Professional World

Engineering Thesis

Honors Thesis

Senior Seminar in European Studies

Writing on Film and Media

Literature and Society

Topics in Literary Theory and Criticism

German Literature and Culture in Translation

German Cinema

Topics in German Linguistics

Research and Writing for Global Middle East Studies

Writing About History

Senior Honors Colloquium

Critical Writing on Information Technology

Organizational Information Systems

**International Studies (INTL ST)**

INTL ST 104BW

INTL ST 147CW

INTL ST 148W

INTL ST 154W

INTL ST 157A

INTL ST 183CW

**Literary Journalism (LIT JRN)**

LIT JRN 101BW

**Logic and Philosophy of Science (LPS)**

LPS 100W

LPS 142W

**Language Science (LSCI)**

LSCI 195W

**Mathematics (MATH)**

MATH 195W

**Management (MGMT)**

MGMT 191W

**Music (MUSIC)**

MUSIC 142W

MUSIC 143W

MUSIC 144W

MUSIC 145W

**Nursing Science (NUR SCI)**

NUR SCI 110W

NUR SCI 179AW

**Philosophy (PHILOS)**

PHILOS 100W

PHILOS 102W

PHILOS 142W

**Pharmaceutical Sciences (PHRMSCI)**

PHRMSCI 174L

PHRMSCI 177L

**Physical Sciences (PHY SCI)**

PHY SCI 139W

**Physics and Astronomy (PHYSICS)**

PHYSICS 106W

PHYSICS 121W

**Political Science (POL SCI)**

POL SCI 122BW

POL SCI 125CW

POL SCI 128BW

POL SCI 136BW

POL SCI 137BW

POL SCI 138AW

POL SCI 138CW

POL SCI 138DW

POL SCI 147CW

POL SCI 154KW

POL SCI 171AW

POL SCI 171CW

POL SCI 174CW

Global Gender and Sexuality

International Humanitarianism

Global Futures

Ethics and Justice in International Affairs

21st Century Africa

Seminar Conflict Resolution

Literary Journalism Core Writing Workshop

Writing Philosophy

Writing/Philosophy of Biology

Writing Skills for Language Science

Mathematical Writing

Business Communication

Topics in Baroque Music

Topics in Classical Music

Topics in Romantic Music

Topics in 20th Century Music

Frameworks for Professional Nursing Practice

Scholarly Concentration I

Writing Philosophy

Introduction to the Theory of Knowledge

Writing/Philosophy of Biology

Biopharmaceutics and Nanomedicine Lab

Medicinal Chemistry Laboratory

Technical Writing and Communication Skills

Advanced Data Acquisition, Analysis, and Scientific Writing

Advanced Laboratory

California Politics

Constitutional Convention

Political Ideologies: The Way We View Our World

Cannibals and Conquistadores: The Philosophy of the Other

Types of Political Representation

Moral of the Story: Introduction to Ethics

Ethics of Difference

The Moral Life During War

International Humanitarianism

US Government in Comparative Perspective

Law and Society

Comparative Constitutional Politics

U.S. Supreme Court

POL SCI 190W

**Psychological Science (PSCI)**

PSCI 111W

**Psychology (PSYCH)**

PSYCH 111BW

PSYCH 112BW

PSYCH 146MW

**Public Health (PUBHLTH)**

PUBHLTH 195W

**Religious Studies (REL STD)**

REL STD 110W

**Social Sciences (SOC SCI)**

SOC SCI 134W

SOC SCI 172AW

SOC SCI 183CW

SOC SCI 184GW

SOC SCI 185W

SOC SCI H190C

SOC SCI 193CW

**Social Ecology (SOCECOL)**

SOCECOL 111W

SOCECOL 183CW

SOCECOL 186CW

SOCECOL H190W

SOCECOL 194W

SOCECOL 195CW

SOCECOL 195W

**Sociology (SOCIOL)**

SOCIOL 120W

SOCIOL 145W

SOCIOL 154W

SOCIOL 155BW

SOCIOL 157AW

SOCIOL 158CW

SOCIOL 161W

SOCIOL 164W

SOCIOL 167AW

SOCIOL 173W

SOCIOL 177W

SOCIOL 180AW

SOCIOL 188BW

**Social Pol and Public Service (SPPS)**

SPPS H190C

SPPS 193CW

**Urban Planning and Public Policy (UPPP)**

UPPP 114W

**Writing (WRITING)**

WRITING 101W

WRITING 139W

Senior Thesis

Advanced Research Methods

Honors Advanced Experimental Psychology

Advanced Experimental Psychology

Writing about Memory

Public Health Practicum and Culminating Experience

Thinking about Religion: Theories and Methodologies

Veterans' Voices

American Culture

Seminar Conflict Resolution

Media Writing

People in Society

Honors Thesis

Field Studies in Social Policy and Public Service

Advanced Research Methods

Seminar Conflict Resolution

Writing/Senior Seminar on Global Sustainability III

Honors Research

Naturalistic Field Research

Advanced Field Study

Field Study Writing Seminar

Sociological Theory

Occupations and Professions

Medical Sociology

Baseball and Society

Sociology of Education

Money, Work, and Social Life

Sociology of Sex and Gender

Sociology of Aging

Racial and Ethnic Relations in the United States

Social Inequality

Immigration and Social Policy

Sociology Majors Seminar

Honors Research and Thesis

Honors Thesis

Field Studies in Social Policy and Public Service

Advanced Research Methods

Undergraduate Seminar: Applications in Literary Theory and Criticism for Creative Writing

Advanced Expository Writing

## II. Science and Technology

Understanding the nature of scientific inquiry and the operation of the biological, physical, and technological world is essential for making personal and public policy decisions in a technological society.

After completing this GE requirement, successful students should be able to do the following:

- demonstrate a broad understanding of the fundamental laws of science, the principles underlying the design and operation of technology, and the interrelations among science and technology disciplines;
- demonstrate a broad understanding of various natural phenomena that surround and influence our lives;
- describe how scientists approach and solve problems;
- solve problems and draw conclusions based on scientific information and models, using critical thinking and qualitative and quantitative analysis of data and concepts;
- and explain the scope and limitations of scientific inquiry and the scientific method.

Courses with an asterisk (\*) can meet one or more GE requirement. Click on the course for more information.

Students must complete three courses from the following list:

## II. Science and Technology

### Art History (ART HIS)

ART HIS 55

Disneyland\*

### Biological Sciences (BIO SCI)

BIO SCI 1A

Life Sciences

BIO SCI 6

Tropical Biology: Race to Save the Tropics

BIO SCI 9A

Nutrition Science

BIO SCI 9B

Biology and Chemistry of Food and Cooking

BIO SCI 9D

Diseases of the Twenty-First Century

BIO SCI 9E

Horticulture Science

BIO SCI 9G

Physiology of Fitness

BIO SCI 9J

Biology of Oriental Medicine

BIO SCI 9K

Global Change Biology

BIO SCI 10

The Biology of Human Diseases

BIO SCI 12

Molecular Basis of Human Disease

BIO SCI 17

Evolutionary Psychology

BIO SCI 23

Sustainable Landscaping: Design and Practices

BIO SCI 35

The Brain and Behavior

BIO SCI 36

Drugs and the Brain

BIO SCI 37

Brain Dysfunction and Repair

BIO SCI 38

Mind, Memory, Amnesia, and the Brain

BIO SCI 41

Aspects of Mood Disorder

BIO SCI 43

Media on the Mind

BIO SCI 44

Stem Cells and Brain Repair

BIO SCI 45

AIDS Fundamentals

BIO SCI 47

Stress

BIO SCI 55

Introduction to Ecology

BIO SCI 56

Life Sciencing from Aristotle to Venter

BIO SCI 75

Human Development: Conception to Birth

BIO SCI H90

The Idiom and Practice of Science

BIO SCI 93

From DNA to Organisms

BIO SCI H93

Honors From DNA to Organisms

BIO SCI 94

From Organisms to Ecosystems

BIO SCI N118

Clinical Psychophysiology

### Biomedical Engineering (BME)

BME 3

Engineering Innovations in Treating Diabetes\*

### Chemistry (CHEM)

CHEM 1A  
CHEM 1B  
CHEM 1C  
CHEM H2A  
CHEM H2B  
CHEM H2C  
CHEM M2A  
CHEM M2B  
CHEM M2C  
CHEM M3C  
CHEM 12  
CHEM 14  
CHEM H30A  
CHEM H90

**Dance (DANCE)**

DANCE 3

**Earth System Science (EARTHSS)**

EARTHSS 1  
EARTHSS 3  
EARTHSS 5  
EARTHSS 7  
EARTHSS 15  
EARTHSS 17  
EARTHSS 19  
EARTHSS 21  
EARTHSS 23  
EARTHSS 27  
EARTHSS H30B  
EARTHSS 40A  
EARTHSS 40B  
EARTHSS 40C

**Economics (ECON)**

ECON 11

**Engineering (ENGR)**

ENGR 1A

**History (HISTORY)**

HISTORY 60

**Information and Computer Sci (I&C SCI)**

I&C SCI 4  
I&C SCI 5  
I&C SCI 6N  
I&C SCI 10  
I&C SCI 11  
I&C SCI 31  
I&C SCI 32  
I&C SCI 32A  
I&C SCI 33  
I&C SCI 51  
I&C SCI 61

**Informatics (IN4MATX)**

IN4MATX 12

**Logic and Philosophy of Science (LPS)**

General Chemistry\*  
General Chemistry\*  
General Chemistry\*  
Honors General Chemistry\*  
Honors General Chemistry\*  
Honors General Chemistry\*  
Majors General Chemistry Lecture\*  
Majors General Chemistry Lecture\*  
Majors General Chemistry Lecture\*  
Majors Quantitative Analytical Chemistry\*  
Chemistry Around Us\*  
Sense and Sensibility in Science\*  
Critical Analysis of Health Science Literature\*  
The Idiom and Practice of Science\*

Scientific Concepts of Health

Introduction to Earth System Science\*  
Oceanography\*  
The Atmosphere\*  
Physical Geology\*  
Introduction to Global Climate Change\*  
Hurricanes, Tsunamis, and Other Catastrophes\*  
Introduction to Modeling the Earth System\*  
On Thin Ice: Climate Change and the Cryosphere\*  
Air Pollution: From Urban Smog to Global Change\*  
The Sustainable Ocean\*  
Environmental Issues Affecting the Sustainability of Societies I\*  
Earth System Chemistry\*  
Earth System Biology\*  
Earth System Physics\*

The Internet and Public Policy\*

General Chemistry for Engineers

The Making of Modern Science\*

Human Factors for the Web  
Global Disruption and Information Technology  
Computational Linear Algebra\*  
How Computers Work  
The Internet and Public Policy\*  
Introduction to Programming\*  
Programming with Software Libraries\*  
Python Programming and Libraries (Accelerated)\*  
Intermediate Programming\*  
Introductory Computer Organization  
Game Systems and Design

Barter to Bitcoin: Society, Technology and the Future of Money\*

LPS 29

LPS 31

LPS 40

LPS 60

LPS H80

LPS H81

LPS H91

LPS H123

**Mathematics (MATH)**

MATH 9

MATH 10

**Medical Humanities Initiative (MED HUM)**

MED HUM 3

**Philosophy (PHILOS)**

PHILOS 3

PHILOS 29

PHILOS 31

**Pharmaceutical Sciences (PHRMSCI)**

PHRMSCI H80

**Physics and Astronomy (PHYSICS)**

PHYSICS 3A

PHYSICS 3B

PHYSICS 3C

PHYSICS 7C

PHYSICS 7D

PHYSICS 7E

PHYSICS 12

PHYSICS 14

PHYSICS 15

PHYSICS 17

PHYSICS 18

PHYSICS 19

PHYSICS 20A

PHYSICS 20B

PHYSICS 20D

PHYSICS 20E

PHYSICS 21

PHYSICS H80

PHYSICS H90

**Psychology (PSYCH)**

PSYCH 122P

**Public Health (PUBHLTH)**

PUBHLTH 2

PUBHLTH 30

PUBHLTH 60

PUBHLTH 80

PUBHLTH 90

**Social Sciences (SOC SCI)**

SOC SCI 11A

**University Studies (UNI STU)**

UNI STU 13A

UNI STU 13B

Critical Reasoning<sup>\*</sup>

Introduction to Inductive Logic<sup>\*</sup>

The Nature of Scientific Inquiry

The Making of Modern Science<sup>\*</sup>

Scientific Realism and Instrumentalism

What is Space?

The Philosophy and Biology of Sex<sup>\*</sup>

What is Disease?

Introduction to Programming for Numerical Analysis<sup>\*</sup>

Introduction to Programming for Data Science<sup>\*</sup>

Art and Medicine<sup>\*</sup>

Technology and Society

Critical Reasoning<sup>\*</sup>

Introduction to Inductive Logic<sup>\*</sup>

Drugs and Society

Basic Physics I<sup>\*</sup>

Basic Physics II<sup>\*</sup>

Basic Physics III<sup>\*</sup>

Classical Physics<sup>\*</sup>

Classical Physics<sup>\*</sup>

Classical Physics<sup>\*</sup>

Science Fiction and Science Fact<sup>\*</sup>

Energy and the Environment<sup>\*</sup>

Physics of Music

Physics of Athletics

How Things Work

Great Ideas of Physics

Introduction to Astronomy<sup>\*</sup>

Cosmology: Humanity's Place in the Universe<sup>\*</sup>

Space Science<sup>\*</sup>

Life in the Universe<sup>\*</sup>

Special Topics in Physics

Impact of World War I on Science

The Idiom and Practice of Science<sup>\*</sup>

Clinical Psychophysiology

Case Studies in Public Health Practice

Introduction to Urban Environmental Health

Environmental Quality and Health

AIDS Fundamentals

Natural Disasters

Barter to Bitcoin: Society, Technology and the Future of Money<sup>\*</sup>

Introduction to Global Sustainability I

Introduction to Global Sustainability II

**Urban Planning and Public Policy (UPPP)**

UPPP H30F

Cities: Focal Point for Sustainability Problems and Solutions II

**III. Social and Behavioral Sciences**

Courses will focus on principles, sources, and interpretations of human behavior and on how people organize, govern, understand, and explain social life. This category includes the analysis of human behavior at all levels, from the individual to collective social, economic, and political life, and on the scientific methods used in the acquisition of knowledge and the testing of competing theories.

After completing this GE requirement, successful students should be able to do the following:

- demonstrate knowledge and understanding of principles, sources, and interpretations of human behavior and how people organize, govern, understand, and explain social life;
- demonstrate an understanding of contemporary and historical perspectives on human behavior;
- understand and explain the scientific methods used in the acquisition of knowledge and the testing of competing theories in the social and behavioral sciences;
- and critically evaluate methods, findings, and conclusions in the research literature on human behavior.

Courses with an asterisk (\*) can meet one or more GE requirement. Click on the course for more information.

Students must complete three courses from the following list:

**III. Social and Behavioral Sciences****African American Studies (AFAM)**

AFAM 40A

African American Studies I \*

AFAM 40B

African American Studies II \*

AFAM 40C

African American Studies III \*

**Anthropology (ANTHRO)**

ANTHRO 2A

Introduction to Sociocultural Anthropology \*

ANTHRO 2B

Introduction to Biological Anthropology

ANTHRO 2C

Introduction to Archaeology

ANTHRO 2D

Introduction to Language and Culture

ANTHRO 25A

Environmental Injustice \*

ANTHRO 41A

Global Cultures and Society \*

ANTHRO 45A

Science, Culture, Power

ANTHRO 48

Archaeology or Aliens?: Conspiracy, Pseudoscience, and the Emergence of Civilizations \*

ANTHRO 125C

Environmental Anthropology

ANTHRO 127

Controversies, Courts, Cultures: The Anthropology of Law

**Art (ART)**

ART 12C

Intelligences of Arts

**Asian American Studies (ASIANAM)**

ASIANAM 50

Asian American Histories \*

ASIANAM 51

The U.S. and Asia \*

ASIANAM 52

Asian American Communities \*

ASIANAM 53

Asian Americans and Race \*

ASIANAM 130

Undocumented Immigrant Experiences \*

**Chicano/Latino Studies (CHC/LAT)**

CHC/LAT 61

Introduction to Chicano/Latino Studies I \*

CHC/LAT 62

Introduction to Chicano/Latino Studies II \*

CHC/LAT 63

Introduction to Chicano/Latino Studies III \*

CHC/LAT 64

Introduction to Race and Ethnicity in Political Science \*

CHC/LAT H80

Latina/o Childhoods: Comparative Approaches to the Study of Children and Youth

CHC/LAT 164A

Undocumented Immigrant Experiences \*

**Criminology, Law and Society (CRM/LAW)**

CRM/LAW C7

Introduction to Criminology, Law and Society

CRM/LAW C10  
CRM/LAW H80  
CRM/LAW C183  
CRM/LAW C187

**Earth System Science (EARTHSS)**

EARTHSS H30C

**Economics (ECON)**

ECON 1  
ECON 11  
ECON 13  
ECON 17  
ECON 20A  
ECON 20B  
ECON 23

**School of Education (EDUC)**

EDUC 10  
EDUC 25  
EDUC 30  
EDUC 40  
EDUC 55

**English (ENGLISH)**

ENGLISH 11  
ENGLISH 11C  
ENGLISH H80  
ENGLISH H81

**Civil and Environmental Engr (ENGRCEE)**

ENGRCEE 60

**European Languages and Studies (EURO ST)**

EURO ST 10  
EURO ST S10  
EURO ST 11  
EURO ST S11  
EURO ST 12

**Gender and Sexuality Studies (GEN&SEX)**

GEN&SEX 60A  
GEN&SEX 60B  
GEN&SEX 60C

**Global Middle East Studies (GLBL ME)**

GLBL ME 60B  
GLBL ME 60C

**History (HISTORY)**

HISTORY 11  
HISTORY 15C  
HISTORY 15F

**Humanities (HUMAN)**

HUMAN H81  
HUMAN H83

**Information and Computer Sci (I&C SCI)**

I&C SCI 3  
I&C SCI 11  
I&C SCI 60

Fundamentals of Criminology, Law and Society  
The Properties of Property  
Controversies, Courts, Cultures: The Anthropology of Law  
Undocumented Immigrant Experiences\*

Environmental Issues Affecting the Sustainability of Societies II

Introduction to Economics  
The Internet and Public Policy\*  
Global Economy\*  
An Economic Approach to Religion  
Basic Economics I  
Basic Economics II  
Basic Economics for Engineers

Educational Research Design  
Introduction to Education: Disciplinary Perspectives  
21st Century Literacies  
Theories of Development and Learning Applied to Education  
Knowing and Learning in Mathematics and Science

Society, Law, and Literature\*  
Society, Law, and Literature\*  
Sanctuary: Medieval and Modern\*  
What is a Person?

Contemporary and Emerging Environmental Challenges

Topics in Historical Foundations (1500-1800)\*  
Historical Foundations: Europe and the Foundations of the Modern World\*  
Issues and Institutions in Modern Europe (1789-1945)\*  
Europe's Futures: 1755-Present\*  
What is the Origin of Language?\*

Gender and Science  
Gender and Law  
Gender and Religion\*

Social Sciences: Problems and Methods for Global Middle East Studies\*  
Social Ecology and Sciences: Problems and Methods for Global Middle East Studies

Genocide and Crimes Against Humanity Since WWII\*  
Asian American Histories\*  
What to Eat? Immigrants and the Development of American Cuisines\*

The Vietnam War\*  
How Nations Remember

Internet Technologies and their Social Impact  
The Internet and Public Policy\*  
Computer Games and Society



**Informatics (IN4MATX)**

IN4MATX 12

IN4MATX H81

**International Studies (INTL ST)**

INTL ST 1

INTL ST 11

INTL ST 12

INTL ST 13

INTL ST 14

INTL ST 15

INTL ST 16

INTL ST 17

**Logic and Philosophy of Science (LPS)**

LPS 91

LPS H91

LPS H95

LPS H125

**Language Science (LSCI)**

LSCI 3

LSCI 10

LSCI 20

LSCI 51

LSCI 68

**Medical Humanities Initiative (MED HUM)**

MED HUM 1

**Management (MGMT)**

MGMT 4A

MGMT 4B

**Philosophy (PHILOS)**

PHILOS 22

PHILOS 91

**Political Science (POL SCI)**

POL SCI 11A

POL SCI 11C

POL SCI 21A

POL SCI 31A

POL SCI 41A

POL SCI 44B

POL SCI 45A

POL SCI 51A

POL SCI 61A

POL SCI 71A

POL SCI H80

**Psychological Science (PSCI)**

PSCI 9

PSCI 11A

PSCI 11B

PSCI 11C

**Psychology (PSYCH)**

PSYCH 7A

PSYCH 9A

PSYCH 9B

Barter to Bitcoin: Society, Technology and the Future of Money<sup>\*</sup>  
 Ethics, Technology, and Design

Introduction to Global Studies<sup>\*</sup>  
 Global Cultures and Society<sup>\*</sup>  
 Global Political Ideologies<sup>\*</sup>  
 Global Economy<sup>\*</sup>  
 Introduction to International Relations<sup>\*</sup>  
 Global Political Economy<sup>\*</sup>  
 Human Rights and Global Governance<sup>\*</sup>  
 Global Environmental Issues<sup>\*</sup>

The Philosophy of Sex  
 The Philosophy and Biology of Sex<sup>\*</sup>  
 Jurisprudence and Constitutional Law  
 What Is Time?

Introduction to Linguistics<sup>\*</sup>  
 Introduction to Phonology<sup>\*</sup>  
 Introduction to Syntax<sup>\*</sup>  
 Acquisition of Language  
 Introduction to Language and Culture

Health, Wellness, and Conception of the Body<sup>\*</sup>

Basic Economics for Managers I  
 Basic Economics for Managers II

Introduction to Law and Society  
 The Philosophy of Sex

Introduction to Political Science: Political Analysis<sup>\*</sup>  
 Introduction to Political Science: Micropolitics  
 Introduction to American Government  
 Introduction to Political Theory  
 Introduction to International Relations<sup>\*</sup>  
 Global Political Ideologies<sup>\*</sup>  
 Human Rights and Global Governance<sup>\*</sup>  
 Introduction to Politics Around the World<sup>\*</sup>  
 Introduction to Race and Ethnicity in Political Science<sup>\*</sup>  
 Introduction to Law  
 Globalization and Human Security<sup>\*</sup>

Introduction to Psychology  
 Psychology Fundamentals  
 Psychology Fundamentals  
 Psychology Fundamentals

Introduction to Psychology  
 Psychology Fundamentals  
 Psychology Fundamentals

PSYCH 9C	Psychology Fundamentals
PSYCH 21A	Adolescent Psychology
PSYCH 46A	Introduction to Human Memory
PSYCH 56L	Acquisition of Language
PSYCH 78A	Self-Identity and Society
<b>Public Health (PUBHLTH)</b>	
PUBHLTH 1	Principles of Public Health
<b>Religious Studies (REL STD)</b>	
REL STD 17	An Economic Approach to Religion
REL STD 61	Gender and Religion *
<b>Social Sciences (SOC SCI)</b>	
SOC SCI 1A	Principles in the Social Sciences
SOC SCI H1E	Honors: Critical Issues on the Social Sciences
SOC SCI H1F	Honors: Critical Issues on the Social Sciences
SOC SCI H1G	Honors: Critical Issues on the Social Sciences
SOC SCI 2A	Introduction to Social Science Analysis
SOC SCI 4A	Introduction to Global Studies *
SOC SCI 5A	Introduction to Human Geography
SOC SCI 5D	US & World Geography *
SOC SCI 11A	Barter to Bitcoin: Society, Technology and the Future of Money *
SOC SCI 12	Global Political Ideologies *
SOC SCI 15	Global Political Economy *
SOC SCI 16	Human Rights and Global Governance *
SOC SCI 17	Global Environmental Issues *
SOC SCI H30D	Social Science Perspectives on the Sustainability of Societies
SOC SCI 40	Social Policy and Public Service
SOC SCI 70C	Comparing Cultures *
SOC SCI 78A	Asian American Histories *
SOC SCI 78B	Asian American Communities *
SOC SCI 78C	Asian Americans and Race *
<b>Social Ecology (SOCECOL)</b>	
SOCECOL H20A	Honors: Critical Issues on the Social Sciences
SOCECOL H20B	Honors: Critical Issues on the Social Sciences
SOCECOL H20C	Honors: Critical Issues on the Social Sciences
<b>Sociology (SOCIOL)</b>	
SOCIOL 1	Introduction to Sociology *
SOCIOL 2	Globalization and Transnational Sociology *
SOCIOL 3	Social Problems *
SOCIOL 31	Self-Identity and Society
SOCIOL 62	Families and Intimate Relations
SOCIOL 177C	Undocumented Immigrant Experiences *
<b>Social Pol and Public Service (SPPS)</b>	
SPPS 40	Social Policy and Public Service
<b>University Studies (UNI STU)</b>	
UNI STU 13C	Introduction to Global Sustainability III
UNI STU H80	Neurodivergent
UNI STU 85A	Leading from Within
UNI STU 85B	Leading Others
UNI STU 85C	Leading Change
<b>Urban Planning and Public Policy (UPPP)</b>	
UPPP 4	Introduction to Urban Studies
UPPP 5	Introduction to Urban Planning and Policy

UPPP 8  
UPPP H30E  
UPPP 142  
UPPP 166

Introduction to Environmental Analysis and Design  
Cities: Focal Point for Sustainability Problems and Solutions I  
Environmental Hazards in an Urbanizing World  
Urban Politics and Policy

## IV. Arts and Humanities

Study of the Arts and Humanities expands the student's sense of diverse forms of cultural expression, past and present. Students develop their critical capacity as they discover how meaning is created and experience variously interpreted.

After completing this GE requirement, successful students should be able to do the following:

- demonstrate knowledge and understanding of how visual and verbal communication is used in literature and film, art and music, and philosophy and history;
- communicate an understanding and appreciation of diverse forms of cultural expression, past and present;
- understand and explain the research methods used in the acquisition of knowledge and the testing of competing theories in the arts and humanities;
- and think critically about how meaning is created and how experience is variously interpreted.

Courses with an asterisk (\*) can meet one or more GE requirement. Click on the course for more information.

Students must complete three courses from the following list:

## IV. Arts and Humanities

### African American Studies (AFAM)

AFAM 40A  
AFAM 40B  
AFAM 40C

African American Studies I \*  
African American Studies II \*  
African American Studies III \*

### Arabic (ARABIC)

ARABIC 51

Introduction to the Koran \*

### Art (ART)

ART 1A  
ART 1B  
ART 1C  
ART 8  
ART 9A  
ART 9B  
ART 9C  
ART 12A  
ART 12B

Art in Context: History, Theory, and Practice  
Art in Context: History, Theory, and Practice  
Art in Context: History, Theory, and Practice  
Changing Creativity  
Visual Culture: Media, Art, and Technology  
Visual Culture: A Culture Divided  
Visual Culture: Thematic Investigations  
Art, Design, and Electronic Culture  
Technology, Culture, and Society: Steam to Steampunk

### Art History (ART HIS)

ART HIS 40A  
ART HIS 40B  
ART HIS 40C  
ART HIS 42A  
ART HIS 42B  
ART HIS 42C  
ART HIS 42D  
ART HIS 42E  
ART HIS 44  
ART HIS 55

Ancient Greek and Roman Art, and Architecture \*  
Arts of Europe: Medieval and Renaissance \*  
Early Modern and Modern Art in Europe and America \*  
History of Asian Art: Arts of India \*  
History of Asian Art: Arts of China \*  
History of Asian Art: Arts of Japan \*  
History of Asian Art: Arts of Islam \*  
Art and Archaeology of Ancient Persia, Egypt, and Mesopotamia \*  
Image Collision: A Multicultural Approach to Images and Their Users \*  
Disneyland \*

### Arts (ARTS)

ARTS 1  
ARTS H81

ArtsCore  
Improvisation and Modes of Research / Creative Expression

### Asian American Studies (ASIANAM)

ASIANAM 50  
ASIANAM 51

Asian American Histories \*  
The U.S. and Asia \*

ASIANAM 54

ASIANAM 55

**Classics (CLASSIC)**

CLASSIC 36A

CLASSIC 36B

CLASSIC 36C

CLASSIC 37A

CLASSIC 37B

CLASSIC 37C

CLASSIC 45A

CLASSIC 45B

CLASSIC 45C

**Comparative Literature (COM LIT)**

COM LIT 3

COM LIT 8

COM LIT 9

COM LIT 10

COM LIT 60A

COM LIT 60B

COM LIT 60C

**Dance (DANCE)**

DANCE 80

DANCE 81

DANCE 83

DANCE 85

DANCE 90A

DANCE 90B

DANCE 90C

**Drama (DRAMA)**

DRAMA 10

DRAMA 11

DRAMA 15

DRAMA 16

DRAMA 20A

DRAMA 20B

DRAMA 20C

DRAMA 40A

DRAMA 40B

DRAMA 40C

**East Asian Studies (EAS)**

EAS 20

EAS 40

EAS 55

EAS H84

**English (ENGLISH)**

ENGLISH 8

ENGLISH 9

ENGLISH 10

ENGLISH 10B

ENGLISH 11

Asian American Stories\*

Asian Americans and the Media\*

The Formation of Ancient Greek Society: Early Greece

The Formation of Ancient Greek Society: Late Archaic and Classical Greece

The Formation of Ancient Greek Society: Fourth-Century and Hellenistic Greece

The Formation of Ancient Roman Society: Origins to Roman Republic

The Formation of Ancient Roman Society: Roman Empire

The Formation of Ancient Roman Society: The Fall of Rome

Classical Mythology: The Gods

Classical Mythology: The Heroes

Classical Mythology: Ancient and Modern Perspectives of Classical Mythology

Just Reading: Developing the Reading Experience\*

Travels in Comparative Literature

Introduction to Multiculturalism\*

Topics in World Literature\*

World Literature\*

Reading with Theory\*

Cultural Studies\*

Introduction to Ballet and Modern Dance\*

American Ballet and Modern Dance since 1900

Dance in Feature Film

What Dance Does: From Ballet to Hip-Hop

Dance History I\*

Dance History II\*

Dance History III

Introduction to Theatre

The Rock and Roll Spectacle Show

Performance Now

Performing Culture

Culture in Performance

Culture in Performance

Culture in Performance

Development of Drama\*

Development of Drama\*

Development of Drama\*

Topics in Asian Religions\*

Topics in East Asian Popular Culture\*

Introduction to East Asian Cultures\*

Traveling East/West

Multicultural American Literature\*

Shakespeare

Topics in English and American Literature

Topics in English and American Literature

Society, Law, and Literature\*

ENGLISH 11C

ENGLISH 12

ENGLISH 16

ENGLISH 17

ENGLISH H80

**European Languages and Studies (EURO ST)**

EURO ST 9

EURO ST 10

EURO ST S10

EURO ST 11

EURO ST S11

EURO ST 12

EURO ST 13

**Film and Media Studies (FLM&MDA)**

FLM&amp;MDA H80

FLM&amp;MDA 85A

FLM&amp;MDA 85B

FLM&amp;MDA 85C

**French (FRENCH)**

FRENCH 50

**Gender and Sexuality Studies (GEN&SEX)**

GEN&amp;SEX 20

GEN&amp;SEX 50A

GEN&amp;SEX 50B

GEN&amp;SEX 50C

**Global Middle East Studies (GLBL ME)**

GLBL ME 60A

**Hebrew (HEBREW)**

HEBREW 50

**History (HISTORY)**

HISTORY 10

HISTORY 12

HISTORY 15A

HISTORY 15C

HISTORY 15D

HISTORY 15F

HISTORY 16A

HISTORY 16B

HISTORY 16C

HISTORY 18A

HISTORY 21A

HISTORY 21B

HISTORY 21C

HISTORY 36A

HISTORY 36B

HISTORY 36C

HISTORY 37A

HISTORY 37B

HISTORY 37C

HISTORY 40A

Society, Law, and Literature\*

Young Adult Fiction

The Craft of Poetry

The Craft of Fiction

Sanctuary: Medieval and Modern\*

Topics in Europe in the Middle Ages\*

Topics in Historical Foundations (1500-1800)\*

Historical Foundations: Europe and the Foundations of the Modern World\*

Issues and Institutions in Modern Europe (1789-1945)\*

Europe's Futures: 1755-Present\*

What is the Origin of Language?\*

Topics in Contemporary Europe (1945 – Today)\*

Honors Seminar: Race Sport Media\*

Introduction to Film and Visual Analysis

Broadcast Media History and Analysis

New Media and Digital Technologies

Topics in French Culture and the Modern World\*

Introduction to Queer Studies\*

Gender and Feminism in Everyday Life\*

Gender and Power\*

Gender and Popular Culture\*

Humanities and Arts: Problems and Methods for Global Middle East Studies\*

Jewish and Israeli Culture\*

The Holocaust\*

Introductory Topics in History

Native American History\*

Asian American Histories\*

History of Sexuality in the US\*

What to Eat? Immigrants and the Development of American Cuisines\*

World Religions I\*

World Religions II\*

Religious Dialogue\*

Major Jewish Texts\*

World: Innovations\*

World: Empires and Revolutions\*

World: Nation, War, and Rights\*

The Formation of Ancient Greek Society: Early Greece

The Formation of Ancient Greek Society: Late Archaic and Classical Greece

The Formation of Ancient Greek Society: Fourth-Century and Hellenistic Greece

The Formation of Ancient Roman Society: Origins to Roman Republic

The Formation of Ancient Roman Society: Roman Empire

The Formation of Ancient Roman Society: The Fall of Rome

Colonial America: New Worlds

HISTORY 40B  
HISTORY 40C  
HISTORY 50  
HISTORY 60  
HISTORY 70A  
HISTORY 70B  
HISTORY 70C  
HISTORY 70D  
HISTORY 70E  
HISTORY 70F

**Humanities (HUMAN)**

HUMAN 1A  
HUMAN 1B  
HUMAN 1C  
HUMAN B1A  
HUMAN 10  
HUMAN H80  
HUMAN H81  
HUMAN H84

**Italian (ITALIAN)**

ITALIAN 50

**Literary Journalism (LIT JRN)**

LIT JRN 20

**Logic and Philosophy of Science (LPS)**

LPS 60

**Medical Humanities Initiative (MED HUM)**

MED HUM 1  
MED HUM 3

**Music (MUSIC)**

MUSIC 3  
MUSIC 4  
MUSIC 5  
MUSIC 8  
MUSIC 9  
MUSIC 25  
MUSIC 40B  
MUSIC 40C  
MUSIC 40D  
MUSIC 41  
MUSIC 42  
MUSIC 44  
MUSIC 45  
MUSIC 46  
MUSIC 47  
MUSIC 48  
MUSIC 51  
MUSIC 78  
MUSIC H80

**Persian (PERSIAN)**

PERSIAN 50

**Philosophy (PHILOS)**

PHILOS 1

Nineteenth-Century U.S.: Crisis and Expansion  
Modern America: Culture and Power  
Crises and Revolutions<sup>\*</sup>  
The Making of Modern Science<sup>\*</sup>  
Problems in History: Asia<sup>\*</sup>  
Problems in History: Europe<sup>\*</sup>  
Problems in History: United States  
Problems in History: Latin America<sup>\*</sup>  
Problems in History: Middle East and Africa<sup>\*</sup>  
Problems in History: Transregional History<sup>\*</sup>

Humanities Core Lecture  
Humanities Core Lecture  
Humanities Core Lecture<sup>\*</sup>  
Humanities Core Biological Sciences Lecture  
Masterpieces of Literature<sup>\*</sup>  
Exploring Memory  
The Vietnam War<sup>\*</sup>  
Traveling East/West

Topics in Italian Culture<sup>\*</sup>

Introduction to Literary Journalism

The Making of Modern Science<sup>\*</sup>

Health, Wellness, and Conception of the Body<sup>\*</sup>  
Art and Medicine<sup>\*</sup>

Introduction to Music  
Introduction to Opera  
Popular Music in the United States  
The Beatles and the Sixties  
Rock: The Early Years  
Fundamentals of Music  
History of European Music: From the Renaissance through the Baroque<sup>\*</sup>  
History of European Music: Hasse to Mahler<sup>\*</sup>  
20th Century Music<sup>\*</sup>  
Major Composer<sup>\*</sup>  
Music and Gender<sup>\*</sup>  
Classical Music in Society<sup>\*</sup>  
History of Film Music  
Music in Multimedia  
Introductory Topics in Music Technology  
Introductory Topics in Music and Culture  
Music Technology and Computers  
History of Jazz<sup>\*</sup>  
Experiments in Music

Persian Culture<sup>\*</sup>

Introduction to Philosophy

PHILOS 2	Puzzles and Paradoxes *
PHILOS 4	Introduction to Ethics
PHILOS 5	Contemporary Moral Problems
PHILOS 7	Introduction to Existentialism
PHILOS 10	History of Ancient Philosophy
PHILOS 11	History of Medieval Philosophy
PHILOS 12	History of Modern Philosophy
PHILOS 13	History of Contemporary Philosophy
PHILOS 21	Philosophy and Religion
<b>Religious Studies (REL STD)</b>	
REL STD 5A	World Religions I *
REL STD 5B	World Religions II *
REL STD 5C	Religious Dialogue *
REL STD 21	Philosophy and Religion
<b>Russian (RUSSIAN)</b>	
RUSSIAN 50	Russian Culture *
<b>Social Sciences (SOC SCI)</b>	
SOC SCI 78A	Asian American Histories *
<b>Spanish (SPANISH)</b>	
SPANISH 50	Latin America, U.S. Latino, and Iberian Cultures *
SPANISH 60E	Mexico and Central America: A Survey *
SPANISH 60S	Mexico and Central America: A Survey *
SPANISH 61	The Culture of the Visual Image in Latin America *
<b>Vietnamese (VIETMSE)</b>	
VIETMSE 50	Vietnamese Culture

## V. Quantitative, Symbolic, and Computational Reasoning

This category consists of two subcategories. Students are required to take one course in each of the subcategories and an additional course from either subcategory, for a total of three courses. A course approved for the GE requirement in category V and also approved for the GE requirement in a category other than V may be used to satisfy the requirements of both categories simultaneously. However, courses approved for both subcategories in category V may only be used once to satisfy one of the subcategories. The two subcategories are indicated as **Va** and **Vb**.

### Va. Quantitative Literacy

Courses in this category focus on the quantitative description, evaluation, and assessment of events occurring in nature or in human social and political systems. This includes quantitative measurements made or data collected to study such events, analysis of the data, and implications of the analysis for our understanding of the events.

After taking a course in category Va, successful students will be able to do all of the following:

- identify appropriate tools for quantitative analysis of processes or events;
- have a basic familiarity with fundamental principles underlying quantitative descriptions of natural or social processes;
- and be able to do one or more of the following:
  - evaluate studies and reports that assess risk and probability in everyday life;
  - use models of natural phenomena to make quantitative predictions of future behavior or events;
  - use models of economic and social structures to make quantitative predictions of future behavior or events.

Courses with an asterisk (\*) can meet one or more GE requirement. Click on the course for more information.

### Va. Quantitative Literacy

#### Anthropology (ANTHRO)

ANTHRO 10A	Probability and Statistics
ANTHRO 10B	Probability and Statistics

#### Biomedical Engineering (BME)

BME 3	Engineering Innovations in Treating Diabetes *
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#### Chemistry (CHEM)

CHEM 1A  
 CHEM 1B  
 CHEM 1C  
 CHEM H2A  
 CHEM H2B  
 CHEM H2C  
 CHEM M2A  
 CHEM M2B  
 CHEM M2C  
 CHEM M3C  
 CHEM 12  
 CHEM 14  
 CHEM H30A  
 CHEM H90

**Earth System Science (EARTHSS)**

EARTHSS 1  
 EARTHSS 3  
 EARTHSS 5  
 EARTHSS 7  
 EARTHSS 15  
 EARTHSS 17  
 EARTHSS 21  
 EARTHSS 23  
 EARTHSS 40A  
 EARTHSS 40C

**Economics (ECON)**

ECON 15A  
 ECON 15B

**School of Education (EDUC)**

EDUC 15

**Information and Computer Sci (I&C SCI)**

I&C SCI 7  
 I&C SCI 32  
 I&C SCI 32A

**Logic and Philosophy of Science (LPS)**

LPS 31

**Management (MGMT)**

MGMT 7

**Philosophy (PHILOS)**

PHILOS 31

**Physics and Astronomy (PHYSICS)**

PHYSICS 3A  
 PHYSICS 3B  
 PHYSICS 3C  
 PHYSICS 7C  
 PHYSICS 7D  
 PHYSICS 7E  
 PHYSICS 12  
 PHYSICS 14  
 PHYSICS 20A  
 PHYSICS 20B  
 PHYSICS 20D

General Chemistry<sup>\*</sup>  
 General Chemistry<sup>\*</sup>  
 General Chemistry<sup>\*</sup>  
 Honors General Chemistry<sup>\*</sup>  
 Honors General Chemistry<sup>\*</sup>  
 Honors General Chemistry<sup>\*</sup>  
 Majors General Chemistry Lecture<sup>\*</sup>  
 Majors General Chemistry Lecture<sup>\*</sup>  
 Majors General Chemistry Lecture<sup>\*</sup>  
 Majors Quantitative Analytical Chemistry<sup>\*</sup>  
 Chemistry Around Us<sup>\*</sup>  
 Sense and Sensibility in Science<sup>\*</sup>  
 Critical Analysis of Health Science Literature<sup>\*</sup>  
 The Idiom and Practice of Science<sup>\*</sup>

Introduction to Earth System Science<sup>\*</sup>  
 Oceanography<sup>\*</sup>  
 The Atmosphere<sup>\*</sup>  
 Physical Geology<sup>\*</sup>  
 Introduction to Global Climate Change<sup>\*</sup>  
 Hurricanes, Tsunamis, and Other Catastrophes<sup>\*</sup>  
 On Thin Ice: Climate Change and the Cryosphere<sup>\*</sup>  
 Air Pollution: From Urban Smog to Global Change<sup>\*</sup>  
 Earth System Chemistry<sup>\*</sup>  
 Earth System Physics<sup>\*</sup>

Probability and Statistics in Economics I  
 Probability and Statistics in Economics II

Statistics for Education Research

Introducing Modern Computational Tools  
 Programming with Software Libraries<sup>\*</sup>  
 Python Programming and Libraries (Accelerated)<sup>\*</sup>

Introduction to Inductive Logic<sup>\*</sup>

Statistics for Business Decision Making

Introduction to Inductive Logic<sup>\*</sup>

Basic Physics I<sup>\*</sup>  
 Basic Physics II<sup>\*</sup>  
 Basic Physics III<sup>\*</sup>  
 Classical Physics<sup>\*</sup>  
 Classical Physics<sup>\*</sup>  
 Classical Physics<sup>\*</sup>  
 Science Fiction and Science Fact<sup>\*</sup>  
 Energy and the Environment<sup>\*</sup>  
 Introduction to Astronomy<sup>\*</sup>  
 Cosmology: Humanity's Place in the Universe<sup>\*</sup>  
 Space Science<sup>\*</sup>



PHYSICS 20E	Life in the Universe*
PHYSICS H90	The Idiom and Practice of Science*
<b>Political Science (POL SCI)</b>	
POL SCI 10A	Probability and Statistics in Political Science I
POL SCI 10B	Probability and Statistics in Political Science II
<b>Psychology (PSYCH)</b>	
PSYCH 10A	Probability and Statistics in Psychology I
PSYCH 10B	Probability and Statistics in Psychology II
<b>Public Health (PUBHLTH)</b>	
PUBHLTH 7A	Public Health Statistics I
PUBHLTH 7B	Public Health Statistics II
<b>Social Sciences (SOC SCI)</b>	
SOC SCI 10A	Probability and Statistics in Social Sciences I
SOC SCI 10B	Probability and Statistics in Social Sciences II
<b>Social Ecology (SOCECOL)</b>	
SOCECOL 13	Statistical Analysis in Social Ecology
<b>Sociology (SOCIOL)</b>	
SOCIOL 10A	Probability and Statistics
SOCIOL 10B	Probability and Statistics
<b>Statistics (STATS)</b>	
STATS 7	Basic Statistics
STATS 8	Introduction to Biological Statistics
STATS 67	Introduction to Probability and Statistics for Computer Science

## Vb. Formal Reasoning

Courses in this category focus on aspects of formal reasoning including symbolic logic, mathematical modeling, and algorithmic reasoning.

After taking a course in category Vb, successful students will be able to do all of the following:

- understand the concept and purpose of formal languages such as propositional and first-order logic, simple programming languages, mathematical models or linguistic formalisms;
- possess an elementary grasp of the power and limits of formal methods; and be able to do one or both of the following:
  - apply formal tools of logic or mathematics to the analysis and evaluation of everyday and/or scientific arguments, texts, and communicative situations;
  - apply basic algorithms for the generation of logical deductions, linguistic structures, or computational processes.

Courses with an asterisk (\*) can meet one or more GE requirement. Click on the course for more information.

## Vb. Formal Reasoning

<b>Anthropology (ANTHRO)</b>	
ANTHRO 10C	Probability and Statistics
<b>Earth System Science (EARTHSS)</b>	
EARTHSS 19	Introduction to Modeling the Earth System*
EARTHSS H30B	Environmental Issues Affecting the Sustainability of Societies I*
<b>European Languages and Studies (EURO ST)</b>	
EURO ST 12	What is the Origin of Language?*
<b>Information and Computer Sci (I&amp;C SCI)</b>	
I&C SCI 6B	Boolean Logic and Discrete Structures
I&C SCI 6D	Discrete Mathematics for Computer Science
I&C SCI 6N	Computational Linear Algebra*
I&C SCI 31	Introduction to Programming*
I&C SCI 32	Programming with Software Libraries*
I&C SCI 32A	Python Programming and Libraries (Accelerated)*
I&C SCI 33	Intermediate Programming*
I&C SCI 46	Data Structure Implementation and Analysis

**Logic and Philosophy of Science (LPS)**

LPS 29

Critical Reasoning\*

LPS 30

Introduction to Symbolic Logic

**Language Science (LSCI)**

LSCI 3

Introduction to Linguistics\*

LSCI 10

Introduction to Phonology\*

LSCI 20

Introduction to Syntax\*

LSCI 43

Introduction to Symbolic Logic

**Mathematics (MATH)**

MATH 2A

Single-Variable Calculus

MATH 2B

Single-Variable Calculus

MATH 2D

Multivariable Calculus

MATH H2D

Honors Multivariable Calculus

MATH 3A

Introduction to Linear Algebra

MATH 5A

Calculus for Life Sciences

MATH 5B

Calculus for Life Sciences

MATH 7A

Single-Variable Calculus I

MATH 7B

Single-Variable Calculus II

MATH 9

Introduction to Programming for Numerical Analysis\*

MATH 10

Introduction to Programming for Data Science\*

**Philosophy (PHILOS)**

PHILOS 2

Puzzles and Paradoxes\*

PHILOS 29

Critical Reasoning\*

PHILOS 30

Introduction to Symbolic Logic

**Political Science (POL SCI)**

POL SCI 10C

Probability and Statistics in Political Science III

**Psychology (PSYCH)**

PSYCH 10C

Probability and Statistics in Psychology III

**Social Sciences (SOC SCI)**

SOC SCI 10C

Probability and Statistics in Social Sciences III

**Sociology (SOCIOL)**

SOCIOL 10C

Probability and Statistics

**VI. Language Other Than English**

Study of a language other than English expands students' horizons by encouraging understanding of another culture through its language and heightens awareness of one's own language through the investigation of another linguistic system.

After completing this GE requirement, successful students should be able to do the following:

- demonstrate competency in reading, writing, speaking, and listening in a non-English language;
- demonstrate an understanding of another (non-English speaking) culture through its language;
- and demonstrate an understanding of one's own language through the investigation of another, non-English linguistic system.

Students must demonstrate competency in a language other than English (includes American Sign Language) by completing one of the following six options:

- College-level course work equivalent to UCI's third quarter of study in a language other than English. UCI courses approved to satisfy this requirement are:

Courses with an asterisk (\*) can meet one or more GE requirement. Click on the course for more information.

**VI. Language Other Than English****Arabic (ARABIC)**

ARABIC 1C

Fundamentals of Arabic

**Armenian (ARMN)**

ARMN 1C

Elementary Armenian

**Chinese (CHINESE)**

CHINESE 1C	Fundamental Mandarin Chinese
CHINESE 1MC	Fundamentals of Mandarin Chinese - Mandarin Background Track
CHINESE S1BC	Fundamentals of Mandarin Chinese

**French (FRENCH)**

FRENCH 1BC	Intensive Fundamentals of French
FRENCH 1BCSP	Accelerated Fundamentals of French for Spanish Speakers
FRENCH 1C	Fundamentals of French
FRENCH S1BC	Intensive Fundamentals of French

**German (GERMAN)**

GERMAN 1BC	Intensive German Fundamentals
GERMAN 1C	Fundamentals of German
GERMAN S1BC	Fundamentals of German

**Greek (GREEK)**

GREEK 1C	Fundamentals of Greek
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**Hebrew (HEBREW)**

HEBREW 1C	Fundamentals of Hebrew
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**Italian (ITALIAN)**

ITALIAN 1BC	Intensive Italian Fundamentals
ITALIAN 1C	Fundamentals of Italian
ITALIAN S1BC	Italian Fundamentals

**Japanese (JAPANESE)**

JAPANESE 1C	Fundamental Japanese
JAPANESE S1BC	Fundamentals of Japanese

**Korean (KOREAN)**

KOREAN 1C	Fundamental Korean
KOREAN 1KC	Fundamental Korean for Students with a Previous Background in Korean
KOREAN S1BC	Fundamentals of Korean

**Latin (LATIN)**

LATIN 1C	Fundamentals of Latin
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**Persian (PERSIAN)**

PERSIAN 1C	Fundamentals in Persian
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**Russian (RUSSIAN)**

RUSSIAN 1C	Fundamentals of Russian
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**Spanish (SPANISH)**

SPANISH 1C	Fundamentals of Spanish
SPANISH S1BC	Fundamentals of Spanish

**Vietnamese (VIETMSE)**

VIETMSE 1C	Fundamentals of Vietnamese
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*For information on UCI's prerequisites, course placement policies, and the grade required to advance to the next level of instruction, consult the School of Humanities (Language Other Than English Placement and Progression) section in this Catalogue.*

- Credit for three years of high school study or its equivalent in a single language other than English with a C average or better in the third year.
- A score of 3, 4, or 5 on a College Board Advanced Placement Examination in a language other than English. NOTE: Students who earn a 3, 4, or 5 on the AP Chinese Examination must take the UCI Chinese placement examination to determine course credit.
- A score of 570 or better on a College Board SAT Subject Test in a language other than English, with the exception of the test in Modern Hebrew for which a score of 500 or better is required.
- Completion of an approved course of study through the UC Education Abroad Program (EAP). Careful planning is required to ensure that this requirement is fulfilled. Check with an EAP counselor at the Study Abroad Center to determine the programs in countries that fulfill this requirement.
- The equivalent as determined by an appropriate and available means of evaluation. For information on availability of such examinations and testing schedules, consult the Academic Testing Center, 949-824-6207. If an appropriate means of evaluating competence in a non-English language of instruction does not exist, satisfactory completion, with a C average or better, of one year of formal schooling at the sixth grade level or higher in an

institution where the language of instruction is not English will meet the requirement. Appropriate documentation must be presented to substantiate that the course work was completed.

## VII. Multicultural Studies

This requirement develops students' awareness and appreciation of the history, society, and/or culture of one or more underrepresented groups in California and the United States.

After completing this GE requirement, successful students should be able to do one of the following:

- demonstrate knowledge of one or more historically underrepresented groups' culture, history, and development in California and the United States;
- demonstrate an awareness and appreciation of cultural differences and inequities;
- and demonstrate an understanding that cooperation and mutual understanding among all cultural groups is needed to interact successfully in a culturally diverse society.

Students must complete one course from the following list. In fulfilling category VII, students are encouraged to use courses that are also being used in fulfillment of other GE categories. For example, HUMAN 1C simultaneously satisfies category VII and a portion of category IV.

Courses with an asterisk (\*) can meet one or more GE requirement. Click on the course for more information.

### VII. Multicultural Studies

#### African American Studies (AFAM)

AFAM 40A

AFAM 40B

AFAM 40C

African American Studies I \*

African American Studies II \*

African American Studies III \*

#### Anthropology (ANTHRO)

ANTHRO 25A

ANTHRO 121D

ANTHRO 128B

ANTHRO 136K

ANTHRO 162B

Environmental Injustice \*

Cross-Cultural Studies of Gender

Race, Gender, and Science

The Woman and the Body

Indian North America

#### Art History (ART HIS)

ART HIS 44

Image Collision: A Multicultural Approach to Images and Their Users \*

#### Asian American Studies (ASIANAM)

ASIANAM 50

ASIANAM 52

ASIANAM 53

ASIANAM 54

ASIANAM 55

ASIANAM 130

ASIANAM 144

Asian American Histories \*

Asian American Communities \*

Asian Americans and Race \*

Asian American Stories \*

Asian Americans and the Media \*

Undocumented Immigrant Experiences \*

The Politics of Protest

#### Chicano/Latino Studies (CHC/LAT)

CHC/LAT 61

CHC/LAT 62

CHC/LAT 63

CHC/LAT 64

CHC/LAT 65

CHC/LAT 151

CHC/LAT 153

CHC/LAT 154

CHC/LAT 158

CHC/LAT 163

CHC/LAT 164A

CHC/LAT 167

CHC/LAT 168

CHC/LAT 176

Introduction to Chicano/Latino Studies I \*

Introduction to Chicano/Latino Studies II \*

Introduction to Chicano/Latino Studies III \*

Introduction to Race and Ethnicity in Political Science \*

Ethnic and Immigrant America

Latinos in U.S. Politics

Cross-Cultural Research on Urban Gangs

Latino Metropolis

Feminisms of Color

U.S. Immigration Policy

Undocumented Immigrant Experiences \*

Latinos in a Global Society

Chicano/Latino Social Psychology

Race, Gender, and Science

CHC/LAT 183

**Comparative Literature (COM LIT)**

COM LIT 9

**Criminology, Law and Society (CRM/LAW)**

CRM/LAW C156

**School of Education (EDUC)**

EDUC 124

EDUC 143BW

**English (ENGLISH)**

ENGLISH 8

**Film and Media Studies (FLM&MDA)**

FLM&MDA H80

**Gender and Sexuality Studies (GEN&SEX)**

GEN&SEX 20

GEN&SEX 50A

GEN&SEX 50B

GEN&SEX 50C

**History (HISTORY)**

HISTORY 15A

HISTORY 15C

HISTORY 15D

HISTORY 15F

HISTORY 15G

**Humanities (HUMAN)**

HUMAN 1C

**International Studies (INTL ST)**

INTL ST 32A

INTL ST 153B

**Language Science (LSCI)**

LSCI 2

**Music (MUSIC)**

MUSIC 78

**Political Science (POL SCI)**

POL SCI 32A

POL SCI 61A

POL SCI 124A

POL SCI 124B

POL SCI 126C

**Psychological Science (PSCI)**

PSCI 192Q

**Social Sciences (SOC SCI)**

SOC SCI 70C

SOC SCI 78A

SOC SCI 78B

SOC SCI 78C

SOC SCI 173L

**Sociology (SOCIOL)**

SOCIOL 1

SOCIOL 3

SOCIOL 51

SOCIOL 63

SOCIOL 64

Multicultural Education in K-12 Schools

Introduction to Multiculturalism\*

Cross-Cultural Research on Urban Gangs

Multicultural Education in K-12 Schools

Classroom Interactions II\*

Multicultural American Literature\*

Honors Seminar: Race Sport Media\*

Introduction to Queer Studies\*

Gender and Feminism in Everyday Life\*

Gender and Power\*

Gender and Popular Culture\*

Native American History\*

Asian American Histories\*

History of Sexuality in the US\*

What to Eat? Immigrants and the Development of American Cuisines\*

Racial Segregation in Modern U.S.

Humanities Core Lecture\*

Dilemmas of Diversity

Cross-Cultural Studies of Gender

Discovering Language

History of Jazz\*

Dilemmas of Diversity

Introduction to Race and Ethnicity in Political Science\*

The Politics of Protest

Latinos in U.S. Politics

U.S. Immigration Policy

Chicano/Latino Social Psychology

Comparing Cultures\*

Asian American Histories\*

Asian American Communities\*

Asian Americans and Race\*

Latinos in a Global Society

Introduction to Sociology\*

Social Problems\*

Asian American Family & Community

Race and Ethnicity

Sociology of Sexuality

SOCIOL 68A	Ethnic and Immigrant America
SOCIOL 177C	Undocumented Immigrant Experiences*
<b>Spanish (SPANISH)</b>	
SPANISH 3H	Heritage Spanish: Latinidad
SPANISH 62	Latinx, Multilingualism, and Social Justice
<b>Social Pol and Public Service (SPPS)</b>	
SPPS 70A	Race and Ethnicity
<b>Urban Planning and Public Policy (UPPP)</b>	
UPPP 172	Latino Metropolis

## VIII. International/Global Issues

Courses in this category focus on significant cultural, economic, geographical, historical, political, and/or sociological aspects of one or more countries other than the United States.

After completing this GE requirement, successful students should be able to do the following:

- demonstrate specific knowledge of the cultural, historical, social, economic, scientific, and political aspects of one or more foreign countries, and the connections among these aspects;
- develop a broader understanding of the formation of different cultures and countries through the world;
- and be prepared to engage in positive interaction with peoples of different cultures and nationalities.

Students must complete one course from the following list. In fulfilling category VIII, students are encouraged to use courses that are also being used in fulfillment of other GE categories. In addition, category VIII may be satisfied by one quarter's participation in the UC Education Abroad Program (EAP) or one quarter's participation in an International Opportunities Program (IOP) with an approved IOP Credit Contract. Summer study abroad on an EAP or IOP (with approved IOP Credit Contract) satisfies this requirement when the program is at least five weeks long and the student completes at least one course worth at least four quarter units.

Courses with an asterisk (\*) can meet one or more GE requirement. Click on the course for more information.

## VIII. International/Global Issues

### Anthropology (ANTHRO)

ANTHRO 2A	Introduction to Sociocultural Anthropology*
ANTHRO 20A	People, Cultures, and Environmental Sustainability
ANTHRO 30A	Global Issues in Anthropological Perspective
ANTHRO 41A	Global Cultures and Society*
ANTHRO 48	Archaeology or Aliens?: Conspiracy, Pseudoscience, and the Emergence of Civilizations*
ANTHRO 125X	Transnational Migration
ANTHRO 134A	Medical Anthropology
ANTHRO 134G	HIV/AIDS in a Global Context
ANTHRO 136A	Nationalism and Ethnicity in the Contemporary World
ANTHRO 136D	Conflict Resolution in Cross-Cultural Perspective
ANTHRO 162A	Peoples and Cultures of Latin America
ANTHRO 163A	Peoples of the Pacific
ANTHRO 164P	Peoples and Cultures of Post-Soviet Eurasia

### Arabic (ARABIC)

ARABIC 2A	Intermediate Arabic Language and Culture
ARABIC 2B	Intermediate Arabic Language and Culture
ARABIC 2C	Intermediate Arabic Language and Culture
ARABIC 51	Introduction to the Koran*

### Armenian (ARMN)

ARMN 2A	Intermediate Armenian
ARMN 2B	Intermediate Armenian
ARMN 2C	Intermediate Armenian

### Art History (ART HIS)

ART HIS 40A	Ancient Greek and Roman Art, and Architecture*
ART HIS 40B	Arts of Europe: Medieval and Renaissance*
ART HIS 40C	Early Modern and Modern Art in Europe and America*
ART HIS 42A	History of Asian Art: Arts of India*
ART HIS 42B	History of Asian Art: Arts of China*
ART HIS 42C	History of Asian Art: Arts of Japan*
ART HIS 42D	History of Asian Art: Arts of Islam*
ART HIS 42E	Art and Archaeology of Ancient Persia, Egypt, and Mesopotamia*
<b>Asian American Studies (ASIANAM)</b>	
ASIANAM 51	The U.S. and Asia*
<b>Chicano/Latino Studies (CHC/LAT)</b>	
CHC/LAT 120	Peoples and Cultures of Latin America
CHC/LAT 161	Transnational Migration
CHC/LAT 178A	Medical Anthropology
<b>Chinese (CHINESE)</b>	
CHINESE 2A	Intermediate Mandarin Chinese
CHINESE 2B	Intermediate Mandarin Chinese
CHINESE 2C	Intermediate Mandarin Chinese
CHINESE 2MA	Intermediate Mandarin Chinese - Mandarin Background Track
CHINESE 2MB	Intermediate Mandarin Chinese - Mandarin Background Track
CHINESE 2MC	Intermediate Mandarin Chinese - Mandarin Background Track
CHINESE 3A	Advanced Mandarin Chinese
CHINESE 3B	Advanced Mandarin Chinese
CHINESE 3C	Advanced Mandarin Chinese
<b>Comparative Literature (COM LIT)</b>	
COM LIT 3	Just Reading: Developing the Reading Experience*
COM LIT 10	Topics in World Literature*
COM LIT 60A	World Literature*
COM LIT 60B	Reading with Theory*
COM LIT 60C	Cultural Studies*
<b>Dance (DANCE)</b>	
DANCE 80	Introduction to Ballet and Modern Dance*
DANCE 82	Topics in World Dance
DANCE 90A	Dance History I*
DANCE 90B	Dance History II*
<b>Drama (DRAMA)</b>	
DRAMA 40A	Development of Drama*
DRAMA 40B	Development of Drama*
DRAMA 40C	Development of Drama*
<b>Earth System Science (EARTHSS)</b>	
EARTHSS 15	Introduction to Global Climate Change*
EARTHSS 17	Hurricanes, Tsunamis, and Other Catastrophes*
EARTHSS 21	On Thin Ice: Climate Change and the Cryosphere*
EARTHSS 23	Air Pollution: From Urban Smog to Global Change*
EARTHSS 27	The Sustainable Ocean*
<b>East Asian Studies (EAS)</b>	
EAS 20	Topics in Asian Religions*
EAS 40	Topics in East Asian Popular Culture*
EAS 55	Introduction to East Asian Cultures*
<b>Economics (ECON)</b>	
ECON 13	Global Economy*
<b>European Languages and Studies (EURO ST)</b>	

EURO ST 9  
EURO ST 10  
EURO ST S10  
EURO ST 11  
EURO ST S11  
EURO ST 13

**French (FRENCH)**

FRENCH 2A  
FRENCH 2AB  
FRENCH 2B  
FRENCH 2BC  
FRENCH 2C  
FRENCH S2AB  
FRENCH S2BC  
FRENCH 50

**Gender and Sexuality Studies (GEN&SEX)**

GEN&SEX 60C

**German (GERMAN)**

GERMAN 2A  
GERMAN 2B  
GERMAN 2C  
GERMAN S2AB  
GERMAN S2BC

**Global Middle East Studies (GLBL ME)**

GLBL ME 60A

GLBL ME 60B

GLBL ME 60C

**Hebrew (HEBREW)**

HEBREW 50

**History (HISTORY)**

HISTORY 10  
HISTORY 11  
HISTORY 16A  
HISTORY 16B  
HISTORY 16C  
HISTORY 18A  
HISTORY 21A  
HISTORY 21B  
HISTORY 21C  
HISTORY 50  
HISTORY 70A  
HISTORY 70B  
HISTORY 70D  
HISTORY 70E  
HISTORY 70F

**Humanities (HUMAN)**

HUMAN 1C  
HUMAN 10

**International Studies (INTL ST)**

INTL ST 1

Topics in Europe in the Middle Ages<sup>\*</sup>  
Topics in Historical Foundations (1500-1800)<sup>\*</sup>  
Historical Foundations: Europe and the Foundations of the Modern World<sup>\*</sup>  
Issues and Institutions in Modern Europe (1789-1945)<sup>\*</sup>  
Europe's Futures: 1755-Present<sup>\*</sup>  
Topics in Contemporary Europe (1945 – Today)<sup>\*</sup>

Intermediate French  
Intensive Intermediate French  
Intermediate French  
Intensive Intermediate French  
Intermediate French  
Intermediate French  
Intermediate French  
Topics in French Culture and the Modern World<sup>\*</sup>

Gender and Religion<sup>\*</sup>

Intermediate German  
Intermediate German  
Intermediate German  
Intermediate German  
Intermediate German

Humanities and Arts: Problems and Methods for Global Middle East Studies<sup>\*</sup>  
Social Sciences: Problems and Methods for Global Middle East Studies<sup>\*</sup>  
Social Ecology and Sciences: Problems and Methods for Global Middle East Studies<sup>\*</sup>

Jewish and Israeli Culture<sup>\*</sup>

The Holocaust<sup>\*</sup>  
Genocide and Crimes Against Humanity Since WWII<sup>\*</sup>  
World Religions I<sup>\*</sup>  
World Religions II<sup>\*</sup>  
Religious Dialogue<sup>\*</sup>  
Major Jewish Texts<sup>\*</sup>  
World: Innovations<sup>\*</sup>  
World: Empires and Revolutions<sup>\*</sup>  
World: Nation, War, and Rights<sup>\*</sup>  
Crises and Revolutions<sup>\*</sup>  
Problems in History: Asia<sup>\*</sup>  
Problems in History: Europe<sup>\*</sup>  
Problems in History: Latin America<sup>\*</sup>  
Problems in History: Middle East and Africa<sup>\*</sup>  
Problems in History: Transregional History<sup>\*</sup>

Humanities Core Lecture<sup>\*</sup>  
Masterpieces of Literature<sup>\*</sup>

Introduction to Global Studies<sup>\*</sup>



INTL ST 11	Global Cultures and Society*
INTL ST 12	Global Political Ideologies*
INTL ST 13	Global Economy*
INTL ST 14	Introduction to International Relations*
INTL ST 15	Global Political Economy*
INTL ST 16	Human Rights and Global Governance*
INTL ST 17	Global Environmental Issues*
INTL ST 114A	International Political Economy
INTL ST 117A	Transnational Migration
INTL ST 122	Nuclear Environments
INTL ST 145A	International Law
INTL ST 153E	Nationalism and Ethnicity in the Contemporary World
INTL ST 158B	Peoples of the Pacific
INTL ST 162B	Peoples and Cultures of Post-Soviet Eurasia
INTL ST 177J	Peoples and Cultures of Latin America
INTL ST 183E	Conflict Resolution in Cross-Cultural Perspective
<b>Italian (ITALIAN)</b>	
ITALIAN 2A	Intermediate Italian
ITALIAN 2B	Intermediate Italian
ITALIAN 2C	Intermediate Italian
ITALIAN 50	Topics in Italian Culture*
<b>Japanese (JAPANESE)</b>	
JAPANESE 2A	Intermediate Japanese
JAPANESE 2B	Intermediate Japanese
JAPANESE 2C	Intermediate Japanese
JAPANESE S2AB	Intermediate Japanese
JAPANESE S2BC	Intermediate Japanese
JAPANESE 3A	Advanced Japanese
JAPANESE 3B	Advanced Japanese
JAPANESE 3C	Advanced Japanese
<b>Korean (KOREAN)</b>	
KOREAN 2A	Intermediate Korean
KOREAN 2B	Intermediate Korean
KOREAN 2C	Intermediate Korean
KOREAN 2KA	Intermediate Korean for Students with a Previous Background in Korean
KOREAN 2KB	Intermediate Korean for Students with a Previous Background in Korean
KOREAN 2KC	Intermediate Korean for Students with a Previous Background in Korean
KOREAN 3A	Advanced Korean
KOREAN 3B	Advanced Korean
KOREAN 3C	Advanced Korean
<b>Language Science (LSCI)</b>	
LSCI 1	Languages of the World
<b>Management (MGMT)</b>	
MGMT 111	China and the Global Order
MGMT 128	International Management
<b>Music (MUSIC)</b>	
MUSIC 40B	History of European Music: From the Renaissance through the Baroque*
MUSIC 40C	History of European Music: Hasse to Mahler*
MUSIC 40D	20th Century Music*
MUSIC 42	Music and Gender*
MUSIC 44	Classical Music in Society*
<b>Persian (PERSIAN)</b>	

PERSIAN 2A  
PERSIAN 2B  
PERSIAN 2C  
PERSIAN 50

**Political Science (POL SCI)**

POL SCI 11A  
POL SCI 41A  
POL SCI 44B  
POL SCI 45A  
POL SCI 51A  
POL SCI H80  
POL SCI 141B  
POL SCI 141C  
POL SCI 154F  
POL SCI 154G  
POL SCI 172A

**Public Health (PUBHLTH)**

PUBHLTH 168  
PUBHLTH 170  
PUBHLTH 174

**Religious Studies (REL STD)**

REL STD 5A  
REL STD 5B  
REL STD 5C  
REL STD 61

**Russian (RUSSIAN)**

RUSSIAN 2A  
RUSSIAN 2B  
RUSSIAN 2C  
RUSSIAN 50

**Social Sciences (SOC SCI)**

SOC SCI 4A  
SOC SCI 5D  
SOC SCI 12  
SOC SCI 15  
SOC SCI 16  
SOC SCI 17  
SOC SCI 183E

**Social Ecology (SOCECOL)**

SOCECOL E127

**Sociology (SOCIOL)**

SOCIOL 2  
SOCIOL 44

**Spanish (SPANISH)**

SPANISH 2A  
SPANISH 2AB  
SPANISH 2B  
SPANISH 2C  
SPANISH S2AB  
SPANISH S2BC  
SPANISH 3  
SPANISH 44

Intermediate Persian  
Intermediate Persian  
Intermediate Persian  
Persian Culture \*

Introduction to Political Science: Political Analysis \*  
Introduction to International Relations \*  
Global Political Ideologies \*  
Human Rights and Global Governance \*  
Introduction to Politics Around the World \*  
Globalization and Human Security \*  
International Political Economy  
International Political Economy of East Asia  
Peoples and Cultures of Post-Soviet Eurasia  
Conflict Resolution in Cross-Cultural Perspective  
International Law

Nuclear Environments  
Introduction to Global Health  
Global Health Ethics

World Religions I \*  
World Religions II \*  
Religious Dialogue \*  
Gender and Religion \*

Intermediate Russian  
Intermediate Russian  
Intermediate Russian  
Russian Culture \*

Introduction to Global Studies \*  
US & World Geography \*  
Global Political Ideologies \*  
Global Political Economy \*  
Human Rights and Global Governance \*  
Global Environmental Issues \*  
Conflict Resolution in Cross-Cultural Perspective

Nuclear Environments

Globalization and Transnational Sociology \*  
Births, Deaths, and Migration

Intermediate Spanish  
Intermediate Intensive Spanish  
Intermediate Spanish  
Intermediate Spanish  
Intermediate Spanish  
Intermediate Spanish  
US Latino Communities  
Hispanic Literatures for Nonmajors

SPANISH 50	Latin America, U.S. Latino, and Iberian Cultures *
SPANISH 60E	Mexico and Central America: A Survey *
SPANISH 60S	Mexico and Central America: A Survey *
SPANISH 61	The Culture of the Visual Image in Latin America *
<b>Vietnamese (VIETMSE)</b>	
VIETMSE 2A	Intermediate Vietnamese
VIETMSE 2B	Intermediate Vietnamese
VIETMSE 2C	Intermediate Vietnamese

Or, students may complete one of the following fourth-quarter language options:

1. Credit for four years of high school study or its equivalent in a single language other than English with a C average or better in the fourth year.
2. A score of 4 or 5 on a College Board Advanced Placement Examination in a language other than English. NOTE: Students who earn a 3, 4, or 5 on the AP Chinese Examination must take the UCI Chinese placement examination to determine course credit.
3. A score of 620 or better on a College Board SAT Subject Test in a language other than English, with the exception of the test in Modern Hebrew for which a score of 540 or better is required.
4. The equivalent as determined by an appropriate and available means of evaluation. For information on availability of such examinations and testing schedules, consult the Academic Testing Center, 949-824-6207. If an appropriate means of evaluating competence in a non-English language of instruction does not exist, satisfactory completion, with a C average or better, of two years of formal schooling at the sixth grade level or higher in an institution where the language of instruction is not English will meet the requirement. Appropriate documentation must be presented to substantiate that the course work was completed.

## University Requirements

### English (UC Entry Level Writing)

The Entry Level Writing Requirement (ELWR) is a graduation requirement for the University of California. Every undergraduate must demonstrate proficiency in writing. The Entry Level Writing requirement may be satisfied *prior to enrollment* in any of the following ways:

1. Score 3 or higher on the College Board Advanced Placement (AP) Examination in English (Language or Literature); *or*
2. Score 5 or higher on the International Baccalaureate (IB) Higher Level Examination or score 6 or higher on the IB Standard Level Examination in English (Language A only); *or*
3. Score 680 or higher on the Evidence-Based Reading and Writing section of the new SAT exam (effective for students enrolling in fall 2018/students applying to UC in November 2017); *or*
4. Score 680 or higher on the Writing Section of the SAT Reasoning Test (last administered January 2016); *or*
5. Score 30 or higher on ACT English Language Arts; *or*
6. Score 30 or higher on ACT Combined English/Writing (last administered June 2015); *or*
7. Complete with a grade of C or better a transferable college course in English composition worth four quarter or three semester units.

The UC Entry Level Writing requirement may be met *after admission* by one of the following options:

1. Passing the UC Analytical Writing Placement Examination given in the spring every year at test centers throughout the state to all entering freshmen admitted for fall quarter (see Placement Testing). Freshmen admitted to UC will receive detailed information in April about the exam. Freshman students who are not California residents may take the exam in the fall after they enroll. Transfer students who have not satisfied the UC Entry Level Writing requirement should contact the UCI Composition Program Office, 420 Humanities Instructional Building; telephone 949-824-6717.
2. Prior to enrolling in the University, complete with a grade of C or better a transferable college course in English composition worth four quarter or three semester units. (Once a student enrolls at a UC campus, courses from institutions other than UC may not be used to satisfy the Entry Level Writing Requirement.) Students who meet the University's basic requirements for minimal transfer eligibility, which include two transferable college courses in English composition, satisfy the Entry Level Writing Requirement.

NOTE: Students who have not met the requirement before entrance must satisfy the requirement before the beginning of their fourth quarter at UCI. Students who have not satisfied the requirement by that time will be ineligible to enroll for a fourth quarter.

The UC Entry Level Writing requirement may be met *after enrollment* by one of the following options:

1. Enrolling in Humanities Core writing courses designated "ES." (NOTE: Students held for UC Entry Level Writing and enrolled in the Humanities Core must enroll in an ES section of the Humanities Core during their first quarter. Successful completion of these writing courses with a letter grade of C or better will satisfy the requirement. Students who do not receive a letter grade of C or better in HUMAN 1AES in the fall quarter and who continue to be held for UC Entry Level Writing must enroll in HUMAN 1BES during the winter quarter and satisfy the requirement by earning a letter grade of C or better.)
2. Taking either WRITING 37, WRITING 39A, or WRITING 39AP and receiving a letter grade of C or better in the course.

Students enrolled in Essentials of Academic Writing (AC ENG 20A, AC ENG 20B, AC ENG 20C, AC ENG 20D) must enroll in WRITING 39A immediately after they are authorized to do so by the Academic English/English as a Second Language Program. Students with a score of 2, 3, or 4 from the UC Analytical Writing Placement Examination are also required to enroll in WRITING 39A; some students with these scores may be required to take the Academic English Placement Test before enrolling in WRITING 39A.

The Pass/Not Pass grade option may not be used to satisfy the UC Entry Level Writing requirement.

Students enrolled at UCI may take only UCI courses to satisfy the UC Entry Level Writing requirement. Continuing UCI students may not take summer courses at another institution to satisfy this requirement.

## American History and Institutions

This requirement may be met by one of the following options:

1. Completion in an accredited high school of a one-year course in United States history with a grade of C or better, *or* a half-year course in United States history and a half-year course in American government with grades of C or better; *or*
2. Achieving a score of 3,4, or 5 on the College Board Advanced Placement Examination in United States History; *or*
3. Achieving a score of 550 or better on the SAT Subject Test United States History; *or*
4. Presentation of a certificate of completion of the requirement at another California institution; *or*
5. Completion at UCI or another U.S. institution of one year of college-level United States history with grades of C or better, *or* one course in United States history and one in United States government with grades of C or better. Acceptable UCI courses: United States history—HISTORY 40A, HISTORY 40B, HISTORY 40C; United States government—POL SCI 21A.

## UCI Requirements

### Unit Requirement

Credit for a minimum of 180 quarter units, earned by examination, by other evaluation, or course work is required. A course normally offers four quarter units of credit.

### Grade Requirement

A minimum grade average of at least C (2.0) is required (1) overall, (2) in all of the courses required for the major program, and (3) in the upper-division courses required for the major program. Higher averages than this may be required only in honors programs. Students who fail to attain a C (2.0) average in courses required in the major program may, at the option of the major unit, be denied the privilege of pursuing a major program in that unit. In this context, “the courses required in the major program” are defined as the courses required for the major and offered by the program of the student’s major (or programs, in the case of an interdisciplinary or interdepartmental major). A major can include additional courses required for the major in this set, with the approval of the Council on Education Policy. In this case, the list of additional courses is published in the *Catalogue* with the requirements for the major.

### Residence Requirement

At least 36 of the final 45 units completed by a student for the bachelor’s degree must be earned in residence at the UCI campus. Exceptions to this rule may be allowed, with prior departmental approval, to students enrolled in the Education Abroad Program, the UCDC Academic Internship Program, the UC Center Sacramento Scholar Intern Program, or the International Opportunities Program with International Study Advance Contract.

#### On This Page:

- Transfer Students: Completion of the UCI General Education Requirement
- Intersegmental General Education Transfer Curriculum
- Intersegmental General Education Transfer Curriculum for STEM
- Transferability of Credit
  - Limitations on Transfer Credit
- UCI Division of Continuing Education
- Important Resources for California Community College Students

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This section provides a guide for transfer students in understanding how their coursework from another collegiate institution applies to fulfilling UCI degree requirements. Transfer students should use this information in conjunction with the Requirements for a Bachelor’s Degree. Transfer students are required to meet University, general education, school, department, and major requirements described in the *Catalogue*. The courses and descriptions in this *Catalogue* may be used by prospective transfer students as a guide for selecting courses of similar content and purpose in their own institutions. No student who has taken a course which is accepted for credit by the Office of Undergraduate Admissions and has been mutually determined with a community college as being acceptable toward completion of the UCI general education requirement shall incur any loss of credit in satisfaction of the requirement.

Transfer students are *strongly* advised to check with the academic counselor in their prospective major or the UCI Office of Undergraduate Admissions about courses that may be used to satisfy UCI requirements.

## Transfer Students: Completion of the UCI General Education Requirement

The general education requirements specify the courses students must take or units they must accumulate in each area. However, each student should consider the general education recommendation for their major, as it may be more important to concentrate on completing the many prerequisites for the major that are screened for in the selection process. Students transferring to UCI must satisfy the UCI general education (GE) requirement by completing either:

1. The current UCI GE requirement;
2. one of the options listed in the Catalogue Rights section; or
3. the California Community College Intersegmental General Education Transfer Curriculum (IGETC); or
4. the California Community College Intersegmental General Education Transfer Curriculum for STEM.

Transfer students do not need to complete the UCI GE requirement prior to matriculating to UCI. The GE requirement, which must be completed prior to graduation, may be satisfied by college-level courses appropriate to UCI offerings and may be met *at any time* during the undergraduate years, *except* in the case of the lower-division writing requirement, which must be completed within the first three quarters of residency at UCI.

NOTE: UCI operates on the quarter system. For the purpose of counting courses for the UCI GE requirement, one semester course is equivalent to one quarter course, and two semester courses are equivalent to three quarter courses.

## Intersegmental General Education Transfer Curriculum

California Community College transfer students may satisfy the UCI GE requirement by completing the Intersegmental General Education Transfer Curriculum (IGETC). The IGETC is a series of courses that California Community College students may complete to satisfy the freshman/sophomore level general education requirements before transferring to UCI. Fulfillment of the IGETC does not satisfy the UCI upper-division writing requirement.

Students who do not complete IGETC prior to transfer may be eligible for partial certification from their community college. Partial certification is defined as completing all but two (2) courses on the IGETC pattern. **Warning:** Students need to meet minimum UC transfer admission requirements. Therefore, partial certification that acknowledges a deficiency in Area 1 and/or Area 2 may also indicate a student does not meet minimum transfer requirements.

Please note:

1. IGETC must be completed in total or partial IGETC certification must be completed prior to enrolling at UCI;
2. students are responsible for requesting IGETC certification from their community college; and
3. the IGETC certification should be submitted to the UCI Office of Undergraduate Admissions no later than the end of the first quarter of UCI enrollment.

Courses used to fulfill the IGETC must be completed with a grade of C or better. (Courses may also be taken on a Pass/No Pass basis provided Pass is equal to a letter grade of C or better.)

Lists of specific approved courses which may be taken in fulfillment of the IGETC are available from California Community Colleges and at the ASSIST website (<http://www.assist.org/web-assist/welcome.html>).

## Intersegmental General Education Transfer Curriculum

**Area 1. English Communication:** One course in English composition and one course in critical thinking/English composition.

**Area 2. Mathematical Concepts and Quantitative Reasoning:** One course.

**Area 3. Arts and Humanities:** Three courses with at least one from the arts and one from the humanities.

**Area 4. Social and Behavioral Sciences:** Three courses from at least two different disciplines, or an interdisciplinary sequence.

**Area 5. Physical and Biological Sciences:** One physical science course and one biological science course, at least one of which includes a laboratory.

**Area 6. Language Other Than English:** Proficiency equivalent to two years of high school courses in the same language.

## Intersegmental General Education Transfer Curriculum for STEM

IGETC for STEM is a pattern of courses that California Community College students may complete to satisfy the lower-division GE requirements before transfer to UCI. IGETC for STEM is a separate IGETC track available for students planning to major in science, technology, engineering, or mathematics. UC will accept IGETC for STEM only if:

- The earned associate degree for transfer (ADT) is at a California Community College that offers IGETC for STEM as an option for those degrees AND
- the UC major program or college accepts partial IGETC certification.

Note: IGETC and IGETC for STEM are not an admission requirement. Completing it does not guarantee admission to UCI.

## Transferability of Credit

The University of California awards unit credit for college courses completed at United States regionally accredited colleges and universities; or at a university recognized by the Ministry of Education (or higher-education authority/appropriate government agency) in another country that offers university-level academic degree program courses comparable to a U.S. associate's or bachelor's degree. To be accepted for credit, the courses must be comparable to those offered at any UC campus. All courses that meet the criteria are used in determining eligibility for admission. The transferability of coursework taken at other institutions for both newly admitted transfer students and for current UCI students who attend other institutions during summer sessions is determined by the Office of Undergraduate Admissions.

Although the Office of Undergraduate Admissions may award unit or subject credit for courses completed at another institution, the courses may not necessarily apply to specific UCI degree requirements (i.e., general education or major requirements). Contact a College, school or department advisor regarding specific credit applications and limitations. Also, be aware of the residence requirements, UCI Requirements section, which are specific to the College or School.

Courses for transfer must be reported on an official transcript from the original college/university and provided in a sealed envelope, or electronically submitted by a campus-acceptable vendor. UCI only accepts electronic transcripts from the following third party vendors: Parchment, Credentials eScript-Safe.

The UCI Office of Undergraduate Admissions mailing address is:

UCI Office of Undergraduate Admissions  
Attention Official Documents  
Irvine, CA 92697-1075

An official transcript must bear the institution's official seal and registrar's signature.

**Duplicate Credit is Prohibited.** Students may not receive unit credit or earn grade points for college courses in which the content duplicates material of a previously completed course or examination for which credit has already been granted, with the exception of the repeat of deficient (C-/D/F) course grades. Students should be advised that college courses taken before or while attending UC may duplicate AP, IB, and/or A-Level examinations. Additionally, exams may duplicate each other (for example AP and IB in the same subject area). If a student does duplicate an exam of the same subject content and/or a college course, we will award credit only once. Exceptions related to Advanced Placement and International Baccalaureate credit and repeat of deficient grades can be found in their respective sections.

## Limitations on Transfer Credit

Students will be granted up to 70 semester/105 quarter units of credit for lower-division coursework completed at any institution or combination of institutions. For units beyond the maximum, subject credit for appropriate coursework taken in excess of this unit limitation will be granted and may be used to satisfy requirements.

Please note:

1. Units earned through Advanced Placement, International Baccalaureate, and/or A-Level examinations are not included in the limitation and do not put applicants at risk of being denied admission.
2. Units earned at any University of California campus (summer, extension/continuing education, cross/concurrent, and regular academic year enrollment) are not included in the limitation but are added to the maximum transfer credit allowed and may put applicants at risk of being denied admission due to excessive units.

In addition, there is a limit to the number of units for which UC grants credit in the following areas:

- English as a Second Language courses: a maximum of 8 semester (12 quarter) units
- Physical education activity courses: a maximum of 4 semester (6 quarter) units

## UCI Division of Continuing Education

UCI Division of Continuing Education courses prefixed by XB, XD, XI, XR, XSB, and XSD are granted unit credit on the same basis as courses taken in residence at any accredited collegiate institution.

Students intending to transfer UCI Division of Continuing Education course credit for a degree at another college or university should verify acceptance of the course with that institution. Resident students of the University of California must obtain the consent of the dean of their school or college prior to enrolling for credit in a UCI Division of Continuing Education course. UCI Division of Continuing Education courses are not accepted as part of the



residence requirements of the University. Grades earned at UCI Division of Continuing Education may, though not in all instances, be calculated as part of the University GPA.

Note: Decisions regarding the acceptability of extension courses taken in institutions other than the University of California rest with the UCI Office of Undergraduate Admissions. Decisions regarding the applicability of such courses toward specific degrees and majors rest with the student's academic dean.

## Important Resources for California Community College Students

Students anticipating transfer to UCI from a California Community College are urged to consult with their community college counselors. The counselors, with the aid of that college's UC Transfer Course Agreement (UCTCA), can advise students about California Community College courses and units which will transfer to the University. In addition, staff in the UCI Office of Undergraduate Admissions can advise students about the transferability of courses. The ASSIST (<http://www.assist.org/>) site (<http://www.assist.org/>) provides information regarding:

- University of California Transfer Course Agreements.
- Selected Major Preparation Articulation Agreements for all California Community Colleges.
  - *The agreements list all lower division course requirements for select majors at UCI and the courses students can complete at their community colleges that satisfy these requirements.*
- Intersegmental General Education Transfer Curriculum (IGETC) course list.
  - *IGETC enables students at California Community Colleges to complete UCI General Education requirements before transfer.*

## School, Departmental, and Major Requirements

In addition to the University and UCI requirements listed above, each undergraduate student must satisfy the degree requirements for the major and, if applicable, the minor or concentration selected. UCI, school, and departmental or major and minor requirements may overlap; courses taken to fulfill a school or departmental requirement may also help fulfill the UCI general education requirement. Students are urged to make sure that they understand how many courses are permitted to satisfy more than one requirement. Information on specific degree requirements and courses is available in the academic unit sections of this *Catalogue*.

Students must declare a major by the time they reach junior status (90 units excluding college work completed prior to high school graduation), and should make certain that the background and the preparation prerequisite to junior and senior work in the major have been accomplished. Transfer students should read the section on Information for Transfer Students: Fulfilling Requirements for a Bachelor's Degree.

Students should note that with the exception of courses designated Pass/Not Pass Only, courses taken Pass/Not Pass may *not* be used to satisfy specific course requirements of the student's school and major, unless authorized by the appropriate dean. Additional information on grading is located in the Academic Regulations and Procedures section.

## Supplementary Educational Programs

Information on Summer Session, the Division of Continuing Education, and ROTC can be found in this section.

### Division of Summer Session

Michael Dennin, **Vice Provost & Dean, OVPTL - Office of the Vice Provost for Teaching & Learning**

#### Summer Session

Summer Session offers 3 different sessions where students can enroll in courses for each summer (SSI, S10 Wk, SSII). Please visit <https://summer.uci.edu/calendar/> for the upcoming academic calendar. Summer Session offers more than 800 courses and annually enrolls more than 14,000 students, most of whom are UCI matriculated students. Those who enroll in these sessions and take an academic program equivalent to a regular quarter may accelerate their progress toward a degree and/or minor.

Courses offered include a wide variety from the regular session, supplemented by offerings available only during the summer, including an increasing number of online courses. Admission is open to all university students, high school graduates, qualified high school students who have completed their sophomore year by summer of the current year, and community members. Admission to Summer Session does not constitute admission to a regular session of the University.

#### Freshman Edge

Incoming first-year students are invited to take part in Freshman Edge. Students begin college during the summer when the campus is more accessible and relaxed. They will be part of a small, highly motivated group of incoming students and have an opportunity to become familiar with the academic rigor and social scene of UCI under ideal conditions of maximum opportunity and support. The program includes special workshops and sessions on various aspects of collegiate life, as well as lecture events that provide an introduction to faculty members, their research, and the interdisciplinary opportunities that students may wish to pursue. For more information, including Freshman Edge fees and schedules, call 949-824-7649; email: [summer-freshman@uci.edu](mailto:summer-freshman@uci.edu); <http://summer.uci.edu/freshman> (<http://summer.uci.edu/programs/freshman/>).

## Transfer Edge

Transfer students can begin their experience in the summer by taking part in Transfer Edge, an innovative, experiential opportunity that provides a small community of transfer students with a rich academic, social, and personal foundation. Special workshops and sessions that help students adjust to the academic rigor and social scene of the university include networking with faculty, research exploration, career planning, leadership development, public speaking, and writing. For more information, including Transfer Edge fees and schedules, call 949-824-7649; email: [summer-transfer@uci.edu](mailto:summer-transfer@uci.edu); <http://summer.uci.edu/transfer> (<http://www.summer.uci.edu/transfer/>).

## High School Students

We offer High School students a chance to experience college level courses at UCI. High Schools interested in taking class at UC, Irvine during the summer must meet our minimum requirements to be eligible. For more information about enrolling as a High School student, please visit <https://summer.uci.edu/programs/highschool> (<https://summer.uci.edu/programs/highschool/>).

## Visiting International Students

International students are welcomed to Summer Session, which is offered on an “open enrollment” basis. International students will need to demonstrate English proficiency with a TOEFL score of 213 computer-based, 550 paper-based, or 79 Internet-based (Summer Session also accepts the equivalent for the IELTS and TOEIC). Housing is available to Summer Session students, as well as a full infrastructure dedicated to helping students succeed with their academic studies. Summer Session also offers students a full range of social activities to broaden and deepen their study abroad experience, and their awareness and understanding of the Orange County area and American culture. For more information, call 949-824-6494; email: [internationalsummer@uci.edu](mailto:internationalsummer@uci.edu); <http://summer.uci.edu/international> (<http://summer.uci.edu/international/>).

# UCI Division of Continuing Education

Gary W. Matkin, Ph.D., **Dean, Division of Continuing Education; Vice Provost, Division of Career Pathways**

UCI Division of Continuing Education (DCE) serves the continuing education needs of the community by providing credit and noncredit courses, certificate programs, specialized studies, seminars, workshops, and lecture programs. For program information, class schedule and fee details, visit the UCI Division of Continuing Education website (<http://ce.uci.edu/>), or call the Student Services office at 949-824-5414. Individual courses promote career advancement and lifelong learning, while certificate programs and specialized studies offer the opportunity for a distinctive achievement in a wide range of fields. Certificate programs and specialized studies are a sequence of courses designed to develop in-depth expertise to improve career opportunities. UCI DCE offers more than 80 programs in fields as diverse as personal financial planning, data science, digital marketing, project management, paralegal, engineering, business, teacher education, medical product development, and human resources. Classes are offered on campus, 100% online, and at corporate sites.

## International Programs

UCI DCE's International Programs (<https://ip.ce.uci.edu/>) offer life-enriching academic, professional and cultural experiences to international students to help them succeed in today's competitive global environment. The experience we provide include superior English-language instruction, high-quality certificates with pathways to internship options and Optical Practical Training (OPT), and comprehensive preparation for successful undergraduate and graduate studies.

International Programs offers intensive, dynamic English language study to students 17 years of age or older, at all levels of English proficiency.

UCI recognizes the value of global exchange, exposure to different learning environments and cultures and encouragement both while in university, and before being ready to apply to college. Our Experience University Research (EUR) programs give high school and university students from around the world exposure to university life in the United States in a safe and prepared schedule.

Custom Designed Programs (CDP) are programs tailored to meet the specific needs of a group. CDPs are ideal for groups who want to participate in a UCI DCE program, but need the time frame, educational focus and content of the course to fit them.

More information can be found at the International Programs website (<http://ip.ce.uci.edu/>) or by contacting International Programs, UCI Division of Continuing Education, P.O. Box 6050, Irvine, CA 92616-6050; telephone 949-824-5991; email [ip@ce.uci.edu](mailto:ip@ce.uci.edu).

## Career Resources for UCI Students

The **Division of Career Pathways** (DCP) is UCI's hub for career development and preparation for students, staff, faculty, and alumni, and serves as the recruitment center for local, regional, and national organizations. The DCP educates and engages UCI students and alumni to realize their career potential by coordinating with the campus community in the professional development of students, providing students and alumni with tools and support to attain their career goals, and delivering exceptional customer service to the employer community.

## Corporate Education

UCI DCE partners with businesses to develop and deliver customized training to their employees. Classes are delivered online, on-site, anywhere the employees are located. Programs are developed following a free consultative intake process and needs assessment. For more information, visit Corporate Training website (<http://unex.uci.edu/corporate/>) or call 949-824-1847.



### Osher Lifelong Learning Institute

UCI DCE supports programs of the Osher Lifelong Learning Institute (OLLI), which offers a wide variety of educational and cultural programs for the retired or semi-retired intellectually active adult, all for one annual membership fee. For more information, visit Osher Lifelong Learning Institute website (<https://ce.uci.edu/olli/>) or call 949-451-1403.

### Concurrent Enrollment

The general public also has an opportunity to take regular UCI courses without formal admission to the University, through UCI DCE's Concurrent Enrollment program. (<https://ce.uci.edu/courses/concurrent/>) Courses are available on a space-available basis with the approval of the course instructor and/or academic department. Call 949-824-5414 for more information.

### Open Education

UCI DCE is also part of the **Open Education Consortium**, a non-profit, global, member-based network of open education institutions and organizations. UCI was the first University of California campus and West Coast University to become a member of the OER and is joined by well-renowned universities such as MIT and Tufts University. UC Irvine's membership in the Open Education Consortium is consistent with its public and land-grant missions and its desire to play a significant role in contributing to the social welfare of the state, the nation and the world. **Open Educational Resources** (OER) showcase the University's high quality education and makes courses and course materials free for everyone in the world. Learn more about **UCI Open Education** initiative.

### On This Page:

- Air Force Reserve Officers Training Corps
- Army ROTC

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## ROTC

Qualified UCI students may participate in the Air Force Reserve Officers Training Corps (AFROTC) or the Army Reserve Officers Training Corps (Army ROTC). Additional information is available from the ROTC offices listed below, as well as from the UCI Office of Admissions and Relations with Schools and the UCI Division of Undergraduate Education.

### Air Force Reserve Officers Training Corps (AFROTC)

Air Force Reserve Officer Training Corps (AFROTC) is a nationwide program that allows students to pursue commissions (become officers) in the United States Air Force (USAF) while simultaneously attending college. AFROTC consists of four years of Aerospace Studies classes (Foundations of the USAF, Evolution of USAF and Space Power, Air Force Leadership Studies, and National Security Affairs/Preparation for Active Duty), and a corresponding Leadership Laboratory for each year (where students apply leadership skills, demonstrate command and effective communication, develop physical fitness, and practice military customs and courtesies). College students enrolled in the AFROTC program (known as 'cadets') who successfully complete both AFROTC training and college degree requirements will graduate and simultaneously commission as Second Lieutenants in the Active Duty Air Force.

Classes are offered at California State University, San Bernardino and the University of California, Los Angeles; however, UCI students may enroll using our cross-town agreement. For more information on the AFROTC program, please contact the Department of Aerospace Studies at UCLA at 310-825-1742 or contact California State University, San Bernardino at 909-537-5440 or visit <http://afrotc.csusb.edu/>.

### Army ROTC

Natural Sciences I, 3rd floor, rooms 3122–3129  
949-824-8538; 949-824-7581

Army ROTC classes are taught at UCI. Physical training and field training are conducted at UCI and other local training areas. Two-, three-, and four-year Army ROTC programs are available to all qualified UCI students. Successful completion of the ROTC program leads to a commission as a Second Lieutenant in the U.S. Army (Active, Reserve, or National Guard). Two-, three-, and four-year competitive scholarships provide payment for tuition or room and board. Fee payments at UCI, payments for books, and stipends ranging from \$350–\$500 per month are also available. Qualified students currently serving in any Reserve or National Guard unit may transfer to the Army ROTC program to complete their commissioning requirements.

ROTC courses are on the courses tab under the Division of Undergraduate Education course listing in this catalogue.

## Courses

### **ROTC 10L. Military Science-Basic Leadership Laboratory. 1 Workload Unit.**

Provides hands-on and practical military science material covered in the corresponding military science courses.

Grading Option: Workload Credit P/NP Only.

Repeatability: May be repeated for credit unlimited times.

### **ROTC 11. Military Science-Personal Development. 1 Workload Unit.**

Focuses on life skills such as physical fitness, nutrition, and time management while providing an introduction to military knowledge, customs, and skills.

Grading Option: Workload Credit Letter Grade with P/NP.

### **ROTC 12. Military Science-Leadership I. 1 Workload Unit.**

Focuses on the fundamentals of leadership, Army leadership values, ethics, and counseling techniques.

Grading Option: Workload Credit Letter Grade with P/NP.

### **ROTC 13. Military Science-Tactical Leadership I. 1 Workload Unit.**

Focuses on leadership at the tactical level and includes instruction in fundamental military skills such as map reading, land navigation, squad and platoon operations, and resource planning techniques.

Grading Option: Workload Credit Letter Grade with P/NP.

### **ROTC 21. Military Science-Team Leadership I. 2 Workload Units.**

Explores the dimensions of creative and innovative tactical leadership strategies and styles by examining team dynamics and two historical leadership theories that form the basis of the Army leadership requirements model.

Grading Option: Workload Credit Letter Grade with P/NP.

### **ROTC 22. Military Science-Team Leadership II. 2 Workload Units.**

Explores team dynamics and two historical leadership theories that form the basis of the Army leadership requirements model.

Grading Option: Workload Credit Letter Grade with P/NP.

### **ROTC 23. Military Science-Tactical Leadership II. 2 Workload Units.**

Examines the challenges of leading tactical teams in the OE. Highlights dimensions of terrain analysis, patrolling, and operation orders.

Grading Option: Workload Credit Letter Grade with P/NP.

### **ROTC 100L. Military Science-Advanced Leadership Laboratory. 1 Workload Unit.**

Provides hands-on and practical exercises for the military science material covered in the corresponding military science courses as well as leader training through practical application of the Leadership Development Program.

Corequisite: ROTC 131 or ROTC 132 or ROTC 133 or ROTC 141 or ROTC 142 or ROTC 143 or ROTC 197.

Grading Option: Workload Credit P/NP Only.

Repeatability: May be repeated for credit unlimited times.

### **ROTC 131. Military Science-Leadership II. 3 Workload Units.**

Challenges cadets to study, practice, and evaluate adaptive leadership skills as they are presented with challenging scenarios related to squad tactical operations. Cadets receive systematic and specified feedback on their leadership attributes and core leader competencies.

Corequisite: ROTC 100L

Prerequisite: ROTC 11 and ROTC 12 and ROTC 13 and ROTC 21 and ROTC 22 and ROTC 23

Grading Option: Workload Credit Letter Grade with P/NP.

### **ROTC 132. Military Science-Team Leadership III. 3 Workload Units.**

Provides cadets systematic and specific feedback on their leadership attributes and core leader competencies. Based on such feedback, as well as their own self-evaluations, cadets continue to develop their leadership and critical thinking abilities.

Corequisite: ROTC 100L

Prerequisite: ROTC 11 and ROTC 12 and ROTC 13 and ROTC 21 and ROTC 22 and ROTC 23

Grading Option: Workload Credit Letter Grade with P/NP.

**ROTC 133. Military Science-Tactical Leadership III. 3 Workload Units.**

Uses increasingly intense situational leadership challenges to build cadet awareness and skills in leading small units. Skills in decision-making, persuading, and motivating team members when 'under fire' are explored, evaluated, and developed.

Corequisite: ROTC 100L

Prerequisite: ROTC 11 and ROTC 12 and ROTC 13 and ROTC 21 and ROTC 22 and ROTC 23

Grading Option: Workload Credit Letter Grade with P/NP.

**ROTC 141. Military Science-Leadership III . 3 Workload Units.**

Transitions the focus of student learning from being trained, mentored, and evaluated as a cadet to learning how to train, mentor, and evaluate cadets. Cadets begin to learn the duties and responsibilities of an Army staff officer.

Corequisite: ROTC 100L

Prerequisite: ROTC 131 and ROTC 132 and ROTC 133

Grading Option: Workload Credit Letter Grade with P/NP.

**ROTC 142. Military Science-Leadership IV. 3 Workload Units.**

Requires students to continue to train, mentor, and evaluate underclass cadets. Cadets learn to safely conduct training by understanding and employing the Composite Risk Management Process and the Comprehensive Soldier Fitness (CSF) program.

Corequisite: ROTC 100L

Prerequisite: ROTC 131 and ROTC 132 and ROTC 133 and ROTC 141

Grading Option: Workload Credit Letter Grade with P/NP.

**ROTC 143. Military Science-Officership. 3 Workload Units.**

Explores the dynamics of leading in the complex situations of current military operations in the OE. Cadets examine differences in customs and courtesies, military law, principles of war, and rules of engagement in the face of international terrorism.

Corequisite: ROTC 100L

Prerequisite: ROTC 131 and ROTC 132 and ROTC 133 and ROTC 141 and ROTC 142

**ROTC 151. United States Military History-1607 to 1865. 3 Workload Units.**

Examines the creation of the American military establishment and traces its evolution in the context of the changing nature of warfare, the progression of military professionalism, and social, political, economic, and technological developments through the Civil War.

Grading Option: Workload Credit Letter Grade with P/NP.

**ROTC 152. United States Military History-1865 to 1945. 3 Workload Units.**

Examines the evolution of the American military establishment and the progression of military professionalism in terms of social, political, economic, military, and technological developments from the end of the Civil War through World War II.

Grading Option: Workload Credit Letter Grade with P/NP.

**ROTC 153. United States Military History-1945 to 2001. 3 Workload Units.**

Examines the evolution of the American military establishment and the progression of military professionalism in terms of social, political, economic, military, and technological developments from the Cold War to the War on Terrorism.

Grading Option: Workload Credit Letter Grade with P/NP.

**ROTC 197. Military Science Independent Studies. 2-4 Workload Units.**

Provides intensive, individual study with scheduled meetings to be arranged between Cadre and student. Assigned reading and tangible evidence of mastery of subject matter required.

Grading Option: Workload Credit Letter Grade with P/NP.

Repeatability: May be taken for credit for 12 units.

# Information for Prospective Students

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## In this section:

- Expenses, Tuition, and Fees
  - Financial Aid
  - Majors and Careers
  - Special Programs
  - Undergraduate Admissions
  - Undergraduate and Graduate Degrees
- 

## On this page:

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## Office of Undergraduate Admissions

The mission of the Office of Undergraduate Admissions, under the Office of the Provost and Executive Vice Chancellor, is to: (1) optimize UCI's undergraduate enrollments by implementing Academic Senate, universitywide, and campus policies for the selection and admission of new freshman and transfer students; and (2) stimulate and advance cooperative educational relationships between UCI and California schools and colleges. Undergraduate Admissions works to improve the preparation of prospective students for higher education and to promote their access to and success at UCI.

For additional information about the Office of Undergraduate Admissions and the services listed below, call 949-824-6703 or visit the Office of Undergraduate Admissions website (<http://www.admissions.uci.edu>).

### Undergraduate Admissions

Staff are involved in monitoring applications and admission targets; collecting and evaluating personal and academic data to select and admit new undergraduate students; establishing students' permanent UCI academic record; and evaluating coursework taken at other colleges and universities by new and matriculated students for transfer credit.

### Intersegmental Relations

Staff are involved as liaison with regard to curricular articulation between UCI and California Community Colleges as well as various educational organizations designed to facilitate regional cooperation (South Coast Higher Education Council, Southern California Intersegmental Articulation Council).

### School and College Relations

Staff: (1) advise prospective students, their parents, teachers, counselors, and school administrators regarding academic programs, admission requirements, and admission selection, and assist them with UC application and enrollment processes; (2) increase public awareness by making presentations to schools, colleges, and the community regarding UCI and the University of California, and by creating publications and communications which explain admissions policies and procedures, academic options, housing, financial aid, and student life opportunities; (3) provide general information on UC admissions and programs for all UC campuses; (4) explain University Admissions policies and procedures specific to undergraduate enrollment to the public; (5) assist prospective transfer students and community college faculty and staff; and (6) participate in activities and projects designed to enhance the academic success of students.

### On-Campus Services

Staff: (1) host programs for prospective students and educational groups; (2) offer activities for applicants; (3) inform UC and UCI administrators and faculty of developments in California schools and community colleges; and (4) provide consultative services to campus departments wishing to provide programs for schools and colleges or special recruitment for specific majors or programs.

### Transfer Student Services

The Office of Undergraduate Admissions provides advice and guidance to prospective UCI transfer students. Staff regularly visit California Community Colleges throughout the state and meet with prospective transfer students to discuss admission requirements, academic planning and preparation, and UCI lower-division major and general education requirements. Articulation agreements, which identify how community college courses may be used to fulfill lower-division UCI degree requirements, are facilitated through the Undergraduate Admissions office. Articulation agreements are available at the ASSIST website (<http://www.assist.org>).

## Campus Tours

Our student Campus Representatives lead tours that depart promptly at noon from The Hill (210-B), our campus bookstore, in the UCI Student Center. To confirm tour dates, times, and parking instructions and to arrange tours for school groups of 10 or more during the regular academic year, visit the Campus Tours website (<http://www.campustours.uci.edu>).

## Expenses, Tuition, and Fees

### On This Page:

- Estimated Expenses
- Tuition and Fees
  - Undergraduate Student
  - Graduate Student
  - Payment of Tuition and Fees
  - Service Charges
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- Special Tuition and Fee Programs, Waivers, and Exemptions
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- California Residence and Nonresident Supplemental Tuition
  - Laws Governing Residence
  - Who is a Resident?
  - Requirements for Financial Independence
  - Establishing Intent to become a California Resident
  - General Rules Applying to Minors
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  - Exemptions from Nonresident Supplemental Tuition
  - Temporary Absences
  - Change in Resident Classification
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  - Inquiries and Appeals
- Tuition and Fee Refunds
  - Student Tuition and Fee Refunds
  - Standard Refund Schedule
  - Refund Schedule for New Students Receiving Federal Financial Aid
  - Housing Refunds

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## Estimated Expenses

The range of estimated nine-month expenses, including projected tuition, fees, books and supplies, room and board, and miscellaneous expenses for California-resident students attending UCI during the 2018-19 academic year are shown in the following chart. Tuition and fees are subject to change without notice, and the university may impose additional fees.

Expenses for students living off campus vary depending upon number of roommates, location of apartment, amenities and other factors. Graduate student expenses assume two students sharing a two-bedroom apartment. All other on- and off-campus estimates are based on two students sharing a bedroom. Figures are based on periodic surveys and are adjusted for inflation for years when surveys are not conducted. These are intended only as a guide in computing average expenses.

### Estimated Expenses

California-Resident Student Status	Living Arrangement	Estimated Nine-Month Expenses
Undergraduate	On campus	\$34,254.12
	Off campus	\$32,448.12
	At home	\$26,259.12

Graduate	On campus – Verano	\$37,471.63
	On campus – Campus Village	\$38,515.63
	On campus – Palo Verde	\$38,484.63
	Off campus	\$48,612.63
	At home	\$37,471.63

## Tuition and Fees

All tuition, fees, and charges are subject to change without notice, and the University may impose additional tuition and fees. Consult the University Registrar's website (<http://www.reg.uci.edu/>) for the most up-to-date information.

### Undergraduate Student Tuition and Fees for Academic Year 2020-21 <sup>1,2</sup>

Fee	Resident	Nonresident
Tuition	\$11,442.00	\$11,442.00
Student Services Fee	\$1,128.00	\$1,128.00
Associated Students Fee - ASUCI Fee	\$54.00	\$54.00
Associated Students Fee - ASUCI Student Resources & Services	\$60.00	\$60.00
UCI Student Center Fee	\$267.00	\$267.00
UCI Student Center Fee - Continuation Fee	\$156.62	\$156.62
Bren Events Center Fee	\$69.00	\$69.00
Recreation Center Fee	\$264.00	\$264.00
Campus Spirit Fee	\$99.00	\$99.00
Measure S Fee	\$24.00	\$24.00
TGIF Fee	\$10.50	\$10.50
Anteater Express Fee	\$131.89	\$131.89
Club Sports Fee	\$15.00	\$15.00
SOAR Fee	\$21.93	\$21.93
Food Pantry Fee	\$10.12	\$10.12
Document Fee	\$165	\$165
eTech Fee <sup>5</sup>	varies	varies
UG Student Health Insurance Plan Fee <sup>6</sup>	\$1,917.87	\$1,917.87
Nonresident Supplemental Tuition <sup>1</sup>	-----	\$29,754.00
TOTAL <sup>7</sup>	\$15,835.93	\$45,589.93

### Graduate Student Tuition and Fees for Academic Year 2020-21 <sup>1, 2, 3</sup>

Fee	Resident	Nonresident
Tuition	\$11,442.00	\$11,442.00
Student Services Fee	\$1,128.00	\$1,128.00
Associated Graduate Student Fee - AGS <sup>4</sup>	\$27.00	\$27.00
UCI Student Center Fee	\$267.00	\$267.00
UCI Student Center Fee - Continuation	\$156.62	\$156.62
Bren Events Center Fee	\$69.00	\$69.00
Recreation Center Fee	\$264.00	\$264.00
eTechFee <sup>5</sup>	varies	varies
Document Fee	\$80	\$80
Grad. Student Health Insurance Plan Fee <sup>6</sup>	\$4,576.53	\$4,576.53
Nonresident Supplemental Tuition	-----	\$15,102.00
TOTAL <sup>7</sup>	\$18,010.15	\$33,112.15

The 2020-21 UC mandatory systemwide undergraduate Nonresident Supplemental Tuition level has not been determined by the Regents at this time. The undergraduate NRST level shown is the 2019-20 approved level and may change for 2020-21. All figures shown may not be final; actual tuition, fees, and charges are subject to change by the Regents of the University of California or, as authorized, by the President of the University of California and/or delegated to the UCI Chancellor. Accordingly, final approved levels and charges may differ from the amounts shown.

Student fees shown are based on three quarters of attendance.

The exact cost of attending UCI varies by program. Students in state-supported professional programs including the Full-time M.B.A., J.D., M.D., Master of Public Health, Master of Public Policy, M.S. Biomedical and Translational Sciences, M.S. Biotechnology Management, M.S. Engineering Management, M.S. Genetic Counseling, Master's Entry Program in Nursing, Master of Urban and Regional Planning, and self-supporting professional programs including the Executive M.B.A. and Fully-Employed M.B.A. programs, Master of Professional Accounting., Master of Finance, M.S. Business Analytics, Master of Innovation and Entrepreneurship, M.A.S. in Criminology, Law and Society, Master of Legal and Forensic Psychology, Master of Embedded & Cyber Physical Systems, Master of Engineering, Master of English, Master of Computer Science, Master of Human-Computer Interaction and Design, Master of Software Engineering, Master of Data Science, Master of American Laws, M.S. Pharmacology, Master of Conservation and Restoration Science and Doctor of Nursing Practice should refer to the tuition and fee information posted on the University Registrar's website (<http://www.reg.uci.edu/>).

In addition to the AGS fee, M.B.A. and M.D. students pay annual supplement fees of \$15.00 and \$30.00 respectively that support their individual graduate students' association

The nonrefundable eTech fee is \$4.00 per undergraduate lecture course unit, up to a maximum of \$60.00 per quarter or \$180.00 per year.

The amounts shown on these tables for undergraduate and graduate student health insurance plans are the estimated 2020-21 fee amounts. The 2020-21 fee levels are currently under negotiation and the final 2020-21 approved fee levels may differ from the amounts shown.

The mandatory campus-based fees listed above (Associated Students Fee, Student Center Fee, Bren Events Center Fee, Recreation Center Fee, Campus Spirit Fee, Measure S Fee, TGIF Fee, Anteater Express Fee, Club Sports Fee, SOAR Fee and Food Pantry Fee) include all currently approved fees.

## Payment of Tuition and Fees

Tuition and fees for each quarter are due and payable in advance within deadlines published in the Quarterly Academic Calendar on the University Registrar's website (<http://www.reg.uci.edu/>). A student will not be officially registered in classes until tuition and fees are paid in full, with the exception of students who are participating in the PACE Plan.

Continuing and returning students are required to pay all outstanding fines and other debts in full before they pay their tuition and fees for an upcoming term.

Information about tuition and fee refunds appears later in this section.

**Tuition** is a mandatory UC systemwide charge and provides general support for the University's operating budget, including costs related to instruction, and funds student financial aid. Graduate students studying out of the State may be eligible to pay 15 percent of tuition. M.D. students are required to pay the full tuition for each quarter in which they enroll, including the summer quarter. The summer quarter tuition level for M.D. students will be the same as that of the previous spring quarter. A portion of Tuition is returned to support student financial aid.

The **Student Services Fee** is a mandatory UC systemwide fee required of all students regardless of the number of courses taken, unless otherwise noted. This fee is a charge to each student for co-curricular programs, activities, and services which benefit the student and which are complementary to, but not a part of, the instructional programs. A portion of the fee is returned to support student financial aid. No part of this fee is refundable to students who do not use all or any of these services. Graduate students studying out of the State may be eligible to pay 15 percent of the Student Services Fee. M.D. students are required to pay the full Student Services Fee for each fall, winter, and spring quarter, and a reduced Student Services Fee of \$80.00 for each summer quarter.

The **Associated Students Fees** are compulsory campus-based fees administered by the Associated Students of UCI, the Associated Graduate Students, The Merage Student Association, and the Associated Medical Students. These funds provide social activities, lectures, forums, concerts, and other activities at either a reduced charge, or no charge, to UCI students. The fees are required of all students. In spring 2017, the undergraduate students voted via referendum to increase the ASUCI fee to fund additional student resources and services.

The **UCI Student Center Fee** is a compulsory campus-based fee required of all students regardless of the number of courses taken. The fee is used to pay the debt service on revenue bonds sold to finance the construction costs, to fund operating costs, and to fund major repairs and maintenance expenses of the UCI Student Center. The Student Center Continuation Fee is the portion of the Student Center Fee originally set to expire in fall 2017. This portion of the fee was renewed via student referendum in spring 2016 and the purpose of the Continuation Fee is to maintain current service levels, support of daily operating expenses and continuous facility maintenance and improvements to the Student Center.

The **Bren Events Center Fee** is a compulsory campus-based fee required of all students regardless of the number of courses taken or units carried. The fee is used for operations, maintenance, including deferred maintenance, and repair and improvement projects for the Bren Events Center. The fee was also used to pay the debt service on revenue bonds sold to finance the construction costs of the Bren Events Center.



The **Recreation Center Fee** is a compulsory campus-based fee required of all students regardless of the number of courses taken or units carried. The fee is used to operate, maintain, and pay the debt service on revenue bonds sold to finance the construction costs of the Student Recreation Center and Athletics facilities improvements.

The **Campus Spirit Fee** is a compulsory campus-based fee required of all undergraduate students regardless of the number of courses taken or units carried. The fee is used to support Athletics and Campus Spirit Programs.

The **Measure S Fee** is a compulsory campus-based fee required of all undergraduate students regardless of the number of courses taken or units carried. The fee is used to support, upgrade, and expand the ASUCI Express Shuttle.

The **Green Initiative Fund (TGIF) Fee** is a compulsory campus-based fee required of all undergraduate students for the fall, winter, and spring quarters regardless of the number of courses taken or units carried. The fee is used to support undergraduate student efforts to reduce the campus's environmental footprint and to promote sustainable educational projects at UCI.

The **Anteater Express Fee** is a compulsory campus-based fee required of all undergraduate students regardless of the number of courses taken or units carried. The purpose of the fee is to support the Anteater Express campus shuttle service. The fee revenue is used to fund expenses including, but not limited to, fleet replacement, disability services, and route expansion. This initiative differs from the current Measure S Fee in that the funds may be spent more broadly and the funds are also overseen by a funding board.

The **Club Sports Fee** is a compulsory campus-based fee required of all undergraduate students for the fall, winter, and spring quarters regardless of the number of courses taken or units carried. The purpose of the fee is to provide a permanent source of operating and programming support for the Club Sports Program at UCI. The fee revenue will be used to fund expenses such as, but not limited to, coaching, cost of equipment and uniforms, tournament fees, travel expenses, events facility rentals and basic-level league dues for all clubs in the Club Sports Program.

The **SOAR Fee** is compulsory campus-based fee required of all undergraduate students for the fall, winter, spring, and summer quarters regardless of the number of courses taken or units carried. The purpose of the fee is to provide a permanent source of operating and programming support for the Student Outreach and Retention (SOAR) Center. The fee revenue is used for, but not limited to, funding student-initiated outreach and retention efforts, expanding current services and programs, and providing leadership and development opportunities for students.

The **Food Pantry Fee** is a compulsory campus-based fee required of all undergraduate students for the fall, winter, spring and summer quarters regardless of the number courses taken or units carried. The purpose of the fee is to cover the expenses of operating the current food pantry which provides non-perishable food to students who experience food insecurity.

The **eTech Fee** is a nonrefundable per-unit fee, required of all students enrolled in undergraduate lecture courses during the fall, winter, and spring quarters. The fee is used to fund the UC Irvine Educational Technology Initiative maintaining and improving existing educational technology, and providing new educational technology services and capabilities supporting the educational goals of UCI students. The fee is \$4.00 per unit of undergraduate lecture course, up to a maximum amount of \$60.00 (or 15 units) per quarter. It will be assessed after the third week of instruction. Further information is available at the eTech website (<http://etech.uci.edu/>).

The **Document Fee** provides lifetime access to official transcripts and academic verifications without a fee for in-person pickup or delivery by USPS. In addition, there is no fee for mailing the initial diploma. Effective Fall 2018, new undergraduate, professional, and graduate students are assessed the one-time document fee. Eligible students are able to use financial aid to cover the Document Fee. Alumni and continuing students receive the benefits but do not pay the new fee, as they have been subject to various fees previously for their degree programs. Students in self-supporting fee programs are not charged the fee; they will pay the per-single document fee for transcripts and verifications, as well as the diploma mailing fee. Summer-only and visiting students are not charged the fee; they will pay the per-single document fee for transcripts and verifications. Services not covered by the document fee are still subject to transaction fees. These include, but are not limited to, express shipping, special handling, replacement diplomas, and notary services.

The **Undergraduate Student Health Insurance Plan Fee** is a mandatory fee charged over three quarters (fall, winter, and spring) to provide 12-month coverage from September through August. The fee is required of all undergraduate students regardless of the number of courses taken or units carried. The fee is used to provide undergraduate students with health insurance. If students provide evidence of comparable coverage from another source, participation in the mandatory plan may be waived. This fee is subject to change pending the outcome of negotiations with insurance carriers.

The **Graduate Student Health Insurance Plan Fee** is a mandatory fee charged over three quarters (fall, winter, and spring) to provide 12-month coverage from September through August. First-year law and medical students who matriculate prior to September, any returning students not enrolled in the previous spring quarter, and transfer students must also pay a prorated GSHIP premium in addition to the fall premium. The fee is required of all graduate and medical students regardless of the number of courses taken or units carried. The fee is used to provide graduate and medical students with health insurance. If students provide evidence of comparable coverage from another source, participation in the mandatory plan may be waived. This fee is subject to change pending the outcome of negotiations with insurance carriers.

The **Medical Student Disability Insurance Fee** is required of all medical students. The entire annual fee is charged for the fall quarter.

The **Professional Degree Supplemental Tuition (PDST)** is mandatory supplemental tuition required of all graduate professional students in specific state-supported graduate professional programs regardless of the number of units taken. The UCI graduate professional programs charging a PDST include the M.B.A., J.D., M.D., Master of Public Health, Master of Public Policy, Master of Urban and Regional Planning, Master of Science in



Biotechnology Management, Master of Science in Engineering Management, Master of Science in Genetic Counseling and Master's Entry Program in Nursing programs.

A \$1,500.00 advance deposit on the Professional Degree Supplemental Tuition is required of all new M.B.A. students upon their acceptance of admission. This deposit is nonrefundable.

### Service Charges (subject to change without notice)

Item	Charge
Changes in Class Enrollment after Announced Dates (each transaction)	\$3.00
Credit by Examination (each petition)	\$5.00
Late Payment of Tuition and Fees	\$50.00
Late Enrollment in Classes	\$50.00
Returned Payment Fee	\$25.00
Student Parking Permits <sup>1</sup>	
- Zone Commuter, monthly	\$75.00
- Zone Commuter, Preferred, Monthly	\$94.00
- Resident, monthly	\$125.00

In addition, students may be assessed a course materials fee. Consult the online *Schedule of Classes* for courses requiring the fee and the fee level.

<sup>1</sup> In accordance with Regents policy, UC parking systems are self-supporting auxiliary enterprises receiving no State appropriations. Visit the Transportation and Distribution Services website (<https://www.parking.uci.edu/permits/studentpermits.cfm>) for fee levels of other types of parking permits. Prices shown are for 2019-20 and are subject to change for 2020-21.

### Miscellaneous Fees (subject to change without notice)<sup>7</sup>

Item	Fee
Application Fee (nonrefundable in all cases) <sup>1,2</sup>	
-Domestic Undergraduate	\$70.00
- International Undergraduate	\$80.00
- Domestic Graduate <sup>3</sup>	\$120.00
- International Graduate <sup>3</sup>	\$140.00
- Secondary Application Fee (Medical)	\$120.00
Application Fee for Readmission <sup>1</sup>	
- Domestic Undergraduate	\$70.00
- International Undergraduate	\$70.00
- Domestic Graduate <sup>4</sup>	\$120.00
- International Graduate <sup>4</sup>	\$120.00
Advancement to Candidacy for Ph.D.	\$90.00
Duplicate Diploma	\$22.00
Duplicate Diploma, School of Medicine	\$125.00
Filing Fee (graduate programs; one-half quarterly Student Services Fee) <sup>5</sup>	\$188.00
Graduate Special Library Borrowing Privileges (per year, nonrefundable, renewable) <sup>6</sup>	\$50.00
Master's Thesis Electronic Submission Fee	\$55.00
M.B.A. Acceptance of Admissions Deposit <sup>1</sup>	\$1,500.00
Transcript of Record (per copy)	\$17.00
Undergraduate Acceptance of Admission deposit (nonrefundable; applied toward Student Services Fee) <sup>1</sup>	\$250.00
Verification of Student Status (per copy)	\$17.00

<sup>1</sup> Nonrefundable in all cases.

<sup>2</sup> The fee entitles an applicant to apply to one UC campus. Applicants who are applying to more than one campus must pay the fee for each campus selected.

<sup>3</sup> The Application Fee for The Paul Merage School of Business is \$150.00.

- 4 The Graduate Readmission Fee is only applicable to students whose status has lapsed during an academic quarter and are trying to be readmitted for the same quarter. Students whose status has lapsed and wish to return in a subsequent quarter must go through the entire application and admission process again and pay the applicable application fee.
- 5 The Filing Fee is one half of the quarterly Student Services Fee.
- 6 This fee entitles graduate students on Official Leave of Absence or Filing Fee Status to keep their library privileges.
- 7 Fees shown are currently approved miscellaneous fees and do not reflect all 2020-21 proposed fees. Fees are subject to change without notice. The university may impose additional fees when approved.

## Special Tuition and Fee Programs, Waivers, and Exemptions

### PACE Plan

The PACE Installment Plan allows students to spread the quarterly costs of tuition and fee payment over a three-month period. A fee is charged for this privilege. Information about PACE is available at the Campus Billing Services website (<http://www.fs.uci.edu/pace/>).

### Reduced-Fee Part-Time Study Program

Part-time study for credit leading to an undergraduate or graduate degree is available in some academic units. To take advantage of reduced tuition and fees for part-time status, quarterly course enrollment is limited to 10 units or fewer for undergraduate students and to eight units or fewer for graduate students. Students enrolled in excess units after Friday of the third week of instruction are liable for full tuition and fees.

The same admissions standards that apply to full-time students apply to part-time students. Under University policy, academic deans (the Dean of the Division of Undergraduate Education, for Undecided/Undeclared students; the Dean of Graduate Studies, for graduate students) may approve Petitions for Part-Time Status *only* for reasons of occupation, family responsibilities, or health.

Undergraduate and graduate students on approved part-time status pay the full Student Services Fee and one-half of Tuition. Those part-time students who have been determined to be nonresidents of the State of California are assessed one-half the Nonresident Supplemental Tuition, in addition to the full Student Services Fee and one-half of Tuition. Part-time students pursuing a professional degree are assessed one-half the Professional Degree Supplemental Tuition, the full Student Services Fee, and one-half of Tuition.

Part-time status lapses at the end of each academic year; therefore, a student must reapply each year that part-time status is desired. See the University Registrar's website (<http://www.reg.uci.edu/>) for more information.

Undergraduate petitions are available from academic counselors or the University Registrar's Office; graduate students may obtain further information and petitions from the Graduate Division. All students are encouraged to consult with the Office of Financial Aid and Scholarships regarding minimum unit requirements.

### Tuition and Fee Reduction for Staff and Academic Employees

Students who are career employees at UCI or the University of California, Irvine Medical Center are eligible for a two-thirds reduction of the Student Services Fee, Tuition, and campus-based fees. This applies for up to nine units or three regular session University courses per quarter, whichever is greater. For staff employees, additional information and the Employee Application for Reduced Fees is available from Human Resources. Academic employees should contact the Office of Academic Personnel.

## California Residency for Tuition Purposes

Information regarding University of California residence regulations for tuition purposes can be found on the University Registrar's website (<https://www.reg.uci.edu/residency/classification.html>).

Please note that changes may be made in the residence requirements between the publication of this statement and the relevant residence determination date. Inquiries regarding residence requirements, determination, and/or recognized exceptions should be directed to the campus Residence Deputy ([regres@uci.edu](mailto:regres@uci.edu)).

## Tuition and Fee Refunds

### Student Tuition and Fee Refunds

Students who pay tuition and fees for a regular academic term and then decide to withdraw from the University must submit a Withdrawal form, complete with the signature of their academic dean. Undergraduate students must submit the form to the University Registrar; graduate students to the Graduate Division; medical students to the School of Medicine's Registrar's Office; law students to the Law School Registrar's Office. This form serves two purposes:

1. A refund of tuition and fees, if applicable; and
2. Withdrawal from classes.

The effective date of withdrawal is used in determining the percentage of tuition and fees to be refunded. This date is normally the date that the student submits the form to the appropriate dean for approval. It is presumed that no University services will be provided to the student after that date. Tuition and fees are refunded as follows.

Prior to and including the first day of instruction, tuition and fees are refunded in full, except for

1. A \$10 service charge for continuing and readmitted students, or the \$100 Acceptance of Admission Fee for new undergraduate students, or the applicable deposit fee for new health sciences and M.B.A. students, and
2. The Student Health Insurance Fee. (The Student Health Insurance Fee is refunded only if the Withdrawal form is submitted *prior to the first day of the quarter*.) Students should bear in mind that the "first day of the quarter" often is several days prior to the "first day of instruction." Refer to the Academic Calendar (<http://www.reg.uci.edu/navigation/calendars.html>) for exact dates.

A refund of the Medical Student Disability Insurance Fee (if applicable) may be requested.

After the first day of instruction, the tuition and fee refund is prorated as shown (with the exception of the Health Insurance Fee).

## Standard Refund Schedule

Calendar days (beginning with the first day of instruction)	Refund
1	100 percent
2-7	90 percent
8-18	50 percent
19-35	25 percent
over 35	no refund

New students receiving Federal Financial Aid follow the refund schedule outlined below.

## Refund Schedule for New Students Receiving Federal Financial Aid

Calendar days (beginning with the first day of instruction)	Refund
1	100 percent
2-7	90 percent
8-14	80 percent
15-21	70 percent
22-28	60 percent
29-35	50 percent
36-42	40 percent
over 42	no refund

Financial aid recipients should see the UCI Office of Financial Aid and Scholarships Student Withdrawal Policy, or consult their Policies and Conditions website (<http://www.ofas.uci.edu/content/PoliciesAndConditions.aspx>).

Claims for a refund of tuition and fees must be presented during the fiscal year (July 1 to June 30) in which the claim is applicable. Refund checks are issued by the Accounting Office approximately three weeks after the official notice of withdrawal is initiated.

Law students follow refund schedules set by the School of Law. Refer to the School of Law website (<http://www.law.uci.edu/>) for further information.

## Housing Refunds

Housing refunds are subject to the terms of the applicable housing agreement.

# Financial Aid

### On This Page:

- Financial Aid
  - Eligibility Requirements for Federal Student Aid
  - UCI Policies on Satisfactory Academic Progress for Financial Aid
  - UCI Office of Financial Aid and Scholarships Student Withdrawal Policy
- Additional Aid for Graduate and Medical Students
- Aid for Students with Disabilities
- Student Employment

Lack of funds need not be a barrier to attending UCI; about 75 percent of UCI's enrolled students are offered some form of financial aid. Students who demonstrate that they need financial assistance in order to attend may be eligible for scholarships, grants, loans, and/or work-study awards through the Office of Financial Aid and Scholarships. In addition to awarding aid on the basis of financial need, some scholarships are awarded on the basis of academic excellence. Information regarding the application process, deadlines, and financial aid programs for undergraduate and graduate students as well as students in the Business, Law, and Medical Schools may be found at the Office of Financial Aid and Scholarships website (<http://www.ofas.uci.edu/content/>).

**Free Application for Federal Student Aid (FAFSA/Renewal Application).** To obtain financial aid, new and continuing students must file the FAFSA and submit the necessary supporting documents each year. FAFSA on the Web is available at [studentaid.gov](http://studentaid.gov) (<https://studentaid.ed.gov/sa/>), and paper forms are available either by completing a PDF FAFSA (<https://studentaid.gov/sites/default/files/2020-21-fafsa.pdf>) or by calling 800-FED-AID / 800-433-3243. Renewal notifications are mailed to current financial aid recipients starting in mid-October. Students are encouraged to apply as early as possible after October 1. The priority deadline to file the FAFSA/FOTW for loans, work-study, and most grants is March 2. For priority consideration of these funds, all other supporting documentation must be submitted to the Office of Financial Aid and Scholarships by May 1 or the specified due date.

The University expects the student and the parent (or spouse) to contribute toward the educational costs to the extent possible. For dependent students, an analysis of the FAFSA and supporting documents determines the amount a student and the student's parents can be expected to contribute toward the cost of the student's education. For independent students, the analysis determines the amount a student and, if applicable, a spouse, can contribute to the cost of the student's education. Income, assets, size of family, and the number of family members in college (excluding parents) are the major factors considered in the analysis. Assets include, but are not limited to, equity in real estate other than family residence; stocks, bonds and other securities; business equity; and cash, savings and checking accounts. Income includes wages, salaries, interest, dividends, and nontaxable income such as Social Security, Veterans' benefits, and foreign income.

**Special Expenditures.** Financial aid recipients who are in need of money for special expenditures (beyond the cost of books and basic supplies associated with certain courses of study) may make an appointment to see a financial aid counselor to explore the possibility of a budget add-on, based on the availability of funds. Examples of such special expenditures include special equipment for students with disabilities and computer purchases.

## Eligibility Requirements for Federal Student Aid

Federal financial aid programs are subject to regulations that define the criteria students must meet to qualify and maintain eligibility for those programs. The regulations state that a student must:

1. Be a U.S. citizen or an eligible noncitizen of the U.S.;
2. Be accepted for admission to the University;
3. Be enrolled in good standing at the University; units taken through the UCI Division of Continuing Education program are not counted toward half- or full-time enrollment;
4. Demonstrate financial need (except for William D. Ford Federal Direct Unsubsidized Loans and Federal PLUS loans); financial need is the difference between the reasonable, approved expenses of attending UCI and all available resources, including the expected contribution from parents, the student, and any outside aid;
5. Maintain satisfactory academic progress for financial aid, as outlined below;
6. Be registered with the Selective Service if the student is a male at least 18 years old, born after December 31, 1960, and not on active duty with the armed forces;
7. Not owe a refund on a federal grant or be in default on a federal educational loan.

Once a student meets the above criteria, disbursement of financial aid funds is made only if the student does not have outstanding debts owed to UCI.

**California Dream Act Application.** Students who qualify for the AB 540 fee exemption and are not able to file a FAFSA can apply for certain types of financial aid by completing the California Dream Act Application.

The California Dream Acts – AB 130 and AB 131 – extend eligibility for privately funded UC scholarships, other UC scholarships and grants, Cal Grants, Middle Class Scholarships and Dream Loans to students, including undocumented students, who qualify for benefits under another California law – AB 540 – which exempts students from paying nonresident supplemental tuition.

Students who think they might be eligible for an AB 540 nonresident tuition exemption should:

1. Submit a California Dream Act Application as soon as possible after it becomes available on October 1, but no later than March 2.
2. Students who are admitted to the University and intend to enroll should submit a Statement of Legal Residence. Those who receive a nonresident classification from the campus residence deputy should submit a California Nonresident Tuition Exemption Request or a University of California Nonresident Tuition Exemption Application and Affidavit, available at the University Registrar's office or website. Official high school transcripts and proof of high school graduation may be requested.

Once applicants have completed these steps, the University will notify them of any financial aid eligibility.

## UCI Policies on Satisfactory Academic Progress for Financial Aid

### Undergraduate and Graduate Students

In defining student eligibility for financial aid, the Higher Education Act Amendments state that a student must maintain “satisfactory progress in the course of study the student is pursuing, according to the standards and practices of the institution at which the student is in attendance.” Federal regulations state that each institution shall establish, publish and apply “reasonable standards” for assuring that every student receiving need-based financial aid should maintain “satisfactory progress in his/her course of study.” Final Federal regulations state that “in order to receive student financial aid under the programs authorized by Title IV of the Higher Education Act, a student must be maintaining satisfactory progress in the course of study he or she is pursuing according to the standards and practices of the institution in which he or she is enrolled.”

The following disclosures on the UCI website provide detailed information about satisfactory academic progress requirements for receiving financial aid at UCI. The Office of Financial and Scholarships will provide a paper copy of this information upon request.

#### Undergraduate and Teaching Credential Students:

[www.ofas.uci.edu/content/pdf/SAPDisclosureForUndergraduates.pdf](http://www.ofas.uci.edu/content/pdf/SAPDisclosureForUndergraduates.pdf) (<http://www.ofas.uci.edu/content/pdf/SAPDisclosureForUndergraduates.pdf>)

#### Graduate Students:

[www.ofas.uci.edu/content/pdf/SAPDisclosureForGraduates.pdf](http://www.ofas.uci.edu/content/pdf/SAPDisclosureForGraduates.pdf) (<http://www.ofas.uci.edu/content/pdf/SAPDisclosureForGraduates.pdf>)

#### Graduate Business Students:

[applicant.merage.uci.edu/FinancialAid/AcademicRequirements.aspx](http://applicant.merage.uci.edu/FinancialAid/AcademicRequirements.aspx) (<http://applicant.merage.uci.edu/FinancialAid/AcademicRequirements.aspx>)

#### Medical Students:

[www.ofas.uci.edu/content/pdf/SAPDisclosureForMedicalStudents.pdf](http://www.ofas.uci.edu/content/pdf/SAPDisclosureForMedicalStudents.pdf) (<http://www.ofas.uci.edu/content/pdf/SAPDisclosureForMedicalStudents.pdf>)

#### Law Students:

[www.law.uci.edu/admission/tuition-aid/pdfs/SAP\\_Disclosure\\_LawStudents.pdf](http://www.law.uci.edu/admission/tuition-aid/pdfs/SAP_Disclosure_LawStudents.pdf) ([http://www.law.uci.edu/admission/tuition-aid/pdfs/SAP\\_Disclosure\\_LawStudents.pdf](http://www.law.uci.edu/admission/tuition-aid/pdfs/SAP_Disclosure_LawStudents.pdf))

## UCI Office of Financial Aid and Scholarships Student Withdrawal Policy

Students who withdraw from UCI prior to completing 60 percent of the period for which they received federal financial aid will be subject to both the UC Fee Refund Policy and the Federal Return of Title IV Funds policy. Title IV Funds are federal funds awarded to a student to meet educational expenses. Examples of Title IV Funds include Federal Pell Grants, Federal Supplemental Educational Opportunity Grants (SEOG) and Federal Direct Loans.

**Cancellation of Enrollment.** Students who cancel their registration or have their registration cancelled by the University prior to the first day of classes will be billed for all financial aid disbursed on their behalf.

The full text of this official policy is available on the Office of Financial Aid and Scholarships Policies and Conditions website (<http://www.ofas.uci.edu/content/PoliciesAndConditions.aspx>).

Any student contemplating withdrawing from the University should contact the Office of Financial Aid and Scholarships to speak with a financial aid counselor concerning the financial ramifications of withdrawing.

Students who are receiving a Cal Grant or Middle Class Scholarship (MCS) should also contact the Office of Financial Aid and Scholarships to discuss the ramifications of withdrawing on their Cal Grant or MCS status.

## Additional Aid for Graduate and Medical Students

Most graduate fellowship programs are administered by the Graduate Division, 120 Aldrich Hall, telephone 949-824-4611. Medical students should contact the School of Medicine Financial Aid Office, 836 Medical Education Building, telephone 949-824-6476.

## Aid for Students with Disabilities

All forms of student financial aid are available to eligible students with disabilities. Interested students should follow the regular financial aid application procedures and should notify the Office of Financial Aid and Scholarships of any additional expenses they may incur because of a disability. Supporting documentation must be provided.

## Student Employment

The UCI Division of Career Pathways, located in the Student Services I building, assists UCI students in obtaining part- or full-time, on- and off-campus jobs and internships during the academic year as well as summer. Students may easily access all job and internship listings, including work-study positions, using their student ID number via Handshake on the UCI Division of Career Pathways website. (<http://www.career.uci.edu/>)

## Scholarships for Entering Freshmen or Transfer Students

UCI scholarships are awarded based on the basis of academic ability and promise; and do not require repayment. There are five scholarship categories to meet the needs of a diverse student body such as Community Leadership, Innovation, Academic Excellence, Anteater, and Distinguished scholarship categories. The scholarships in these categories are awarded on the basis of academic merit, financial need, leadership experience, community service, and overcoming adversity. UCI offers entering freshmen and transfer students with proven high academic achievement and leadership potential five top honors awards from the Distinguished Scholarship Category: The Regents' Scholarship, the Chancellor's Excellence Scholarship, the Deans' Scholarship, the Directors' Scholarship, and the Promise Scholarship.

UCI Distinguished Scholarships are intended for entering freshmen and transfer students and are based on the information gathered on the UC Application for Undergraduate Admission. Additional materials, such as the scholarship application, are neither required nor considered in the selection process. Entering freshmen and transfer students who submit the UCI-specific scholarship application are also considered for scholarships in the other four categories based on available funds. In addition, the UCI Alumni Association offers Alumni Scholarships by invitation only. Admitted students who have submitted a Statement of Intent to Register and meet the criteria for qualifications will be invited to apply for an Alumni Scholarship. Information about the UCI Alumni Association Endowed Scholarship is available on the UC Application for Undergraduate Admission and Scholarships, and a separate application is required.

## Scholarships for Entering Graduate Students Enrolled in Master-Degree Programs

Entering graduate students enrolled in Master Degree programs can apply to several available scholarships. Scholarship applications are forwarded to the schools for selection of recipients.

## Scholarships for Continuing Students

Continuing students may apply to campus-wide scholarships and school-specific scholarships during the application period of January-February for the following academic year. The Office of Financial Aid and Scholarships reviews these applications and considers all applicants for all available scholarships. The campus-wide scholarships are both merit-based and need-based. Students will be notified about their potential scholarships during the June-July timeframe.

## Grants

Grants are awarded on the basis of financial need. There is no repayment requirement. A student's financial aid award includes grant funds whenever regulations, UCI policies and funding levels permit.

**Federal Pell Grant** is the largest federally funded grant program and provides up to a maximum of \$6,345 for the 2020-21 academic year. To be eligible, applicants must be U.S. citizens or eligible noncitizens, be enrolled as undergraduates, have not previously received a bachelor's degree, and demonstrate financial need. Students must use the FAFSA to apply for this grant. Students must be enrolled full time (12 units) to receive the full grant, and enrolled at least half time (6 or more units) to receive a prorated amount. The amount of Pell Grant funds students may receive over their lifetime is limited to the equivalent of six years of Pell Grant funding.

**Cal Grant A** is a state-funded grant program which currently provides awards to be applied to the payment of University tuition and fees. In 2019-20, Cal Grant A awards paid up to \$12,570. To be eligible, applicants must be California residents and demonstrate financial need. Students must use the FAFSA and GPA Verification Form to apply for Cal Grant A. The filing deadline for new applicants is March 2 for the following year. Students must be enrolled full time (12 units) to receive the full grant, and enrolled at least half time (6 or more units) to receive a prorated amount.

**Cal Grant B** is a state-funded grant program which provided access awards in the 2019-20 year up to a maximum of \$1,672 for living expenses during the student's first year. In subsequent years, students qualify for this access award plus an award for tuition and fees. In 2019-20, Cal Grant B tuition/fee awards paid up to \$12,570. To be eligible, applicants must be California residents, demonstrate financial need, and be entering college or not have completed more than one quarter of college work. Students must use the FAFSA and GPA Verification Form to apply for Cal Grant B. The filing deadline for new applicants is March 2 for the following year. Students must be enrolled full time (12 units) to receive the full grant, and enrolled at least half time (6 or more units) to receive a prorated amount. *NOTE: Students may not receive both Cal Grant A and Cal Grant B.*

**Middle Class Scholarship (MCS)** is a state-funded scholarship program which currently provides awards to be applied to the payment of University tuition and fees. To be eligible, applicants must be undergraduate students who are California residents or AB-540 eligible and have a household income no greater than \$184,000 and household assets of no more than \$184,000. Students must use the FAFSA/California Dream Application to apply for this award. The filing deadline for new applicants is March 2 for the following year. Students must be enrolled at least half time (6 units) to receive the scholarship. In 2019-20, Middle Class Scholarship awards paid up to \$5,028. Award amounts are determined after a student is awarded any federal and state grants as well as any portion of UC aid which is specifically designated for system-wide tuition and fees. A student will be awarded a scholarship only if these awards, taken together, do not already exceed the amount that the student is entitled to under the MCS program.

**Federal Supplemental Educational Opportunity Grant (FSEOG)** provides grant aid for U.S. citizens and eligible noncitizens who are undergraduate students and have demonstrated financial need. The amount awarded depends upon financial need and funding levels.



**UCI Grant** is funded by The Regents of the University of California and by the State of California and provides grant aid for full-time students who demonstrate financial need. The amount awarded depends upon financial need and funding levels.

## Loans

Loans are often part of a financial aid award. They provide recipients with an opportunity to defer the cost of their education by borrowing when needed and paying later. However, loan recipients must pay interest on the amount borrowed. The deferment and cancellation provisions for the loans listed below are contained on the promissory note each recipient must sign and may be obtained from the Office of Financial Aid and Scholarships.

A student's loan responsibility, prior to acceptance of the loan, is to understand the terms of the loan. After accepting the loan, the recipient must repay the loan in accordance with the repayment schedule; advise the Office of Financial Aid and Scholarships upon leaving UCI; participate in an exit interview; and provide the Financial Services Office with a current address after leaving UCI. In case of death or total disability, outstanding loan obligations may be cancelled upon presentation of official confirming documents.

**University Loan**, funded by The Regents of the University of California, provides long-term loans to undergraduates who are full-time students who demonstrate financial need. The maximum amount for an academic year is typically \$1,000. Interest of five percent a year begins six months after the student ceases to be enrolled at least half time, and repayment must be completed within ten years. Two cosigners are required.

**DREAM Loan**, funded by The Regents of the University of California and the State of California, provides long-term subsidized loans to DREAMER students who demonstrate financial aid eligibility. The maximum amount for an academic year is \$4,000. The interest rate matches the subsidized Direct Loan rate for that same academic year (Interest rates are available at the Federal Student Aid Interest Rates and Fees website (<https://studentaid.ed.gov/sa/types/loans/interest-rates/>)). Interest begins six months after the student ceases to be enrolled at least half time, and repayment must be completed within ten years.

### William D. Ford Direct Loan Program

**Subsidized William D. Ford Federal Direct Loan**, processed through the U.S. Department of Education and UCI, is available to undergraduates who are U.S. citizens or eligible noncitizens, and who demonstrate financial need. During an academic year, the maximum a student may borrow is \$3,500, freshmen; \$4,500, sophomores; \$5,500, juniors and seniors. A loan fee will be deducted from the amount of the loan prior to issuing the check.

Interest rate: If a student receives a loan that is first disbursed between July 1, 2012, and July 1, 2016, the student will be responsible for paying any interest that accrues during the grace period. If a student chooses not to pay the interest that accrues during the grace period, the interest will be added to the principal balance.

If a student received a loan prior to July 1, 2012, the federal government pays the interest during the deferment period.

Interest rate: Visit the Federal Student Aid Interest Rates and Fees website (<https://studentaid.ed.gov/sa/types/loans/interest-rates/>) for current as well as historic loan rates and fees.

For first-time borrowers borrowing on or after July 1, 2013, there is a limit on the maximum period of time (measured in academic years) that you can receive Direct Subsidized Loans. In general, you may not receive Direct Subsidized Loans for more than 150 percent of the published length of your program. For more information, visit: <https://studentaid.ed.gov/types/loans/subsidized-unsubsidized#eligibility-time-limit> (<https://studentaid.ed.gov/types/loans/subsidized-unsubsidized/#eligibility-time-limit>)

**Unsubsidized Federal Direct Loans** have the same terms and conditions as the Federal Direct Loan, including the aggregate loan limits, interest rate and repayment. During an academic year the maximum a dependent student may borrow is \$5,500, freshmen; \$6,500, sophomores; \$7,500, juniors and seniors. Independent students may borrow an annual maximum of: \$9,500, freshmen; \$10,500, sophomores; \$12,500, juniors and seniors; \$20,500, graduate/professional; and \$32,000, medical students. These maximum amounts include any amount borrowed under the Subsidized William D. Ford Federal Direct Loan program. However, the loan is not based on need. Students may borrow an amount equal to the cost of attendance, less any estimated financial assistance up to the annual loan limits in effect at the time the loan is disbursed. Students must first apply for the Federal Direct Loan prior to consideration for the Unsubsidized Federal Direct Loan. There is no interest subsidy for this loan; students pay the interest charged while enrolled at UCI. Students may receive both subsidized and unsubsidized Federal Direct Loans, but the total may not exceed the loan limits. Borrowers with both types of loans may have a single repayment schedule.

Interest rate: Visit the Federal Student Aid Interest Rates and Fees website (<https://studentaid.ed.gov/types/loans/interest-rates/>) for current as well as historic loan rates and fees.

Cumulative maximum: Dependent, undergraduate, \$23,000; independent, undergraduate, \$57,500; graduate and professional students, \$138,500 (includes undergraduate loans); medical students, \$224,000 (includes undergraduate loans). Deferment period before repayment: six months after ceasing to be enrolled at least half time. Interest accrues immediately and may be paid monthly or quarterly. Students also may request that the lender add the interest to the principal balance. Repayment of principal begins six months after ceasing to be enrolled at least half-time. Full repayment: Up to 10 years. Minimum payment: \$50 per month.

**Graduate PLUS Loans** are available to graduate and professional-level students. Students may borrow up to the cost of education for the academic year, less any estimated financial aid. The loan is limited to students who do not have adverse credit histories as defined by regulation.

Interest rate: Visit the Federal Student Aid Interest Rates and Fees website (<https://studentaid.ed.gov/sa/types/loans/interest-rates/>) for current as well as historic loan rates and fees.

**Federal Direct Parent Loans for Undergraduate Students (PLUS)** are designed to assist parents of dependent undergraduate students who are unable to demonstrate financial need for campus-based funds. Parents are eligible to borrow up to the cost of education for the academic year, less any estimated financial aid each academic year, on a student's behalf. The loan is limited to parents who do not have adverse credit histories as defined by regulation.

Interest rate: Visit the Federal Student Aid Interest Rates and Fees website (<https://studentaid.ed.gov/sa/types/loans/interest-rates/>) for current as well as historic loan rates and fees.

Cumulative maximum: None. Deferment period before repayment: 60 days from day of final check disbursement for loan period. Full repayment: Up to 10 years.

**Loans for Disadvantaged Students and Primary Care Loans** are available to medical students. For information, call the School of Medicine Financial Aid Office at 949-824-6476 or visit the School of Medicine Financial Aid Office website. (<http://www.ofas.uci.edu/content/medical.aspx>)

**Emergency loans** are made from an emergency student loan fund made possible through various philanthropic individuals and organizations.

Undergraduate, graduate, and medical students who have experienced unanticipated financial problems of a temporary nature may borrow up to \$300 without interest or service charge. Emergency loans must be repaid within 30 days after disbursement or by the end of the academic quarter, whichever occurs first. Applications are available in the Office of Financial Aid and Scholarships or at the School of Medicine Financial Aid Office. This loan is not based on demonstrated financial need.

## Federal Work-Study

The Federal Work-Study Program offers eligible students who demonstrate need an opportunity to pay for their living and educational expenses as they occur. By participating in the Federal Work-Study Program, students can reduce the amount of the loan to be repaid after leaving school. Students awarded work-study have the choice of obtaining a work-study job either on campus or off campus at an approved nonprofit agency. A variety of work opportunities are available, and such part-time work experience can be a valuable asset when seeking employment after graduation. Students eligible for work-study will be notified as such via their UCI Financial Aid award notification. Specific information regarding the terms and conditions of work-study employment will be available with the award notification.

**The U.S. Department of Veterans Affairs (VA) Work-Study Program** is managed by the Veteran Services Center (VSC) at UC Irvine and available to active duty, reservists, National Guard, veterans and dependents (adult children and spouses) who are receiving VA education benefits, including Chapters 30, 31, 32, 33, 35, and 1606. For more information about this program, please follow this link: <https://www.benefits.va.gov/gibill/workstudy.asp>. Please contact the VSC to complete the application for a VA Work-Study position at [veteran@uci.edu](mailto:veteran@uci.edu) or (949) 824-3500. For applications and detailed information, call the **Veteran Services Center** at 949-824-3500 or visit the Veteran Services website. (<http://veteran.uci.edu/>)

## Majors and Careers

### On This Page:

- [Choosing a Major](#)
  - [Undecided/Undeclared Students](#)

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## Choosing a Major

Many students select their University major, the field of study which represents their principal academic interest, at the time they fill out their *University of California Undergraduate Application for Admission and Scholarship*. Some students, however, are not ready to choose a major at the time they apply and that's OK, and still others may wish to change to a different major after they have enrolled.

In preparation for choosing a major, students need to familiarize themselves as much as possible with UCI and its academic programs. Entering students are exposed to a wide range of areas of study, and it is not unusual for students to become enthusiastic about academic disciplines previously unfamiliar to them. At UCI, a number of traditionally separate academic disciplines have strong interrelationships, so that the academic environment is influenced by broad interactions among disciplines. As a complement to classroom study, UCI encourages its students to become involved in a variety of educational experiences such as independent study, laboratory research, field study, writing workshops, computing, and arts productions. Such experiences can help students identify additional areas of interest.

The *UCI General Catalogue* is a good place to find specific information about programs available and requirements. Students are encouraged to talk to academic advisers and faculty advisers and to go to any department to learn more about its programs of study, its requirements for graduation, and possible enrollment limitations. While advisers may not be familiar with all fields, they can suggest ways to investigate other areas of study and be



helpful in planning a lower-division program which will keep several options open. Courses and workshops designed to assist students in choosing a major are offered by the UCI Career Center, the Division of Undergraduate Education, and some of the academic units.

All students are required to choose a major by the time they reach junior status. It is important to look well ahead to this decision and to think about it carefully during the freshman and sophomore years. When considering possible majors, students should keep in mind that some major programs require quite specific preliminary study. At the same time, excessive early concentration could reduce a student's options and could cause the student to need more than four years to obtain the baccalaureate degree. Furthermore, courses required for graduation need to be considered. For these reasons, it is desirable for students to plan their programs carefully and thoughtfully, seeking a balance between exposure to a variety of academic areas and completion of courses which are prerequisite to a major under consideration. A qualified student interested in two areas of study may graduate with a double major by fulfilling the degree requirements of any two programs. Certain restrictions may apply; students should check with their academic adviser.

Each school or program has its own standards for change of major. Once a student selects a major, or decides to change majors, the student should visit the academic advising office for their prospective major to obtain current information about prerequisites, program planning, and policies and procedures. For most majors, students may request a change of major by submitting an online application through StudentAccess. Further information and a list of excluded majors is available on the University Registrar's website (<http://www.reg.uci.edu/request/changemajor/>).

All schools with exceptional requirements have major-change criteria approved by the Academic Senate and published on the Division of Undergraduate Education's Change of Major Criteria website (<http://www.changeofmajor.uci.edu>). Students changing majors may meet the approved major-change criteria of the unit they wish to enter that are in place at the time of their change of major or those in effect up to one year before.

## **Division of Undergraduate Education - Undergraduate/Undeclared**

Students who enter the University as freshmen or sophomores, who are uncertain about their major, and who wish to explore their options, experiment, and then decide, may participate in the Division of Undergraduate Education - Undergraduate/Undeclared Advising Office administered by the Division of Undergraduate Education. The Division is devoted to enriching the learning environment for lower-division students, especially those in the freshman year. Detailed information about the Undergraduate/Undeclared Advising Program is available in the Division of Undergraduate Education section.

## **Preparation for Graduate or Professional Study**

Undergraduate students should keep the possibility of future graduate or professional study in mind as they plan their academic programs, and they should discuss their career goals with their advisors. Students who have an idea of the direction in which they would like to go should familiarize themselves with the basic requirements for postbaccalaureate study and keep those requirements in mind when selecting courses. Furthermore, students should supplement their undergraduate programs by anticipating foreign language or other special requirements at major graduate schools and by related research, or intensive work in areas outside their major that are of special relevance to their intended graduate work. Students should consult the graduate advisor or academic counselor in the academic unit corresponding to their area of interest and visit the UCI Career Center which offers a number of services useful to those considering graduate or professional study.

General information for prospective graduate students is available on the Graduate Division website (<http://www.grad.uci.edu/>), while information about UCI's graduate education policies and procedures is available at the Irvine Division of the Academic Senate website (<http://www.senate.uci.edu>).

## **Preprofessional Preparation**

### **Law**

Law schools educate lawyers to serve the entire spectrum of legal issues (e.g., tax, criminal, entertainment, or immigration law), and across a wide variety of careers in private, public, and nonprofit sectors. As a result, a wide range of academic backgrounds can serve as good preparation for a career in law. Law schools look less for specific areas of study than they do for evidence of academic excellence. A good record in physics or classics, for example, will be preferred over a mediocre record in history or political science. Most law schools give equal preference to students from all academic disciplines. Courses that demand strong writing and analytical work (e.g., logic, writing, mathematics, research methods, and statistics) build skills that are the key to doing well on the Law School Admissions Test (LSAT) and succeeding in law school and the legal profession.

UCI offers a number of law-related courses that students in any major may take. The School of Humanities offers a Humanities and Law minor, emphasizing courses that require critical reading and analysis, and courses that focus on theoretical and applied analytical perspectives on ethical, political, and social issues relevant to the law. Further, the globalization and increased diversity of our world puts a premium on strong language skills and an understanding of multiple cultures. The School of Social Sciences offers courses in the study of law, international relations, and economics of law and recommends that students take some political science courses as well. The School of Social Ecology offers many law-related courses in both substantive law (such as environmental and criminal law) and in law and society and criminal justice. Social Ecology majors are provided the opportunity to apply theories learned in the classroom to actual problems through its field study program. Students may pursue fieldwork in both public and private law practices, law enforcement, and corrections agencies. Through these placements, students gain direct experience and have the opportunity to shadow professionals in these areas.

Students should know that law schools look closely at five aspects of a student's application: grades, LSAT results, the applicant's statement of purpose, in-depth letters of recommendation, extracurricular activities, and law-related work experience. Students should be aware that not everyone who applies is admitted to law school. One consideration in selecting an undergraduate major is alternative careers should one's goals change.

## Medicine and Other Health-Related Sciences

Although health science educators strongly recommend that students obtain a bachelor's degree prior to admission to the health sciences, there is no preferred major. Many UCI students, who plan to enter the health professions, major in Biological Sciences because much of the basic course work for that major is also required for medical school admission; however, students may major in any academic field as long as they also take the prerequisite courses required by professional health science schools. In general, the minimum amount of undergraduate preparation required includes one year each of English writing/composition, physics, biology with laboratory, chemistry (to include inorganic, organic, and biochemistry), and mathematics (especially calculus and statistics). Courses in cell biology, developmental biology, genetics, molecular biology, physiology, and computer science are recommended. In addition, some health sciences schools have additional course requirements or recommendations, for example, English and/or a foreign language, in particular, Spanish.

Although many factors ultimately are considered when reviewing applicants for admission, admission committees look carefully at the undergraduate grade point average; academic performance in biology, chemistry, physics, and math coursework; the results of the Medical College Admission Test (MCAT); the student's personal essay and/or interview; letters of recommendation; clinical exposure; research experience, especially in a biological, medical, or behavioral science; and extracurricular activities which demonstrate the applicant's ability to interact successfully with a diverse population of individuals.

Since medical programs cannot accommodate all qualified applicants and competition for entrance is keen, it is important to keep in mind alternative career opportunities should one not be accepted to a health science school, or should one decide to pursue instead, one of the expanding number of health-related programs now available.

## Business/Management

The contemporary executive or manager must be a creative thinker, make complex decisions, and have the ability to perceive and participate in the full scope of an enterprise while understanding its role in the economy. Effective management requires leadership ability, strong problem-solving skills, the ability to successfully deploy and manage information technologies, effective oral and written communication skills, analytical skills, an understanding of global economic trends, and a basic knowledge of behavioral processes in organizations.

Although not required for preprofessional school preparation, The Paul Merage School of Business offers a major in Business Administration and a major in Business Information Management with the Donald Bren School of Information and Computer Sciences. The Merage School also offers minors in Management, Accounting, and Innovation and Entrepreneurship as a supplement to any undergraduate major. The Management minor can provide students with a broad understanding of management theory and practice and may be helpful to students in determining whether they wish to pursue a career in business or management or undertake graduate-level study in management. The Accounting minor prepares students for careers in the accounting field or for graduate-level study. The minor in Innovation and Entrepreneurship provides extensive academic and practical training for students to embark on careers as entrepreneurs (innovating to form new companies) and intrapreneurs (innovating within existing companies).

Students can also supplement their major course work to develop the skills needed for business and management by taking electives such as calculus, statistics, economics, psychology, sociology, computer science, and political science. Also, students are encouraged to take intensive course work in the culture, history, geography, economy, politics, and language of specific foreign countries.

For admission purposes, the majority of graduate schools of business look at five areas: grades, scores on the Graduate Management Admission Test (GMAT), the applicant's statement of purpose, in-depth letters of recommendation, evidence of leadership in school and community activities, and work experience. Substantive work experience is becoming an increasingly important prerequisite for many programs.

Students from a variety of undergraduate disciplines including liberal arts, social sciences, physical or biological sciences, computer science, and engineering are encouraged to apply to UCI's Paul Merage School of Business.

## Career Opportunities

UCI's academic units which offer undergraduate education leading to the bachelor's degree provide students with opportunities to explore a wide range of interests leading to a career choice or to further education at the graduate or professional level. The lists which follow show the varied career areas pursued by UCI graduates. Any major can lead to a number of careers. Additional discussions of careers are presented in individual academic unit sections.

### Arts Career Areas

*Acting, Advertising, Animation, Arts Administration, Art Therapy, Broadcasting, Choreography, Community Development, Composition, Conducting, Conservation/Restoration, Consulting, Criticism, Curating, Digital Arts Production, Direction, Environmental Design, Graphic Design, Illustration, Instrument Repair/Tuning, Interior/Industrial Design, Journalism, Law, Librarianship, Lighting, Marketing, Medical Illustration, Music Therapy, Performance, Photography, Photo Journalism, Physical Fitness, Printing, Production, Publicity, Public Relations, Publishing, Set/Stage/Costume Design, Stage Management, Talent Management, Teaching, Tourism, Visual Resources Management, Writing*

The exceptionally talented graduates of the Claire Trevor School of the Arts may choose to become professional actors, art historians, artists, dancers, or musicians. However, there are many other careers to explore in numerous arts-related areas, or the graduate may wish to combine part-time professional performance with supplemental work. The field of arts administration is an increasingly important career area, offering opportunities to work with opera and dance companies, repertory theatre companies, museums, state and local arts councils, community arts organizations, and arts festivals.

## Biological Sciences Career Areas

*Bioanalysis, Biochemistry, Biomedical Engineering, Cell Biology, Chiropractic Medicine, Dentistry, Developmental Biology, Dietetics, Environmental Management, Forestry, Genetic Engineering, Health Administration, Industrial Hygiene, Marine Biology, Medical Technology, Medicine, Microbiology, Nurse Practitioner, Occupational Therapy, Oceanography, Optometry, Osteopathy, Plant Biology, Pharmacology, Pharmacy, Physicians' Assistant, Physical Therapy, Podiatry, Public Health, Quality Control, Research, Sales, Speech Pathology, Teaching, Technical Writing and Editing, Veterinary Medicine*

The health field is one of the fastest-growing career areas in the country. Work sites may include private corporations, educational institutions, hospitals, health care complexes, private foundations, city and county governments, state agencies, the federal government, and many others.

## Education Sciences Career Areas

*Administration and Leadership, Adult and Family Services, After School Learning and Development, Child and Adolescent Learning and Development, Curriculum Design, Digital Media, Education Publishing, K-12 Education, Language Learning, Learning Technologies, Policy Analytics, Research and Evaluation, School and Vocational Counseling, Student Affairs*

Graduates of Education Sciences are prepared for careers in the global knowledge economy, with opportunities to apply learning modalities and technologies in multicultural contexts. Graduates may choose from diverse career opportunities in public education, informatics, higher education, and education software development. Employers include government, private industry, and non-profit organizations. Many graduates will pursue advanced degrees leading to instructional certification, academic research, or administrative leadership.

## Engineering Career Areas

*Aerospace, Biochemical, Biomedical Devices and Instrumentation, Biomedical Imaging, Biotechnology, Chemical Engineering, Communications, Computer Architecture, Computer Engineering, Computer Software, Control Systems, Digital Signal Processing, Earthquake Safety, Electric Power, Electronics, Electro-optics, Environmental Control, Environmental Engineering, Flood Control, Geotechnical, High-Speed Image Processing, Hydraulics, High-Frequency Devices and Systems, Land Development and Urban Planning, Manufacturing Engineering, Materials, Process Control, Propulsion and Power, Public Works, Reliability, Robotics, Structures, Traffic, Transportation, Water Resources, Water Supply*

These are some areas for employment available to UCI engineering graduates. Career paths typically involve one or more of the following: design, research and development, manufacturing or construction, operations, consulting, applications and sales, management, or teaching. At UCI they will have had the choice of Aerospace, Biomedical, Biomedical: Premedical, Chemical, Civil, Computer, Computer Science and Engineering, Electrical, Environmental, Materials Science and Engineering, or Mechanical Engineering, as well as a general program in Engineering. However, they will frequently find challenging positions in related areas such as industrial engineering, for which their general and specialty course work at UCI, followed by formal or informal, on-the-job training will qualify them. Approximately half of UCI's Engineering graduates obtain advanced degrees from UCI or other universities, and almost all engage in continuing education to keep abreast of advances in technology. Many Engineering graduates build on their engineering background and enter graduate programs to obtain degrees in the fields of administration, law, medicine, physics, or mathematics.

## Humanities Career Areas

*Advertising, Banking, Broadcasting, Business, Counseling, Communications, Diplomacy, Education, Film and Television, Foreign Service, Government Service, Human Resources, Insurance, International Relations, Journalism, Law, Library Science, Management/Administration, Marketing, Medicine, Personnel, Politics, Public Administration, Public Relations, Publicity, Publishing, Research, Retail Sales, Screenwriting, Social Service, Social Welfare, Teaching, Technical Writing, Tourism, Translating/Interpreting, Writing*

The School of Humanities prepares students to be global citizens and leaders in today's world. Students not only master a body of knowledge, but they also develop a set of portable skills needed for a lifetime. Humanities majors are well-suited for widely-varied careers because they are taught to read closely, to observe critically, to think logically and analytically, to research methodically, and to communicate effectively across cultures. They can develop varied, long, and successful careers because of their heightened social and emotional intelligence and ability to learn and adapt on the job. Diverse career fields available to Humanities graduates include entry-level positions in both the public and private sectors or professional-level opportunities combining the degree with further specialization. Humanities graduates may also elect to enter into professional graduate programs such as education, law, library science, medicine (with proper prerequisites), or public administration. Business and industry utilize Humanities graduates for various management training programs including areas in banking, retail sales, and insurance. Graduates with special skills in oral and written communications may look to positions with newspapers, advertising agencies, public relations firms, radio and television stations, and publishing houses. Technical writers are in demand, particularly those who have had some preparation in engineering, computer science, and/or the sciences. Opportunities for graduates fluent in languages other than English can be found in areas like government, business, social service, counseling, foreign service, and international trade.

## Information and Computer Science Career Areas

*Applications Programming, Bioinformatics, Computer-Aided Design, Computer Animation, Computer Architecture, Computer Networks, Computer Simulation, Computer Systems Design, Cybersecurity, Databases, Digital Media and Learning, Information Systems Design and Consulting, Embedded Systems, Machine Learning, Management Information Systems, Multimedia Applications, Parallel and Distributed Systems, Software Engineering, Human-Computer Interface Design, Supercomputing, Systems Administration, Systems Analysis and Design, Systems Programming, Business Information Management*

Graduates of the Donald Bren School of Information and Computer Sciences pursue a variety of careers. Many graduates specify, design, and develop a variety of computer-based systems comprised of software and hardware in virtually every application domain, such as aerospace, automotive, biomedical, consumer products, engineering, entertainment, environmental, finance, gaming, investment, law, management, manufacturing, and pharmacology. Bren School graduates also find jobs as members of research and development teams, developing advanced technologies, designing software and hardware systems, and specifying, designing, and maintaining computing infrastructures for a variety of institutions. Some work for established or start-up companies while others work as independent consultants. After a few years in industry, many move into management or advanced technical positions. Some Bren School students also use the undergraduate major as preparation for graduate study in computer science or another field (e.g., medicine, law, engineering, management).

## **Nursing Science Career Areas**

*Direct Patient Care in Hospitals, Clinics, Communities, and Homes, Advance Primary Care Practice (e.g., Nurse Practitioner), Higher Education (e.g., Nursing Professor), Health-related Research, Health Care Administration, Provider Relations, Policy Analysis, Policy Development, Risk Assessment, Global Health, Consulting, Program Evaluation, Incident/Disease Investigation, Research Methodology, Data Analysis, Clinical Trials, Social and Economic Development, Health Policy and Law, Women's Health, Children's Health, Health and Behavior, Design of Health Care Systems, Pharmaceutical Production and Development, Biotechnology, Medicinal Chemistry, Medicine, Pharmacy, Health Promotion, Health Care Delivery Systems, Physical Restoration and Rehabilitation, Program Management and Design, Disease Prevention and Control, Community Health and Outreach, Health Forensics, Health Insurance and Management, Information Technology, Marketing, Public Relations*

Graduates of Nursing Science are prepared for a wide range of unparalleled career opportunities at the frontiers of many emerging and established fields in health care, industry, government, and research and education. Opportunities include working with private corporations, hospitals, medical clinics, health care agencies, pharmaceutical industry, biotechnology industry, local and state government agencies, the federal government, educational providers, court and probation systems, and many others. Graduates can use their education and training to enter a rich variety of graduate programs and to earn professional degrees in related fields.

## **Pharmaceutical Sciences Career Areas**

*Pharmaceutical Production and Development, Biotechnology, Medicinal Chemistry, Medicine, Pharmacy, Health Promotion, Health Care Delivery Systems, Physical Restoration and Rehabilitation, Program Management and Design, Disease Prevention and Control, Community Health and Outreach, Health Forensics, Health Insurance and Management*

Graduates of Pharmaceutical Sciences are prepared for an unparalleled range of career opportunities in emerging and established biomedical fields in industry, government, research institutes, and education. Opportunities include working in private corporations, hospitals, medical clinics, health care agencies, pharmaceutical industry, biotechnology industry, local and state government agencies, the federal government, educational providers, court and probation systems, and many others. Graduates have a rich variety of choices in filling professional positions in any of these settings or first pursuing additional training at the graduate level in pharmaceuticals, chemistry, pharmacology, or biological sciences. Earning an advanced professional degree in pharmacy, medicine, dentistry, physician assistant, nursing, or public health is yet another popular option.

## **Physical Sciences Career Areas**

*Actuarial Science, Aerospace, Analytical Chemistry, Applied Physics and Chemistry, Astrophysics/Astronomy, Bioscience, Computers, Data Science, Energy Science, Electronics, Engineering Applications, Environmental Science, Food Chemistry, Forensic Chemistry, Geoscience, Inorganic Chemistry, Instrumentation, Laboratory Science, Lasers, Materials Science, Medicine, Nuclear Science, Optical Devices, Organic Chemistry, Pharmacology, Physical Chemistry, Plasma Physics, Quality Control, Radiation Science, Radiology, Solid State Devices, Space Science, Statistics, Teaching*

Graduates of the School of Physical Sciences have backgrounds appropriate to a variety of areas in research, teaching, and management. Career opportunities for physical scientists are found in federal, state, and local government as well as in private industry. Chemists may work in research and development and in jobs dealing with health, pollution, energy, fuel, drugs, and plastics. Water districts, crime labs, and major chemical and oil companies are also good resources for employment. Earth System Science and Environmental Science majors will find employment in areas such as hazardous waste treatment, resource extraction, pollution remediation, and as consultants to government and high-technology fields. Mathematics graduates find employment in both government and the private sector in such technical fields as operations research, computer programming, marketing research, actuarial work, banking, retail management, and scientific research. Physics and Applied Physics graduates find professional positions in education, research and development, and in the electronic and aerospace industries. Possible careers include science teaching and writing, computer and electrical engineering, device and instrumentation development, nuclear and reactor physics, environmental and radiological science, laser and microchip development, astronomy, and geophysics.

## **Public Health Career Areas**

*Global and International Health, Disease Prevention, Surveillance, Natural Disasters, Emergency Preparedness and Response, Environmental Health Science, Epidemiology, Health Behavior, Health Psychology, Health Economics, Engineering and Health, Health Policy Analysis, Health Care Management, Health Services Administration, Biostatistics, Health Communication, Health Informatics, Complementary and Alternative Medicine, Health Promotion, Health Demography, Health Insurance, Community Health, Health Risk Assessment, Forensics, Biotechnology, Vaccinology, Genetic Engineering, Health Geography, Health Education, Infectious Disease Prevention, Chronic Disease Prevention, Wellness, Clinical Trials, Urban Health, Rural Health, Water Quality, Nutrition and Food Protection, Air Quality and Health, Health Geology, Vulnerable Populations, Burden of Disease Assessment*



The increase in human population, widening diversity of socioeconomic and cultural attributes, rapid mobility, and internet-enabled broadening of social networks are compelling reasons to pursue careers in public health. Government policies that affect access to health care resources may also influence our ability to prevent disease and promote health in populations. Graduates of the UC Irvine Program in Public Health are prepared for careers in research, teaching, and public health practice in private and public sectors. Challenges in public health require acquisition and ready deployment of fundamental knowledge and practical skills. Employment opportunities exist at city and county health care agencies, state departments of public health, national institutions such as the Centers for Disease Control and Prevention, and international agencies such as the World Health Organization. Private foundations and corporations employ public health graduates, including, for example, the Bill and Melinda Gates Foundation and various health insurance providers. Nonprofit organizations and community service groups also employ public health degree holders. Graduates who are interested in academic career tracks focusing on research and/or teaching will find employment at various units within public and private universities and think-tanks.

## Social Ecology Career Areas

*Administration, Architecture, Biostatistics, Clinical Psychology, Corrections/Probation, Counseling, Education, Educational Support Services, Environmental Design, Environmental Planning and Consulting, Epidemiology, Government Service, Health Service, Hospital Administration, Housing Development, Human Resources, Law, Management/Administration, Mental Health, Program Coordination, Psychology, Public Health Research, Public Relations, Real Estate/Development, Research and Research Design, Social Service, Teaching, Urban Planning, Water Quality Control*

Graduates of the School of Social Ecology may hold positions as urban planners, environmental consultants, juvenile probation officers, counselors, elementary and secondary school teachers, legal aides, coordinators of juvenile diversion programs, social workers, mental health workers, special education teachers, architectural consultants, and elected officials, just to cite some examples of career choices. Many School of Social Ecology graduates have used their training to enter graduate programs and obtain advanced degrees in the fields of law; clinical, community, social, developmental, and environmental psychology; public health; public and business administration; environmental studies; urban planning; social welfare; criminology; and the administration of justice.

## Social Sciences Career Areas

*Banking, Correction/Probation, Counseling, Environmental Analysis, Finance, Foreign Service, Government Service, Health Services, Human Services, Industrial Relations, International Affairs, Labor Relations, Law, Library Science, Management/Administration, Marketing, Personnel, Psychology, Public Relations, Publishing, Real Estate, Research, Sales, Statistical Analysis, Teaching, Writing*

Business and industry often look to social science graduates to fill positions in management, finance, marketing and advertising, personnel, production supervision, and general administration. In the public sector, a wide variety of opportunities are available in city, county, state, and federal government. Teaching is a frequently chosen career at all levels from elementary school teacher to university professor. In addition, many graduates enter professional practice, becoming lawyers, psychologists, researchers, or consultants in various fields.

## Special Programs

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### Concurrent Enrollment and Summer Session

Exceptional high school students can enroll in UCI classes without formal admission to the University year-round.

During the academic year, concurrent enrollment is ideal for well-prepared high school seniors who have exhausted the curriculum available in high school and who are looking for advanced-level course work, or for students who are seeking an enrichment course or course work not available at their high school. For information, call 949-824-5414, email [dce-services@uci.edu](mailto:dce-services@uci.edu), or visit the Concurrent Enrollment website (<https://ce.uci.edu/courses/concurrent/>).

During the summer, high school students who will be a junior or senior in the upcoming fall and have an unweighted GPA of 3.0 or higher in college preparatory classes can enroll in UCI Summer Session courses numbered 1-99 without special prerequisites through open enrollment. Complete an enrollment form and submit it along with your transcript to the Summer Session Office. For more information, contact the UCI Summer Session Office at 949-824-6494, email [summer-session@uci.edu](mailto:summer-session@uci.edu), or visit the Summer Session website (<http://summer.uci.edu>).

Admission and enrollment in courses either through Concurrent Enrollment or UCI Summer Session does not constitute admission to UCI as an entering freshman student. See the Undergraduate Admissions section of this *Catalogue* for information about applying to UCI and the formal admission process.

### UCI Center for Educational Partnerships

The mission of the UCI Center for Educational Partnerships (CFEP) (<http://www.cfep.uci.edu/>) is to create collaborations that support preparation for and success in higher education. CFEP's focus is on equity and access for all students in order to achieve the University of California's goal of academic excellence. CFEP has three guiding principles: (1) diversity among students and faculty enhances the educational experience the University provides and the scholarship it produces; (2) collaboration promotes the exchange of ideas, leverages resources and drives collective action; and (3) research guides practice, promotes accountability and advances knowledge.

In order to achieve its mission, CFEP builds lasting partnerships with individuals and institutions committed to improving education; facilitates faculty involvement; engages in K-12 academic preparation; provides teacher professional development; promotes college-going culture; supports

undergraduate retention; enhances graduate school preparation; conducts research and evaluation; participates in the national dialogue about educational reform and collaboration; and fosters learning communities to support ongoing professional and intellectual development.

For additional information, call 949-824-7482 or visit the Center for Educational Partnerships website (<http://www.cfep.uci.edu>).

## Student Success Initiatives

**Student Success Initiatives**, housed in the **Division of Undergraduate Education**, provides students with the personal, academic, and professional support and development to thrive and succeed at UCI and beyond. SSI is dedicated to serving and assisting with the transitions of low-income students, first-generation students, international students, undocumented students, former foster youth, transfer students, adult-learners, students in transition, students with dependents, and students with disabilities. SSI also provides a learning community that empowers students to be productive and engaged in their academic careers and personal endeavors. Drop-in counseling, scholarships for tutoring, peer mentoring, and weekly workshops are offered throughout the year. Summer academic programs are also available for incoming students. See the Division of Undergraduate Education section of the *Catalogue* for additional information.

## Graduate Diversity Programs

The University of California believes that a diverse student and faculty population is integral to academic excellence. It is critical to promoting the lively intellectual exchange and the variety of ideas and perspectives that are essential to advanced scholarly research. The university remains committed to expanding outreach, recruitment, and retention efforts. Through the Graduate Division's diversity programs, steps are taken to increase the participation of diverse groups of U.S. citizens and permanent residents who have been disadvantaged in obtaining graduate education in the United States. See the Graduate Division section of the *Catalogue* for additional information.

## Medical Student Support Programs

The School of Medicine's Office of Student Support is designed to meet the challenges of California's changing demographics and to contribute to the School's goal of achieving a broad spectrum of diversity in the student population, and ultimately, in the medical profession. The office plays a major role in the recruitment and retention of targeted socioeconomically disadvantaged students who have the potential of service to the medically underserved communities in California. The Office of Student Support also serves as a resource for students by providing a supportive learning environment through advising and counseling prospective students and mentoring students following their admission to medical school. See the School of Medicine section for additional information.

## Undergraduate Admissions

The UCI Office of Undergraduate Admissions is responsible for the admission of new undergraduate freshman and transfer students. Inquiries may be addressed to:

Office of Undergraduate Admissions

University of California, Irvine  
Irvine, CA 92697  
<http://www.admissions.uci.edu>

The Office of Undergraduate Admissions is open from 8 a.m. to 5 p.m., Monday through Friday; telephone 949-824-6703.

## Categories of Application

An **undergraduate** applicant is a student who wishes to complete a program of study leading to a Bachelor of Arts, Bachelor of Fine Arts, Bachelor of Music, or Bachelor of Science degree.

A **freshman** applicant is a student who is currently in high school or has graduated from high school but has not enrolled in a regular session (fall, winter, spring) at a college or university.

A **transfer** applicant is a student who has enrolled in a regular session (fall, winter, or spring) at a college or university after high school. (Students who meet this definition cannot disregard their college records and apply as freshmen. A student who attends a college summer program immediately after graduating from high school or who has completed college work while in high school is still considered a freshman applicant.)

A **California Community College** applicant is one who completed at least 30 semester (45 quarter) UC-transferable units at one or more California Community Colleges. The last college the student attended in a regular session (fall/spring or fall/winter/spring) before admission to a UC campus must be a California Community College.

A **nonresident** applicant is a student whose legal permanent residence (as determined by the University) is outside of the State of California. Nonresident applicants are generally required to pay Nonresident Supplemental Tuition and must also present a higher grade point average than is required of California residents.

An applicant for **readmission** is a student who was formerly registered and enrolled at UCI and who has interrupted the completion of one or more quarters of enrollment. See Readmission: Undergraduate and Graduate Students.

A **second baccalaureate** applicant is a college graduate who wishes to obtain a second bachelor's degree in a major different from that of the first degree.

An **international** applicant is a student who is not a U.S. citizen or U.S. permanent resident.

A **limited status** applicant - frequently known as a non-degree-seeking student - is held to the same restrictions as applicants pursuing a second B.A. or B.S. degree.

## Admission as a Freshman Applicant

The undergraduate admissions policy of the University of California is guided by the University's commitment to serve the people of California and the world, from every culture and ethnicity and across the economic spectrum.

The University's admission requirements, described in detail in the Minimum Admission Requirements for Freshmen section, are designed to ensure that students are adequately prepared for University-level work. Meeting admission requirements entitles an applicant to be considered for admission but does not constitute an offer of admission.

In recent years, the number of freshman applicants to UCI has exceeded the number of spaces available. Since the campus cannot admit all eligible applicants, it must use standards that are more demanding than the minimum UC requirements to select students. These standards, which the University calls selection criteria, are used to identify applicants who have demonstrated the highest academic achievement and who have a variety of other qualities that can contribute to the strength and diversity of the campus community.

In the case that UCI is unable to accommodate all qualified applicants in their first-choice major, those students who indicate a valid alternate major may be offered admission in that major. Students who wish to change their major after enrolling at UCI must submit an Undergraduate Petition for Change of Major to the academic counseling office in the school or program of their prospective major.

## Admissions Selection

**Due to COVID-19, be sure to visit [admissions.uci.edu/fall2020FAQ](https://admissions.uci.edu/fall2020FAQ) (<https://admissions.uci.edu/fall2020FAQ/>) for the most up-to-date information regarding undergraduate admission requirements.**

UCI seeks to select students who have a demonstrated record of academic and personal achievement. Academic achievement includes the number of college preparatory courses completed; the level of achievement in these courses, including honors, Advanced Placement, International Baccalaureate, and college courses completed; and the quality of the senior-year program as measured by the type and number of academic courses in progress or planned. Also considered are the high school grade point average (GPA) calculated on UC-specified subjects (UCI uses a maximum of eight honors grade points in determining the UC GPA) and the required standardized national examinations.

The level of performance needed to gain admission varies from year to year depending on the size and the academic quality of the applicant pool and the number of enrollment spaces.

Personal achievement outside of the classroom is also considered in UCI's selection process. A range of pursuits is considered, including academic activities, the creative and performing arts, community service and leadership, athletics, participation in pre-collegiate programs that develop academic ability, and other extracurricular activities. Persistence counts more than scattered involvement, while initiative and curiosity are also important.

The admissions process at UCI is also sensitive to individual circumstances and the effect these may have had on the resources available to and the experiences of applicants. While all applications receive careful consideration, reviewers take note of any extenuating circumstances and/or a variety of cultural and economic situations, including students who are the first in their families to attend college, who have a low family income, or who have worked in support of their family during high school. The emphasis, however, is less on the personal circumstances of the applicant and instead is more focused on how the applicant has responded to challenges while achieving academic success.

Every attempt is made to become familiar with the unique accomplishments of each applicant.

Students interested in the majors below should be aware of the following provisions.

### Dance and Music:

Dance applicants must audition in late January/early February in ballet, modern, and jazz, prior to the fall quarter when entrance is anticipated, and be selected by faculty.

All Music applicants must apply to the B.A. program and audition in late January/early February with an instrument or voice, prior to the fall quarter when entrance is anticipated; admission to the B.Mus. program is by a second audition after matriculation.

**Computer Science and Engineering** (offered jointly by the Donald Bren School of Information and Computer Sciences and The Henry Samueli School of Engineering): Applicants must complete four years of high school mathematics through pre-calculus or math analysis and are advised to have completed one year each of chemistry and physics. One semester of programming coursework is also advised. (This requirement does not apply to

other majors offered by the Donald Bren School of Information and Computer Sciences.) That preparation, along with honors courses and advanced placement courses, is fundamental to success in the program. The Henry Samueli School of Engineering recommends that freshman applicants in Engineering majors take the Math Level 2 SAT Subject Test.

**Nursing Science:** Admission to the Nursing Science major is limited and selective. Applicants must complete two years of basic science providing fundamental knowledge in the core disciplines of biology and chemistry. Advanced laboratory science classes that have biology or chemistry as prerequisites and offer substantial additional material may be used to fulfill this requirement. Students must earn grades of C or higher in order to fulfill their subject requirements. Students with the highest combination of overall grade point average, grade point average in science courses, and scores on the SAT or ACT examinations will be given priority.

## Admission Requirements for Freshmen

**Due to COVID-19, be sure to visit** [admissions.uci.edu/fall2020FAQ](https://admissions.uci.edu/fall2020FAQ/) (<https://admissions.uci.edu/fall2020FAQ/>) **for the most up-to-date information regarding undergraduate admission requirements.**

The requirements described below represent the minimum academic standards students must attain to be considered for admission to the University. Meeting minimum admission requirements does not guarantee admission. Admission to UCI and the program of choice often requires students meet more demanding standards.

Freshman applicants who are not residents of California should also refer to the Nonresident Admission Requirements section.

### Subject Requirement

To satisfy the subject requirement, students must complete a minimum of 15 yearlong (or 30 semester) UC-approved college preparatory courses with a letter grade of C or better, with at least 11 (22 semester) of the courses finished prior to the beginning of their last year of high school. These courses are also known as the A-G courses. A grade point average (GPA) of 3.0 or better must be earned (3.4 if the student is a nonresident) in these courses with no grade lower than a C.

#### The 15 required A-G courses are:

**A. History:** Two years of history, including one year of world or European history, cultures and geography (may be a single yearlong course or two one-semester courses); and one year of U.S. history or one-half year of U.S. history and one-half year of civics or American government.

**B. English:** Four years of college-preparatory English that include frequent writing, from brainstorming to final paper, as well as reading of classic and modern literature. No more than one year of ESL-type courses can be used to meet this requirement.

**C. Mathematics:** Three years of college-preparatory mathematics that include the topics covered in elementary and advanced algebra and two- and three-dimensional geometry. A geometry course or an integrated math course with a sufficient amount of geometry content must be completed. Approved integrated math courses may be used to fulfill part or all of this requirement, as may math courses taken in the seventh and eighth grades if the high school accepts them as equivalent to its own courses.

**D. Science:** Two years of college-preparatory science, including or integrating topics that provide fundamental knowledge in two of these three subjects: biology, chemistry, or physics. One year of approved interdisciplinary or earth and space sciences coursework can meet one year of the requirement. Computer Science, Engineering, Applied Science courses can be used in area D as an additional science (i.e., third year and beyond).

**E. Language Other Than English:** Two years, or equivalent to the second level of high school instruction, of the same language other than English are required. (Three years/third level of high school instruction recommended.) Courses should emphasize speaking and understanding, and include instruction in grammar, vocabulary, reading, composition, and culture. American Sign Language and classical languages, such as Latin and Greek, are acceptable. Courses taken in the seventh and eighth grades may be used to fulfill part or all of this requirement if the high school accepts them as equivalent to its own courses. (Students are strongly encouraged to complete three or four years of one language in preparation for the UCI Language Other Than English and/or the International/Global Issues general education requirements.)

**F. Visual and Performing Arts:** One yearlong course of visual and performing arts chosen from the following disciplines: dance, drama/theater, music, interdisciplinary arts or visual art -- or two one-semester courses from the same discipline is also acceptable.

**G. College Preparatory Elective:** One year (two semesters), in addition to those required in 'A-F' above, chosen from the following areas: visual and performing arts, history, social science, English, advanced mathematics, laboratory science and language other than English (a third year in the language used for the "E" requirement or two years of another language).

### Courses Satisfying the "G" Requirement

**History:** All history courses should require extensive reading and writing. Courses should enable students to establish a breadth of understanding of history (for example, world history, political history or economic history) and should provide an understanding of the human past, including its relation to the present. Courses should develop a student's critical thinking, ability to evaluate historical data, and ability to analyze and synthesize evidence.

**Social Science:** Courses should be in one of the social sciences: anthropology, economics, geography, political science, psychology, or sociology, or, alternatively, courses should be interdisciplinary, drawing knowledge from two or more of these fields. Course objectives should include as many of the following as are applicable to the field: (1) to understand the development and basic features of major societies and cultures; (2) to examine the historic



and contemporary ideas that have shaped the world; (3) to understand the fundamentals of how differing political and economic systems function; (4) to examine the nature and principles of individual and group behavior; and (5) to study social science methodologies.

In order to develop a student's critical thinking, ability to evaluate ideas and information, and ability to analyze and synthesize qualitative and quantitative evidence in the laboratory and in the field, a social science course must include a body of basic knowledge, extensive reading, and written and oral exposition.

Courses which are designed to meet state-mandated social studies graduation requirements are acceptable provided that they meet the above criteria. Courses of an applied, service, or vocational character are not acceptable social science electives.

**English:** All English courses should require substantial reading with frequent and extensive practice in writing which is carefully evaluated and criticized. A course in creative writing, journalism, speech or debate is acceptable if it meets the general requirements in reading and writing stated above. An advanced-level course in English as a Second Language (ESL) or English Language Development (ELD) may be acceptable provided it meets the standards outlined under the "B" requirement.

**Advanced Mathematics:** Acceptable electives are courses in mathematics with second-year algebra as a prerequisite such as trigonometry, linear algebra, precalculus (analytic geometry and mathematical analysis), calculus, and probability and statistics.

A computer science course is an acceptable mathematics elective if it fulfills the following objectives. The course should enable each student to express algorithms in a standard computer language such as C++, Pascal, Java, BASIC, FORTRAN, or COBOL. By the end of the course, each student should complete substantial programming projects in the language used. The course should also involve the study and mastery of various aspects of computer science: how computers deal with data and instructions, the internal components of a computer, and the underlying computer logic.

**Science:** Acceptable courses should cover topics from the biological or physical sciences in which students make their own observations and measurements and analyze these data to obtain further information.

An introductory science course normally offered in the ninth grade, (such as earth science or physical science) is an acceptable science elective provided it is designed to prepare students for laboratory science courses in the tenth grade and beyond. The course must provide an introduction to the fundamental principles of physical and/or biological science. Laboratory activities as defined above shall be included. (A terminal course designed only to meet graduation requirements is not an acceptable science elective.)

**Language Other Than English:** It is recommended that elective courses be in the same language used to satisfy the language other than English "E" subject requirement. Elective courses in this language must have at least two years of the language as a prerequisite. In order for a second language to qualify as an elective, at least two years of this language must be completed.

**Visual and Performing Arts:** Courses in this area consist of instruction in dance, drama/theater, music, interdisciplinary arts or visual art. Courses should enable students to understand and appreciate artistic expression and, where appropriate, to talk and write with discrimination about the artistic material studied.

Courses devoted to artistic performance and developing creative artistic ability should have prerequisites (either one year of introductory coursework or experience approved by the instructor) and should assume proficiency beyond the introductory level.

Courses must require on average the equivalent of a five-period class per week. Work outside of class must be required; for example, portfolio/performance preparation, reading, writing, research projects and/or critical listening/viewing.

Dance courses offered for physical education credit or under any other departmental arrangement are acceptable provided they include content satisfying the above criteria.

Courses which are primarily athletic or body conditioning are not acceptable visual and performing arts electives.

**College Preparatory Elective:** The general objectives of the "G" requirement are to improve students' analytical abilities, promote artistic development, and strengthen oral and written skills. The requirement is intended to encourage prospective University students to fill out their high school programs with courses that: (1) strengthen general study skills, particularly analytical reading, expository writing and oral communication; (2) provide an opportunity to begin work that could lead directly into a major program of study at the University; (3) experience, at some depth, new areas of academic disciplines that might form the basis for future major or minor studies at the University.

Courses that fulfill the "G" requirement should allow students to prepare for college-level work in the subject area, so that the level attained at the end of such courses would be well beyond the introductory or survey level. Courses that have narrow objectives aimed at meeting specific societal or personal lifestyle goals are not acceptable.

**California High School Students.** Courses taken to fulfill the subject requirement must be certified by the University as meeting the requirement and must be included on the UC-certified course list of the school the student attended. The high school counselor or principal will have a copy of this list. In addition, the lists are available at the A-G course list site (<https://hs-articulation.ucop.edu/guide/>).

**Out-of-State High School Students.** The UCI Office of Undergraduate Admissions will review and accept courses that meet the requirements for applicants graduating from out-of-state schools.

## Exam Requirement

**UC Regents has suspended the standardized test requirements for students applying for fall 2021 freshman admission. Due to COVID-19, be sure to visit [admissions.uci.edu/fall2020FAQ](https://admissions.uci.edu/fall2020FAQ/) (<https://admissions.uci.edu/fall2020FAQ/>) for the most up-to-date information regarding undergraduate admission requirements.**

All freshman applicants must submit exam scores as described below. *Students applying for admission for the fall term should be sure to take their admissions tests no later than December of their senior year/last year prior to high school graduation - preferably earlier.* All students applying for freshman admission must submit college admissions test scores from either the SAT with Essay or the ACT with Writing and be aware of the guidelines below:

- Report ACT and/or SAT scores on the admissions application, then request that an official copy of the scores be sent to UC Irvine from the testing agency. Applicants can have their official score report sent to one UC campus, and all UC campuses they apply to will receive it.
- In the College Board's Score Choice module, we encourage you to send all official scores to UC. We will use the highest scores from a single administration. There is no disadvantage to submitting all scores. A higher sub-score from another test date may be used to meet university or campus graduation requirements after admission.
- For the ACT with Writing test, UCI will focus on the highest combined score from the same test administration.
- For the SAT with Essay, UCI will focus on the highest total score from a single test date.
- UC does not require results of tests taken for the purpose of talent programs in middle or junior high school (e.g., Johns Hopkins Center for Talented Youth, Duke University's Talent Identification Program, UC Berkeley's Academic Talent and Development Program, etc.). Those test scores do not have to be sent to UC.
- UC does not accept test substitutions.
- SAT Subject Test scores are no longer required, however they are recommended for certain selective majors. Submission of SAT Subject Test scores may add positively to the review of a student's application.

More information about these examinations is available online. For the SAT with Essay and SAT Subject Tests, visit the College Board website (<https://www.collegeboard.org/>). For the ACT with Writing, visit the ACT website (<http://www.actstudent.org/>).

SAT Subject Tests are not required for admission. Students may submit scores if they wish to showcase academic mastery. Competitive majors may recommend particular SAT Subject Tests to demonstrate subject proficiency. Additionally, Subject Tests may be used to fulfill A-G requirements.

**IMPORTANT:** Please note the SAT Subject Test recommendations below.

- The Claire Trevor School of the Arts recommends that freshmen applicants take any SAT Subject Tests that will demonstrate the student's strengths.
- The Henry Samueli School of Engineering recommends that freshmen applicants in Engineering majors (including the joint Computer Science and Engineering major) take the SAT Subject Test in Math Level 2 and a science test (Biology E/M, Chemistry or Physics) closely related to the applicant's intended major.
- The School of Physical Sciences recommends that freshmen applicants in Chemistry, Earth System Science, Mathematics, Physics, and Applied Physics majors take the SAT Subject Test in Math Level 2 and a science test closely related to the applicant's intended major.
- The Program in Public Health recommends that freshmen applicants take the following SAT Subject Tests: for the major in Public Health Sciences: Biology E, Biology M, Chemistry, and/or Math Level 2; for the major in Public Health Policy: Biology E, Biology M, and/or World History.

## Scholarship Requirement

In order to be considered for admission, applicants must have earned a minimum GPA of 3.0 (3.4 for nonresidents) in all A-G courses completed in grades 10 and 11, with no grade lower than a C. We award extra grade points for grades received in approved honors-level courses to a maximum of eight semesters, including no more than four semesters taken in the 10th grade.

## California Students

State residents who qualify for admission requirements by one of the following paths and are not admitted to a campus they apply to will be offered admission at another campus if space is available.

- Statewide path: Students must rank in the top 9 percent of California students, according to the UC admissions index.
- Local path (ELC): Students must rank in the top 9 percent of their own high school graduating class.

## Eligibility in the Local Context (ELC)

To qualify for Eligibility in the Local Context, an applicant must be a California resident and attend a participating California high school.

To be considered for ELC, an applicant must have a minimum GPA of 3.0 and complete the following A-G courses prior to their senior year:

- History: 1 year
- English: 2 years

- Mathematics: 2 years
- Science: 1 year
- Language Other Than English: 1 year
- Other A-G courses (chosen from the subjects listed above or another course approved by the University): 4 years

## Admission By Exam

In general, this method of consideration is designed for students who have been unable to meet the regular subject requirements and/or earn a high school diploma because of unique circumstances, such as non-traditional education or long-term illness. To be considered, a student must take either the ACT with Writing or the SAT, as well as two SAT Subject Tests, and earn a minimum UC Score calculated from their exam scores.

Students may not use an SAT Subject Test to meet this requirement if they have completed a transferable college course with a grade of C or better in that subject.

Students who qualify by examination are not guaranteed admission. However, they are entitled to a full review of their application. For more information, visit UC Admission by Exam website (<http://admission.universityofcalifornia.edu/freshman/requirements/examination/>).

## Nonresident Freshman Admission Requirements

**Due to COVID-19, be sure to visit** [admissions.uci.edu/fall2020FAQ](https://admissions.uci.edu/fall2020FAQ/) (<https://admissions.uci.edu/fall2020FAQ/>) **for the most up-to-date information regarding undergraduate admission requirements.**

Nonresident freshman applicants must meet the same admission requirements as those for California-resident students, *except*, nonresident applicants must have a minimum 3.4 GPA in the 15 college preparatory courses (A-G), with no grade lower than a C. Refer to the Expenses, Tuition, and Fees section of this *Catalogue* for information regarding residence classification for tuition purposes and the Nonresident Supplemental Tuition.

## Admission as a Transfer Applicant

The University defines a transfer applicant as a student who enrolled in a regular session (fall, winter, or spring) at a college or university after high school. (Summer sessions do not count.) UCI considers a California Community College transfer applicant as a student who has completed at least 30 semester units/45 quarter UC transferable units at one or more California Community Colleges and the last college attended in a regular session (fall/spring or fall/winter/spring) before admission to UCI is a California Community College. A competitive UCI transfer applicant should have a UC transferable GPA of 3.0 or above. All majors at UCI are selective and applicants are encouraged to earn the highest possible GPA. A transfer applicant may not disregard the college record and apply for admission as a freshman. (Transfer applicants who are not residents of California should also refer to the section on Nonresident Transfer Admission Requirements.)

**Transfer Admission Guarantee:** UCI's Transfer Admission Guarantee (TAG) program offers provisional admission to well-qualified junior-level students from participating California Community Colleges. While all majors at UCI are selective, through TAG, admission to participating TAG majors can be guaranteed for transfer students who meet the TAG eligibility and major prerequisites requirements. (see TAG Requirements later in this section).

## Selection Criteria

**Due to COVID-19, be sure to visit** [admissions.uci.edu/fall2020FAQ](https://admissions.uci.edu/fall2020FAQ/) (<https://admissions.uci.edu/fall2020FAQ/>) **for the most-up-to-date information regarding undergraduate admission requirements.**

UCI attempts to accommodate as many qualified transfer applicants as possible. Priority consideration for admission of transfer applicants is given to junior-level applicants (with a minimum of 60 semester/90 quarter units of UC transferable credit) from California Community Colleges and is based upon:

1. GPA in transferable courses;
2. depth of preparation toward general education and major requirements; and
3. participation in the TAG (Transfer Admission Guarantee) program, which requires early completion of one transferable English composition course and one transferable course in mathematical concepts and quantitative reasoning.

*TAG Applicants for fall quarter 2021 admission must have completed the first English and one mathematics course by the end of summer 2020. The second English course must be completed by spring 2021.* Transfer applicants with the strongest academic performance will be the most competitive for admission. Junior transfers from four-year colleges, including other UC campuses, and lower-division transfers will be considered as space permits.

In the case that UCI is unable to accommodate all qualified applicants in their first-choice major, those students who indicate a valid alternate major may be offered admission in that major. Students who wish to change their major after enrolling at UCI must submit an Undergraduate Petition for Change of Major to the academic counseling office in the school or program of their prospective major. This is of particular importance to those who apply in majors which are subject to additional course prerequisites and/or have a limit placed on the number of applicants admitted into the major. (See the following list.)

UCI's transfer selection process is also based upon consideration of the academic criteria in conjunction with the following personal achievement criteria: an exceptionally challenging curriculum; outstanding accomplishments relevant to academic aims; hardships or unusual circumstances the applicant has faced, and the ways in which the student has responded to these challenges; a strong, thoughtful match between UCI's programs and the student's academic and career objectives, preparation, talents, and skills; and potential contributions to the campus. The level of performance needed to gain admission varies from year to year depending on the size and the academic quality of the applicant pool and the number of enrollment spaces.

Transfer applicants to the following majors must complete prerequisite courses for the major as specified.

**Biological Sciences:** Junior-level applicants with the highest grades overall and who satisfactorily complete course prerequisites will be given preference for admission to the Biological Sciences major. All applicants must complete one year of general chemistry with laboratory with grades of C or better; one year of organic chemistry with laboratory with grades of C or better; one year of biology courses equivalent to BIO SCI 93, BIO SCI 94 at UCI with a grade of C or better in each course; and have a cumulative GPA of 3.0 or higher.

**Biology/Education:** Junior-level applicants with the highest grades overall and who satisfactorily complete course prerequisites will be given preference for admission to the Biology/Education major. All applicants must complete one year of general chemistry with laboratory with grades of C or better; one year of organic chemistry with laboratory with grades of C or better; one year of biology courses equivalent to BIO SCI 93, BIO SCI 94 at UCI with a grade of C or better in each course; and have a cumulative GPA of 3.0 or higher.

**Business Administration:** Junior-level applicants with the highest grades overall (minimum cumulative GPA of 3.0) and who satisfactorily complete lower-division courses equivalent to UCI's calculus (MATH 2A - MATH 2B), economics (ECON 20A - ECON 20B or MGMT 4A - MGMT 4B), and statistics and accounting (MGMT 7, MGMT 30A - MGMT 30B) will be given preference for admission. MGMT 1 may be completed at UCI. Admission to the major will be competitive due to limited space availability.

**Business Information Management:** Junior-level applicants who satisfactorily complete the following requirements will be given preference for admission:

1. one year of approved college-level math, preferably courses in calculus equivalent to UCI's MATH 2A - MATH 2B; if not available, two semester courses equivalent to other major-related math courses are acceptable;
2. Completion of one year of transferable computer science courses involving concepts such as those found in Java, Python, C++, data structures, or other object-oriented or high-level programming language.
3. one year of introductory accounting theory and practice equivalent to UCI's MGMT 30A - MGMT 30B and
4. one year of micro- and macro-economics theory equivalent to UCI's ECON 20A - ECON 20B.

NOTE: The introductory sequence in Information and Computer Science (ICS) has moved to Python. The Bren School of ICS strongly encourages all participants to become familiar with this programming language prior to matriculation. Additional computer science courses beyond the two required are strongly recommended, particularly those that align with the major(s) of interest. Java is used extensively in the curriculum; therefore, transfer students should plan to learn it by studying on their own or by completing a Java-related programming course prior to their first quarter at UCI.

Additional courses beyond those required for admission must be taken to fulfill the lower-division degree requirements, as many are prerequisites for upper-division courses. For some transfer students, this may mean that it will take longer than two years to complete their degree.

The Business Information Management major is offered jointly by the Donald Bren School of Information and Computer Sciences and The Paul Merage School of Business. More information is available at the Bren School of ICS Student Affairs Office website (<http://www.ics.uci.edu/ugrad/>); telephone 949-824-5156; email: [ucounsel@uci.edu](mailto:ucounsel@uci.edu).

**Chemistry:** Preference will be given to junior-level applicants with the highest grades overall and who have satisfactorily completed the following required courses: one-year of general chemistry with laboratory and one year of approved calculus. Completion of one year of organic chemistry is strongly recommended.

**Computer Game Science:** Visit the *UCI Office of Admissions website* for information on transfer requirements for this major.

**Computer Science and Engineering** (offered jointly by the Donald Bren School of Information and Computer Sciences and The Henry Samueli School of Engineering): Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer, including one year of approved calculus; one year of calculus-based physics with laboratories (mechanics, electricity and magnetism); one year of transferable computer science courses<sup>1</sup> involving concepts such as those found in Java, Python, C++, or other object-oriented or high-level programming language; and one additional approved transferable course for the major (an approved math, science, or CSE course).

<sup>1</sup>Additional computer science courses beyond the two required are strongly recommended, particularly those that align with the major of interest. Java and C++ are used in the curriculum; therefore, transfer students should plan to learn these languages by studying on their own or by completing related programming courses prior to their first quarter at UCI.

Students who enroll at UCI in need of completing lower-division course work may find that it will take longer than two years to complete their degrees. For further information, contact the Donald Bren School of Information and Computer Sciences at 949-824-5156 or The Henry Samueli School of Engineering at 949-824-4334.

**Dance:** Applicants must audition in late January/early February in ballet, modern, and jazz, prior to the fall quarter when entrance is anticipated, and be selected by faculty.

**Education Sciences:** Preference will be given to junior-level applicants with the highest grades overall (minimum cumulative GPA of 3.0). It is suggested that prospective transfer students work toward completing coursework to fulfill the UCI general education requirements or IGETC.

**Earth System Science:** Preference will be given to junior-level applicants with the highest grades overall and who have satisfactorily completed the following required courses: one year of approved calculus and *either* one year of general chemistry with laboratory (preferred) or one year of calculus-based physics with laboratory.

**Ecology and Evolutionary Biology:** Junior-level applicants with the highest grades overall and who satisfactorily complete course prerequisites will be given preference for admission to the Ecology and Evolutionary Biology major. All applicants must complete one year of general chemistry with laboratory with grades of C or better; one year of organic chemistry with laboratory with grades of C or better; one year of biology courses equivalent to BIO SCI 93, BIO SCI 94 at UCI with a grade of C or better in each course; and have a cumulative GPA of 3.0 or higher.

**Economics:** Transfer applicants with the highest grades overall and who satisfactorily complete course prerequisites will be given preference for admission to the majors in Economics, Business Economics, and Quantitative Economics. All applicants must complete one course in microeconomics, one course in macroeconomics, and two quarters/two semesters of approved first-year calculus. Applicants interested in the major of Quantitative Economics must also complete one quarter/one semester of approved linear algebra.

**Engineering:** Applicants must select either Aerospace Engineering, Biomedical Engineering, Biomedical Engineering: Premedical, Chemical Engineering, Civil Engineering, Computer Engineering, Computer Science and Engineering, Electrical Engineering, Environmental Engineering, Materials Science and Engineering, Mechanical Engineering, or Engineering Undeclared (option for freshmen only) as their major on the application. Junior-level applicants with the highest grades overall and who satisfactorily complete course prerequisites will be given preference for admission. All applicants must complete the following required courses: two years of approved calculus, one year of calculus-based physics with laboratories (mechanics, electricity and magnetism), additional courses as specified by the major, and completion of lower-division writing. Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. See The Henry Samueli School of Engineering section of this *Catalogue* for information on courses required for each major.

See also the listing for **Computer Science and Engineering**, a major jointly administered by the Donald Bren School of Information and Computer Sciences and The Henry Samueli School of Engineering.

**Environmental Science:** Preference will be given to junior-level applicants with the highest grades overall and who have satisfactorily completed the following required courses: *either* one year of general chemistry with laboratory (preferred), or one year of biology with laboratory. One year of economics or sociology is recommended.

**Humanities:** Junior-level transfers for all majors within the School of Humanities must have completed the UC Entry Level Writing Requirement, and two semester or two quarter courses of approved lower-division English composition with grades of C or better.

**Information and Computer Science (ICS):** This major is not open for admission on the UC application. Students are strongly encouraged to follow the transfer preparation guidelines for any of the other Bren ICS majors. Applicants must select either Business Information Management<sup>1</sup>, Computer Game Science, Computer Science, Computer Science and Engineering<sup>2</sup>, Data Science, Informatics, or Software Engineering as their major on the application. Visit the *UCI Office of Admissions website* for information on transfer requirements for these majors.

<sup>1</sup> See also the listing for Business Information Management, a collaborative major between the Donald Bren School of ICS and The Paul Merage School of Business in the Interdisciplinary section of the *Catalogue*.

<sup>2</sup> Apply at the Interdisciplinary section of the UC Application. See also the listing for Computer Science and Engineering, a major jointly administered by the Donald Bren School of ICS and The Henry Samueli School of Engineering in the Interdisciplinary section of the *Catalogue*.

**Mathematics:** Preference will be given to junior-level applicants with the highest grades overall and who have satisfactorily completed the required coursework of one year of approved calculus. Additional coursework in multivariable calculus, linear algebra, and differential equations is strongly recommended.

**Music:** All Music applicants must apply to the B.A. program and audition in late January/early February with an instrument or voice, prior to the fall quarter when entrance is anticipated; admission to the B.Mus. program is by a second audition after matriculation.

**Nursing Science:** Admission to the major is limited and selective. Junior-level applicants with the highest grades overall and who satisfactorily complete course prerequisites will be given preference for admission to the Nursing Science major. The following list of prerequisites is required for transfer students applying for fall 2020 entry. All applicants must complete the following with grades of B or better: one year of general chemistry equivalent to UCI's CHEM 1A - CHEM 1B - CHEM 1C; one quarter/semester of organic chemistry equivalent to UCI's CHEM 51A; one quarter/semester of genetics equivalent to UCI's BIO SCI 97; one quarter/semester of biochemistry equivalent to UCI's BIO SCI 98; one quarter/semester of human physiology with laboratory equivalent to UCI's BIO SCI E109 and BIO SCI E112L; one quarter/semester of microbiology with laboratory equivalent to UCI's BIO SCI M122 and BIO SCI M118L; one quarter/semester of human anatomy with laboratory equivalent to UCI's BIO SCI D170; one quarter/semester of philosophy equivalent to UCI's PHILOS 4 or PHILOS 5; one quarter/semester of psychology equivalent to UCI's PSYCH 7A/PSCI 9; one



quarter/semester of public health equivalent to UCI's PUBHLTH 1; one quarter/semester of sociology equivalent to UCI's SOCIOL 1; and one quarter/semester of statistics equivalent to UCI's STATS 7 or STATS 8. Applicants must have a cumulative GPA of 3.0 or higher to be considered.

**Pharmaceutical Sciences:** Students may be admitted to the Pharmaceutical Sciences major upon entering the University as freshmen, via change of major, or as transfer students from other colleges and universities.

Information about change-of-major policies is available in the Department of Pharmaceutical Sciences office and at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>).

**Transfer Students:** All applicants must have completed the following required courses with a grade of B- or better in all courses: one year of general chemistry with laboratory equivalent to UCI's CHEM 1A-CHEM 1B-CHEM 1C and CHEM 1LC-CHEM 1LD **AND** one year of organic chemistry with laboratory equivalent to UCI's CHEM 51A-CHEM 51B-CHEM 51C and CHEM 51LB-CHEM 51LC-CHEM 51LD. Transfer students must also complete two years of biology courses equivalent to UCI's BIO SCI 93, BIO SCI 94, BIO SCI 97, BIO SCI 98, and BIO SCI 99. Moreover, all transfer applicants must have a cumulative GPA of 3.0 or better. Additional courses that are recommended, but not required: one year of calculus and one year of calculus-based physics.

**Physics:** Preference will be given to junior-level applicants with the highest grades overall and who have satisfactorily completed the following required courses: one year of approved calculus and one year of calculus-based physics with laboratory for engineering and physics majors.

**Public Health:** Junior-level applicants with the highest grades overall and who satisfactorily complete lower-division requirements will be given preference for admission to the Public Health majors. All applicants to the B.S. in Public Health Sciences must have a minimum overall GPA of 3.0 and a minimum GPA of 3.0 in required courses, one year of general chemistry with laboratory, and one year of courses equivalent to UCI's BIO SCI 93 and BIO SCI 94. All applicants to the B.A. in Public Health Policy must have a minimum overall GPA of 3.0 and a minimum GPA of 3.0 in required courses, and complete one year of social science courses in any combination of the following topics: anthropology, economics, sociology, and/or psychology.

## Transfer Student Admission Requirements

**Due to COVID-19, be sure to visit** [admissions.uci.edu/fall2020FAQ](https://admissions.uci.edu/fall2020FAQ) (<https://admissions.uci.edu/fall2020FAQ/>) **for the most up-to-date information regarding undergraduate admission requirements.**

The University of California requirements for admission as a transfer applicant vary according to the high school record. Transfer applicants who have completed a California Certificate of Proficiency or the equivalent must also meet regular University entrance requirements.

Transfer applicants should also refer to the section on Information for Transfer Students: Fulfilling Requirements for a Bachelor's Degree.

The transcript submitted from the last college attended must show, as a minimum, that the student was in good standing and had earned a GPA of 2.4 (2.8 for nonresidents) or better in all transferable coursework.

A transfer applicant must also meet **one** of the following conditions:

1. If a student was eligible for admission to the University when the student graduated from high school — meaning that the student satisfied the Subject, Scholarship, and Examination Requirements or was identified by the University as eligible under the Eligibility in the Local Context (ELC) program and completed the Subject and Examination Requirements in the senior year — the student is eligible to transfer provided the applicant maintained a grade-point average of at least 2.0 in all transferable college coursework.
2. If a student met the Scholarship Requirement in high school but did not satisfy the Subject Requirement, the student must take transferable college courses in the missing subjects, earn a grade of C or better in each of these required courses, and earn an overall C (2.0) average in all transferable college coursework to be eligible to transfer.
3. Students who were not eligible for admission to the University when they graduated from high school because they did not meet the Scholarship Requirement must:
  - a. Complete 60 semester (90 quarter) units of UC transferable college coursework with a grade point average of at least 2.4 (2.8 for nonresidents). A competitive UCI transfer applicant should have a UC transferable GPA of 3.0 or above. No more than 14 semester (21 quarter) units may be taken Pass/No Pass credit and Pass/No Pass credit may not be used for major requirements; **and**
  - b. Complete the following course pattern requirement, earning a grade of C or better in each course:
    - i. Two UC transferable college courses (3 semester or 4–5 quarter units each) in English composition; **and**
    - ii. One UC transferable college course (3 semester or 4–5 quarter units) in mathematical concepts and quantitative reasoning; **and**
    - iii. Four UC transferable college courses (3 semester or 4–5 quarter units each) chosen from at least two of the following subject areas: arts and humanities, social and behavioral sciences, or physical and biological sciences.

The above seven courses may be completed with a Pass/Credit/Satisfactory grade if such designations are equivalent to a letter grade of C (2.0) or better.

**NOTE: For UCI, in fulfilling items i and ii, applicants for fall should complete the courses in English and mathematics no later than the spring term.**

## Transfer Admission Guarantee (TAG) Requirements

**Due to COVID-19, be sure to visit** [admissions.uci.edu/fall2020FAQ](https://admissions.uci.edu/fall2020FAQ/) (<https://admissions.uci.edu/fall2020FAQ/>) **for the most up-to-date information regarding undergraduate admission requirements.**

UCI's Transfer Admission Guarantee (TAG) program guarantees admission to highly-qualified students from all California Community Colleges. Admission to most majors at UCI can be guaranteed through TAG for transfer students who meet the eligibility requirements, complete and submit the online TAG application September 1-30 at <http://uctap.universityofcalifornia.edu>, and submit the UC Application to UCI online (applying to the same major as on the TAG application) November 1-30 at <https://admission.universityofcalifornia.edu>. A California Community College applicant is defined as a student:

- who completed at least 30 semester or 45 quarter UC transferable units at one or more California Community Colleges; and
- for whom the last college attended in a regular session (fall/spring or fall/winter/spring) before admission to a UC campus is a California Community College.

California Community College students may be eligible for admission to UCI through TAG if they will have met all of the following requirements:

- complete 30 semester or 45 quarter UC transferable units including Advanced Placement (AP), International Baccalaureate (IB), and A level credit by the end of the summer 2020 term for fall 2021 admission;
- earn a minimum GPA of 3.4 in all UC transferable coursework by the end of the summer 2020 term for fall 2021 admission and will maintain a 3.4 GPA in all UC transferable coursework for all subsequent terms;
- complete one UC transferable math course with a grade of C or better by the end of the summer 2020 term;
- complete one UC transferable English composition course with a grade of C or better by the end of the summer 2020 term;
- complete a second UC transferable English composition course with a grade of C or better by the end of the spring 2021 term;
- complete 60 semester or 90 quarter UC transferable units by the end of the spring 2021 term for fall 2021 admission, with at least 30 semester or 45 quarter UC transferable units completed at a California Community College;
- complete all major coursework for chosen major, including course prerequisites and maintain minimum course GPA through the end of the spring 2021 term for fall 2021 admission (major course prerequisite information are available at <https://www.admissions.uci.edu/apply/transfer/requirements.php>);
- is in good standing for all colleges attended and satisfy all UC transfer eligibility requirements; and
- attend a California Community College during a regular session in your last term.

**NOTE: The majors in Business Administration, Business Information Management, Cognitive Sciences, Computer Game Science, Computer Science, Computer Science and Engineering, Dance, Data Science, Informatics, Language Science, Music, Nursing Science and Software Engineering do not participate in the TAG program. For the most current information, visit the Admissions website (<http://www.admissions.uci.edu/>).**

## Nonresident Transfer Admission Requirements

**Due to COVID-19, be sure to visit** [admissions.uci.edu/fall2020FAQ](https://admissions.uci.edu/fall2020FAQ/) (<https://admissions.uci.edu/fall2020FAQ/>) **for the most up-to-date information regarding undergraduate admission requirements.**

Nonresident transfer applicants must meet the same minimum admission requirements as those for California-resident students, *except*, nonresidents must have a grade point average of 2.8 or higher in all transferable college coursework. Refer to the Expenses, Tuition, and Fees section of this *Catalogue* for information regarding residence classification for tuition purposes and the Nonresident Supplemental Tuition.

## Admission of International Students

**Due to COVID-19, be sure to visit** [admissions.uci.edu/fall2020FAQ](https://admissions.uci.edu/fall2020FAQ/) (<https://admissions.uci.edu/fall2020FAQ/>) **for the most up-to-date information regarding undergraduate admission requirements.**

The credentials of an international undergraduate applicant — a student who is not a U.S. citizen or U.S. permanent resident and who wishes to attend school in the United States — are evaluated in accordance with the general regulations governing admission. The application should be submitted at University of California Admissions website (<http://admission.universityofcalifornia.edu/how-to-apply/apply-online/>) early in the appropriate application filing period. This will allow time for exchange of necessary correspondence and, if the applicant is admitted, will help the student in obtaining the necessary passport visa. Official certificates and detailed transcripts of records should be submitted directly to the UCI Office of Undergraduate Admissions only when requested.

International applicants who completed their secondary school/high school in a country where English is not the language of instruction, can demonstrate English proficiency in a number of ways. This is most often accomplished by achieving a paper-based test score of 550 or higher (completed prior to October 2017), revised paper-delivered test score of 60 or higher (completed October 2017 or later), or Internet-based test (iBT) score of 80 or higher on the Test of English as a Foreign Language (TOEFL); or with a 6.5 or higher band score (academic modules) on the International English Language Testing System (IELTS) examination. Information about these exams is available at most U.S. consulates and overseas U.S.

educational advising offices, the University of California Admissions website (<https://admission.universityofcalifornia.edu/admission-requirements/international-applicants/english-language-proficiency-toefl-ielts.html>), as well as by mail and online at:

## TOEFL

## IELTS

Students must ask TOEFL or IELTS to forward results of their tests to the UCI Office of Undergraduate Admissions. These scores must be received no later than January for students applying for the fall term. As an alternative to providing TOEFL or IELTS scores to clear the English proficiency requirement, international freshman applicants may complete one UC-E approved English composition course; transfer applicants must complete two UC-E approved English composition courses with a grade of C or better.

Students who wish to improve their English proficiency to meet the TOEFL or IELTS requirement may enroll in the intensive Program in English as a Second Language sponsored by UCI Division of Continuing Education. Information is available from:

International Programs  
UCI Division of Continuing Education  
Building CE-3 #234

Pereira at Brandywine  
Irvine, CA 92697

Web: <http://ip.ce.uci.edu>

Email: [ip@ce.uci.edu](mailto:ip@ce.uci.edu) (%20ip@ce.uci.edu)  
949-824-5991

In addition to achieving a minimum TOEFL or IELTS score, all international students whose native language is other than English must take an Academic English/English as a Second Language Placement Test upon arrival and prior to registration. Based upon the results of this test, students may be required to improve certain language skills by enrolling in Academic English/English as a Second Language courses during their first year, with other major coursework being adjusted accordingly.

Generally, financial assistance and scholarships from the University are not available to the non-immigrant-visa student. International students must provide proof that sufficient funds will be available to meet their educational commitments while studying in the United States. International undergraduate students are considered nonresidents of California and are required to pay Nonresident Supplemental Tuition in addition to fees paid by legal residents of California.

Please direct all inquiries regarding the undergraduate admission of international students to the Office of Undergraduate Admissions. See [admissions.uci.edu/contact](https://www.admissions.uci.edu/contact) (<https://www.admissions.uci.edu/contact/request.php>).

## English Language Proficiency of Permanent Resident, Refugee, and International (F-1 Visa) Students: Academic English/English as a Second Language

Any student (1) who completed their secondary school/high school in a country where English is not the language of instruction (2) whose verbal scores on the Writing section of the SAT fall below a set level, (3) who has not satisfied the UC Entry Level Writing requirement, and (4) who has received a letter from the AE/ESL Program requiring them to take the AE placement test, or any such student without a verbal SAT score, must take the AE placement test prior to the first quarter of enrollment, regardless of the student's TOEFL (Test of English as a Foreign Language) score, IELTS (International English Language Testing System) score, or TSWE (Test of Standard Written English) score. Also, any student who is identified as an ESL student through the UC Analytical Writing Placement Examination must take the AE placement test. The test is given prior to the beginning of each quarter, during Welcome Week prior to the beginning of fall quarter instruction, and on dates to be announced. Information is available from the Academic Testing Center, telephone 949-824-6207, and the Program in Academic English/English as a Second Language, telephone 949-824-6781.

Based upon the results of the test, students may be required to enroll in AE/ESL courses prior to enrolling in any other required writing courses. Students who do not sit for the placement exam before the start of their first quarter will enroll in AE 20A. Students required to enroll in AE/ESL courses must begin satisfying their AE/ESL requirements within their first or second quarter at UCI. They must take these courses in consecutive quarters. The AE/ESL requirements are to be completed within the first six quarters at UCI. Students who have not satisfied the AE/ESL requirements by the end of their sixth quarter will be ineligible to enroll for a seventh quarter at UCI. The UC Entry Level Writing requirement must be satisfied during the quarter following the completion of AE/ESL requirements. If the AE/ESL requirements are completed during the first quarter of enrollment, the UC Entry Level Writing requirement must be satisfied before the beginning of the fourth quarter of enrollment.

AE/ESL courses, offered by the School of Humanities and listed in the School's section of this *Catalogue*, include classes in writing, speaking and listening, and reading and vocabulary development.



## Credit for AE/ESL Coursework

Students whose first language is not English may receive up to 12 baccalaureate credits for AE/ESL coursework. Students may receive workload credit for courses taken beyond this 12-unit limit but will not receive additional credits applicable to the bachelor's degree.

## Credit for Native Language

Students whose first language is not English may receive credit for coursework in their native language and literature, provided such courses were completed at the college level in the country of the vernacular, or at the upper-division or graduate level at UCI or another accredited English-speaking institution. Some restrictions apply; see the School of Humanities section for information.

## Admission for a Second Bachelor's Degree

A student whose educational objective has changed substantially after receiving the bachelor's degree may be considered for admission to a program for a second degree. Admission as a candidate for a second bachelor's degree requires that the applicant be fully eligible for admission to the University and have strong promise of academic success in the new major. All such admissions are subject to the approval of the dean or director of the UCI school or program in which the second degree will be earned.

Students who have *not* attended UCI as undergraduates during a regular academic quarter should complete the undergraduate application for admission and scholarships, available at the University of California Admissions website (<http://admission.universityofcalifornia.edu/how-to-apply/apply-online/>). Students who have attended UCI as undergraduates during a regular academic quarter should contact the Academic Advising Office of the major of interest to initiate the electronic Second Baccalaureate/Readmission Process. For more information, visit the University Registrar's Readmission website (<http://www.reg.uci.edu/enrollment/readmission.html>).

## Advanced Placement and International Baccalaureate Credit

**Duplicate Credit.** Students should be aware that AP examinations, IB examinations, and college courses taken prior to or after enrolling at the university may be duplicative. In these cases, the university will award credit for only one of these. Students cannot earn units or grade points at UCI in courses from which they have been exempted on the basis of AP or IB credit. Students who elect to enroll in courses for which they have already received AP or IB credit will have those courses specially coded on their transcript without unit or grade credit. However, some examinations exempt the student from a greater number of UCI units than the number of AP or IB units earned. In such cases, the student may elect to take the final course in the series for credit.

**Advanced Placement (AP).** Students who earn scores of 3, 4, or 5 on the College Board AP examinations will receive credit toward graduation at UCI. The unit and subject credit allowed toward degree requirements assigned to each test are shown in the accompanying chart.

### College Board Advanced Placement

Advanced Placement Examination	AP Score	Unit Credit	Credit Allowed Toward Degree
<b>Art</b>			
- Art History	3	8	One course toward Art History major, minor, category IV of the UCI GE requirement as ART HIS 40A, and satisfaction of category VIII, plus 4 units of elective credit; may not replace School of Humanities requirements
	4 or 5	8	Two courses toward Art History major, minor, category IV of the UCI GE requirement as ART HIS 40A and ART HIS 40B, and satisfaction of category VIII; may not replace School of Humanities requirements
<b>- Studio Art<sup>1</sup></b>			
- - Drawing	3, 4, or 5	8	Elective credit only
- - 2-D Design Portfolio	3, 4, or 5	8	Elective credit only
- - 3-D Design Portfolio	3, 4, or 5	8	Elective credit only
<b>Biology</b>	3, 4, or 5	8	Non-Bio. Sci. majors earn one Biological Sciences course toward Category II of the UCI GE requirement. Bio. Sci. majors earn elective credit only

Capstone Research Pilot			Approved as area g college-prep elective only. No university credit awarded
Capstone Seminar Pilot			Approved as area g college-prep elective only. No university credit awarded
Chemistry	3	8	Elective credit only
	4 or 5	8	CHEM 1A or ENGR 1A, plus 4 units of elective credit. Students pursuing Chemistry or a related field, and all students with a score of 5, are encouraged to enroll in Honors General Chemistry: CHEM H2A-CHEM H2B-CHEM H2C
Chinese Language and Culture <sup>2</sup>	3	8	Elective credit only
	4 or 5	8	CHINESE 1A-CHINESE 1B-CHINESE 1C, CHINESE 2A. Satisfies categories VI and VIII of the UCI GE requirement. Additional course credit may be awarded following placement examination
Computer Science			
- A Exam	3, 4, or 5	8	Elective credit only
Computer Science Principles	3,4, or 5	8	I&C SCI 20
Economics			
- Macroeconomics	3	4	Elective credit only
	4 or 5	4	ECON 20B. May not replace School of Social Sciences requirements for the bachelor's degree
- Microeconomics	3	4	Elective credit only
	4 or 5	4	ECON 20A. May not replace School of Social Sciences requirements for the bachelor's degree
English <sup>1</sup>	3 (on either or both exams)	8	Elective credit only. Fulfills UC Entry Level Writing requirement
- Composition and Literature	4 or 5	8	WRITING 39B <sup>5</sup> and one course toward category IV of the UCI GE requirement for ENGLISH 10 or ENGLISH 12; may not replace Literary Journalism major or minor, English major or minor, or School of Humanities requirements
- Language and Composition	4 or 5	8	WRITING 39B <sup>5</sup> and one course toward category IV of the UCI GE requirement for ENGLISH 10 or ENGLISH 12; may not replace Literary Journalism major or minor, English major or minor, or School of Humanities requirements
	4 or 5 (on both exams)	8	WRITING 39B <sup>5</sup> and two courses toward category IV of the UCI GE requirement for ENGLISH 10 and ENGLISH 12; may not replace Literary Journalism major or minor, English major or minor, or School of Humanities requirements
Environmental Science	3	4	Elective credit only
	4 or 5	4	EARTHSS 1 or UPPP 8

## French

- French Language and Culture (French Language before 5/12)	3	8	FRENCH 1A-FRENCH 1B- FRENCH 1C. Satisfies category VI of the UCI GE requirement
	4 or 5	8	FRENCH 2A-FRENCH 2B- FRENCH 2C. Satisfies categories VI and VIII of the UCI GE requirement

## Geography

- Human Geography	3, 4, or 5	4	Elective credit only
German Language and Culture (German Language before 5/12)	3	8	GERMAN 1A-GERMAN 1B- GERMAN 1C. Satisfies category VI of the UCI GE requirement
	4 or 5	8	GERMAN 2A-GERMAN 2B- GERMAN 2C. Satisfies categories VI and VIII of the UCI GE requirement

## Government and Politics

- U.S. Government and Politics	3	4	Elective credit only
	4 or 5	4	American Institutions and POL SCI 21A credit. May not replace School of Social Sciences requirements for the bachelor's degree
- Comparative Government and Politics	3	4	Elective credit only
	4 or 5	4	POL SCI 51A credit. May not replace School of Social Sciences requirements for the bachelor's degree

## History

- European	3 or 4	8	Elective credit only
	5	8	One lower-division course toward the History major or minor (excluding HISTORY 70B), GE category IV, and satisfaction of category VIII; plus 4 units of elective credit; may not replace School of Humanities requirements
- United States	3 or 4	8	Satisfies American History and Institutions requirement
	5	8	One course toward HISTORY 40A- HISTORY 40B-HISTORY 40C, GE category IV; plus 4 units of elective credit; may not replace School of Humanities requirements. Satisfies American History and Institutions requirement
- World	3 or 4	8	Elective credit only
	5	8	One course toward HISTORY 21A- HISTORY 21B-HISTORY 21C, GE category IV, and satisfaction of category VIII; plus 4 units of elective credit; may not replace School of Humanities requirements

Italian Language and Culture (Italian  
Language before 5/12)

3	8	ITALIAN 1A-ITALIAN 1B- ITALIAN 1C. Satisfies category VI of the UCI GE requirement
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	4 or 5	8	ITALIAN 2A-ITALIAN 2B- ITALIAN 2C. Satisfies categories VI and VIII of the UCI GE requirement
Japanese Language and Culture <sup>2</sup> (Japanese before 5/12)	3	8	JAPANESE 1A-JAPANESE 1B- JAPANESE 1C. Satisfies category VI of the UCI GE requirement
	4 or 5	8	JAPANESE 2A-JAPANESE 2B- JAPANESE 2C. Satisfies categories VI and VIII of the UCI GE requirement
Latin	3	4	Elective credit only
	4 or 5	4	Satisfies categories VI and VIII of the UCI GE requirement. Course credit toward the Classics major or School of Humanities language requirement awarded upon petition
Mathematics <sup>1</sup>			
- Calculus AB Exam	3	4	Elective credit only
	4 or 5	4	MATH 2A or MATH 5A
- Calculus BC Exam <sup>4</sup>	3	8	MATH 2A or MATH 5A
	4 or 5	8	MATH 2A-MATH 2B or MATH 5A- MATH 5B
Music Theory	3, 4 or 5	8	Elective credit only
Physics <sup>1</sup>			
- Physics 1	3, 4, or 5	8	Elective credit only
- Physics 2	3, 4, or 5	8	Elective credit only
- Exam C, Part I or II	3	4	Elective credit only
	4	4	PHYSICS 2
- Exam C, Part I (Mechanics)	5	4	PHYSICS 3A
- Exam C, Part II (Electricity and Magnetism)	5	4	PHYSICS 3B
Psychology	3	4	Elective credit only
	4 or 5	4	PSCI 9 or PSYCH 7A
Research			Approved as area g college-prep elective only. No university credit awarded
Seminar			Approved as area g college-prep elective only. No university credit awarded
Spanish <sup>2</sup>			
- Spanish Language and Culture	3	8	SPANISH 1A-SPANISH 1B- SPANISH 1C. Satisfies category VI of the UCI GE requirement
	4 or 5	8	SPANISH 2A-SPANISH 2B- SPANISH 2C. Satisfies categories VI and VIII of the UCI GE requirement.
- Spanish Literature and Culture	3	8	SPANISH 1A-SPANISH 1B- SPANISH 1C. Satisfies category VI of the UCI GE requirement
	4 or 5	8	SPANISH 2A-SPANISH 2B- SPANISH 2C. Satisfies categories VI and VIII of the UCI GE requirement
Statistics	3, 4, or 5	4	STATS 7 or STATS 8 or MGMT 7 or SOCECOL 13 or EDUC 15

- <sup>1</sup> Maximum credit 8 units.
- <sup>2</sup> Students who wish to enroll in any Chinese, Japanese, or Spanish course at UCI are still required to take the placement examination (and oral interview, if necessary). Students, however, cannot earn units or grade points in courses from which they have been exempted on the basis of Advanced Placement credit, even if placement results require enrollment in such a level.
- <sup>3</sup> Maximum credit 4 units.
- <sup>4</sup> Students who take the Calculus BC examination and earn a subscore of 3 or higher on the Calculus AB portion will receive credit for the Calculus AB examination, even if they do not receive a score of 3 or higher on the BC examination.
- <sup>5</sup> Students who score a 4 or 5 on either exam receive credit for WRITING 39B and qualify to take only WRITING 39C to satisfy GE category Ia Lower-Division Writing. Students who qualify cannot take WRITING 30 or WRITING 31 to satisfy the Lower-Division Writing requirement.
- \* NOTE: All students should refer to the Duplicate Credit section that appears before the AP chart.

**International Baccalaureate (IB).** Students completing the IB diploma with a score of 30 or above will receive at minimum 6 quarter units (4 semester units) toward their UC undergraduate degree. In addition to the diploma units, the University will grant 8 quarter units credit for certified IB Higher Level examinations on which a student scores 5, 6, or 7. The University does not grant credit for Standard Level examinations. Some Higher Level examinations may be used to fulfill course requirements in lower-division major or general education requirements.

IB Exam	IB Score	Unit Credit	Credit Allowed Toward Degree
Anthropology	5, 6, or 7	8	ANTHRO 2A. Satisfies the School requirement for School of Social Sciences major; satisfies one Anthropology course toward category III, and one course toward category VIII of the UCI GE requirement.
Biology	5, 6, or 7	8	Satisfies one Biological Science course toward category II of the UCI GE requirement.
Business & Management	5, 6, or 7	8	Elective credit only.
Chemistry	5, 6, or 7	8	Elective credit only.
Classical Languages <sup>1</sup>			
- Classical Greek	5	8	GREEK 100
- Classical Greek	6 or 7	8	GREEK 100 and two courses of GREEK 103, or GREEK 100 and two courses of GREEK 104, or GREEK 100 and GREEK 103 and GREEK 104.
- Latin	5	8	LATIN 100
- Latin	6 or 7	8	LATIN 100 and two courses of LATIN 103, or LATIN 100 and two courses of LATIN 104, or LATIN 100 and LATIN 103 and LATIN 104.
Computer Science	5, 6, or 7	8	Satisfies category Vb of the UCI GE requirement.
Dance	5, 6, or 7	8	Elective credit only.
Economics	5, 6, or 7	8	ECON 20A-ECON 20B. Satisfies the major requirement for Economics and International Studies; satisfies category III of the UCI GE requirement.
Film	5, 6, or 7	8	Elective credit only.
Geography	5, 6, or 7	8	Satisfies two Geography courses toward category III of the UCI GE requirement.
Global Politics	5, 6, or 7	8	Elective credit only.
History <sup>2</sup>			
History of the Americas	5, 6, or 7	8	Satisfies two courses toward HISTORY 40A-HISTORY 40B-HISTORY 40C for category IV of the UCI GE requirement.

Non-U.S. exams	5, 6, or 7	8	Satisfies two courses toward HISTORY 21A-HISTORY 21B-HISTORY 21C for category IV; satisfies category VIII of the UCI GE requirement.
Language A: Language and Literature, or Language A: Literature <sup>3</sup>			
- (Native Language)			
- (Replaced Language A1 in May 2013)			
- Arabic	5, 6, or 7	8	ARABIC 2C
- Chinese*	5, 6, or 7	8	CHINESE 2C
- English (Higher Level)	5, 6, or 7	8	Satisfies the UC Entry Level Writing Requirement.
- English (Standard Level)	6 or 7	No unit credit	Satisfies UC ELWR ( <a href="http://www.ucop.edu/elwr/index.html">http://www.ucop.edu/elwr/index.html</a> ( <a href="http://www.ucop.edu/elwr/">http://www.ucop.edu/elwr/</a> ), v. 5/5/14)
- French*	5, 6, or 7	8	FRENCH 2C
- German	5, 6, or 7	8	GERMAN 2C
- Hebrew	5, 6, or 7	8	Satisfies School of Humanities language other than English requirement for School of Humanities majors.
- Italian	5, 6, or 7	8	ITALIAN 2C
- Japanese*	5, 6, or 7	8	JAPANESE 2C
- Korean*	5, 6, or 7	8	KOREAN 2C
- Persian	5, 6, or 7	8	PERSIAN 2C
- Portuguese	5, 6, or 7	8	Elective credit only.
- Russian	5, 6, or 7	8	RUSSIAN 2C
- Spanish*	5, 6, or 7	8	SPANISH 3
-Vietnamese	5, 6, or 7	8	VIETMSE 2C
- Albanian, Amharic, Bosnian, Bulgarian, Catalan, Croatian, Czech, Danish, Dutch, Estonian, Filipino, Finnish, Greek (Modern), Hindi, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian, Macedonian, Malay, Nepali, Norwegian, Persian, Polish, Romanian, Serbian, Sesotho, Sinhalese, Slovak, Slovene, Swahili, Swedish, Thai, Turkish, Ukrainian, Urdu, Welsh	5, 6, or 7	8	Course credit for requirements may be awarded upon petition.
English Language A: Language & Literature (Standard Level)	6 or 7	No unit credit	Satisfies ELWR ( <a href="http://www.ucop.edu/elwr/index.html">http://www.ucop.edu/elwr/index.html</a> ( <a href="http://www.ucop.edu/elwr/">http://www.ucop.edu/elwr/</a> ), v. 5/5/14)
English Language A: Literature & Performance (Higher Level)	5, 6, or 7	8	Does NOT satisfy ELWR ( <a href="http://www.ucop.edu/elwr/index.html">http://www.ucop.edu/elwr/index.html</a> ( <a href="http://www.ucop.edu/elwr/">http://www.ucop.edu/elwr/</a> ), v. 5/5/14)
Language B <sup>3 4</sup> (Non-native Language)			
- Arabic	5, 6, or 7	8	ARABIC 2C
- Mandarin or Cantonese*	5, 6, or 7	8	CHINESE 2C
- English	5, 6, or 7	8	Elective credit (does not satisfy ELWR)
- French*	5, 6, or 7	8	FRENCH 2C <sup>4</sup>
- German	5, 6, or 7	8	GERMAN 2C <sup>4</sup>

- Italian	5, 6, or 7	8	ITALIAN 2C <sup>4</sup>
- Japanese*	5, 6, or 7	8	JAPANESE 2C <sup>4</sup>
- Portuguese	5, 6, or 7	8	Elective credit only.
- Russian	5, 6, or 7	8	RUSSIAN 2C <sup>4</sup>
- Spanish*	5 or 6	8	SPANISH 2C <sup>4</sup>
- Spanish	7	8	SPANISH 3
- Danish, Dutch, Finnish, Hindi, Indonesian, Swedish	5, 6, or 7	8	Elective credit only.
Mathematics	5, 6, or 7	8	MATH 2A
Mathematics, Further	5, 6, or 7	8	MATH 3A and MATH 13
Music	5, 6, or 7	8	Elective credit only.
Philosophy	5, 6, or 7	8	Elective credit only.
Physics	5, 6, or 7	8	Satisfies two Physics courses toward category II of the UCI GE requirement.
Psychology	5	8	Satisfies category III of the UCI GE requirement.
Psychology	6 or 7	8	PSYCH 9C or PSCI 11C. Satisfies category III of the UCI GE requirement.
Theater Arts	5, 6, or 7	8	Elective credit only.
Visual Arts	5, 6, or 7	8	Elective credit only.
Diploma Programme		6 or more	The Diploma Programme included six IB exams, with varying GE and/or course credit. Students are granted 6 quarter units if they earn 30 total Diploma Programme points.

<sup>1</sup> Course credit satisfies the School of Humanities language other than English requirement for School of Humanities majors; satisfies categories VI and VIII of the UCI GE requirement.

<sup>2</sup> History exam credit is only applicable toward GE, not School of Humanities major requirements.

<sup>3</sup> Course credit applies toward the School of Humanities language other than English requirement for School of Humanities majors and International Studies; satisfies both categories VI and VIII of the UCI GE requirement.

<sup>4</sup> Additional course credit may be awarded toward the major, upon petition. Course credit applies toward the School of Humanities language other than English requirement for School of Humanities majors and International Studies; satisfies both categories VI and VIII of the UCI GE requirement.

\* Students who wish to enroll in any Chinese, French, Japanese, Korean or Spanish course at UCI are still required to take the placement exam (and oral interview if necessary). Students, however, cannot earn units or grade points in courses from which they have been exempted on the basis of IB credit, even if placement results require enrollment in such a level.

The units granted for IB examinations are not counted toward the maximum number of credits required for formal declaration of an undergraduate major or the maximum number of units a student may accumulate prior to graduation from the University. Students who enter the University with IB credit do not have to declare a major earlier than other students nor are they required to graduate earlier.

## Application Procedures

Students may apply to UCI using the online application at the University of California Admissions website (<http://admission.universityofcalifornia.edu/how-to-apply/apply-online/>).

Applications must be submitted by the last day of the admission application filing period. The nonrefundable application fee is \$70 (\$80 for international students).

## When to Apply for Admission

**UC Regents has suspended the standardized test requirements for students applying for fall 2021 freshman admission. Due to COVID-19, be sure to visit [admissions.uci.edu/fall2020FAQ](https://admissions.uci.edu/fall2020FAQ/) (https://admissions.uci.edu/fall2020FAQ/) for the most up-to-date information regarding undergraduate admission requirements.**

To ensure that applications will be considered for admission to UCI and the student's choice of major or program of study, the completed application and the application fee should be submitted during the admission application filing period, November 1–30, 2020, for fall quarter 2021. UCI accepts

for consideration all applications it receives during this period. Additionally, students required to fulfill the exam requirements for freshman admission should make arrangements to take the standardized tests early. Completing the exam requirement (SAT with Essay or ACT with Writing) no later than the December testing date of the senior year of high school is required for students applying for the fall quarter.

After the admission application filing period has ended, UCI will accept applications only if openings remain for new students.

**Academic Record.** On the application, students must report all high schools and colleges attended, regardless of credit earned or courses completed. All courses taken must also be reported, regardless of grades earned. This includes reporting courses repeated with both the original and repeated grade.

Failure to submit an accurate academic record will result in any admissions offer being rescinded.

## Transcripts

**Due to COVID-19, be sure to visit** [admissions.uci.edu/fall2020FAQ](https://admissions.uci.edu/fall2020FAQ/) (<https://admissions.uci.edu/fall2020FAQ/>) **for the most up-to-date information regarding undergraduate admission requirements.**

The UCI Office of Undergraduate Admissions requires complete, accurate, and up-to-date information about a student's academic program and work in progress in order to process and respond to the application in a timely manner. Transcripts and other documents submitted as part of the application become the property of the University; they cannot be returned or forwarded in any form to another college or university.

**Freshman Applicants.** *Freshman applicants should not send transcripts unless requested to do so. Applicants will be notified if a preliminary high school transcript is required.* Applicants are also responsible for asking testing agencies to report exam scores for either the SAT with Essay or ACT with Writing to UC. Once students are admitted and decide to enroll at UCI, *an official final high school transcript showing an official graduation date must be forwarded to the Office of Undergraduate Admissions even if a student attends summer session.* Final official transcripts are due in the Office of Undergraduate Admissions by July 1 for those students admitted for fall quarter. [A California Certificate of Proficiency, the results from a proficiency test from any state, or a General Educational Development (GED) Certificate can be accepted in place of a high school diploma.] Delays in receiving official transcripts will disadvantage students in the academic advising process and can affect enrollment in appropriate courses.

**Transfer Applicants.** *Transfer applicants should not send transcripts unless requested to do so.* It is essential that applicants accurately complete the self-reported college credit information in the application because it will be used for initial admission screening. *Once students are admitted and decide to enroll at UCI, an official transcript from each college attended and the high school from which they graduated must be sent to the Office of Undergraduate Admissions even if a student attends summer session.* Final official transcripts are due in the Office of Undergraduate Admissions by July 1 for those students admitted for the fall quarter. Summer-session transcripts must be submitted by September 15. Delays in receiving official transcripts will disadvantage students in the academic advising process and can affect enrollment in appropriate courses.

## Exam Arrangements

**UC Regents has suspended the standardized test requirements for students applying for fall 2021 freshman admission. Due to COVID-19, be sure to visit** [admissions.uci.edu/fall2020FAQ](https://admissions.uci.edu/fall2020FAQ/) (<https://admissions.uci.edu/fall2020FAQ/>) **for the most up-to-date information regarding undergraduate admission requirements.**

Freshman applicants should make arrangements to take the SAT with Essay with the College Board (<http://www.collegeboard.org>). For the ACT with Writing, students should contact ACT (<http://www.actstudent.org>). Test fees should be paid to the testing services, not to the University.

Freshman applicants must also report ACT with Writing or SAT with Essay scores on their original UC Application, then request that the testing agency send an official score report to UC. Applicants can have their official score report sent to one UC campus, and all UC campuses they apply to will receive it. Ensure that all scores are sent to UC. UC will use the highest scores from a single administration.

To prevent confusion or unnecessary delay, it is important to use precisely the same form of the student's name on both the application for admission and the test reports.

The 2020-21 SAT with Essay and SAT Subject Tests schedule is available at the College Board website (<http://www.collegeboard.org>).

The 2020-21 ACT with Writing test schedule is available at the ACT website (<http://www.actstudent.org/regist/dates.html>).

Detailed information, including confirmation of test dates, is available from the College Board, ACT, and from most high school counseling offices.

## Notification of Admission

Most fall quarter freshman applicants are notified of their admission status between February 1 and March 31. Transfer applicants are usually notified by May 1. In some cases for transfer applicants, complete transcripts of coursework and/or a mid-term progress report are required before a final decision can be made; such records will be requested by the Office of Undergraduate Admissions. Note that these target dates apply only to those applicants who submitted their applications during the fall admission application filing period, November 1–30. Those students who apply after the admission application filing period will be notified as soon as possible after the other applicants.



## Statement of Intent to Register

Students who are offered admission and wish to attend UCI must return a Statement of Intent to Register (SIR). The SIR serves to notify UCI of the student's decision to accept or not accept its offer of admission. Before completing and returning their SIR, students who have applied to more than one campus are advised to take as much time as is appropriate in considering their response to each campus. However, it is essential that students allow enough time to meet the stipulated deadline. Once they have decided which UC campus to attend, students should submit their positive SIR and nonrefundable \$250 deposit (if applicable) either electronically or by mail. (This deposit, known as the Undergraduate Acceptance of Admission Fee, is applied to the Student Services Fee when the student enrolls.) Low-income students may have the deposit postponed (deferred) until financial aid is disbursed to cover tuition and fees.

Students must submit their SIR by the following deadline:

Freshmen entering fall 2021: May 1, 2021

Transfers entering fall 2021: June 1, 2021

**Electronic Filing:** Students are encouraged to return their SIR electronically. Log in to the UCI Applicant Portal (<http://www.admissions.uci.edu/portal/>). Students submitting an SIR electronically are required to pay their \$250 deposit (if requested) by credit card.

**Filing by Mail:** Students who are unable to submit their SIR online may download and print an SIR from the UCI Applicant Portal (<http://www.admissions.uci.edu/portal/>). Students must return the printed SIR along with the \$250 deposit (if requested), made payable to UC Regents and mailed to the following address:

Office of Undergraduate Admissions  
University of California, Irvine  
Irvine, CA 92697

Students who are not able to either submit their SIR electronically or download an SIR from the UCI Applicant Portal (<http://www.admissions.uci.edu/portal/>) should contact the Office of Undergraduate Admissions at 949-824-6703.

*Admission to UCI is not an assurance of receiving financial aid nor does it guarantee assignment to University housing. Separate applications are required of applicants desiring financial aid and/or University housing, and receipt of communications from the Office of Financial Aid and Scholarships, the Housing Office, or any office other than the Office of Undergraduate Admissions does not imply that eligibility for admission has been established.*

## Student Records Access and Disclosure

At UCI, an "applicant" becomes a "student" at the time of submission of a positive SIR. Information regarding access to student records and disclosure of student record information (both public and confidential) may be found in the Appendix.

## Undergraduate and Graduate Degrees

Degree Title	Degree <sup>1</sup>
Accountancy	M.P.Ac.
Aerospace Engineering	B.S.
African American Studies	B.A.
Anthropology	B.A., M.A. <sup>2</sup> , Ph.D.
Applied Physics	B.S.
Art	B.A., M.F.A.
Art History	B.A., M.A.
Asian American Studies	B.A., M.A.
Biochemistry and Molecular Biology	B.S.
Biological Sciences	B.S., M.S. <sup>4</sup> , Ph.D.
Biology/Education	B.S.
Biomedical and Translational Science	M.S.
Biomedical Engineering	B.S., M.S., Ph.D.
Biomedical Engineering: Premedical	B.S.
Biomedical Sciences	M.S. <sup>2</sup> , Ph.D.
Biotechnology Management	M.S.
Business Administration	B.A., M.B.A.
Business Analytics	M.S.
Business Economics	B.A.

Business Information Management	B.S.
Chemical and Biomolecular Engineering	M.S., Ph.D.
Chemical Engineering	B.S.
Chemistry	B.S., M.S. <sup>2,5</sup> , Ph.D.
Chicano/Latino Studies	B.A.
Chinese Studies	B.A.
Civil and Environmental Engineering	M.S., Ph.D.
Civil Engineering	B.S.
Classics	B.A., M.A. <sup>2</sup> , Ph.D. <sup>3,6</sup>
Cognitive Neuroscience	M.S. <sup>2</sup>
Cognitive Sciences	B.S., M.S. <sup>2</sup> , Ph.D.
Comparative Literature	B.A., M.A. <sup>2</sup> , Ph.D.
Computational Science	M.S. <sup>2</sup> , Ph.D.
Computer Engineering	B.S.
Computer Game Science	B.S.
Computer Science	B.S., M.C.S., M.S., Ph.D.
Computer Science and Engineering	B.S.
Conservation and Restoration Science	M.C.R.S.
Criminology, Law and Society	B.A., M.A.S., Ph.D.
Culture and Theory	M.A. <sup>2</sup> , Ph.D. <sup>3</sup>
Dance	B.A., B.F.A., M.F.A.
Data Science	B.S.
Developmental and Cell Biology	B.S.
Drama	B.A., M.F.A.
Drama and Theatre	Ph.D. <sup>7</sup>
Earth System Science	B.S., M.S. <sup>2</sup> , Ph.D.
East Asian Cultures	B.A.
East Asian Studies	M.A. <sup>2</sup> , Ph.D.
Ecology and Evolutionary Biology	B.S.
Economics	B.A., M.A. <sup>2</sup> , Ph.D.
Education	Credential Programs <sup>3</sup>
Education	M.A. <sup>2</sup> , Ph.D.
Education Sciences	B.A.
Electrical and Computer Engineering	M.S., Ph.D.
Electrical Engineering	B.S.
Elementary and Secondary Education	M.A.T.
Embedded and Cyber-Physical Systems	M.E.C.P.S.
Engineering	B.S., M.Eng., M.S., Ph.D.
Engineering Management	M.S.
English	B.A., M.E., M.F.A., Ph.D.
Environmental Engineering	B.S.
Environmental Health Sciences	M.S., Ph.D.
Environmental Science	B.A.
Environmental Science and Policy	B.A.
Epidemiology	M.S. <sup>2</sup> , Ph.D.
European Studies	B.A.
European Thought and Culture	M.A.
Exercise Sciences	B.S.
Film and Media Studies	B.A.
Finance	M.Fin.
French	B.A.
Gender and Sexuality Studies	B.A.

Genetic Counseling	M.S.
Genetics	B.S.
German	M.A. <sup>2</sup> , Ph.D.
German Studies	B.A.
Global Cultures	B.A.
Global Middle East Studies	B.A.
Global Studies	M.A. <sup>2</sup> , Ph.D.
History	B.A., M.A., Ph.D.
History and Theory of Music	M.A. <sup>2</sup> , Ph.D.
Human Biology	B.S.
Human Computer Interaction and Design	M.H.C.I.D.
Informatics	B.S., M.S., Ph.D.
Information and Computer Science	B.S., M.S.
Innovation and Entrepreneurship	M.I.E.
Integrated Composition, Improvisation, and Technology	M.A., Ph.D.
International Studies	B.A.
Japanese Language and Literature	B.A.
Korean Literature and Culture	B.A.
Language Science	B.A., M.A. <sup>2</sup> , Ph.D.
Law	J.D., LL.M.
Legal and Forensic Psychology	M.L.F.P
Literary Journalism	B.A.
Management	M.S. <sup>2</sup> , Ph.D.
Materials Science and Engineering	B.S., M.S., Ph.D.
Mathematical, Computational, and Systems Biology	M.S., Ph.D.
Mathematics	B.S., M.S. <sup>5</sup> , Ph.D.
Mechanical and Aerospace Engineering	M.S., Ph.D.
Mechanical Engineering	B.S.
Medical Science	M.S.
Medicine	M.D.
Microbiology and Immunology	B.S.
Music	B.A., B.Mus., M.F.A.
Music Theatre	B.F.A.
Networked Systems	M.S., Ph.D.
Neurobiology	B.S.
Nursing	D.N.P.
Nursing Science	B.S., M.S., Ph.D.
Pharmaceutical Sciences	B.S.
Pharmacological Sciences	M.S. <sup>2</sup> , Ph.D.
Pharmacology	M.S.
Philosophy	B.A., M.A. <sup>2</sup> , Ph.D.
Philosophy, Political Science, and Economics	M.A.
Physics	B.S., M.S. <sup>2</sup> , Ph.D.
Political Science	B.A., M.A. <sup>2</sup> , Ph.D.
Psychological Science	B.A., Ph.D.
Psychology	B.A., B.S.
Public Health	M.P.H., M.S., Ph.D.
Public Health Policy	B.A.
Public Health Sciences	B.S.
Public Policy	M.P.P.
Quantitative Economics	B.A.
Religious Studies	B.A.

Social Ecology	B.A., M.A., Ph.D.
Social Policy and Public Service	B.A.
Social Science	M.A. <sup>8</sup> , Ph.D.
Sociology	B.A., M.A. <sup>2</sup> , Ph.D.
Software Engineering	B.S., M.S., M.S.E., Ph.D.
Spanish	B.A., M.A. <sup>2</sup> , Ph.D.
Statistics	M.S., Ph.D.
Transportation Science	M.S., Ph.D.
Urban and Environmental Planning and Policy	Ph.D.
Urban and Regional Planning	M.U.R.P.
Urban Studies	B.A.
Visual Studies	M.A. <sup>2</sup> , Ph.D.

- <sup>1</sup> Degrees: B.A. = Bachelor of Arts; B.F.A. = Bachelor of Fine Arts; B.S. = Bachelor of Science; B.Mus. = Bachelor of Music; D.N.P. = Doctor of Nursing Practice; J.D. = Juris Doctor; LL.M. = Master of Laws; M.A. = Master of Arts; M.A.S. = Master of Advanced Study; M.A.T. = Master of Arts in Teaching; M.B.A. = Master of Business Administration; M.C.S. = Master of Computer Science; M.C.R.S. = Master of Conservation and Restoration Science; M.E. = Master of English; M.E.C.P.S. = Master of Embedded and Cyber-Physical Systems; M.Fin. = Master of Finance; M.F.A. = Master of Fine Arts; M.H.C.I.D. = Master of Human Computer Interaction and Design; M.I.E. = Master of Innovation and Entrepreneurship; M.L.F.P. = Master of Legal and Forensic Psychology; M.P.Ac. = Master of Professional Accountancy; M.P.H. = Master of Public Health; M.P.P. = Master of Public Policy; M.S. = Master of Science; M.S.E. = Master of Software Engineering; M.D. = Doctor of Medicine; M.U.R.P. = Master of Urban and Regional Planning; Ph.D. = Doctor of Philosophy. Titles of degrees may not correspond exactly with specific fields of study offered; see the Index and the academic unit sections for information.
- <sup>2</sup> Emphasis at the graduate level is on the Ph.D. degree; the master's degree may be awarded to Ph.D. students after fulfillment of the requirements.
- <sup>3</sup> Admission to this program is no longer available.
- <sup>4</sup> Emphasis at the graduate level is on the Ph.D. degree; the M.S. degree may be awarded to Ph.D. students after fulfillment of the requirements. However, students may apply directly to the M.S. concentration in Biotechnology and to the M.S. concentration in Ecology and Evolutionary Biology.
- <sup>5</sup> In addition to the regular M.S. degree program, a program coordinated with the School of Education leads to an M.S. degree and a Teaching Credential.
- <sup>6</sup> UCI, UCR, and UCSD joint program.
- <sup>7</sup> UCI and UCSD joint program.
- <sup>8</sup> Emphasis at the graduate level is on the Ph.D. degree; the M.A. degree may be awarded to Ph.D. students after fulfillment of the requirements. However, an M.A. in Social Science (concentration in Demographic and Social Analysis; Mathematical Behavioral Sciences; or Medicine, Science, and Technology Studies) is available.

# Interdisciplinary Studies

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UCI offers a variety of interdisciplinary programs of study which span the boundaries of traditional academic scholarship and provide students with opportunities to pursue subject areas deriving from the interaction of different disciplines. Faculty participation is determined by research and teaching interests and, as such, faculty may be drawn from various departments and schools across the campus.

- Business Information Management, B.S.
- Civic and Community Engagement, Minor
- Computational Science, Ph.D.
- Computer Science and Engineering, B.S.
- Environmental Science and Policy, B.A.
- Global Middle East Studies, B.A.
- Global Middle East Studies, Minor
- Global Sustainability, Minor
- History and Philosophy of Science, Minor
- Master of Embedded and Cyber-Physical Systems
- Mathematical, Computational, and Systems Biology, M.S.
- Mathematical, Computational, and Systems Biology, Ph.D.
- Medical Humanities, Graduate Emphasis
- Medical Humanities, Minor
- Native American Studies, Minor
- Networked Systems, M.S.
- Networked Systems, Ph.D.
- Transportation Science, M.S.
- Transportation Science, Ph.D.

## Business Information Management, B.S.

As the business environment becomes increasingly global and information-centric, the need has increased for graduates who understand and can use technology that gathers and provides information, who are able to distill and recognize patterns in that information, and who can apply those analyses to achieve business objectives.

The undergraduate Business Information Management major administered by the Donald Bren School of Information and Computer Sciences is a collaborative, interdisciplinary degree program between the Bren School and The Paul Merage School of Business. The program seeks to educate students to understand and then apply the theories and concepts of a broad, integrated curriculum covering computing, informatics, business fundamentals, and analytical decision-making. The major prepares students for a wide variety of careers and life experiences. Business Information Management majors can pursue careers in the for-profit and not-for-profit sectors or can proceed to graduate school in several disciplines, including information systems, computing, economics, business, and law.

The curriculum is presented across three general academic areas: Computing (computer science, informatics, and software); Business Foundations (accounting, finance, marketing, strategy, and operations); and Analytical Methods (mathematics, statistics, economics, management science, and decision analysis). The fundamentals of information and computer science, including the rudiments of software design and construction with an emphasis on data management, provide the foundation for understanding, describing, and evaluating the technology through which most business information is gathered and presented. The business fundamentals, covering all the functional areas in the Merage School, provide a background and context in which information and its analysis will be applied.

Admission into this major is limited. If the number of Business Information Management applicants exceeds the number of positions available, applicants may be subject to screening beyond minimum University of California admissions requirements.

**Freshmen Applicants:** See the Undergraduate Admissions section.

**Transfer Applicants:** See the Undergraduate Admissions section.

**All students must meet the University Requirements.**

### Major Requirements

**A. Lower-Division: Complete one of the following course groups:**

#### Group 1

I&C SCI 31

Introduction to Programming

I&C SCI 32	Programming with Software Libraries
I&C SCI 33	Intermediate Programming
<b>Group 2</b>	
I&C SCI 32A	Python Programming and Libraries (Accelerated)
I&C SCI 33	Intermediate Programming
<b>B. Complete the following:</b>	
I&C SCI 45J	Programming in Java as a Second Language
IN4MATX 43	Introduction to Software Engineering
<b>C. Complete the following:</b>	
MATH 2A- 2B	Single-Variable Calculus and Single-Variable Calculus
I&C SCI 6D	Discrete Mathematics for Computer Science
I&C SCI 6N	Computational Linear Algebra
or MATH 3A	Introduction to Linear Algebra
STATS 7	Basic Statistics <sup>1</sup>
or STATS 8	Introduction to Biological Statistics
or STATS 67	Introduction to Probability and Statistics for Computer Science
<b>D. Complete the following:</b>	
ECON 20A- 20B	Basic Economics I and Basic Economics II
MGMT 30A- 30B	Principles of Accounting I and Principles of Accounting II
<b>E. Upper-Division Core:</b>	
MGMT 101	Management Science
MGMT 102	Managing Organizational Behavior
MGMT 105	Introduction to Marketing
MGMT 107	Introduction to Management Information Systems
MGMT 109	Introduction to Managerial Finance
MGMT 110	Strategic Management
MGMT 173	Business Intelligence for Analytical Decisions
MGMT 178	Management of Information Technology
MGMT 189	Operations Management
COMPSCI 121/IN4MATX 141	Information Retrieval
COMPSCI 122A/EECS 116	Introduction to Data Management
IN4MATX 113	Requirements Analysis and Engineering
IN4MATX 143	Information Visualization
STATS 110	Statistical Methods for Data Analysis I

**F. Electives:**

Select five upper-division courses, except independent study and internships, with at least three of the five courses to be taken within the Bren School. Upper-division courses completed via the UC Education Abroad Program may also be utilized toward this requirement upon prior approval by the Bren School of ICS Student Affairs Office.

1. MGMT 7 or any other Statistics course will not be accepted as a substitute for the STATS 7, STATS 8, or STATS 67 requirement. Please check with the ICS Student Affairs Office if considering a course outside of these three options.

NOTE: Students majoring in Business Information Management may not double major in Business Administration nor minor in Management, Innovation and Entrepreneurship, Informatics, or Information and Computer Science.

<b>Freshman</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
I&C SCI 31	I&C SCI 32	I&C SCI 33
MATH 2A	ECON 20A	I&C SCI 6B
WRITING 39A	MATH 2B	ECON 20B
	WRITING 39B	WRITING 39C

<b>Sophomore</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
I&C SCI 45J	COMPSCI 122A	IN4MATX 43
I&C SCI 6D	MGMT 30B	MGMT 102
MGMT 30A	I&C SCI 6N	STATS 7, 8, or 67
General Education IV	General Education IV	General Education IV
<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
STATS 110	IN4MATX 113	IN4MATX 143
MGMT 107	MGMT 101	MGMT 105
I&C SCI UD Elective	MGMT 178	General Education VI
General Education III	UD Writing	
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
I&C SCI UD Elective	IN4MATX 141	I&C SCI UD Elective
MGMT 109	MGMT 110	UD Elective
MGMT 173	MGMT 189	General Education VIII
General Education VII	UD Elective	

**NOTES:**

1. Students are advised that this sample program lists the minimum requirements; it is possible that students may have to take additional courses to prepare for required courses.
2. The lower-division writing requirement must be completed by the end of the seventh quarter at UCI.
3. This is only a sample plan. Course offerings may be moved due to unforeseen circumstances. It is strongly recommended that students meet with an academic advisor to create an academic plan tailored to meet their specific areas of interest.
4. ICS upper-division electives may be satisfied by courses offered by the Donald Bren School of Information and Computer Sciences only.

## Civic and Community Engagement, Minor

<http://engage.due.uci.edu/>  
 CCEMinor@uci.edu

The minor in Civic and Community Engagement is an interdisciplinary program that provides students with the knowledge, skills, attitudes, and values to engage as citizens and active community members in the 21st century. It provides a theoretical and empirical framework to increase students' understanding of public problems (environmental, social, and other) from multiple disciplinary perspectives. Students learn about strategies to address public problems, including through public policy; through the involvement of community-based and nonprofit organizations; and through the cultivation of leadership. The minor helps students build on their major programs of study to make connections between public problems and issues of equity and social justice. The minor also empowers students through knowledge about meanings and roles of leadership in society, and provides students opportunities to cultivate leadership in public and private settings.

It is open to students of all majors and is distinguished both by what students learn, and by how they learn it: through a combination of coursework, research, and service.

Completion of seven courses (28 units total). A maximum of two courses for the minor may overlap with courses required for a student's major or for another minor.

**A. Complete:**

UNI STU 10	Introduction to Civic and Community Engagement and Community Research
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**B. For students choosing the Poverty track, complete:**

UPPP 115	Global Poverty and Inequality in the 21st Century
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**C. For students choosing the Leadership track, complete:**

UNI STU 85A	Leading from Within
UNI STU 85B	Leading Others

**D. For students in the Poverty track, select four of the following. For students in the Leadership track, select three elective courses from the Leadership and Public Policy theme. For all other students, select five elective courses related to public problems and civic and community engagement from the following:**

Environmental Stewardship:

BIO SCI E150	Conservation Biology
BIO SCI E189	Environmental Ethics
BIO SCI 191A- 191B	Senior Seminar on Global Sustainability I and Senior Seminar on Global Sustainability II
EARTHSS 176W	Marine Conservation, Policy, and Society
EARTHSS 190A- 190B	Senior Seminar on Global Sustainability I and Senior Seminar on Global Sustainability II
ECON 145E	Economics of the Environment
UPPP 139	Water Resource Policy
UPPP 142	Environmental Hazards in an Urbanizing World
SOCECOL 186A- 186B	Senior Seminar on Global Sustainability I and Senior Seminar on Global Sustainability II
SOCECOL 186CW	Writing/Senior Seminar on Global Sustainability III
UNI STU 13A- 13B- 13C	Introduction to Global Sustainability I and Introduction to Global Sustainability II and Introduction to Global Sustainability III
ANTHRO 20A	People, Cultures, and Environmental Sustainability
Educational Equity:	
ECON 158	Economics of Education
EDUC 104E	Multimedia and the Arts in the Multicultural Classroom
EDUC 124	Multicultural Education in K-12 Schools
EDUC 128	Exceptional Learners
EDUC 132	Reading and Writing Enrichment for After-School Programs
EDUC 150	Changing the High School Experience
EDUC 160	Foundations of Out-of-School Learning
Health and Communities:	
ANTHRO 128B	Race, Gender, and Science
ANTHRO 134G	HIV/AIDS in a Global Context
CHC/LAT 176	Race, Gender, and Science
IN4MATX 171	Introduction to Medical Informatics
INTL ST 122	Nuclear Environments
NUR SCI 170	Community-Based Health Care
PHILOS 131C	Medical Ethics
UPPP 112	Foundations of Community Health
UPPP 170	Health Policy
PUBHLTH 122	Health Policy
PUBHLTH 147	Drug Abuse and Its Prevention
PUBHLTH 167	Air Pollution, Climate, and Health
PUBHLTH 168	Nuclear Environments
PUBHLTH 173	Health and Global Environmental Change
SOCECOL E127	Nuclear Environments
PUBHLTH 60	Environmental Quality and Health
GEN&SEX 110D	The Politics of Health and Medicine
PUBHLTH 90	Natural Disasters
PUBHLTH 125	Foundations of Community Health
Public History and Public Art:	
AFAM 138	Topics in African American History
ART HIS 140A	History of Contemporary Art
ART HIS 140B	Topics in Contemporary Art
ART HIS 163	Asian American Art, Contemporary
ART HIS 164A	Modern African American Art
ART HIS 164B	Contemporary African American Art
ASIANAM 137	Asian American Labor



CHC/LAT 132A	Chicana/Chicano History: Pre-Colonial to 1900
CHC/LAT 132B	Chicana/Chicano History: Twentieth Century
CHC/LAT 134	U.S. Latino Literature and Cultures
CHC/LAT 135	Latinas in the Twentieth Century U.S.
COM LIT 100A	Nations, Regions, and Beyond
COM LIT 105	Topics in Comparative Multiculturalism
COM LIT 107	Colonialisms and Postcolonialisms
COM LIT 140	Critical Cultural Studies
DANCE 110	World Dance
DRAMA 103	Lectures in Dramatic Literature
DRAMA 122	Asian American Theatre
ENGLISH 105	Multicultural Topics in Literatures in English
HISTORY 142A	California Dreaming: Conquest, Conflict, and Globalization in the Golden State
HISTORY 148B	Topics in Multicultural U.S. History
HISTORY 150	Topics in African American History
HISTORY 151A	Chicana/Chicano History: Pre-Colonial to 1900
HISTORY 151B	Chicana/Chicano History: Twentieth Century
HISTORY 151C	Latinas in the Twentieth Century U.S.
HISTORY 152	Topics in Asian-American History
MUSIC 148	Studies in Ethnomusicology
REL STD 106	Topics in Gender and Religion
REL STD 120	Topics in Asian Religious Traditions
REL STD 130	Jewish, Islamic, and Middle Eastern Religious Traditions
SPANISH 110C	U.S. Latino Literature and Cultures
Global Citizenship:	
ANTHRO 125X	Transnational Migration
ANTHRO 136D	Conflict Resolution in Cross-Cultural Perspective
CHC/LAT 161	Transnational Migration
CHC/LAT 163	U.S. Immigration Policy
GLBLCLT 191	Senior Seminar: Topics in Global Cultures
POL SCI 121G	American Public Policy
POL SCI 126C	U.S. Immigration Policy
POL SCI 153E	Human Rights
POL SCI 154G	Conflict Resolution in Cross-Cultural Perspective
POL SCI 172A	International Law
SOCIOL 177	Immigration and Social Policy
ANTHRO 30A	Global Issues in Anthropological Perspective
Social Justice:	
AFAM 115	Race and Visual Representation
AFAM 128	Topics in Gender/Sexuality
ANTHRO 121D	Cross-Cultural Studies of Gender
ASIANAM 138	Race and Urban Space
ASIANAM 167	Asian American and African American Relations
CHC/LAT 148	Racial and Ethnic Relations in the United States
COM LIT 130	Gender, Sexuality, Race, Class
CRM/LAW C120	Law and Inequality
FLM&MDA 130	Multicultural Topics in the Media
HISTORY 146H	Topics in Women and Gender Relations in the United States
HISTORY 152B	Asian American and African American Relations
PHILOS 131A	Applied Ethics
UPPP 102	Urban Inequality

UPPP 113	Poverty and Change in Developing Countries
SOCIOL 167A	Racial and Ethnic Relations in the United States
GEN&SEX 110A	Gender, State, and Nation
GEN&SEX 110B	Money, Sex, and Power
GEN&SEX 100D	Queer Knowledges
UPPP 115	Global Poverty and Inequality in the 21st Century
CRM/LAW C110	Community Context of Crime
CRM/LAW C114	Miscarriages of Justice
CRM/LAW C127	Hate Crimes
Leadership and Public Policy:	
ANTHRO 136D	Conflict Resolution in Cross-Cultural Perspective
ASIANAM 132	Comparative Minority Politics
ASIANAM 144	The Politics of Protest
CHC/LAT 147	Comparative Minority Politics
CHC/LAT 152A	Race, Ethnicity, and Social Control
INTL ST 152A	Non-Government Organization (NGO) Fundamentals
UPPP 109	Housing and Urban Development Policy
UPPP 110	Urban Economic Development Policy
UPPP 129	American Public Policy
UPPP 133	Environmental Law and Policy
UPPP 145	Environmental Governance
UPPP 166	Urban Politics and Policy
UPPP 167	Public Policy and Management
POL SCI 124A	The Politics of Protest
POL SCI 124C	Comparative Minority Politics
POL SCI 126D	Urban Politics and Policy
POL SCI 154G	Conflict Resolution in Cross-Cultural Perspective
POL SCI 121G	American Public Policy
PSCI 192B	The Science and Practice of Compassion
PUBHLTH 120	Nutrition and Global Health
PUBHLTH 132	American Public Policy
PUBHLTH 170	Introduction to Global Health
SOC SCI 152C	American Public Policy
SOC SCI 181A	Ethical Leadership
SOC SCI 184A	Sage Leader Research I
SOC SCI 184B	Sage Leader Research II
CRM/LAW C113	Gender and Social Control
CRM/LAW C116	Race, Ethnicity, and Social Control
CRM/LAW C128	Environmental Law and Policy
MGMT 129	Leadership
NUR SCI 160	Leadership and Management in Health Care
UNI STU 85A	Leading from Within
UNI STU 85B	Leading Others
UNI STU 85C	Leading Change
UNI STU 110	Philanthropy in the Community
Additional elective courses may be substituted by petition.	

E. Select four units of an approved internship related to civic and community engagement. Internships will typically be completed over one or more quarters.

The internship can be completed through the following courses (or by petition to the faculty director of the minor):

ANTHRO 197	Field Study
ARTS 199	Independent Study
BIO SCI 14	California Teach 1: Introduction to Science and Mathematics Teaching

BIO SCI 101	California Teach 2: Middle School Science and Mathematics Teaching
CHEM 191	Chemistry Outreach Program
EDUC 100	Educational Strategies for Tutoring and Teacher Aiding
HUMAN 195	Humanities Out There (H.O.T.) Practicum
IN4MATX 117	Project in Software System Design
IN4MATX 132	Project in Human-Computer Interaction Requirements and Evaluation
IN4MATX 163	Project in the Social and Organizational Impacts of Computing
IN4MATX 191A- 191B	Senior Design Project and Senior Design Project
MATH 192	Studies in the Learning and Teaching of Secondary Mathematics
PHY SCI 5	California Teach 1: Introduction to Science and Mathematics Teaching
PHY SCI 105	California Teach 2: Middle School Science and Mathematics Teaching
PHYSICS 191	Field Experience in Physics Education
PUBHLTH 195W	Public Health Practicum and Culminating Experience
SOCECOL 195	Field Study
SOC SCI 193B- 193C	Field Studies in Social Policy and Public Service and Field Studies in Social Policy and Public Service
SOC SCI 194A	Public Service Internship
SOC SCI 195A-195B-195C	
SOC SCI 196	Global Connect
SOC SCI 197	Professional Internship
UCDC 170	Washington DC Internship
UNI STU 196	Directed Studies in Undergraduate Education

**Residence Requirement for the Minor:** Students must complete at least four of the required courses for the minor in residence at UCI.

## Computational Science, Ph.D.

**Lee Swindlehurst, UCI Director**

949-824-2818

<http://www.computationalscience.uci.edu/>

### Joint Doctoral Program with UC Irvine and San Diego State University

A joint offering with San Diego State University (SDSU), the Ph.D. program in Computational Science trains professionals capable of developing novel computational approaches to solve complex problems in both fundamental sciences and applied sciences and engineering. A program of study combining applied mathematics, computing, and a solid training in basic science culminates in doctoral research focused on an unsolved scientific problem.

The Ph.D. in Computational Science produces broadly educated, research-capable scientists that are well prepared for diverse careers in academia, industry, business, and government research laboratories.

Students are admitted into the joint program via a Joint Admissions Committee. Applicants apply to UCI directly using the UCI graduate application.

Applicants are expected to hold a Bachelor's degree in one of the science, technology, engineering, and mathematics (STEM) fields.

Applicants are evaluated on the basis of their prior academic record and their potential for creative research and teaching, as demonstrated in submitted materials. These materials include official university transcripts, three letters of recommendation, GRE scores, a Statement of Purpose, and a Personal History statement.

### Program Requirements

The normative time to completion is five years. The maximum time to completion is seven years. A total minimum of 66 units of course work, independent study, and research must be completed. These units must be distributed as follows:

- Minimum of 18 units of graduate-level coursework as SDSU.
- Minimum of 24 units of graduate-level coursework at UCI.
- Minimum of 24 units of combined research, practicum, and dissertation research units at either institution.

**Summer Research Survey**

Students are required to attend the annual summer seminar series featuring participating faculty members describing their current research and possible projects.

**Course Requirements****Core Courses at SDSU**

MATH 636 - Mathematical Modeling OR MATH 638 - Continuous Dynamical Systems and Chaos

MATH 693B - Advanced Computational PDEs

COMP 605 - Scientific Computing

**Elective Courses at SDSU**

*Students select 9 units from the following list, or appropriate substitutions, with the approval of the program director and their research mentor*

AE 601 - Computational Fluid Mechanics  
 AE 641 - Structural Optimization  
 AE 670 - Optimal Control  
 BIOL 606 - Biological Data  
 BIOL 668 - Advanced Biological Data Analysis  
 BIOL 740 - Phylogenetic Systematics  
 BIOMI 608 - Programming Problems in Bioinformatics  
 CHEM 711 - Chemical Thermodynamics  
 CHEM 712 - Chemical Kinetics  
 CHEM 713 - Quantum Chemistry  
 CIVE 620 - Traffic Flow and Control  
 CIVE 697 - Traffic Signals Systems Operations and Control  
 COMP 526 - Computational Methods for Scientists  
 COMP 607 - Computational Database Fundamentals  
 COMP 670 - Seminar: Problems in Computational Science  
 CS 600 - Bioinformatics  
 CS 610 - Computational Genomics  
 CS 653 - Data Mining and Knowledge  
 CS 666 - Advanced Distributed Systems  
 CS 696 - Programming Problems in Bioinformatics  
 EE 645 - Antennas and Wave Propagation  
 EE 657 - Digital Signal Processing  
 EE 658 - Advanced Digital Signal Processing  
 EE 665 - Multimedia Wireless Networks  
 EE 740 - Advanced Topics in Physical Electronics Antenna Design  
 MATH 693A - Advanced Computational Optimization  
 MATH 693B - Advanced Computational PDEs  
 MB 610A-B - Advanced Topics in Molecular Biology  
 ME 610 - Finite Element Methods  
 PHYS 604 - Electricity and Magnetism  
 PHYS 606 - Statistical Mechanics  
 PHYS 608 - Classical Mechanics  
 PHYS 610 - Quantum Mechanics  
 STATS 676 - Bayesian Statistics  
 STATS 678 - Survival Analysis  
 STATS 700 - Data Analysis  
 STATS 701 - Monte Carlo Methods  
 STATS 702 - Data Mining

**Core Courses at UCI (16 units)**

COMPSCI 206	Principles of Scientific Computing
COMPSCI 271	Introduction to Artificial Intelligence
ENGRCEE 290	Merging Models and Data
STATS 201	Statistical Methods for Data Analysis I

**Elective Courses at UCI**

*Students select 8 units from the following list, or appropriate substitutions, with the approval of the program director and their research mentor*

BME 232	Introduction to Computational Biology
BME 233	Dynamic Systems in Biology and Medicine
BME 238	Spectroscopy and Imaging of Biological Systems
CHEM 230	Classical Mechanics and Electromagnetic Theory
CHEM 231A	Fundamentals of Quantum Mechanics
CHEM 231B	Applications of Quantum Mechanics
CHEM 232A	Thermodynamics and Introduction to Statistical Mechanics
CHEM 232B	Advanced Topics in Statistical Mechanics
CHEM 250	Computational Chemistry
CHEM 250L	Computational Chemistry Laboratory
COMPSCI 211A	Visual Computing
COMPSCI 221	Information Retrieval, Filtering, and Classification
COMPSCI 242	Parallel Computing
COMPSCI 261	Data Structures
COMPSCI 265	Graph Algorithms
COMPSCI 268	Introduction to Optimization
COMPSCI 273A	Machine Learning
COMPSCI 274A	Probabilistic Learning: Theory and Algorithms
COMPSCI 284A	Artificial Intelligence in Biology and Medicine
COMPSCI 284C	Computational Systems Biology
EECS 203A	Digital Image Processing
EECS 215	Design and Analysis of Algorithms
EECS 227	Cyber-Physical System Design
EECS 240	Random Processes
EECS 242	Information Theory
EECS 250	Digital Signal Processing I
EECS 282	Monolithic Microwave Integrated Circuit (MMIC) Analysis and Design II
ENGRCEE 250	Finite Element Method in Structural Engineering
ENGRCEE 270	Flood Risk and Modeling
ENGRCEE 273	Watershed Modeling
ENGRCEE 274	Climate Data Analysis
ENGRCEE 292	Wavelets in Hydrology, Engineering, and Geoscience
ENGRMAE 230A	Inviscid Incompressible Fluid Mechanics I
ENGRMAE 230B	Viscous Incompressible Fluid Mechanics II
ENGRMAE 270A	Linear Systems I
STATS 210B	Statistical Methods II: Categorical Data
STATS 230	Statistical Computing Methods

### Research Units at SDSU

COMP 897 - Doctoral Research  
 COMP 898 - Practicum  
 COMP 899 - Dissertation

### Research Units at UCI

COMPSCI 298	Thesis Supervision
COMPSCI 299	Individual Study
ENGR 297	Doctor of Philosophy Dissertation Research
ENGR 299	Individual Research

### Practicum and Doctoral Research

Dissertation research is carried out at either UCI or SDSU, or at an industry or national laboratory under the supervision of the Doctoral Advisor. While conducting dissertation research, students must enroll in the appropriate research units at the campus of the Doctoral Advisor. If research is done outside of UCI or SDSU, students should register in-absentia if appropriate.

## Research Report Exam

The student is expected to pass the research report within two years of admittance. This examination consists of a term research project supervised by a faculty mentor. The student is required to prepare a written account of research work performed and its results, and offer an oral presentation before the members of the Doctoral Committee. The student must submit a paper based on their research report before giving the oral presentation to the Doctoral Committee. Should a student fail the research report exam, one retake is allowed.

## Dissertation Proposal

Students must submit a dissertation proposal to the doctoral committee by the end of their third year in the program. This proposal should take the form of a scientific grant proposal to a major funding agency. It should describe the research project that the student intends to carry out and upon which their doctoral dissertation will be based. The student must also offer an oral presentation of the proposal before the Computational Science faculty. Upon successful completion of this presentation, the student will be recommended for advancement to candidacy for the doctoral degree.

## Advancement to Doctoral Candidacy

After successful completion of the dissertation proposal and certification that all other requirements are fulfilled, the student is advanced to candidacy at both campuses. Students not registered at UCI will need to formally advance to candidacy in the summer term. Advancement to candidacy for the Ph.D. must occur at least one term prior to dissertation defense.

## Dissertation and Final Oral Examination

On completion of the research, the student prepares the dissertation in accordance with UCI regulations. A final draft of the dissertation is presented to each member of the doctoral committee at least three weeks prior to the final oral examination. The oral defense is held on the campus of the primary faculty advisor. Students must follow UCI filing deadlines. Students are required to be registered for Dissertation Research (3 units) at SDSU and Dissertation Research (4 units) simultaneously at UCI during the semester in which they present their doctoral defense. Alternatively, students can request filing fee status at UCI in the quarter in which they present their doctoral defense.

## Requirements for the M.S.

Requirements for a Master's degree include a satisfactory completion of first- and second-year coursework plus submission of a satisfactory research report.

## University of California, Irvine Faculty

Jun F. Allard, Ph.D. University of British Columbia, *Assistant Professor of Mathematics; Physics and Astronomy* (Mathematical and computational biology)

Pierre F. Baldi, Ph.D. California Institute of Technology, *UCI Chancellor's Professor of Computer Science; Biological Chemistry; Biomedical Engineering; Developmental and Cell Biology* (Bioinformatics, computational biology)

Kieron Burke, Ph.D. University of California, Santa Barbara, *Professor of Chemistry; Physics and Astronomy* (Physical chemistry and chemical physics, polymer, materials, nanoscience, theoretical and computational)

Olivier Cinquin, Ph.D. University College London, *Assistant Professor of Developmental and Cell Biology* (Mathematical modeling of networks, systems biology)

Donald A. Dabdub, Ph.D. California Institute of Technology, *Professor of Mechanical and Aerospace Engineering; Civil and Environmental Engineering* (Mathematical modeling of urban and global air pollution, dynamics of atmospheric aerosols, secondary organic aerosols, impact of energy generation on air quality, chemical reactions at gas-liquid interfaces)

Kristen Davis, Ph.D. Stanford University, *Assistant Professor of Civil and Environmental Engineering; Earth System Science* (Coastal Dynamics)

Filipp Furche, Ph.D. University of Karlsruhe, *Professor of Chemistry* (Physical chemistry and chemical physics, theoretical and computational)

Wayne B. Hayes, Ph.D. University of Toronto, *Associate Professor of Computer Science* (Biomedical Informatics and Computational Biology, Computer Vision Scientific and Numerical Computing)

Frithjof Kruggel, M.D., Ph.D. Ludwig Maximilian University of Munich, *Professor of Biomedical Engineering; Electrical Engineering and Computer Science* (Biomedical signal and image processing, anatomical and functional neuroimaging in humans, structure-function relationship in the human brain)

Arthur D. Lander, Ph.D. University of California, San Francisco, *Donald Bren Professor and Professor of Developmental and Cell Biology; Biomedical Engineering; Logic and Philosophy of Science; Pharmacology* (Systems biology of development, pattern formation, growth control)

Feng Liu, Ph.D. Princeton University, *Professor of Mechanical and Aerospace Engineering* (Computational fluid dynamics and combustion, aerodynamics, aeroelasticity, propulsion, turbomachinery aerodynamics and aeromechanics)

John S. Lowengrub, Ph.D. Courant Institute of Mathematical Sciences, *UCI Chancellor's Professor of Mathematics; Biomedical Engineering; Chemical Engineering and Materials Science* (Applied and computational mathematics, mathematical and computational biology)

Ray Luo, Ph.D. University of Maryland, College Park, *Professor of Molecular Biology and Biochemistry; Biomedical Engineering; Chemical Engineering and Materials Science* (Protein structure, noncovalent associations involving proteins)

Eric D. Mjolsness, Ph.D. California Institute of Technology, *Professor of Computer Science; Mathematics* (Applied mathematics, mathematical biology, modeling languages)

David L. Mobley, Ph.D. University of California, Davis, *Associate Professor of Pharmaceutical Sciences; Chemistry* (Chemical biology, physical chemistry and chemical physics, theoretical and computational)

Seyed Ali Mortazavi, Ph.D. California Institute of Technology, *Assistant Professor of Developmental and Cell Biology* (Functional genomics to study transcriptional regulation in development)

Shaul Mukamel, Ph.D. Tel Aviv University, *UCI Distinguished Professor of Chemistry; Physics and Astronomy* (Physical chemistry and chemical physics, polymer, materials, nanoscience, theoretical and computational)

Hung Nguyen, Ph.D. North Carolina State University, *Assistant Professor of Chemical Engineering and Materials Science* (Computational Nanoscience of Functional Biomaterials & Complex Fluids)

Alexandru Nicolau, Ph.D. Yale University, *Department Chair and Professor of Computer Science; Electrical Engineering and Computer Science* (Architecture, parallel computation, programming languages and compilers)

Roger H. Rangel, Ph.D. University of California, Berkeley, *Professor of Mechanical and Aerospace Engineering* (Fluid dynamics and heat transfer of multiphase systems including spray combustion, atomization and metal spray solidification, applied mathematics and computational methods)

Elizabeth L. Read, Ph.D. University of California, Berkeley, *Assistant Professor of Chemical Engineering and Materials Science; Molecular Biology and Biochemistry* (Dynamics of complex biochemical systems, regulation of immune responses)

Eric Rignot, Ph.D. University of Southern California, *Donald Bren Professor of Earth System Science* (Glaciology, climate change, radar remote sensing, ice sheet modeling, interferometry, radio echo sounding, ice-ocean interactions)

Timothy Rupert, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Mechanical and Aerospace Engineering; Chemical Engineering and Materials Science* (Mechanical behavior, nanomaterials, structure property relationships, microstructural stability, grain boundaries and interfaces, materials characterization)

Hal S. Stern, Ph.D. Stanford University, *Professor of Statistics; Cognitive Sciences* (Bayesian methods, model diagnostics, forensic statistics, and statistical applications in biology/health, social sciences, and sports)

Lizhi Sun, Ph.D. University of California, Los Angeles, *Professor of Civil and Environmental Engineering; Chemical Engineering and Materials Science* (Micro- and nano-mechanics, composites and nanocomposites, smart materials and structures, multiscale modeling, elastography)

A. Lee Swindlehurst, Ph.D. Stanford University, *Professor of Electrical Engineering and Computer Science* (Signal processing, estimation and detection theory, applications in wireless communications, geo-positioning, radar, sonar, biomedicine)

Kevin Thornton, Ph.D. University of Chicago, *Associate Professor of Ecology and Evolutionary Biology School of Biological Sciences* (Genome evolution, gene duplication, population genetics, adaptation)

Douglas J. Tobias, Ph.D. Carnegie Mellon University, *Professor of Chemistry* (Atmospheric and environmental, chemical biology, physical chemistry and chemical physics, theoretical and computational)

Jasper A. Vrugt, Ph.D. University of Amsterdam, *Associate Professor of Civil and Environmental Engineering; Earth System Science* (Complex systems, modeling, statistics, hydrology, geophysics, ecology, data, optimization, hydropower, data assimilation)

Yun Wang, Ph.D. Pennsylvania State University, *Associate Professor of Mechanical and Aerospace Engineering* (Fuel cells, computational modeling, thermo-fluidics, two-phase flows, electrochemistry, Computational Fluid Dynamics (CFD), turbulent combustion)

Daniel Whiteson, Ph.D. University of California, Berkeley, *Associate Professor of Physics and Astronomy; Logic and Philosophy of Science* (Particle Physics)

## San Diego State University Faculty

Andy Cooksy, Ph.D. University of California, Berkeley, *Professor of Chemistry and Biochemistry* (Laser Spectroscopy, Reaction Dynamics, and Ab Initio Calculation of Free Radicals and Other Transient Molecule)

Chris Curtis, Ph.D., University of Washington, *Assistant Professor of Mathematics* (Fluid Mechanics, Modeling and Simulation, Computational Fluid Dynamics and Numerical Simulation)



Robert Edwards, Ph.D. University of Sussex, Brighton, England, *Professor of Computer Science* (Microbiology, Bioinformatics, and High Performance Computing)

Juanjuan Fan, Ph.D. University of Washington, *Professor of Statistics* (Multivariate Failure Time Data, Tree Based Methods, Genetic Epidemiology)

Jerome Gilles, Ph.D. Ecole Normale Supérieure, France, *Assistant Professor of Mathematics* (Applied Harmonic/Functional Analysis, Signal/Image Processing)

Ke Huang, Ph.D. University of Grenoble, France, *Assistant Professor of Electrical and Computer Engineering* (VLSI Testing, Fault Modeling and Diagnosis. Machine Learning, Data Mining. Trustworthy ICs. Computer-Aided Design)

Gustav Jacobs, Ph.D., University of Illinois at Chicago, *Professor of Aerospace Engineering* (Computational Physics, High-Order Methods, Fluid and Plasma Dynamics)

Calvin Johnson, Ph.D. University of Washington, *Professor of Physics* (Theoretical and Computational Nuclear Structure and Nuclear Astrophysics)

Parag Katira, Ph.D., University of Florida, *Assistant Professor of Mechanical Engineering* (Biomolecular Motors, Cell Mechanics, Mechanosensing, Tissue Dynamics, Soft Matter Interactions, Design of Active Materials)

David Kopriva, Ph.D. University of Arizona, *Research Professor, CSRC at SDSU* (Computational Mathematics, Numerical Analysis)

Sunil Kumar, Ph.D., Birla Institute of Technology and Science, India, *Professor of Electrical and Computer Engineering* (Multimedia Traffic, Compression Techniques, Image Processing Techniques)

Lyuba Kuznesova, Ph.D. Cornell University, *Assistant Professor of Physics* (Nanophotonics)

Richard Levine, Ph.D. Cornell University, *Professor of Statistics* (Markov Chain Monte Carlo Methods, Environmental Statistics, Biostatistics, Bayesian Decision Theory)

Xiaobai Liu, Ph.D. Huazhong University of Science and Technology, China, *Assistant Professor of Computer Science* (Computer Vision, Machine Learning, Computational Statistics and their applications to clinic diagnosis, sports, transportation, surveillance, video games and others)

Antonio Luque, Ph.D. University of Barcelona, *Assistant Professor of Mathematics* (Applied Mathematics, Biophysics, Physical Virology)

Duy Nguyen, Ph.D. McGill University, Canada, *Assistant Professor of Electrical and Computer Engineering* (Signal Processing, Communications, and Information Theories for Wireless Systems and Networks)

Kenneth Nollett, Ph.D. University of Chicago, *Assistant Professor of Physics* (Astrophysics and Nuclear Physics)

Christopher Paolini, Ph.D. San Diego State University, *Assistant Professor of Electrical and Computer Engineering* (Cyberinfrastructure, Computational Geochemistry)

Shangping Ren, Ph.D. University of Illinois at Urbana-Champaign, *Professor of Computer Science* (Cyber-Physical Systems, Real-Time Scheduling, and Cloud Computing)

Forest Rohwer, Ph.D. San Diego State University, *Professor of Biology* (Genomic Analysis of Phage, Diversity of Coral-associated Bacteria, Opportunistic Infections and Coral Disease)

Anca Segal, Ph.D. University of Utah, *Professor of Biology* (The Mechanism of Site-Specific Recombination; Structure/Function Analysis of Recombination Proteins)

Satish Sharma, Ph.D. Banaras Hindu University, India, *Professor of Electrical and Computer Engineering* (Electromagnetics Antennas)

Samuel Shen, Ph.D. University of Wisconsin, Madison, *Albert W. Johnson Distinguished Professor of Mathematics* (Statistical Climatology & Agroclimatology, Fluid Dynamics & Forced Nonlinear Waves)

Nicholas Shikuma, Ph.D. University of California, Santa Cruz, *Assistant Professor of Biology* (Molecular Mechanisms of Bacteria/Bacteriophage/Animal Interactions)

Patrick Shoemaker, Ph.D. University of California, San Diego, *Research Associate Professor CSRC at SDSU* (Analog Integrated Circuit Design, Neurobiology, Neural Computation)



Usha Sinha, Ph.D. Indian Institute of Science, Bangalore, India, *Professor of Physics* (Medical and Imaging Physics, Magnetic Resonance Imaging (MRI), and Informatics)

Mauro Tambasco, Ph.D. University of Western Ontario, *Associate Professor of Physics* (Medical Physics)

Naveen Vaidya, Ph.D. York University, Canada, *Assistant Professor of Mathematics* (Applied Mathematics, Mathematical Biology, Disease Modeling, Differential Equations)

Satchi Venkataraman, Ph.D. University of Florida, *Professor of Aerospace Engineering* (Structural Mechanics, Design Optimization, Composite Materials, Biomechanics)

Wei Wang, Ph.D. University of Nebraska, Lincoln, *Associate Professor of Computer Science* (Cyber-Physical Systems, Wireless Multimedia Networking, Breast Cancer Image Processing)

Fridolin Weber, Ph.D. University of Munich, Germany, *Albert W. Johnson Distinguished Professor of Physics* (Superdense Matter, Astrophysics, General Relativity)

Tao Xie, Ph.D. New Mexico Institute of Mining and Technology, *Professor of Computer Science* (High-Performance Computing, Energy-Efficient Storage Systems, Parallel/Distributed Systems, and Security-Aware Scheduling)

Robert W Zeller, Ph.D. California Institute of Technology, *Professor of Biology* (Cell and Molecular Biology)

## Computer Science and Engineering, B.S.

The undergraduate program in Computer Science and Engineering is administered by faculty from two academic units: the Department of Computer Science (CS) in the Donald Bren School of Information and Computer Sciences, and the Department of Electrical Engineering and Computer Sciences (EECS) in The Henry Samueli School of Engineering. Successful completion of the program leads to a B.S. in Computer Science and Engineering.

**Program Educational Objectives:** Graduates of the program will: (1) establish a productive Computer Science and Engineering career in industry, government, or academia; (2) engage in professional practice of computer systems engineering and software systems engineering; (3) promote the development of innovative systems and solutions using hardware and software integration; (4) promote design, research, and implementation of products and services in the field of Computer Science and Engineering through strong communication, leadership, and entrepreneurial skills.

(Program educational objectives are those aspects of computer science and engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

This program is designed to provide students with the fundamentals of computer science, both hardware and software, and the application of engineering concepts, techniques, and methods to both computer systems engineering and software system design. The program gives students access to multidisciplinary problems in engineering with a focus on total systems engineering. Students learn the computer science principles that are critical to development of software, hardware, and networking of computer systems. From that background, engineering concepts and methods are added to give students exposure to circuit design, network design, and digital signal processing. Elements of engineering practice include systems view, manufacturing and economic issues, and multidisciplinary engineering applications.

**Career Paths.** Most likely careers will involve building the computer-based infrastructure—computers, networks, embedded devices, as well as operating systems, compilers, and networking software. The focus is on cooperation between hardware and software to yield the highest performance. Examples of such problem areas would be in traffic management, flight control, earthquake monitoring, automotive control, and smart homes.

### Change of Major

Students interested in changing their major to Computer Science and Engineering should contact the Student Affairs Office in the Bren School of ICS or The Henry Samueli School of Engineering for information about change-of-major requirements. Information is also available at UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>).

**High School Students:** Students must have completed four years of mathematics through pre-calculus or math analysis and are advised to have completed one year each of chemistry and physics. One semester of programming coursework is also advised. That preparation, along with honors courses and advanced placement courses, is fundamental to success in the program.

The Henry Samueli School of Engineering recommends that freshmen applicants in Engineering majors take the SAT Subject Test, Math Level 2.

**Transfer Students.** Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer, including one year of approved calculus; one year of calculus-based physics with laboratories (mechanics, electricity and magnetism); one year of transferable computer science courses<sup>1</sup> involving concepts such as those found in Java, Python, C++, or other object-oriented, high-level programming language, and one additional approved transferable course for the major (an approved math, science, or CSE course).

- <sup>1</sup> Additional computer science courses beyond the two required are strongly recommended, particularly those that align with the major of interest. Java and C++ are used in the curriculum; therefore, transfer students should plan to learn these languages by studying on their own or by completing related programming courses prior to their first quarter at UCI.

Students who enroll at UCI in need of completing lower-division coursework may find that it will take longer than two years to complete their degrees. For further information, contact the Donald Bren School of Information and Computer Sciences at 949-824-5156 or The Henry Samueli School of Engineering at 949-824-4334.

**All students must meet the University Requirements.**

### Major Requirements

#### Mathematics and Basic Science Courses

Mathematics Courses: Students must complete a minimum of 32 units of mathematics including:

I&C SCI 6B	Boolean Logic and Discrete Structures
I&C SCI 6D	Discrete Mathematics for Computer Science
MATH 2A- 2B	Single-Variable Calculus and Single-Variable Calculus
MATH 2D	Multivariable Calculus
MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations
STATS 67	Introduction to Probability and Statistics for Computer Science

Basic Science Courses: Students must complete a minimum of 18 units of basic science courses including:

PHYSICS 7C- 7LC	Classical Physics and Classical Physics Laboratory
PHYSICS 7D- 7LD	Classical Physics and Classical Physics Laboratory

Students select, with the approval of a faculty advisor, two additional basic science courses needed to satisfy school and department requirements from two courses in General Education II, except those offered by Computer Science and Engineering, Economics, Engineering, Information and Computer Sciences, or Math.

#### Engineering and Computing Topics Courses

Students must complete a minimum of 72 units of engineering topics, 24 units of engineering design, and 63 units of computing topics. All courses below qualify as engineering topics; those marked with an asterisk (\*) qualify as computing topics also. The following courses must be completed:

A. Select one of the following course groups:

I&C SCI 31- 32- 33	Introduction to Programming and Programming with Software Libraries and Intermediate Programming
or	
I&C SCI 32A- 33	Python Programming and Libraries (Accelerated) and Intermediate Programming

B. Complete:

COMPSCI 132/EECS 148	Computer Networks *
COMPSCI 143A	Principles of Operating Systems *
or EECS 111	System Software
EECS 31	Introduction to Digital Systems *
EECS 31L	Introduction to Digital Logic Laboratory *
I&C SCI 45C	Programming in C/C++ as a Second Language *
I&C SCI 46	Data Structure Implementation and Analysis *
EECS 50	Discrete-Time Signals and Systems
EECS 70A	Network Analysis I
CSE 90	Systems Engineering and Technical Communications
CSE 112	Electronic Devices and Circuits
EECS 112	Organization of Digital Computers *
EECS 112L	Organization of Digital Computers Laboratory *
COMPSCI 141	Concepts in Programming Languages I *
COMPSCI 142A	Compilers and Interpreters *
COMPSCI 145	Embedded Software

COMPSCI 145L	Embedded Software Laboratory
COMPSCI 161	Design and Analysis of Algorithms *
EECS 159A- 159B	Senior Design Project I and Senior Design Project II
ENGR 190W	Communications in the Professional World
IN4MATX 43	Introduction to Software Engineering *

Students select, with the approval of a faculty advisor, any additional engineering and computer topics courses needed to satisfy school and department requirements.

#### Technical Elective Courses:

Students must complete a minimum of two courses (with 3 or more units each) of technical electives. A technical elective may be any upper-division course from the Departments of Computer Science, Electrical Engineering and Computer Science, or Informatics, not otherwise used for the CSE degree, chosen from the following ranges:

Computer Science: 100–189, except COMPSCI 121

Electrical Engineering and Computing Science: 100–189

Informatics: 100–139

(The nominal Computer Science and Engineering program will require 183 units of courses to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary).

NOTE: Students majoring in Computer Science and Engineering may not complete the major in Computer Engineering, the major in Computer Science, the major or minor in Information and Computer Science, or the minor in Informatics.

Freshman		
Fall	Winter	Spring
MATH 2A	MATH 2B	MATH 2D
I&C SCI 31	I&C SCI 32	I&C SCI 33
General Education	PHYSICS 7C- 7LC	PHYSICS 7D- 7LD
General Education	EECS 31	EECS 31L
Sophomore		
Fall	Winter	Spring
MATH 3A	MATH 3D	EECS 50
I&C SCI 45C	I&C SCI 46	CSE 90
I&C SCI 6B	EECS 70A	I&C SCI 6D
	Science Elective	General Education
Junior		
Fall	Winter	Spring
IN4MATX 43	STATS 67	COMPSCI 143A
CSE 112	EECS 112L	COMPSCI 142A
EECS 112	COMPSCI 141	COMPSCI 145- 145L
COMPSCI 161	General Education	
Senior		
Fall	Winter	Spring
EECS 159A	EECS 159B	ENGR 190W
EECS 148	Technical Elective	Technical Elective
General Education	General Education	Science Elective
General Education	General Education	General Education

## Courses

### CSE 90. Systems Engineering and Technical Communications . 2 Units.

Introduces systems engineering concepts, including specifications and requirements, hardware and software design, integration, testing, and documentation. Emphasizes organization and writing of reports and effective presentations.

Restriction: Computer Science Engineering Majors have first consideration for enrollment.

**CSE 112. Electronic Devices and Circuits. 4 Units.**

A first course in the design of Very Large Scale Integrated (VLSI) systems. Introduction to CMOS technology; MOS transistors and CMOS circuits. Analysis and synthesis of CMOS gates. Layout design techniques for building blocks and systems. Introduction to CAD tools.

(Design units: 4)

Prerequisite: PHYS 7D and (CSE 70A or EECS 70A)

Overlaps with EECS 119, EECS 170D.

Restriction: Computer Science Engineering Majors have first consideration for enrollment.

**CSE 199. Individual Study. 1-4 Units.**

Supervised independent reading, research, or design for undergraduate Engineering majors. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Repeatability: May be taken for credit for 8 units.

## Environmental Science and Policy, B.A.

The Gulf oil spill. Global climate change. Drought and water supply. Fukushima. Each of these topics illustrates the continuing need for environmental professionals with training in the natural sciences and social sciences. The Environmental Science and Policy B.A. prepares students interested in environmental problem solving by linking an understanding of natural science with socioeconomic factors and public policy.

The curriculum combines a quantitative understanding of environmental science, chemistry, and biology with law, policy, and economics to provide a foundation for careers in environmental policy, resource management, education, environmental law, urban and environmental design, and related fields.

Students may be admitted to the Environmental Science and Policy major upon entering the university as freshmen, via change of major, or as transfer students from other colleges and universities. Information about change of major policies is available from the Physical Sciences student affairs office and the UCI Change of Major Criteria website (<http://changeofmajor.uci.edu/>).

The Environmental Science and Policy major provides students with a solid foundation to recognize the impacts of human activities on the environment, and in turn, the impacts of environmental change on society. Students are taught the mechanisms by which key institutions, policies, and regulations impact ecosystems and the physical environment.

Once the core course work is complete, students are encouraged to focus on a particular area within Environmental Science and Policy, and to choose electives that build a coherent core of knowledge. Focus areas include, but are not limited to, urban planning, public policy, sociology, economics, climatology, water resources, water quality, agriculture, air pollution, resource management, and atmospheric sciences.

**All students must meet the University Requirements.**

A. Complete:

EARTHSS 40A	Earth System Chemistry
or CHEM 1A-CHEM 1B-CHEM 1C-CHEM 1LC-CHEM 1LD	
or CHEM H2A-CHEM H2B-CHEM H2C-CHEM H2LA-CHEM H2LB-CHEM H2LC	
EARTHSS 40B	Earth System Biology
or BIO SCI 93-BIO SCI 94	
EARTHSS 40C	Earth System Physics
or PHYSICS 3A-PHYSICS 3B-PHYSICS 3C-PHYSICS 3LB-PHYSICS 3LC	
or PHYSICS 7C-PHYSICS 7D-PHYSICS 7E-PHYSICS 7LC-PHYSICS 7LD	
UPPP 8	Introduction to Environmental Analysis and Design
UPPP 5	Introduction to Urban Planning and Policy
STATS 7	Basic Statistics <sup>1</sup>
or STATS 8	
or SOCECOL 13	
or SOC SCI 10A-SOC SCI 10B-SOC SCI 10C	
EARTHSS 70A	Sustainable Energy Systems
EARTHSS 70B	Sustainable Food and Water Systems
EARTHSS 116	Introduction to Environmental Data Science

EARTHSS 192	Careers in Earth System Science
SOCECOL 10	Research Design
B. Select one of the following:	
SOCECOL 195	Field Study (4 units)
SOCECOL 195W	Field Study Writing Seminar <sup>2</sup>
SOCECOL 195B	Advanced Field Study <sup>2</sup>
SOCECOL 195CW	Advanced Field Study <sup>2</sup>
UC Washington, D.C. (UCDC) Academic Internship Program <sup>3</sup>	
UC Center Sacramento Academic Internship Program <sup>3</sup>	
C. Select three of the following:	
UPPP 131	Environmental Sustainability I
UPPP 133	Environmental Law and Policy
UPPP 139	Water Resource Policy
UPPP 142	Environmental Hazards in an Urbanizing World
UPPP 145	Environmental Governance
UPPP 146	Principles of Economics for Planning and Policy
D. Seven 4-unit upper-division courses from the list below, with at least two courses from UPPP and two courses from EARTHSS:	
UPPP or EARTHSS courses (100-196)	
EARTHSS 199	Undergraduate Research
SOCECOL 199	Special Studies
SOCECOL H190A	Honors Research
or SOCECOL H190W	Honors Research
EARTHSS H199A	Honors Research in Earth System Science
or EARTHSS H199B	Honors Research in Earth System Science
or EARTHSS H199C	Honors Research in Earth System Science

Courses used to count toward degree requirements may not be used as electives. Up to two of the seven electives can be satisfied with 4-unit EARTHSS 199, EARTHSS H199A, EARTHSS H199B, EARTHSS H199C, and/or 4-unit SOCECOL 199 or SOCECOL H190W courses. For this requirement, SOCECOL 199 courses can be counted as UPPP electives.

- <sup>1</sup> Students who score a minimum of 3 on the AP Statistics exam do not have to take STATS 7 or its equivalents.
- <sup>2</sup> Site must be listed within one of the following sections of the Field Study Catalog (<https://fieldstudy.sococo.uci.edu/pages/field-study-catalog/>): Environment, Planning, or Public Policy. For more information, visit the Social Ecology Field Study website (<https://fieldstudy.sococo.uci.edu/>).
- <sup>3</sup> See Field Study website for more information. Specific course work is required - 12 units minimum.

NOTE: This major is open to all students. However, courses being applied to another major cannot also be counted as upper-division electives for the B.A. in Environmental Science and Policy.

Freshman		
Fall	Winter	Spring
EARTHSS 40A	EARTHSS 40B	EARTHSS 40C
UPPP 8	STATS 7	UPPP 5
General Education/Elective	General Education/Elective	General Education/Elective
	General Education/Elective	General Education/Elective
Sophomore		
Fall	Winter	Spring
SOCECOL 10	EARTHSS 70B	EARTHSS 70A
General Education/Elective	General Education/Elective	General Education/Elective
Elective	General Education/Elective	General Education/Elective
Elective	Elective	
Junior		
Fall	Winter	Spring
UPPP 145	SOCECOL 195	UPPP 133
EARTHSS 116	EARTHSS upper-division elective	UPPP upper-division elective
EARTHSS 192	Elective	Elective
Elective	Elective	Elective

Senior		
Fall	Winter	Spring
Upper-division elective	UPPP 146	UPPP upper-division elective
Upper-division elective	Upper-division elective	EARTHSS upper-division elective
General Education/Elective	Elective	Elective
Elective	Elective	Elective

Environmental Science and Policy students may complete either the Earth System Science Honors Program or the Social Ecology Honors Program.

In a year-long honors course sequence, Environmental Science and Policy students admitted into the Environmental Science and Policy honors program pursue research with faculty in the Earth Systems Science or Urban Planning and Public Policy Departments, and prepare a written thesis of their work. Visit the Earth System Science honors program website ([http://catalogue.uci.edu/interdisciplinarystudies/environmentalscienceandpolicy\\_ba/%20https://www.ess.uci.edu/undergrad/ess/honors/](http://catalogue.uci.edu/interdisciplinarystudies/environmentalscienceandpolicy_ba/%20https://www.ess.uci.edu/undergrad/ess/honors/)) and the Social Ecology Honors Program (<https://students.sococo.uci.edu/pages/social-ecology-honors-program/>) for more information.

The Environmental Science and Policy major provides a strong interdisciplinary foundation for students to pursue a range of public and private sector positions, including environmental management, resource management, environmental law, environmental consulting, work with nonprofit organizations and non-governmental agencies, and related areas. Students are poised to pursue graduate studies (professional Masters degree or Ph.D.) in the following fields: environmental science, environmental studies, public policy, public administration, urban and regional planning, geography and related fields.

## Global Middle East Studies, B.A.

### Mark LeVine, Director

400 Murray Krieger Hall

949-824-6735

[www.humanities.uci.edu/gmes](http://www.humanities.uci.edu/gmes) (<http://www.humanities.uci.edu/gmes/>)

[gmes@uci.edu](mailto:gmes@uci.edu) (%20gmes@uci.edu)

The Global Middle East Studies major offers students an in-depth, interdisciplinary grounding in the histories and present-day realities of the Middle East in a global context. The goal is to ensure students have a well-developed and competitive foundation to continue their studies at the graduate level in the U.S. and globally, and/or begin a career in law, business, consulting, foreign affairs, humanitarian affairs, medicine, science, or security studies, in which both theoretical and practical/first-hand knowledge of the regions we study are equally important.

Global Middle East Studies is both an attractive program and the perfect complement to numerous other programs on campus, particularly those with a disciplinary focus such as history, comparative literature, anthropology, political science, sociology, art history, international studies, global cultures, business, pre-law and criminology, pre-med, computer and information sciences, engineering, and other physical sciences.

## Requirements for the B.A. in Global Middle East Studies

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Requirements for the Major

A. Complete the following:

GLBL ME 60A- 60B- 60C

Humanities and Arts: Problems and Methods for Global Middle East Studies  
and Social Sciences: Problems and Methods for Global Middle East Studies  
and Social Ecology and Sciences: Problems and Methods for Global Middle East Studies

GLBL ME 100W

Research and Writing for Global Middle East Studies

B. Complete course work equivalent to UCI's sixth quarter of study (2C level) in one of the following single languages: Arabic, Persian, or Hebrew. Students may also petition to complete the requirement in other languages.

C. Complete four upper-division courses, selected from two of the following emphases (eight total): <sup>1</sup>

1. Environment, Economies, and Conflicts

2. Histories, Cultures, and Identities

3. Geographies, Migrations, and Politics

<sup>1</sup> Courses must be selected from the approved lists published on the Global Middle East Studies website (<http://www.humanities.uci.edu/gmes/>).

**Residence Requirement for the Major:** A minimum of five upper-division courses required for the major must be completed successfully at UCI.

## Global Middle East Studies, Minor

### Mark LeVine, Director

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949-824-6735

[www.humanities.uci.edu/gmes](http://www.humanities.uci.edu/gmes) (<http://www.humanities.uci.edu/gmes/>)

[gmes@uci.edu](mailto:gmes@uci.edu) (%20gmes@uci.edu)

The Global Middle East Studies minor offers students an in-depth, interdisciplinary grounding in the histories and present-day realities of the Middle East in a global context. The goal is to ensure students have a well-developed and competitive foundation to continue their studies at the graduate level in the U.S. and globally, and/or begin a career in law, business, consulting, foreign affairs, humanitarian affairs, medicine, science, or security studies, in which both theoretical and practical/first-hand knowledge of the regions we study are equally important.

Global Middle East Studies is both an attractive program and the perfect complement to numerous other programs on campus, particularly those with a disciplinary focus such as history, comparative literature, anthropology, political science, sociology, art history, international studies, global cultures, business, pre-law and criminology, pre-med, computer and information sciences, engineering, and other physical sciences. The Global Middle East Studies minor can be combined with any major.

### Requirements for the Minor in Global Middle East Studies

#### A. Complete:

GLBL ME 60A- 60B- 60C

Humanities and Arts: Problems and Methods for Global Middle East Studies

and Social Sciences: Problems and Methods for Global Middle East Studies

and Social Ecology and Sciences: Problems and Methods for Global Middle East Studies

#### B. Complete four upper-division courses selected from an approved list.<sup>1</sup>

<sup>1</sup> Courses must be selected from the approved lists published on the Global Middle East Studies website. (<http://www.humanities.uci.edu/gmes/>)

**Residence Requirement for the Minor:** Four upper-division courses required for the minor must be completed successfully at UCI. Two of the four may be taken through the UC Education Abroad Program, provided course content is approved in advance by the appropriate program director.

## Global Sustainability, Minor

**Peter A. Bowler**, Professor of Teaching in Ecology and Evolutionary Biology, Director of the Minor of Global Sustainability

**Jessica Pratt**, Coordinator of the Minor's Capstone Course Sequence

321 Steinhaus Hall

949-824-6006

Fax 949-824-2181

<http://environment.uci.edu/degree/minor-gs> (<https://sustainability.uci.edu/education/forstudents/>)

The interdisciplinary minor in Global Sustainability prepares students to consider the challenges of meeting the needs of the present without compromising the ability of future generations to meet their own needs, with emphasis upon addressing the extreme poverty that afflicts at least 20 percent of the world's current population. The Earth is a complex system comprised of interactions between its various physical, biological, social, and political components, and human populations have initiated many global trends that cannot be sustained indefinitely. Some of these trends are physiochemical or biological in nature (the depletion of fossil fuels, the accumulation of ozone-depleting chemicals, the destruction of wildlife habitat, and high rates of species extinction), while others are social and political (accelerating urbanization, population displacement, and regional economic imbalance).

As a result, the vitality of the Earth depends upon interdisciplinary and collaborative approaches that draw on the strengths of multiple fields. In this program, students will become aware of the main drivers of climate change, both natural and human-induced, the intrinsic as well as the resource values of species, ecosystems, and communities, and how the loss of cultural diversity and a growing income gap between nations leads to additional pressure for biological resource exploitation. Students will become familiar with foundational sustainability concepts in social practice, governance and allocation, the physical sciences, and the biological sciences to better understand and effectively deal with contemporary environmental and social equity crises.

The minor is open to all UCI students. Courses in addition to those already approved for the minor (below) may be petitioned to the Director, and the list of accepted courses is updated on an annual basis.

Students are required to complete three introductory courses (12 units), three electives (12 units), one methods course (4 units), and three quarters of a senior capstone sequence (8 units).



**A. Introductory Course**

Select one of the following:

EARTHSS 1	Introduction to Earth System Science
EARTHSS 3	Oceanography
EARTHSS 5	The Atmosphere
EARTHSS 15	Introduction to Global Climate Change
UNI STU 13A	Introduction to Global Sustainability I

**B. Introductory Course B**

Select one of the following:

BIO SCI 9K	Global Change Biology
BIO SCI 55	Introduction to Ecology
UNI STU 13B	Introduction to Global Sustainability II

**C. Introductory Course C**

Select one of the following:

ANTHRO 20A	People, Cultures, and Environmental Sustainability
ANTHRO 30A	Global Issues in Anthropological Perspective
ANTHRO 41A	Global Cultures and Society
POL SCI 41A	Introduction to International Relations
PUBHLTH 30	Introduction to Urban Environmental Health
PUBHLTH 60	Environmental Quality and Health
SOCECOL E8	
SOCIOL 44	Births, Deaths, and Migration
UNI STU 13C	Introduction to Global Sustainability III

**D. Electives**

Select three courses from among a list of quarterly approved courses, with each elective course drawn from a different category. Two of the three courses must be upper-division and none of the three courses may overlap with selected introductory courses. As per university policy, students may overlap a maximum of two courses between their major and minor.

Category 1 - Social Practice (Ethics, Identity, Culture, Wellness, Education Business):

AFAM 128	Topics in Gender/Sexuality
ANTHRO 20A	People, Cultures, and Environmental Sustainability
ANTHRO 30A	Global Issues in Anthropological Perspective
HISTORY 12	Introductory Topics in History
HISTORY 100W	Writing About History
HISTORY 190	Colloquium
PHILOS 131A	Applied Ethics
PUBHLTH 60	Environmental Quality and Health
PUBHLTH 90	Natural Disasters
PUBHLTH 125	Foundations of Community Health
PUBHLTH 167	Air Pollution, Climate, and Health
PUBHLTH 173	Health and Global Environmental Change

Category 2 - Governance and Allocation (Natural Resource Management, Economics, Development, Poverty Alleviation, Social Justice):

ANTHRO 125A	Economic Anthropology
ECON 145E	Economics of the Environment
ECON 145FW	Economics of the Environment II
ECON 152A	Economic Anthropology
ECON 164A	
UPPP 4	Introduction to Urban Studies
UPPP 40	Urban Sociology
UPPP 113	Poverty and Change in Developing Countries
UPPP 131	Environmental Sustainability I
UPPP 132	Environmental Sustainability II
UPPP 139	Water Resource Policy



UPPP 155	Urban Design Principles
SOC SCI 5D	US & World Geography
SOC SCI 119	Special Topics in Geography
SOCECOL E8	
SOCIOL 44	Births, Deaths, and Migration
UNI STU 13C	Introduction to Global Sustainability III
Category 3- Physical Sciences (Earth System Science, Engineering, Computing):	
EARTHSS 1	Introduction to Earth System Science
EARTHSS 3	Oceanography
EARTHSS 5	The Atmosphere
BIO SCI 9K	Global Change Biology
EARTHSS 15	Introduction to Global Climate Change
EARTHSS 17	Hurricanes, Tsunamis, and Other Catastrophes
EARTHSS 19	Introduction to Modeling the Earth System
EARTHSS 21	On Thin Ice: Climate Change and the Cryosphere
EARTHSS 23	Air Pollution: From Urban Smog to Global Change
EARTHSS 51	Land Interactions
EARTHSS 55	Earth's Atmosphere
EARTHSS 60B	
EARTHSS 60C	
EARTHSS 146	Consequences of Air Pollution
EARTHSS 164/BIO SCI E118	Ecosystem Ecology
EARTHSS 174	
UPPP 131	Environmental Sustainability I
UPPP 132	Environmental Sustainability II
ENGRCEE 60	Contemporary and Emerging Environmental Challenges
ENGRCEE 160	Environmental Processes
ENGRCEE 171	Water Resources Engineering
ENGRMAE 118	Sustainable Energy Systems
ENGRMAE 164	Air Pollution and Control
I&C SCI 5	Global Disruption and Information Technology
IN4MATX 161	Social Analysis of Computing
UNI STU 13A	Introduction to Global Sustainability I
Category 4 - Biological Sciences (Biology, Ecology, Evolutionary Sciences):	
BIO SCI 9E	Horticulture Science
BIO SCI 23	Sustainable Landscaping: Design and Practices
BIO SCI 55	Introduction to Ecology
BIO SCI 94	From Organisms to Ecosystems
BIO SCI E106	Processes in Ecology and Evolution
BIO SCI E118/EARTHSS 164	Ecosystem Ecology
BIO SCI E120	Marine Biology
BIO SCI E127/EARTHSS 168	Physiological Plant Ecology
BIO SCI E150	Conservation Biology
BIO SCI E172	Plant Diversity in a Changing World
BIO SCI E179	Limnology and Freshwater Biology
BIO SCI E182	Mediterranean Ecosystems: Biodiversity and Conservation
BIO SCI E186	Population and Community Ecology
BIO SCI E189	Environmental Ethics
UNI STU 13B	Introduction to Global Sustainability II
<b>E. Methods</b>	
Select one of the following:	
BIO SCI E166L	Field Biology

EARTHSS 19	Introduction to Modeling the Earth System
EARTHSS 114	Earth System Science Laboratory and Field Methods
EARTHSS 116	Introduction to Environmental Data Science
ENGRCEE 11	Methods II: Probability and Statistics
ENGRCEE 20	Introduction to Computational Problem Solving
UPPP 107	Urban and Regional Planning
SOCECOL E8	
SOCECOL 10	Research Design
SOCECOL 13	Statistical Analysis in Social Ecology
SOCIO 10A- 10B- 10C	Probability and Statistics and Probability and Statistics and Probability and Statistics
<b>F. Senior Capstone Sequence</b>	
BIO SCI 191A- 191B- 191CW	Senior Seminar on Global Sustainability I and Senior Seminar on Global Sustainability II and Writing/Senior Seminar on Global Sustainability III
or	
EARTHSS 190A- 190B- 190CW	Senior Seminar on Global Sustainability I and Senior Seminar on Global Sustainability II and Writing/Senior Seminar on Global Sustainability III
or	
SOCECOL 186A- 186B- 186CW	Senior Seminar on Global Sustainability I and Senior Seminar on Global Sustainability II and Writing/Senior Seminar on Global Sustainability III

## History and Philosophy of Science, Minor

**Brian Skyrms, Director**  
949-824-1520

The minor in the History and Philosophy of Science is intended for students who wish to study the history of science, the philosophical foundations of scientific inquiry, and the relationship between science and other fields. The history of science explores how science is actually done and how it has influenced history. This may involve tracking down an idea's source or its influences, evaluating the cultural forces at work in the generation of a scientific theory or the reaction of culture to science, or taking a detailed look at the work of a particular scientist or movement within science. The philosophy of science is concerned with determining what science and mathematics are, accounting for their apparent successes, and resolving problems of philosophical interest that arise in the sciences. Philosophy of science courses cover such topics as the role of logic and language in science and in mathematics, scientific explanation, evidence, and probability. These courses may also cover work that has been done on the philosophical problems in specific sciences—for example, the direction of time in physics, the model of mind in psychology, the structure of evolution theory in biology, and the implications of Gödel's incompleteness theorems for mathematics.

The minor is available to all UCI students.

A. Select two of the following:

LPS 31	Introduction to Inductive Logic
LPS 40	The Nature of Scientific Inquiry
HISTORY 60	The Making of Modern Science

B. Select two of the following:

HISTORY 135B	Crossing the World's Oceans: From Sail to Steam
HISTORY 135E	Topics in the History of Science and Technology
PHILOS 110–115 (when topic is science)	
PSYCH 120H	History of Psychology

C. Select three of the following:

LSCI 141	Topics in Philosophy of Language
LPS 106	Topics in Logic
LPS 108	Topics in Induction, Probability, and Decision Theory
LPS 140	Topics in Philosophy of Science
LPS 141A	Topics in Philosophy of Physics

LPS 141C	Philosophy of Quantum Mechanics
LPS 142W	Writing/Philosophy of Biology
LPS 143	Topics in Philosophy of Psychology
LPS 145	Topics in Philosophy of Language
LPS 146	Topics in Philosophy of Logic
LPS 147	Topics in Philosophy of Mathematics

## Master of Embedded and Cyber-Physical Systems

### Rainer Doemer, Interim Director

3211 Engineering Hall

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<http://www.mecps.uci.edu>

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The graduate program in Embedded and Cyber-Physical Systems is administered by faculty from two academic units: the Donald Bren School of Information and Computer Sciences, and the Henry Samueli School of Engineering. The program offers the Master of Embedded and Cyber-Physical Systems.

Embedded systems are now entrenched into almost every aspect of our daily life, rivaling in ubiquity anything that exists today. Currently, we have tools to help us design embedded systems, making good use of available technologies at a variety of levels and scales, from hardware to interface, operating system, middleware, and software. Cyber-Physical Systems (CPS) are systems-of-systems that tightly couple their cyber (i.e. computation, communication, and control), and physical components (sensing and actuation) in the context of applications such as (but not limited to): automotive and transportation, manufacturing, power distribution grid, medical and healthcare, robotics, civil infrastructure, avionics, etc.

Thus, these Cyber-Physical Systems marry knowledge from the fields of embedded systems, networking, sensors, real-time systems, and control, as well as domain-specific knowledge, to realize systems that are of untapped complexity and scale. The Master of Embedded and Cyber-Physical Systems (MECPS) program's goal is to train students in the foundation, skills, and practices of embedded and cyber-physical systems design, optimization, and evaluation. MECPS draws primarily from Computer Science and from Engineering.

Applicants for the MECPS Program apply through the Office of Graduate Division and indicate on their applications their interest in the program. Applicants are expected to hold a bachelor's degree in Computer Engineering, Computer Science, or Electrical Engineering.

Students from other disciplines may be considered for admission if they have sufficient background in the basics of embedded systems. Applicants are evaluated on the basis of their prior academic record and their potential for carrying out graduate-level work as demonstrated in submitted application materials. These materials include official university transcripts, letters of recommendation, GRE scores, and Statement of Purpose.

Of particular interest are students whose background is in one of the target application areas of CPS (e.g. mechanical engineering, civil, biomedical, etc.). Students with some industry experience will be considered favorably, especially if their experience is relevant to the areas emphasized by CPS. An admissions committee composed of senate faculty members evaluates the applicant files and makes admissions decisions based on the overall file presented by the student. Overall, students are admitted using criteria similar to those used in traditional M.S. degrees from relevant departments (Electrical Engineering and Computer Science and Computer Science).

48 units are required. The course requirements are as follows:

#### A. Complete the following:

ECPS 202	Cyber-Physical Systems Design
ECPS 203	Embedded Systems Modeling and Design
ECPS 204	Embedded System Software
ECPS 205	Sensors, Actuators and Sensor Networks
ECPS 206	Real-Time and Distributed Systems
ECPS 207	Security and Privacy in Cyber-Physical Systems
ECPS 208	Control Systems for Cyber-Physical Systems
ECPS 211	Machine Learning and Data Mining
ECPS 212	Entrepreneurship for Scientists and Engineers

#### B. Complete the following case studies courses:

ECPS 209	Cyber-Physical Systems Case Studies
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#### C. Complete the following project course:

ECPS 210	Cyber-Physical Systems Project
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Normative time to degree is five quarters.

## Mathematical, Computational, and Systems Biology, M.S.

The graduate program in Mathematical, Computational, and Systems Biology (MCSB) is designed to meet the interdisciplinary training challenges of modern biology and function in concert with existing departmental programs (Departmental option) or as an individually tailored program (stand-alone option) leading to a M.S. degree.

The degree program provides students with both opportunity for rigorous training toward research careers in areas related to systems biology and flexibility through individualized faculty counseling on curricular needs, and access to a diverse group of affiliated faculty and research projects from member departments. Current member departments include Biomedical Engineering, Biological Chemistry, Computer Science, Developmental and Cell Biology, Ecology and Evolutionary Biology, Mathematics, Microbiology and Molecular Genetics, Molecular Biology and Biochemistry, Chemistry, and Physics.

Students interested in the MCSB Program apply to the Office of Graduate Studies (OGS). Applicants must specify that they wish to pursue the M.S. or Ph.D. Upon completion of the M.S., students who may wish to pursue a Ph.D. may request to be evaluated together with the pool of prospective Ph.D. candidates for admission to the Ph.D. program.

Applicants are expected to hold a Bachelor's degree in one of the Science, Technology, Engineering, and Mathematics (STEM) fields. Applicants are evaluated on the basis of their prior academic record and their potential for creative research and teaching, as demonstrated in submitted application materials (official university transcripts, letters of recommendation, GRE scores, and statement of purpose).

### Required Core Courses

DEV BIO 203A	Graduate Tutorial in Developmental and Cell Biology
PHYSICS 230A	Biophysics of Molecules and Molecular Machines
DEV BIO 232	Systems Cell and Developmental Biology
ECO EVO 251	Evolutionary and Ecological Principles in Medicine
or DEV BIO 203C	Graduate Tutorial in Developmental and Cell Biology
MATH 227A	Mathematical and Computational Biology <sup>1</sup>
or BME 233	Dynamic Systems in Biology and Medicine
MATH 227B	Mathematical and Computational Biology
COMPSCI 284C	Computational Systems Biology
or MATH 227C	Mathematical and Computational Biology

<sup>1</sup> BME 233 may be taken only if MATH 227A has been completed.

Students must complete the required core courses with at least a B+ average (3.3 GPA).

### Required Labs

Students are expected to complete a minimum of two rotations during the first year. In some cases, students may arrive during the summer months (July and August) to start a rotation early, or finish a rotation prior to the start of the classes. In general, students are expected to complete rotations by the end of the spring quarter of their first academic year.

Students must perform one laboratory rotation in an experimental (wet) lab, and one in a computational (dry) lab.

### Master of Science Program

Students pursuing the M.S. may choose either Plan I (Research Thesis Option) or Plan II (Literature Thesis Option). Students following Plan I must complete the seven required core courses (listed above), plus two electives. Students in Plan II must complete the seven required core courses, plus five elective courses selected from Breadth Categories I, II, and III. Students in Plan I and Plan II must attend first-year bootcamp.

In both plans, students must be supervised by a training faculty participating in the MCSB Ph.D. program and the student's choice of Plan I or Plan II must be approved by the MCSB Executive Committee in consultation with the Program Director and their faculty supervisor. The normative time to degree is two years.

## Mathematical, Computational, and Systems Biology, Ph.D.

The graduate program in Mathematical, Computational, and Systems Biology (MCSB) is designed to meet the interdisciplinary training challenges of modern biology and function in concert with existing departmental programs (Departmental option) or as an individually tailored program (stand-alone option) leading to a Ph.D. degree.

The degree program provides students with both opportunity for rigorous training toward research careers in areas related to systems biology and flexibility through individualized faculty counseling on curricular needs, and access to a diverse group of affiliated faculty and research projects from member departments. Current member departments include Biomedical Engineering, Biological Chemistry, Computer Science, Developmental and Cell Biology, Ecology and Evolutionary Biology, Mathematics, Microbiology and Molecular Genetics, Molecular Biology and Biochemistry, Chemistry, and Physics.

Students interested in the MCSB Program apply to the Office of Graduate Studies (OGS). Applicants must specify that they wish to pursue the M.S. or Ph.D. Upon completion of the M.S., students who may wish to pursue a Ph.D. may request to be evaluated together with the pool of prospective Ph.D. candidates for admission to the Ph.D. program.

Applicants are expected to hold a Bachelor's degree in one of the Science, Technology, Engineering, and Mathematics (STEM) fields. Applicants are evaluated on the basis of their prior academic record and their potential for creative research and teaching, as demonstrated in submitted application materials (official university transcripts, letters of recommendation, GRE scores, and statement of purpose).

## Required Core Courses

DEV BIO 203A	Graduate Tutorial in Developmental and Cell Biology
PHYSICS 230A	Biophysics of Molecules and Molecular Machines
DEV BIO 232	Systems Cell and Developmental Biology
ECO EVO 251	Evolutionary and Ecological Principles in Medicine
or DEV BIO 203C	Graduate Tutorial in Developmental and Cell Biology
MATH 227A	Mathematical and Computational Biology <sup>1</sup>
or BME 233	Dynamic Systems in Biology and Medicine
MATH 227B	Mathematical and Computational Biology
COMPSCI 284C	Computational Systems Biology
or MATH 227C	Mathematical and Computational Biology

Enrolled students participate in a common first-year "gateway" program and must complete the seven required core courses (listed above). Students are assigned an MCSB Advisory Committee consisting of two participating faculty members to oversee course and laboratory work. Subsequently, students select a thesis advisor and choose between the **Departmental** or **Interdisciplinary** (Stand-Alone) options for the remainder of their Ph.D. training.

### Departmental Option

For students who select the Departmental option, a faculty member in a participating department must agree to serve as the student's thesis advisor. Completion of the Ph.D. is subject to the degree requirements of the departmental Ph.D. program in which the student enrolls. Participating departments accept both the course work and research conducted during the "gateway" year in partial fulfillment of such requirements. Students are encouraged to consult with the department of choice for specific information on additional requirements. All department student advisory committees are established according to the rules of the participating department. In addition, the student's MCSB Advisory Committee meets annually to follow progress and provide additional guidance. The normative time to degree for students in the Departmental option is five years.

To complete the coursework requirements for the Departmental option, students must:

- Attend first-year bootcamp
- Perform at least two laboratory rotations; one in an experimental (wet) lab and one in a computational (dry) lab
- Complete the seven required core courses, in addition to any departmental requirements.

### Interdisciplinary (Stand-Alone) Option

For students who select the stand-alone option, the student's thesis advisor assumes the role of the Committee Chair when a participating MCSB faculty member agrees to accept that role. Adjustments to the MCSB Advisory Committee may be made based on the area of the student's research, or by request of the student, thesis advisor, or committee members. The student meets biannually with the Advisory Committee until an Advancement to Candidacy Committee has formed, which then assumes the duties until the M.S. or Ph.D. defense. The normative time to degree for students in the Stand-Alone option is five years.

To complete the coursework requirements for the Stand-Alone option, students must:

- Attend first-year bootcamp
- Perform at least two laboratory rotations; one in an experimental (wet) lab and one in a computational (dry) lab
- Complete the seven required core courses, plus five elective courses selected from Breadth Categories I and II.

## Native American Studies, Minor

The minor in Native American Studies is an interdisciplinary, interschool program, hemispheric in scope. Focusing on North America and Mesoamerica, the two core courses provide an overview respectively of: pre-Columbian history, worldviews, social organization, religion, and the centrality of place; American Indian diplomacy, law and history since 1776; and a critical assessment of colonialism, evolutionary theory, and ethnography. Upper division offerings, drawing upon research and teaching specializations of faculty from different departments, further enrich the minor with analysis of Native American literature and histories of native Latin America.

A. Select two from the following:

HISTORY 15A	Native American History
HISTORY 40A	Colonial America: New Worlds
ENGLISH 8	Multicultural American Literature

B. Complete:

ANTHRO 121D	Cross-Cultural Studies of Gender
ANTHRO 135A	Religion and Social Order
ANTHRO 162A	Peoples and Cultures of Latin America

ART HIS 175

EDUC 124

Multicultural Education in K-12 Schools

Students may also select from the following courses when the topics presented relate to Native American Studies:

ANTHRO 149	Special Topics in Archaeology
ANTHRO 169	Special Topics in Area Studies
COM LIT 105	Topics in Comparative Multiculturalism
ENGLISH 105	Multicultural Topics in Literatures in English
HISTORY 169	Topics in Latin American History
SOCIOL 149	Special Topics: Structures
SOCIOL 169	Special Topics in Age, Gender, Race, and Ethnicity

## Networked Systems, M.S.

The graduate program in Networked Systems is administered by faculty from two academic units: the Department of Computer Science (CS) in the Donald Bren School of Information and Computer Sciences and the Department of Electrical Engineering and Computer Science (EECS) in The Henry Samueli School of Engineering. The program offers an M.S. and a Ph.D. in Networked Systems.

The Networked Systems program provides education and research opportunities to graduate students in the areas of computer and telecommunication networks. Networked Systems include telephone, cable TV networks, wireless, mobile, ad hoc, and cellular phone networks, as well as the Internet. Networked Systems, as a field, is inherently interdisciplinary since it combines technology in software, hardware, and communications. As a result, it transcends traditional departmental boundaries. Networked Systems draws primarily from Computer Science, Computer Engineering, and Electrical Engineering. At UCI, these areas are housed in two departments: CS and EECS. The Networked Systems program unites the respective strengths of these two departments and provides integrated M.S. and Ph.D. programs in this area.

Program requirements include core, breadth, and concentration courses. **Core courses** are taken by all Networked Systems students and form a foundation for networking topics. **Breadth courses** may be selected from technical courses (including distributed systems, algorithms, data structures, operating systems, databases, random processes, and linear systems) and management and applications of technology (including educational technology, management of information technology, and social impact). **Concentration courses** may be selected from a long list including courses on networks, performance, middleware, communications, and operations research. Core, breadth, and concentration course lists are available on the Networked Systems website (<http://www.networkedsystems.uci.edu/>) or from the Networked Systems Program Office.

Prospective graduate students apply directly to the Networked Systems program, specifying if they are pursuing an M.S. or a Ph.D. Applicants who do not hold a bachelor's degree in Computer Science, Computer Engineering, or Electrical Engineering may be required to take supplementary course work to obtain and demonstrate sufficient background in the field.

Applicants are evaluated on the basis of prior academic record and potential for creative research and teaching, as demonstrated in their application materials including official university transcripts, letters of recommendation, GRE test scores, and statement of purpose.

Students pursuing the M.S. may choose either Plan I (Thesis Plan) or Plan II (Comprehensive Examination Plan).

### Requirements

Students following Plan I must complete the three core courses, two courses chosen from the breadth course list with at most one chosen from the Management and Applications of Technology list, three courses chosen from the concentration course lists with at least one course chosen from at least



two different concentrations, two additional courses chosen with the approval of the advisor, and a thesis. In addition, students pursuing Plan I must enroll in two courses of thesis-related research: COMPSCI 298 or EECS 296.

Students following Plan II must complete the three core courses, three courses chosen from the breadth course list with at most two chosen from the Management and Applications of Technology list, four courses chosen from the concentration course lists with at least one course chosen from at least three different concentrations, and two additional courses chosen with the approval of the advisor. Students pursuing this option must also pass a comprehensive examination which will be administered through NET SYS 295 and will consist of a term paper on a topic relevant to the student's educational program and that term's speakers.

## Networked Systems, Ph.D.

The graduate program in Networked Systems is administered by faculty from two academic units: the Department of Computer Science (CS) in the Donald Bren School of Information and Computer Sciences and the Department of Electrical Engineering and Computer Science (EECS) in The Henry Samueli School of Engineering. The program offers an M.S. and a Ph.D. in Networked Systems.

The Networked Systems program provides education and research opportunities to graduate students in the areas of computer and telecommunication networks. Networked Systems include telephone, cable TV networks, wireless, mobile, ad hoc, and cellular phone networks, as well as the Internet. Networked Systems, as a field, is inherently interdisciplinary since it combines technology in software, hardware, and communications. As a result, it transcends traditional departmental boundaries. Networked Systems draws primarily from Computer Science, Computer Engineering, and Electrical Engineering. At UCI, these areas are housed in two departments: CS and EECS. The Networked Systems program unites the respective strengths of these two departments and provides integrated M.S. and Ph.D. programs in this area.

Program requirements include core, breadth, and concentration courses. **Core courses** are taken by all Networked Systems students and form a foundation for networking topics. **Breadth courses** may be selected from technical courses (including distributed systems, algorithms, data structures, operating systems, databases, random processes, and linear systems) and management and applications of technology (including educational technology, management of information technology, and social impact). **Concentration courses** may be selected from a long list including courses on networks, performance, middleware, communications, and operations research. Core, breadth, and concentration course lists are available on the Networked Systems website (<http://www.networkedsystems.uci.edu/>) or from the Networked Systems Program Office.

Prospective graduate students apply directly to the Networked Systems program, specifying if they are pursuing an M.S. or a Ph.D. Applicants who do not hold a bachelor's degree in Computer Science, Computer Engineering, or Electrical Engineering may be required to take supplementary course work to obtain and demonstrate sufficient background in the field.

Applicants are evaluated on the basis of prior academic record and potential for creative research and teaching, as demonstrated in their application materials including official university transcripts, letters of recommendation, GRE test scores, and statement of purpose.

### Requirements

The Ph.D. requires the following 13 courses: three core courses; three courses chosen from the breadth course list, with at most two chosen from the Management and Applications of Technology list; four courses chosen from the concentration course lists, with at least one course chosen from at least three different concentrations; and three additional courses, chosen with the approval of the research advisor. Students must also complete two teaching practicum courses (I&C SCI 399) and a dissertation.

Courses applied to the M.S. can also be applied to the Ph.D. Students who have taken similar graduate-level courses at another university may petition to apply these courses to the Ph.D. requirements. Ph.D. students who have served as teaching assistants, readers, or tutors at another university may petition to apply this experience toward the teaching practicum requirement. Normative time for advancement to candidacy is three years (two for students who entered with a master's degree). Normative time for completion of the Ph.D. is six years (five for students who entered with a master's degree), and maximum time permitted is seven years.

## Transportation Science, M.S.

**Jean-Daniel Saphores, Director**

949-824-2611

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<http://www.transci.uci.edu/>

The graduate program in Transportation Science includes faculty from four academic units: the Department of Civil and Environmental Engineering in The Henry Samueli School of Engineering, the Department of Economics in the School of Social Sciences, the Department of Planning, Policy, and Design in the School of Social Ecology, and the Department of Computer Science in the Bren School of Information and Computer Sciences. The program is designed to educate students in a broad set of competencies and perspectives that mirror the actual practice of current transportation research. The M.S. and Ph.D. degrees in Transportation Science are offered.

Admission is limited to a small number of exceptionally talented, independent, and self-disciplined students. The deadline for application for admission is March 1 for fall quarter. A second window for application for admission for winter or spring quarters is open from April 15 through June 1 but funding

options for this second window may be very limited. All applicants must take the Graduate Record Exam (GRE) prior to the application deadline. Applicants whose first language is not English must also submit Test of English as a Foreign Language (TOEFL) scores.

The M.S. program is a 44-unit program with two options: (1) thesis; and (2) comprehensive examination. Students will choose one of these two options. For both options, no more than 12 credit hours of non-transportation courses can count toward the required number of course-work units. Exceptions must be approved by the student's advisor and the Director of the Transportation Science program. Opportunities are available for part-time study toward the M.S. degree. The normative time for completion of the M.S. is four quarters, with some students finishing in a single academic year, and others staying into a second year. Many students will choose to stay for five or six quarters, and the maximum time permitted is four years.

## Requirements

Core courses must be chosen from lists in each of the four program areas: *Area 1 (Transportation Systems Engineering)*, *Area 2 (Urban and Transportation Economics)* and *Area 3 (Transportation Planning)*, and *Area 4 (Computer Science)*.

Substitutions and exceptions must be requested ahead of time and must be approved by the Director of the Transportation Science program.

Each student must choose at least two graduate courses from Area 1, at least one graduate course from Areas 2 and 3, and at least four additional graduate courses from any of the four areas. At least five of the eight core courses must be transportation courses, which are indicated by an asterisk.

Specific courses in each of these areas are shown below:

### Area 1 (Transportation Systems Engineering)

ENGRCEE 220A	Travel Demand Analysis I *
ENGRCEE 220B	Travel Demand Analysis II
ENGRCEE 221A	Transportation Systems Analysis I *
ENGRCEE 222	Transit Systems Planning
ENGRCEE 223	Transportation Systems III: Planning and Forecasting
ENGRCEE 224A	Transportation Data Analysis I *
ENGRCEE 226A	Traffic Flow Theory I *
ENGRCEE 228A	Urban Transportation Networks I *
ENGRCEE 229A	Traffic Systems Operations and Control I

### Area 2 (Urban and Transportation Economics) <sup>1</sup>

ECON 210A- 210B	Microeconomic Theory I and Microeconomic Theory II
ECON 281A- 281B	Urban Economics I and Urban Economics II *
ECON 281B	Urban Economics II
ECON 282A- 282B	Transportation Economics I and Transportation Economics II *
ECON 282B	Transportation Economics II
Economics 289 A–Z*	

### Area 3 (Transportation Planning)

UPPP 202	History of Urban Planning
UPPP 207	Land-Use Law
UPPP 212	Transportation Planning and Policy
UPPP 231	Transportation and Environmental Health
UPPP 235	Geographic Information Systems (GIS) Problem Solving in Planning
UPPP 237	Introduction to Geographic Information Systems

Pre-approved upper-division undergraduate courses, independent study units, or seminars:

### Area 4 (Computer Science)

COMPSCI 206	Principles of Scientific Computing
COMPSCI 248A	Introduction to Ubiquitous Computing
COMPSCI 260	Fundamentals of the Design and Analysis of Algorithms
COMPSCI 268	Introduction to Optimization
COMPSCI 271	Introduction to Artificial Intelligence
COMPSCI 274A	Probabilistic Learning: Theory and Algorithms

A. Pre-approved upper-division undergraduate courses:



ECON 105A- 105B	Intermediate Quantitative Economics I and Intermediate Quantitative Economics II
ECON 123A- 123B	Econometrics I and Econometrics II
ECON 123B	Econometrics II
ECON 149	Special Topics in Economics of Public and Private Organizations
ENGRCEE 121	Transportation Systems I: Analysis and Design
ENGRCEE 122	Transportation Systems II: Operations and Control
ENGRCEE 123	Transportation Systems III: Planning and Forecasting
ENGRCEE 124	Transportation Systems IV: Freeway Operations and Control
I&C SCI 45C	Programming in C/C++ as a Second Language
I&C SCI 46	Data Structure Implementation and Analysis
COMPSCI 115	Computer Simulation
COMPSCI 121	Information Retrieval
COMPSCI 122A	Introduction to Data Management
B. Independent study units:	
ECON 299	Independent Study
ENGRCEE 296	Master of Science Thesis Research
ENGRCEE 298	Special Topics in Civil Engineering
ENGRCEE 299	Individual Research
UPPP 298	Directed Studies in Urban Planning
UPPP 299	Independent Study in Urban Planning
COMPSCI 298	Thesis Supervision
COMPSCI 299	Individual Study
C. Students who choose the thesis option may also select up to eight units of the following:	
ENGRCEE 296	Master of Science Thesis Research (4 to 12 units)
UPPP 298	Directed Studies in Urban Planning
COMPSCI 298	Thesis Supervision

<sup>1</sup> NOTE: ECON 281A-ECON 281B and ECON 282A-ECON 282B require ECON 210A or consent of the instructor. Students can only count one ECON 289 course toward the required number of units.

After approval from their advisor, students may petition the Director of the Transportation Science Program with requests for substitution of the required courses.

### Plan I: Thesis Option

Students who select the thesis option must complete at least 44 units of study, up to eight of which can be taken in conjunction with the thesis research topic (thesis units should be taken in the home department of the faculty advisor); they must also complete at least 36 units of course work with no more than four units of pre-approved upper-division undergraduate courses, independent study units, or seminars. The thesis should reflect an original research investigation and it must be approved by a thesis committee of at least three full-time faculty members, a majority of which must be Transportation Science faculty.

### Plan II: Comprehensive Examination Option

Students who select the comprehensive examination option must successfully complete 44 units of course work and pass a comprehensive examination. These units may include no more than 12 units of pre-approved upper-division undergraduate courses, independent study units, or seminars. The comprehensive examination requirements may be met with a publication-quality paper dealing with a transportation topic; this paper must be approved by the student's advisor and the Director of the Transportation Science program.

UCI is a major research university and has an excellent library collection, as well as special interlibrary loan arrangements with other University of California libraries including the Transportation Library at Berkeley. Research is coordinated with the Irvine branch of the Institute of Transportation Studies (ITS). Approximately 30 to 40 graduate students are employed as research assistants each year in ITS. Research covers a broad spectrum of transportation issues. Current funded research projects focus upon intelligent transportation systems (ITS), particularly advanced transportation management systems; planning and analysis of transportation systems; transportation systems operation and control; transportation engineering; transportation safety; road and congestion pricing; environmental and energy issues and demand for alternative fuel vehicles; public transit operations, transportation-land use interactions, demand for autos, and travel demand.

ITS is part of the University of California Transportation Center, one of ten federally designated centers of excellence for transportation research. The transportation research program at UCI is also supported by the Advanced Transportation Management Systems (ATMS) Laboratories. The Institute

maintains a regular publications series documenting research conducted within its programs and is the editorial headquarters of the *Journal of Regional Science*.

## Transportation Science, Ph.D.

### Jean-Daniel Saphores, Director

949-824-2611

aregan@uci.edu (%20aregan@uci.edu)

<http://www.transci.uci.edu/>

The graduate program in Transportation Science includes faculty from four academic units: the Department of Civil and Environmental Engineering in The Henry Samueli School of Engineering, the Department of Economics in the School of Social Sciences, the Department of Planning, Policy, and Design in the School of Social Ecology, and the Department of Computer Science in the Bren School of Information and Computer Sciences. The program is designed to educate students in a broad set of competencies and perspectives that mirror the actual practice of current transportation research. The M.S. and Ph.D. degrees in Transportation Science are offered.

Admission is limited to a small number of exceptionally talented, independent, and self-disciplined students. The deadline for application for admission is March 1 for fall quarter. A second window for application for admission for winter or spring quarters is open from April 15 through June 1 but funding options for this second window may be very limited. All applicants must take the Graduate Record Exam (GRE) prior to the application deadline. Applicants whose first language is not English must also submit Test of English as a Foreign Language (TOEFL) scores.

The Ph.D. program is a 48-unit program requiring a qualifying examination and dissertation defense.

Prior to the qualifying examination, students must have completed a minimum of 36 units of coursework, a replication project, or a publishable research paper as first author, and a dissertation proposal.

### Requirements

Courses are selected from one of the four areas listed below.

Substitutions and exceptions must be approved by the student's advisor and the Director of the Transportation Science program.

The normative time for completion of the Ph.D. is five years and the maximum time permitted is seven years. Core courses must be chosen from lists in each of the four program areas. Each student must choose at least two graduate courses from Area 1 (Transportation Systems Engineering), at least one graduate course from each of Area 2 Urban and Transportation Economics) and Area 3 (Transportation Planning, and at least four additional graduate courses from any of those areas, or the Area 4 (Computer Science). At least five of the eight core courses must be transportation courses (indicated by an asterisk).

Students must complete the following general theory core courses:

#### Area 1 (Transportation Systems Engineering)

ENGRCEE 220A	Travel Demand Analysis I
ENGRCEE 220B	Travel Demand Analysis II
ENGRCEE 221A	Transportation Systems Analysis I
ENGRCEE 222	Transit Systems Planning
ENGRCEE 223	Transportation Systems III: Planning and Forecasting
ENGRCEE 224A	Transportation Data Analysis I
ENGRCEE 226A	Traffic Flow Theory I
ENGRCEE 228A	Urban Transportation Networks I
ENGRCEE 228A	Urban Transportation Networks I
ENGRCEE 229A	Traffic Systems Operations and Control I

#### Area 2 (Urban and Transportation Economics)

ECON 210A	Microeconomic Theory I
ECON 281A	Urban Economics I
ECON 281B	Urban Economics II
ECON 282A	Transportation Economics I
ECON 282B	Transportation Economics II
ECON 289A-Z	

Students can only count on ECON 289 course toward the required number of units.

#### Area 3 (Transportation Planning)

UPPP 202	History of Urban Planning
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UPPP 207	Land-Use Law
UPPP 212	Transportation Planning and Policy
UPPP 231	Transportation and Environmental Health
UPPP 235	Geographic Information Systems (GIS) Problem Solving in Planning
UPPP 237	Introduction to Geographic Information Systems
Area 4 (Computer Science)	
COMPSCI 206	Principles of Scientific Computing
COMPSCI 248A	Introduction to Ubiquitous Computing
COMPSCI 260	Fundamentals of the Design and Analysis of Algorithms
COMPSCI 268	Introduction to Optimization
COMPSCI 271	Introduction to Artificial Intelligence
COMPSCI 274A	Probabilistic Learning: Theory and Algorithms
A. Pre-approved upper-division undergraduate courses:	
ENGRCEE 121	Transportation Systems I: Analysis and Design
ENGRCEE 122	Transportation Systems II: Operations and Control
ENGRCEE 123	Transportation Systems III: Planning and Forecasting
ENGRCEE 124	Transportation Systems IV: Freeway Operations and Control
ECON 105A	Intermediate Quantitative Economics I
ECON 105B	Intermediate Quantitative Economics II
ECON 123A	Econometrics I
ECON 123B	Econometrics II
ECON 149	Special Topics in Economics of Public and Private Organizations
I&C SCI 45C	Programming in C/C++ as a Second Language
I&C SCI 46	Data Structure Implementation and Analysis
COMPSCI 115	Computer Simulation
COMPSCI 121	Information Retrieval
COMPSCI 122A	Introduction to Data Management
B. Independent study units	
ENGRCEE 296	Master of Science Thesis Research
ENGRCEE 298	Special Topics in Civil Engineering
ENGRCEE 299	Individual Research
ECON 299	Independent Study
UPPP 298	Directed Studies in Urban Planning
UPPP 299	Independent Study in Urban Planning
COMPSCI 298	Thesis Supervision
COMPSCI 299	Individual Study
C. Students who choose the thesis option may also take up to eight units of the following:	
ENGRCEE 296	Master of Science Thesis Research
UPPP 298	Directed Studies in Urban Planning
COMPSCI 298	Thesis Supervision

After approval from their advisor, students may petition the Director of the Transportation Science Program with requests for substitution of the required courses.

### Replication Project or Publishable Paper

Students entering the program with an M.S. are encouraged to transform a course project or thesis from this program or an earlier one into a publishable paper. That paper could be sole-authored, or authored with a student's former or current faculty mentors. The dissertation supervisor and the Director of the Transportation Science Program must approve the replication project or paper prior to the date of the qualifying exam.

Prior to preparing a dissertation proposal, each student who has not completed a master's thesis (or otherwise independently published) must replicate the empirical work of a published paper from a major transportation journal, chosen by the student and approved by the advisor. This replication may involve the collection of new data, the use of better statistical techniques, additional simulations, or the identification and correction of theoretical errors. Through the replication project, students gain direct experience in reducing a general problem to a manageable research project, in using data, and in carrying out a research project.

A replication project involves choosing an empirical paper, obtaining the data necessary to replicate the project and then replicating the project and describing the replication and any related extensions in a research paper. Such projects are most common in economics, but could also be done based on any of the four transportation science research areas.

### **Dissertation Proposal**

Dissertation proposals differ across areas but a typical proposal would be 15-30 pages long and would include an introduction, a review of related literature, a plan for the dissertation research and an indication of the sorts of products that will emerge from the project (publishable papers, case studies, software, technologies, etc.). The proposal is not a binding contract, because research evolves, but it should provide the committee with sufficient information to judge the likelihood that the project will be sufficient to meet the requirements for a Ph.D.

### **Qualifying Examination**

The qualifying exam must include five faculty members of which at least three members must be selected from the Transportation Science core faculty, and at least one of whom must be outside of that group. The qualifying exam is primarily an oral presentation of the dissertation proposal but might also include a discussion of other major research efforts conducted by the candidate and can involve questions from courses taken at UCI, or general transportation related questions.

Upon completion of the coursework and the publication or replication paper requirement, each student must develop a dissertation proposal defining the research problem, related literature, research methods, and data resources. The Ph.D. qualifying examination consists of an oral defense of that proposal before a candidacy committee chosen according to normal campus regulations, upon the recommendation of the Graduate Director. Typically, this is a committee of at least three members of the Transportation Science faculty and at least one faculty member who is not associated with Transportation Science.

UCI is a major research university and has an excellent library collection, as well as special interlibrary loan arrangements with other University of California libraries including the Transportation Library at Berkeley. Research is coordinated with the Irvine branch of the Institute of Transportation Studies (ITS). Approximately 30 to 40 graduate students are employed as research assistants each year in ITS. Research covers a broad spectrum of transportation issues. Current funded research projects focus upon intelligent transportation systems (ITS), particularly advanced transportation management systems; planning and analysis of transportation systems; transportation systems operation and control; transportation engineering; transportation safety; road and congestion pricing; environmental and energy issues and demand for alternative fuel vehicles; public transit operations, transportation-land use interactions, demand for autos, and travel demand.

ITS is part of the University of California Transportation Center, one of ten federally designated centers of excellence for transportation research. The transportation research program at UCI is also supported by the Advanced Transportation Management Systems (ATMS) Laboratories. The Institute maintains a regular publications series documenting research conducted within its programs and is the editorial headquarters of the *Journal of Regional Science*.

# Office of Research

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## Pramod Khargonekar, Vice Chancellor for Research

The mission of the Office of Research (<http://www.research.uci.edu>) (OR) is to support and enhance the creative and scholarly activities of UCI researchers.

OR provides central campus administrative support for UCI's research programs. It includes Research Administration, University Laboratory Animal Resources (ULAR), Federal Relations, Administrative Operations and Planning, and the Office of the Vice Chancellor. Each of these units contributes to the overall objective of facilitating campus research activities. Additionally, the Office of Research oversees the operation of many research centers and institutes. Learn more about the Office of Research, its mission, organizational structure and leadership here: <http://research.uci.edu/about/>

Below is a comprehensive list of centers and institutes that report (directly or indirectly) to the Vice Chancellor for Research.

## Special Research Programs

Special Research Programs (SRPs) exist at UC Irvine to provide a structure for collaborative research activities that do not fit the definition and purpose of an Organized Research Unit, a Campus Center, or a School Center.

### Beckman Laser Institute

The Beckman Laser Institute (BLI) was established in 1982 by Dr. Arnold O. Beckman and Dr. Michael W. Berns as an interdisciplinary center for the development and application of optical technologies in biology and medicine. Since the opening in 1986, Beckman Laser Institute has grown to include 18 faculty and their 130 affiliated students, postdoctoral fellows, technical staff, and administrative support. BLI is one of five national Beckman Institutes supported by the Arnold and Mabel Beckman Foundation. BLI is dedicated to cutting-edge interdisciplinary research and the interface of physical science, engineering, and biology. Because BLI also houses a medical clinic, it is unique in its capacity for conducting translational research that moves basic technologies rapidly from "benchtop to bedside." For more information visit the Beckman Laser Institute website (<http://www.bli.uci.edu>).

### California Institute for Telecommunications and Information Technology (Calit2)

Calit2 is a two-campus multidisciplinary research institute established by the State of California in 2000. One of four University of California Institutes for Science and Innovation, Calit2 is a partnership between academia and the business community. The Institute's unique research approach integrates academic intellectual capital across a wide range of disciplines with industry expertise. In collaboration with its sister division at UC San Diego, Calit2@UCI seeks innovative IT approaches that will benefit society and ignite economic development in the state and throughout the country.

More than 150 UCI faculty, 250 students, and 100 industry partners are actively engaged in Calit2 research areas that include the environment, transportation, emergency management, health care, education, and entertainment.

Calit2 also strives to prepare students for successful careers after graduation; the Institute's programs include SURF-IT, a summer undergraduate opportunity that immerses students in hands-on research, as well as a graduate fellows program that helps fund a select group of students doing multidisciplinary, IT-focused graduate work. For more information visit the Calit2 website (<http://www.calit2.net>).

### Facility for Imaging and Brain Research (FIBRE)

The Facility for Imaging and Brain Research (FIBRE), located on the ground floor of the Social and Behavioral Sciences Gateway, houses a 3T Siemens Prisma scanner, a mock scanner, and data analysis facilities. This research-dedicated MRI scanning facility, operated by Dr. Craig Stark, is designed to suit a wide range of basic and translational research programs by researchers across the UCI campus and beyond. For more information visit the FIBRE website. (<http://imaging.uci.edu/fibre/>)

### Institute for Clinical and Translational Science

The Institute for Clinical and Translational Science (ICTS) in the Office of Research is a uniquely transformative, novel, and integrative academic home for clinical and translational science with the resources to train and advance a cadre of well-trained multi- and interdisciplinary investigators and research teams. The Institute facilitates access to innovative research tools and information technologies to promote the application of new knowledge and techniques to patient care. ICTS assists basic, translational, and clinical investigators, community clinicians, clinical practices, networks, professional societies, and industry to develop new professional interactions, programs, and research projects. ICTS fosters a new discipline of clinical and translational science that is much broader and deeper than their separate components. The faculty members associated with ICTS are instrumental in supporting students in related advanced degree programs via their grants and other sources of financial support. ICTS consists of several units: Pilot and Collaborative Translational and Clinical Studies; Translational Technologies and Resources; Development of Novel Clinical and Translational Methodologies; Biomedical Informatics (including the Center for Medical Informatics); Design, Biostatistics, and Clinical Research Ethics; Regulatory Knowledge and Support; Participant and Clinical Interactions Resources; Community Engagement; and Research Education, Training, and Career Development. More information is available at the ICTS website (<http://www.icts.uci.edu/>).

## Thesaurus Linguae Graecae®

The Thesaurus Linguae Graecae (TLG)® is a research project that was established at UCI in 1972, thanks to a gift by UCI alumna Marianne McDonald. Its goals are to create a comprehensive digital library of Greek literature from antiquity to the present era; to conduct literary research using collected texts; and to apply technological innovation in these endeavors. The TLG® corpus currently contains more than 105 million words of Greek text from Homer (8 c. B.C) to the fall of Byzantium in A.D. 1453 and beyond.

TLG® research activities combine the traditional concerns and methodologies of philological and literary study with the most advanced features of computer technology. Included among current research foci are the identification of ancient Greek literary and documentary materials from various literary-historical periods; the conversion of these materials into digital form using modern methods of text encoding; the enhancement of automated text-correction routines; and the formulation of criteria for the lexical analysis and categorization of the texts in the corpus. The full corpus is available to more than 2,000 subscribing institutions and thousands of individuals in 58 countries worldwide.

TLG®'s library holdings enhance those of the UCI Langson Library, and TLG® conferences and scholarly visits afford faculty and students contact with eminent scholars in related fields. The Thesaurus Linguae Graecae® has made UCI a major source of Classics research activity. For more information visit the TLG website (<http://www.tlg.uci.edu/>).

## UCI-NATURE

UCI-NATURE offers UC Irvine's faculty and students opportunities to bring their research, scholarship, teaching, public service, and developing careers out into the natural environment in a wide diversity of settings characteristic of California. UC Irvine directly oversees four protected natural areas, two of which include lodging facilities and are about a three hour drive from Irvine, and two of which are within walking distance of campus. UCI-NATURE also maintains partnership agreements that facilitate access to additional natural areas and facilities not directly managed by the University. Together, these field-based assets span regional gradients across environments from the ocean to the desert, as well as a diversity of societal contexts, all within a few hours of campus. This system of assets available to UC Irvine's faculty and students is connected on yet a larger scale to the system-wide UC Natural Reserve System (<http://ucnrs.org/>). UCI-NATURE functions as a single umbrella structure for the management, operations, and leveraging of these natural assets, and includes faculty governance that allows for communication and optimal allocation of resources across the different programs. The place-based focus fosters excellence in research and scholarship, tangible interdisciplinary interactions, and community-based partnerships that engage our faculty and students in meaningful real-world problems. For further information contact UCI-NATURE Administrative Director Megan Lulow at [mlulow@uci.edu](mailto:mlulow@uci.edu), Director Kailen Mooney [mooneyk@uci.edu](mailto:mooneyk@uci.edu)

### UC Natural Reserve System

The University of California maintains a network of 39 Reserves (756,000 ac) that are representative of the State's habitat and geographic diversity. These serve as outdoor classrooms and laboratories for students, faculty, and staff, and are intended primarily for purposes of education and research. UCI oversees three of these Reserves: the Burns Piñon Ridge Reserve, the San Joaquin Marsh Reserve, and the Steele Burnand Anza-Borrego Desert Research Center. For further information visit the Natural Reserve System website (<http://www.ucnrs.org/>) at <https://ucnrs.org> (<https://ucnrs.org/>) or contact UCI-NATURE Administrative Director Megan Lulow at [mlulow@uci.edu](mailto:mlulow@uci.edu), Director Kailen Mooney [mooneyk@uci.edu](mailto:mooneyk@uci.edu), or Faculty Advisors Peter Bowler, [pabowler@uci.edu](mailto:pabowler@uci.edu) or Travis Huxman [thuxman@uci.edu](mailto:thuxman@uci.edu).

### Burns Piñon Ridge Reserve

The Burns Piñon Ridge Reserve is located near the town of Yucca Valley in San Bernardino County. It is a 306-acre parcel of high-desert habitat representing an ecotone between montane and desert biota, with mixtures of Joshua tree, piñon pine, and juniper woodland. The Reserve has a field station with dormitories and communal living and kitchen space, as well as primitive camping facilities, and is used primarily for overnight field trips and research. For further information, visit <http://burns.ucnrs.org> (<http://burns.ucnrs.org/>) or contact UCI-NATURE Administrative Director Megan Lulow at [mlulow@uci.edu](mailto:mlulow@uci.edu).

### San Joaquin Marsh Reserve

The San Joaquin Marsh Reserve, one of the last remaining coastal marshes in Southern California, is a 202-acre wetland adjacent to the UCI campus. The Marsh consists of a series of freshwater ponds and their attendant aquatic flora and fauna, and is especially known for its rich bird life, both resident and migratory. The Reserve also sustains one of the largest Pacific pond turtle populations in Southern California. The Marsh has about 150 acres of cattail wetlands in three large cells, and 11 experimental bulrush-dominated ponds whose water levels can be manipulated for teaching and research purposes. For further information, visit <http://sanjoaquin.ucnrs.org> (<http://sanjoaquin.ucnrs.org/>) or contact UCI-NATURE Administrative Director Megan Lulow at [mlulow@uci.edu](mailto:mlulow@uci.edu) or Faculty Advisor Peter Bowler at [pabowler@uci.edu](mailto:pabowler@uci.edu).

### Steele/Burnand Anza-Borrego Desert Research Center

The Steele/Burnand Anza-Borrego Desert Research Center, adjacent to the town of Borrego Springs, includes approximately 80 acres, with a large historic clubhouse that serves as home base for researchers and students. Through a cooperative agreement with California State Parks and the Anza-Borrego Foundation, the Research Center offers access to California's largest state park. The 615,000-acre Anza-Borrego Desert State Park encompasses native fan palm oases and piñon pine-juniper forests, and is home to the endangered desert bighorn sheep. The Research Center encourages the study of environmental and ecological problems in the region. For further information, visit <http://anzaborrego.ucnrs.org/>, or contact the Research Center on-site Manager Jim Dice at [dicej@uci.edu](mailto:dicej@uci.edu) or UCI-NATURE Administrative Director Megan Lulow at [mlulow@uci.edu](mailto:mlulow@uci.edu).



## UC Systemwide Natural Reserve System California Ecology and Conservation Course

The Natural Reserve System course, available to all undergraduate students in the UC system, allows students to experience a diversity of ecological experiences through the use of UC Natural Reserve System sites. It provides a tool for students to see first-hand how climate change and other environmental variations in California directly influence plant and animal ecology throughout the state. For further information, visit the Natural Reserve System website (<http://www.ucnrs.org/>) <https://ucnrs.org> (<https://ucnrs.org/>).

## UCI Ecological Preserve

The 62-acre UCI Ecological Preserve consists of several small hills and surrounding flatlands bearing remnants of coastal sage scrub flora and associated fauna, including the California gnatcatcher (Federally listed as Threatened) and the coastal cactus wren. The Preserve is located on the campus and is set aside for teaching, research, and passive recreational use by the campus community. The property is protected under the Natural Communities Conservation Plan and is part of the Nature Reserve of Orange County (<https://occonservation.org/>). For more information contact UCI-NATURE Administrative Director Megan Lulow at [mlulow@uci.edu](mailto:mlulow@uci.edu), or Faculty Advisors Travis Huxman [thuxman@uci.edu](mailto:thuxman@uci.edu) and Peter Bowler, [pabowler@uci.edu](mailto:pabowler@uci.edu).

## UCI Arboretum and Herbarium (IRVC)

The UCI Arboretum is a botanical garden developed and managed by the School of Biological Sciences. It contains areas planted with floras adapted to climates similar to those of Southern California and maintains a large collection of plants native to Southern California and Baja California, as well as South African monocots. The Arboretum provides materials and space for research and teaching needs and its collections are also used as an educational resource for the community at large. The UCI Herbarium (<http://arboretum.bio.uci.edu/plant-exhibits/herbarium/>) (IRVC) curates ca. 35,000 vascular plant specimens, especially from southern California and Baja California, Mexico, and is a part of the Arboretum. IRVC is a member of the Consortium of California Herbaria and is a participant in the Consortium's Digital Herbarium project. For further information call 949-824-5833 or contact Rebecca Crowe, Nursery Manager at [rcrowe@uci.edu](mailto:rcrowe@uci.edu) and Peter Bowler, Faculty Advisor at [pabowler@uci.edu](mailto:pabowler@uci.edu).

## Crystal Cove State Park Research Cottage

UCI-NATURE maintains a partnership with California State Parks and the Crystal Cove Alliance for use of their Research Cottage to promote scholarly work pertinent to the understanding and management of ecosystems at the Park. It has beach shore and coastal hill access within the Park, meeting and lecture space, and small wet and dry labs. For more information, contact UCI-Nature Administrative Director Megan Lulow at [mlulow@uci.edu](mailto:mlulow@uci.edu).

## University of California Humanities Research Institute

The University of California Humanities Research Institute (UCHRI) is a multicampus research program of the University of California, serving all 10 campuses in the UC system. Founded in 1987 and headquartered at the UC Irvine campus, the Institute promotes collaborative work representing different fields and institutions both within and beyond the University of California. UCHRI addresses topics in traditional humanities disciplines, as well as in new areas intersecting with social and natural sciences, technology, art, medicine, and the professions. Stressing interdisciplinary collaborative research, UCHRI bridges gaps between disciplines across the humanities and human sciences and seeks to overcome the intellectual and institutional barriers that can separate the humanities from other fields.

The Institute is also an integral part of the newly funded system-wide UC Humanities Networking Initiative. In this role, UCHRI provides support for the Society of Fellows in the Humanities and the Consortium of Humanities Centers. UCHRI is a founding member of HASTAC, the Humanities, Arts, Science and Technology Advanced Collaboratory, a consortium of humanists, artists, social scientists, scientists, and engineers committed to new forms of collaboration across communities and disciplines fostered by creative uses of technology.

UCHRI also administers the UC Consortium in California Studies; the Andrew Vincent White and Florence Wales White Graduate Student Scholarship supporting dissertation research in the humanities or theoretical social sciences and medicine; the UC-University Utrecht faculty collaborative research grants; and the annual summer Seminar in Experimental Critical Theory.

UCHRI, in partnership with Duke University, administers the Digital Media and Learning Competition, a \$2-million annual program funded by the MacArthur Foundation to award emerging leaders who use digital technologies to envision the future of learning.

For additional information, contact the University of California Humanities Research Institute, 4000 Humanities Gateway, Irvine, CA 92697-3350; 949-824-8180; [uchri@uci.edu](mailto:uchri@uci.edu); or visit the UCHRI website (<http://uchri.org/>).

## Organized Research Units

Organized Research Units (ORUs) normally consist of an interdisciplinary group of faculty, students, and other researchers engaged in a continuing program of multidisciplinary or interdisciplinary research, supported by both University and extramural funding. The work of some ORUs is directed toward the solution of complex contemporary problems, while others conduct basic research essential to the understanding of natural or social phenomena or of humanistic ideas and expressions. The following ORUs have been established on the Irvine campus.

## AirUCI

AirUCI is a research team based at UCI focused on probing a new type of chemistry that occurs in the atmosphere at the interface between air and water. Funded by the National Science Foundation (Divisions of Chemistry and Atmospheric Sciences), AirUCI began in August 2002 as a Collaborative Research in Chemistry (CRC) group and was accepted as an ORU in July 2008.

Chemical reactions that play key roles in the formation of smog, acid rain, and in global climate change are known to occur between gases, as well as inside liquid droplets that are present in the atmosphere in the form of airborne particles, fogs, and clouds. Only recently has it been apparent that chemical reactions also occur right at the interface between air and these atmospheric droplets. Both the speed with which these interface reactions occur and the manner in which they take place may be quite different from reactions in either the gas or liquid. AirUCI's scientific team combines theory, experiments, and computer modeling of air quality to provide new insights into how this chemistry at interfaces impacts the atmosphere. More information is available at the AirUCI website (<http://airuci.uci.edu/>).

## Cancer Research Institute

The UCI Cancer Research Institute (CRI) is an Organized Research Unit dedicated to basic cancer research. The CRI has 55 faculty affiliates from departments in the Schools of Biological Sciences, Engineering, Medicine, and Physical Sciences. The CRI supports faculty research, organizes cancer-related training, and functions as the basic sciences arm of the UCI Chao Family Comprehensive Cancer Center. The CRI offices are located in Sprague Hall on the UCI main campus; Sprague Hall is a facility dedicated to research in cancer and genetics. Additional information is available at the CRI website (<http://cri.bio.uci.edu/>).

## Center for Complex Biological Systems

The UCI Center for Complex Biological Systems (CCBS) promotes research and education in the area of systems biology broadly defined, which includes aspects of synthetic biology, genomics and functional genomics, computational biology, mathematical biology, biophysics, bioengineering, and molecular biology. The goal is to develop a more comprehensive and accurate understanding of complex biological systems and their behaviors. The basic approach is to facilitate the formation of multidisciplinary research teams to address the most critical questions. Additional information is available on the CCBS website (<http://ccbs.uci.edu/>).

## Center for Embedded and Cyber-physical Systems Systems

The purpose of the Center for Embedded and Cyber-physical Systems - also known as CECS - is to conduct leading-edge interdisciplinary research in embedded systems, emphasizing automotive, communications and medical applications, and promote technology and knowledge transfer for the benefit of the individual and society. Additional information is available on the CECS website (<http://www.cecs.uci.edu/>).

## Center for Virus Research

The Center for Virus Research (CVR) seeks to foster interdisciplinary scholarship, training, and research among virologists and other faculty. Research on viruses provides a biological and technological foundation from which much has been discovered concerning the basic molecular processes of organisms. Viruses supply some of the most useful experimental models for disease, cancer, immunity, and genetic systems of gene control. In addition, viral-based technology is being vigorously pursued and developed in the context of gene therapy and is teaching us much about the control of cellular processes. With the growing worldwide threat of emerging viral diseases, interest in virus research at all levels has intensified and has taken on a new global perspective. Previously separate disciplines such as molecular biology, pathogenesis, evolutionary biology, neurology, and radiological sciences can now be readily linked by virus research.

The CVR is also committed to advanced post-graduate training. In addition to shared facilities and the seminar and symposia series, the CVR oversees two training grants. Since graduate training in virology encompasses six departments in three schools, the CVR has also become the focus and administrative point for the organization of graduate virology courses and the virology track of the interdisciplinary graduate program in Cellular and Molecular Biosciences (CMB). For more information visit the Center for Virus Research website (<http://cvr.bio.uci.edu/>).

## Health Policy Research Institute

The Health Policy Research Institute (HPRI) is an interdisciplinary faculty research organization dedicated to improving the quality of care and reducing the disparities in health care. Through research, its faculty and associates translate scientific findings into practice by uniting clinical sciences with the social and behavioral science fields of economics, psychology, anthropology, sociology, and business. This unique platform provides the basis for HPRI's research results to directly effect health policy and the health of the local community and the public.

HPRI is committed to building the center into a nationally recognized focal point for health care research. HPRI has four principal functions: (1) to produce high-level health policy research in the areas of quality of chronic disease care (i.e., diabetes, cancer, nursing home care) and reduce health disparities and improve quality of care for ethnic minorities; (2) to disseminate research findings to UCI's faculty and students through seminar series, meetings, and publications; (3) to serve as the research center for UCI graduate and undergraduate students who have health interests; and (4) to support improvements in patient health and safety and organizational improvements in the UCI health care system.

HPRI's achievement of these goals begins with its faculty—an interdisciplinary group of national leaders representing health services research, health economics, clinical epidemiology, psychometrics, and behavioral sciences in medicine. The current research led by HPRI's members and its campuswide collaborators enhance UCI as one of the best research universities in the country. For more information visit the HPRI website (<http://www.healthpolicy.uci.edu/>).



## **Institute for Genomics and Bioinformatics**

The Institute for Genomics and Bioinformatics (IGB) provides an organizational structure for interdisciplinary research and training in genomics, proteomics, bioinformatics, chemoinformatics, and computational biology—emerging scientific disciplines that are revolutionizing biology, medicine, and society. IGB computational and life scientists are working together to pioneer fundamental processes for reverse engineering gene and protein networks to understand complex biological systems. Through these interdisciplinary collaborations, IGB scientists are creating new theoretical, algorithmic, and software advances in storing, retrieving, networking, processing, modeling, analyzing, navigating, and visualizing biological information. In turn, their computational and computer science accomplishments are providing methods, predictions, and new hypotheses that are driving biological research in previously unanticipated ways. This scientific cross-fertilization is enriching both fields and will continue to do so in the coming decades. More complete descriptions of the Institute's research and training programs are available at the IGB website (<http://www.igb.uci.edu/html>).

## **Institute for Immunology**

The UCI Institute for Immunology currently comprises of more than two-dozen faculty members from the School of Biological Sciences and the School of Medicine, whose research and instructional efforts are in immunology. It integrates the immunological research and educational activities of multiple departments, including Molecular Biology and Biochemistry, Microbiology and Molecular Genetics, Physiology and Biophysics, Pathology, Medicine, Neurology and Chemistry. The activities of the Institute extend to synergize with allied areas of research including biomedical engineering, public health, and physical rehabilitation. The major mandate of the Institute for Immunology is to consolidate and further the research and training/instructional efforts in immunology at UCI, thereby promoting the rapid development of world-class research and outstanding graduate and medical training programs in immunology. For more information visit the UCI Institute for Immunology website (<http://www.immunology.uci.edu/>).

## **Institute for Mathematical Behavioral Sciences**

The Institute for Mathematical Behavioral Sciences fosters research in the application of mathematical models and methods to describe and to better understand human behavior, both individual and social. Mimicking the successful interaction between mathematics and the physical sciences, a goal of the Institute is to generate successful interactions between mathematics and the behavioral and social sciences. The Institute sponsors specialized seminars and colloquia, a visiting scholars program, workshops, and focused research groups of faculty, students, and visitors, and it maintains a Technical Report Series. Participants include faculty from the Departments of Anthropology, Cognitive Sciences, Economics, Logic and Philosophy of Science, Political Science, and Sociology in the School of Social Sciences; the Department of Mathematics in the School of Physical Sciences; the Department of Electrical Engineering and Computer Science in The Henry Samueli School of Engineering; the Donald Bren School of Information and Computer Sciences; and The Paul Merage School of Business. Additional information is available at the Institute for Mathematical Behavioral Sciences website (<http://www.imbs.uci.edu/>).

## **Institute for Memory Impairments and Neurological Disorders (UCI MIND)**

The Institute is an Organized Research Unit dedicated to investigating the causes of Alzheimer's disease and related dementias and to improving the quality of life and promoting successful aging. The vision for The Institute for Memory Impairments and Neurological Disorders is to develop approaches for lessening the impact of memory-related disorders. Tackling these complex issues requires a multidisciplinary approach, which is reflected in the diversity of the Institute's faculty, who have primary appointments in the Schools of Biological Sciences, Information and Computer Sciences, Engineering, Medicine, Nursing, and Social Sciences.

The Institute is one of 31 Alzheimer's Disease Research Centers (<https://www.mind.uci.edu/adrc/about/>) (ADRCs) supported by the National Institute for Aging, a branch of the National Institutes of Health, and is also one of 10 California Alzheimer's Disease centers (ADC) funded by the California Department of Public Health. For more information visit the UCI MIND website (<http://www.mind.uci.edu/>).

## **Institute of Transportation Studies**

The Institute of Transportation Studies (ITS), a University of California Organized Research Unit with branches at Irvine, Davis, and Berkeley, was established to foster research, education, and training in the field of transportation.

ITS research at the University of California, Irvine (UCI) involves faculty and students from The Henry Samueli School of Engineering, the School of Social Sciences, the School of Social Ecology, The Paul Merage School of Business, and the Bren School of Information and Computer Sciences. The Institute also hosts visiting scholars from the U.S. and abroad to facilitate cooperative research and information exchange, and sponsors conferences and colloquia to disseminate research results. ITS has a long and rich history of providing both direct and indirect support to the UCI transportation graduate programs. It provides office and research space to virtually all of the students enrolled in UCI's four graduate transportation programs—the interdisciplinary Program in Transportation Science; the graduate concentration in Transportation Economics; the Transportation Planning option in the Department of Planning, Policy, and Design; and the Transportation Systems Engineering graduate focus in the Department of Civil and Environmental Engineering. ITS provides extensive computing resources to all of these students, together with state-of-the-art simulation and laboratory facilities. ITS subscribes to the major transportation research journals and offers a variety of computer-based information retrieval services. More information can be found at the ITS website (<http://www.its.uci.edu/>).

## **Institute for Virtual Environments and Computer Games**

The Institute for Virtual Environments and Computer Games (IVECG) seeks to advance UC Irvine's strengths as a national leader in research and education activities that are revolutionizing how we teach and learn, conduct business and commerce, provide health care, and interact and behave in society.

The power of virtual environments and computer games cannot be understated in its ability to inspire, attract and empower. Virtual environments and computer games comprise the primary manifestation of digital technology in the lives of millions of people: This is how many learn, communicate, understand, relax and even give meaning to their lives. Learn more about the cutting-edge research at the IVECG website (<http://ivecg.uci.edu/>).

### **Jack W. Peltason Center for the Study of Democracy**

The Jack W. Peltason Center for the Study of Democracy (CSD) fosters academic research and education to provide a better understanding of the democratic process, and the steps that may strengthen democracy at home and abroad. The faculty and students of the Center study both democratizing nations and the expansion of the democratic process in the United States and other Western democracies. The Center hosts research conferences, sponsors faculty research, publishes a research paper series, and facilitates research and teaching on democratic themes.

In 1995, the National Science Foundation selected UCI to establish a Graduate Research Traineeship on Democratization and Democratic Politics. University, foundation, and philanthropic support has continued this graduate education through the Democracy Fellows program. The formal course work and faculty mentorship of the training program draw upon faculty of the Center and build upon its present research and educational activities. In addition, graduate fellows in the training program participate in the research activities of the Center. For more information visit the CSD website (<http://www.democracy.uci.edu/>).

### **Reeve-Irvine Research Center**

The Reeve-Irvine Research Center is a world renowned basic science research center devoted to the study of repair, regeneration, and recovery of function after spinal cord injury. Based at the University of California, Irvine, RIRC labs are equipped and staffed to allow cutting edge research at multiple levels ranging from stem cells to robotic retraining to promote functional recovery. RIRC scientists were amongst the first to test the potential of stem cells for spinal cord injury therapy, and research by RIRC scientists formed the basis for the first two clinical trials testing stem cell therapies in people with spinal cord injuries.

The mission of the RIRC is to find new treatments for spinal cord injury through the collaborative research and educational efforts of prominent scientists and clinicians both at the University of California, Irvine and around the world. More information is available at the RIRC website (<http://www.reeve.uci.edu/>).

## **Campus Centers**

A Campus Center provides a group of researchers with use of the "Center" title and a structure for its collaborative activities. The rationale for establishing a Campus Center may include attracting greater recognition and extramural support for a research program at UCI and/or providing an infrastructure that promotes synergistic interactions between a group of researchers within a school or across schools. Directors of campus centers typically report to the Dean of their respective schools. More information about the following centers may be found at the Campus Centers website (<http://www.research.uci.edu/centers-institutes/CC-centers-and-institutes.html>).

Center for Asian Studies (<http://www.asian-studies.uci.edu/>)  
 Center for Global Peace and Conflict Studies (CGPACS) (<http://www.cgpac.uci.edu/>)  
 Center for Hearing Research (CHR) (<http://hearing.uci.edu/>)  
 Center for Organizational Research (COR) (<http://cor.web.uci.edu/>)  
 Center for the Study of Cannabis (<http://cannabis.uci.edu/>)  
 Center in Law, Society and Culture (CLSC) (<http://clsc.sococo.uci.edu/>)  
 Epilepsy Research Center (<http://www.epilepsyresearch.uci.edu/>)  
 Newkirk Center for Science and Society (<http://newkirkcenter.uci.edu/>)  
 Samuel M. Jordan Center for Persian Studies and Culture (<http://www.humanities.uci.edu/persianstudies/>)  
 UCI Interdisciplinary Center for the Scientific Study of Ethics and Morality (<http://www.ethicscenter.uci.edu/>)  
 UCI Long China-US Institute (<https://www.longinstitute.uci.edu/>)  
 UCI Water-Energy Nexus Center (<http://wex.uci.edu/>)

## **Other Research Centers and Institutes at UCI**

"Other" research units do not fit the definition of an Organized Research Unit (ORU), Special Research Program (SRP), or Campus Center, but are similarly interdisciplinary. These units may have been designated as Centers by a sponsoring agency such as the National Science Foundation (NSF) or the National Institutes of Health (NIH), or they may be part of an intercampus-consortium, such as Centers funded by the UC Multicampus Research Programs and Initiatives (MRPI) competition. More information about the following centers may be found at the Centers & Institutes website (<http://www.research.uci.edu/centers-institutes/>).

Chao Family Comprehensive Cancer Center (<http://www.cancer.uci.edu/>)  
 Chemistry at the Space-Time Limit (CaSTL) (<http://www.chem.uci.edu/CCI/>)  
 Conte Center for Brain Programming in Adolescent Vulnerabilities (<http://contecenter.uci.edu/>)  
 Digital Media and Learning Research Hub (<http://www.dmlcentral.net/>)  
 Gavin Herbert Eye Center (<https://www.ghei.uci.edu/>)  
 Institute for Complex Adaptive Matter (ICAM) (<http://icam-i2cam.org/>)  
 Institute for Interdisciplinary Salivary Bioscience Research (<https://iisbr.uci.edu/>)

Memory Prosthetics Multi-Campus Research Programs (<http://www.cnlm.uci.edu/2014/12/30/279/>)  
National Fuel Cell Research Center (<http://www.nfcrc.uci.edu/>)  
Neuroscience Imaging Center (<http://www.research.uci.edu/facilities-services/nic/>)  
NSF-Simons Center for Multiscale Cell Fate Research (<http://cellfate.uci.edu/>)  
Sue and Bill Gross Stem Cell Research Center (<http://stemcell.uci.edu/>)  
Susan Samueli Center for Integrative Medicine (<http://www.sscim.uci.edu/>)  
UC-Cuba Academic Initiative (<http://www.socsci.uci.edu/uc-cuba/>)  
UC Humanities Network (<http://uchumanitiesnetwork.org/>)  
UC Irvine Health Diabetes Center (<http://www.ucirvinehealth.org/medical-services/diabetes/>)

# Previous Catalogue Editions

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Visit the University Registrar website for additional editions. (<https://www.reg.uci.edu/catalogue/>)

# Program in Public Health

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Anteater Instruction & Research Building, Suite 2010

Undergraduate Advising: 949-824-2358

Graduate Advising: 949-824-7095

<http://publichealth.uci.edu/>

## Program in Public Health

**Bernadette Boden-Albala, MPH, DrPH**

### Director and Founding Dean, Program in Public Health

The Program in Public Health was established in 2003 to advance the collaborative interdisciplinary mission of public health research, education, and service with the end goal of enhancing health and wellbeing locally, nationally, and domestically.

The undergraduate degree programs in public health began enrolling students in 2006. The Program in Public Health offers a B.S. in Public Health Sciences, a B.A. in Public Health Policy, a minor in Public Health, a minor in Global Health, a Master of Public Health (M.P.H.) in four emphases: Biostatistics, Environmental Health, Epidemiology, and Sociocultural Diversity and Health.

The Department of Epidemiology and Biostatistics offers a Doctor in Philosophy in Epidemiology (Ph.D.) and an M.S. in Epidemiology. Faculty provide guidance on curricular and programmatic activities for the M.P.H. in Epidemiology.

The Department of Environmental and Occupational Health offers an M.S. and a Ph.D. in Environmental Health Sciences. There are two tracks offered in both degree programs: Environmental Toxicology, and Exposure Sciences and Environmental Epidemiology. Faculty provide guidance on curricular and programmatic activities for the M.P.H. in Environmental Health.

The Department of Health, Society, and Behavior Faculty provide guidance on curricular and programmatic activities for the M.P.H. in Sociocultural Diversity and Health, and jointly administers the Ph.D. in Public Health with the Department of Population Health and Disease Prevention.

The Department of Population Health and Disease Prevention offers a Doctor of Philosophy (Ph.D.) in Public Health in two concentrations: Disease Prevention and Global Health, which is jointly administered with the Department of Health, Society, and Behavior. The program also offers a dual-degree M.D./M.P.H., a concurrent J.D./M.P.H. with the School of Law, a concurrent J.D./Ph.D. with the School of Law, and a joint Doctor of Philosophy (Ph.D.) in Environmental Health Sciences with the School of Medicine.

The Program is fully accredited by the Council on Education for Public Health (<http://ceph.org/>). The Program is also a member of the Association of Schools and Programs of Public Health.

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## Honors

### Honors Research Program in Public Health

The Public Health Honors Program provides an opportunity for selected outstanding students in the program to pursue advanced work in independent research and earn honors in Public Health upon graduation. Successful completion of the honors program requires three quarters of commitment, while enrolled in PUBHLTH H192A-PUBHLTH H192B-PUBHLTH H192C. Students are also expected to enroll in supervised Undergraduate Research (PUBHLTH 199) with their research mentor. The program concludes with a presentation and submission of an honors culminating thesis.

### Eligibility and Application Process

In order to be considered, a student must have satisfied the following requirements: completion of all lower-division Public Health courses required for the major; completion of at least five upper-division Public Health courses; an overall UCI grade point average of a minimum of 3.5; and a minimum 3.5 grade point average in all required and completed Public Health courses. Acceptance into the program is based upon evidence of the student's ability, interest in research, and proposed thesis project with a faculty member.

Admission to the program is based on formal invitation and/or an application to participate in the Public Health Honors Program submitted by the student in the spring quarter of the junior year.

### Requirements

Beyond fulfilling the regular courses required for either the Public Health Sciences or Public Health Policy major, honor students must take the following:

#### A. Fall Quarter

PUBHLTH H192A

Public Health Honors Seminar and Thesis I (4 units)

PUBHLTH 199

Undergraduate Research (4 units)

#### B. Winter Quarter

PUBHLTH H192B	Public Health Honors Seminar and Thesis II (4 units)
PUBHLTH 199	Undergraduate Research (4 units)
C. Spring Quarter	
PUBHLTH H192C	Public Health Honors Seminar and Thesis III (4 units)
PUBHLTH 199	Undergraduate Research (4 units)

### Graduation with Honors

Of the graduating seniors, no more than 16 percent will receive Latin honors: approximately 2 percent *summa cum laude*, 4 percent *magna cum laude*, and 10 percent *cum laude*. The selection for these awards is based on spring quarter rank-ordered grade point averages. To be eligible for honors at graduation, the student must, by the end of spring quarter of the senior year, be officially declared a Public Health major; submit an Application to Graduate by the end of winter quarter of the senior year; have completed at least 72 units in residence at a UC campus by the end of the spring quarter of the academic year in which they graduate; have all corrections to the academic record processed by the University Registrar's Office by the end of spring quarter; if completing the Language Other Than English general education requirement with a language exemption test, pass the test by the end of spring quarter; and be able to verify completion of all course work by the end of the spring quarter of the senior year. For information on other important factors that are considered, please visit at Honors Recognition.

### Campuswide Honors Collegium

The Campuswide Honors Collegium is available to selected high-achieving students from all academic majors from their freshman through senior years. For more information contact the Campuswide Honors Collegium, 1200 Student Services II; 949-824-5461; [honors@uci.edu](mailto:honors@uci.edu); <http://www.honors.uci.edu/>.

### Dean's Honor List

The quarterly Dean's Honor List is composed of students who have received a 3.5 grade point average while carrying a minimum of 12 graded units.

### Public Health Honors, Scholarships, Prizes, and Awards

The following honors, scholarships, prizes, and awards are presented at the annual Public Health Honors and Awards Ceremony held in June.

**Academic Excellence.** This award is given to any student within the Program in Public Health, who graduates with a cumulative 4.0 UCI GPA.

**Excellence in Public Health Practicum.** This award recognizes a student whose project in public health practice contributes to the improvement of health and makes a significant contribution to public health.

**Excellence in Public Health Research.** This award is for research conducted by a student that is exceptional in quality.

**Excellence in Undergraduate Leadership.** This award recognizes a student who has demonstrated exemplary leadership in their execution of student activities that furthers the mission of the Program in Public Health, or the University of California, Irvine. This student has taken key leadership roles, inspired others to contribute, developed new programs to support students, and built relations that enable and grow the broader public health community.

**Excellence in Writing.** This award honors students who best demonstrate an ability to communicate ideas clearly through writing.

**Outstanding Contribution to Public Health, Community and UCI Service.** This award is given to an undergraduate who has made a significant contribution to the Public Health community, including the intellectual growth of others. This award signifies any work/research done by a student that benefits the campus community or the community-at-large.

**Outstanding Contribution to the Program in Public Health.** This award is presented to an outstanding undergraduate who has impacted and contributed significantly to the Program in Public Health.

**Recognition of Preceptors.** This award goes to nominated Practicum Preceptor Sites who have shown an outstanding commitment to UCI students or have been nominated for the award by student recognition.

**Special Recognition.** This award is given to undergraduates who deserve special recognition.

- Department of Environmental and Occupational Health
- Department of Epidemiology and Biostatistics
- Department of Health, Society, and Behavior
- Department of Population Health and Disease Prevention

### Requirements for the Bachelor's Degree

All Program in Public Health students must complete the following requirements.

**All students must meet the University Requirements.**

**Program Requirements:**

**Grade Requirement:** A minimum grade point average of at least C (2.0) is required (1) overall, (2) in all courses required for the major program, (3) in the upper-division courses required for the major, and (4) in PUBHLTH 195W.

**Residence Requirement:** After matriculation, all Public Health courses required for the major must be successfully completed at UCI. The Program in Public Health strictly enforces the UCI residence requirement. At least 36 of the final 45 units completed by a student for the bachelor's degree must be earned in residence at the UCI campus. (The Program considers courses taken in the Education Abroad Program to be in-residence courses.)

**Normal Progress:** Students in the Public Health Program are expected to make progress toward their degree, and their progress will be monitored. If normal academic progress toward the degree in Public Health is not being met, students will be subject to probation.

**Double Majoring and Minor**

Second majors and/or minors will not be approved unless the student can complete both the degree and double major/minor(s) in their allotted time permitted at UCI. Students must be in good standing and not on academic probation for acceptance as a double major/minor(s).

Students may not enter as a double major, but Public Health students interested in other areas may apply for a double major after their first quarter, if the Public Health Program approves.

**Overlap Restrictions**

**Double Majoring in Public Health Sciences and Public Health Policy.** Students may double major in Public Health Sciences and Public Health Policy; however there are only seven courses that may overlap between the two majors. Students may overlap PUBHLTH 1, PUBHLTH 2, PUBHLTH 101, MATH 2A, MATH 2B, STATS 7 or STATS 8, and PUBHLTH 195W. There are no other courses that can count for both majors.

**Other Double Majors.** In fulfilling degree requirements for multiple majors, a maximum of two courses may overlap between any two majors.

**Major and Minor Requirements.** In fulfilling minor requirements, a maximum of two courses may overlap between a major and minor. No course overlap is permitted between minors.

Students may not double major in Public Health Sciences, Pharmaceutical Sciences, Nursing Science, Biomedical Engineering: Premedical, or with any of the School of Biological Sciences majors or minors.

- Environmental Health Sciences, M.S.
- Environmental Health Sciences, Ph.D.
- Epidemiology, M.S.
- Epidemiology, Ph.D.
- Global Health, Minor
- M.D./M.P.H. Dual Degree Program
- Master of Public Health
- Public Health Policy, B.A.
- Public Health Sciences, B.S.
- Public Health, M.S.
- Public Health, Minor
- Public Health, Ph.D.

## Faculty

Alpesh N. Amin, M.D. M.B.A. Northwestern University, *Department Chair and Thomas and Mary Cesario Endowed Chair in Medicine and Professor of Medicine; Biomedical Engineering; Paul Merage School of Business; Program in Public Health; Radiological Sciences*

Scott Bartell, Ph.D. University of California, Davis, *Associate Professor of Program in Public Health; Environmental Health Sciences; Statistics*

Hans-Ulrich Bernard, Ph.D. University of Goettingen, *Professor Emeritus of Molecular Biology and Biochemistry; Program in Public Health*

Zuzana Bic, Dr.P.H. Loma Linda University, *Associate Professor of Teaching of Program in Public Health*

Stephen C. Bondy, Ph.D. University of Birmingham, *Professor of Medicine; Environmental Health Sciences; Program in Public Health*

Tim-Allen Bruckner, Ph.D. University of California, Berkeley, *Associate Professor of Program in Public Health; Urban Planning and Public Policy*

Bharath Chakravarthy, M.D. Boston University, *Associate Clinical Professor of Emergency Medicine; Program in Public Health*



- Wayne Wei Chung Chang, M.D. Saint Louis University, *Health Sciences Clinical Professor of Medicine; Program in Public Health*
- Yunan Chen, Ph.D. Drexel University, *Associate Professor of Informatics; Program in Public Health* (medical informatics, human computer interaction)
- Robert C. Detrano, M.D. Sapienza University of Rome, *Health Sciences Clinical Professor of Radiological Sciences; Medicine; Program in Public Health*
- Karen L. Edwards, Ph.D. University of Washington, *Department Chair and Professor of Epidemiology; Program in Public Health*
- Rufus D. Edwards, Ph.D. Rutgers, The State University of New Jersey, *Professor of Program in Public Health; Environmental Health Sciences; Epidemiology*
- Daniel L. Gillen, Ph.D. University of Washington, *Department Chair and Professor of Statistics; Program in Public Health*
- Michele B. Goodwin, J.D. Boston College, *Director, Center for Biotechnology and Global Health Policy and UCI's Chancellor's Professor of School of Law; Criminology, Law and Society; Gender and Sexuality Studies; Program in Public Health*
- Lisa B. Grant Ludwig, Ph.D. California Institute of Technology, *Professor of Program in Public Health*
- Scott Hardy, M.D., M.P.H. Saint Louis University School of Medicine, *Clinical Professor of Environmental Health Sciences; Program in Public Health*
- Suellen Hopfer, Ph.D. Pennsylvania State University, *Assistant Professor of Program in Public Health; Asian American Studies*
- Michael A. Hoyt, Ph.D. Arizona State University, *Associate Professor of Program in Public Health; Epidemiology; Psychological Science*
- Kamyar Kalantar-Zadeh, M.D. University of Bonn, *Professor of Medicine; Program in Public Health*
- Alya Khan, M.D., M.S. Saba School of Medicine, *Assistant Clinical Professor of Environmental Health Sciences; Program in Public Health*
- Michael T. Kleinman, Ph.D. New York University, *Adjunct Professor of Environmental Health Sciences; Program in Public Health*
- Cynthia Lakon, Ph.D. University of North Carolina at Chapel Hill, *Associate Professor of Program in Public Health*
- Alana Lebron, Ph.D. University of Michigan, *Assistant Professor of Program in Public Health; Chicano/Latino Studies*
- Shahram Lotfipour, M.D. University of Iowa, *Professor of Emergency Medicine; Program in Public Health*
- Yunxia Lu, Ph.D. University Tongi Medical College, *Associate Professor of Program in Public Health*
- Ulrike Luderer, M.D., Ph.D. Northwestern University, *Director of the Environmental Health Sciences Graduate Program and Professor of Medicine; Developmental and Cell Biology; Environmental Health Sciences; Program in Public Health*
- Frank L. Meyskens, M.D. University of California, San Francisco, *Daniel G. Aldrich, Jr. Endowed Chair and Professor of Medicine; Biological Chemistry; Program in Public Health*
- Dana Mukamel, Ph.D. University of Rochester, *Professor of Medicine; Program in Public Health*
- Andrew Noymer, Ph.D. University of California, Berkeley, *Associate Professor of Program in Public Health; Sociology*
- Oladele A. Ogunseitan, Ph.D. University of Tennessee, *Department Chair and Professor of Program in Public Health; Environmental Health Sciences*
- Annie E. Ro, Ph.D. University of California, Los Angeles, *Assistant Professor of Program in Public Health; Asian American Studies*
- Miryha Gould Runnerstrom, Ph.D. University of California, Irvine, *Assistant Professor of Teaching of Program in Public Health*
- Roxane C. Silver, Ph.D. Northwestern University, *Professor of Psychological Science; Program in Public Health* (coping with traumatic life events (personal losses and collective traumas), stress, social psychology, health psychology)
- Dara H. Sorkin, Ph.D. University of California, Irvine, *Associate Professor in Residence of Medicine; Program in Public Health; Psychological Science*
- Sharon M. Stern, Ph.D. University of Utah, *Professor of Teaching Emerita of Program in Public Health*
- Bryan Sykes, Ph.D. University of California, Berkeley, *Associate Professor of Criminology, Law and Society; Program in Public Health; Sociology* (demography, criminology, research methods, health, social inequality, statistics)
- David Timberlake, Ph.D. University of California, San Diego, *Associate Professor of Program in Public Health*
- Veronica M. Vieira, D.Sc. Boston University, *Professor of Program in Public Health; Environmental Health Sciences*
- Lari B. Wenzel, Ph.D. Arizona State University, *Professor of Medicine; Program in Public Health*



Jun Wu, Ph.D. University of California, Los Angeles, *Associate Professor of Program in Public Health; Environmental Health Sciences*

Guiyun Yan, Ph.D. University of Vermont, *Professor of Program in Public Health; Ecology and Evolutionary Biology*

## Courses

### **PUBHLTH 1. Principles of Public Health. 4 Units.**

Introduces the major concepts and principles of public health and the determinants of health status in communities. Emphasizes the ecological model that focuses on the linkages and relationships among multiple natural and social determinants affecting health.

Restriction: Nursing Science Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

(III)

### **PUBHLTH 2. Case Studies in Public Health Practice. 4 Units.**

Presents case studies in various themes of public health practice to demonstrate how the principles of public health were established and continue to evolve.

Prerequisite: PUBHLTH 1

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

(II)

### **PUBHLTH 7A. Public Health Statistics I. 4 Units.**

Introduces the development and application of statistical reasoning and methods in addressing, analyzing, and solving problems in public health, health care, and biomedical, clinical, and population-based research and practice.

Overlaps with SOCECOL 13, STATS 7, STATS 8, MGMT 7.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

(Va)

### **PUBHLTH 7B. Public Health Statistics II. 4 Units.**

Introduces the development and application of statistical reasoning and methods in addressing, analyzing, and solving problems in public health, health care, and biomedical, clinical, and population-based research and practice.

Prerequisite: PUBHLTH 7A

Restriction: Public Health Majors only. Public Health Sciences Majors only. Public Health Policy Majors only.

(Va)

### **PUBHLTH 10. Special Topics in Public Health . 2-4 Units.**

Introduction to emerging topics in public health. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

### **PUBHLTH 30. Introduction to Urban Environmental Health. 4 Units.**

Study of natural and physical components of earth's environmental problems due to human activities. Topics include global air, water, soil, biodiversity, rainforests, energy, demographics, agriculture, and urbanization. Theme is sustainability. Integrated into the science are social, legal, and economic considerations.

(II)

### **PUBHLTH 60. Environmental Quality and Health. 4 Units.**

Overviews how pollution in the environment affects human health. Topics are toxicology, epidemiology, risk assessment, water, food, air, radiation, pesticides, solid and hazardous waste. Included are interdisciplinary elements of environmental regulations, education, and consumer protection.

(II)

**PUBHLTH 80. AIDS Fundamentals. 4 Units.**

Considers the biological and sociological bases of the AIDS epidemic. Topics include the history of AIDS, current medical knowledge, transmission, risk reduction, and how the community can respond.

Same as BIO SCI 45.

(II)

**PUBHLTH 90. Natural Disasters. 4 Units.**

Natural disasters are natural Earth processes that adversely affect humans. Topics include tectonics, earthquakes, tsunamis, volcanoes, landslides, severe weather, flooding, coastal processes, wildfire, related topics, and use of GIS for hazard and risk assessment.

Overlaps with EARTHSS 17.

(II)

**PUBHLTH 91. Disparities in Health Care. 2-8 Units.**

Student participatory course practicing initiation, planning, and coordination of various speakers on the subject of Disparities in Health Care.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 8 units.

**PUBHLTH 100. Special Topics in Public Health. 4 Units.**

Studies in selected areas of public health. Topics addressed vary each quarter. Course may be offered online when topic is Public Health in the Corporate World.

Prerequisite: PUBHLTH 1

Repeatability: Unlimited as topics vary.

**PUBHLTH 101. Introduction to Epidemiology. 4 Units.**

The distribution of disease and injury across time, space, and populations. Covers basic concepts and methods of descriptive epidemiology including the natural history of disease, data, and indices of health.

Prerequisite: STATS 7 or STATS 8 or PUBHLTH 7 or PUBHLTH 7A

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 102. Social Epidemiology. 4 Units.**

Overviews evidence linking environmental factors to mental and physical disorders including such variables as socioeconomic status, income inequality, work stress, job loss, social capital, location, and other demographic characteristics. Measurement and research design issues of both individual and aggregate levels.

Prerequisite: (PSCI 9 or PSCI 11C or PSYCH 7A or PSYCH 9C) and SOCECOL 10 and SOCECOL 13

Same as PSCI 183S.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PUBHLTH 105. Introduction to Medical Informatics. 4 Units.**

Broad overview of medical informatics for students with varied backgrounds. Electronic medical records, online resources, mobile technologies, patient safety, and computational design. Legal, ethical, and public policy issues. Health systems management. Evaluation and fieldwork for health systems.

Prerequisite: WRITING 39C or WRITING 30 or WRITING 31 or HUMAN 1C or HUMAN H1C. WRITING 39C with a grade of C or better. WRITING 30 with a grade of C or better. WRITING 31 with a grade of C or better. HUMAN 1C with a grade of C or better. HUMAN H1C with a grade of C or better

Same as IN4MATX 171.

Restriction: Upper-division students only. Satisfactory completion of the Lower-Division Writing requirement.

**PUBHLTH 106. Project in Health Informatics. 4 Units.**

Students undertake significant quarter-long projects related to health informatics. Topics may include field evaluations of health care technologies, prototypes, iterative design, and system implementations.

Prerequisite: PUBHLTH 105 or IN4MATX 171

Same as IN4MATX 172.

**PUBHLTH 107. Epidemiology of Drug Use and Misuse. 4 Units.**

Applies epidemiologic concepts to the use and misuse of licit/illicit substances. Emphasizes descriptive aspects of drug use and determinants of progressing from experimental use to misuse. Assesses subgroups of abusers, risk factors, trends, and surveillance techniques for estimating drug prevalence.

Prerequisite: PUBHLTH 101

Restriction: Upper-division students only. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 115. Community, Social Justice, and Health Equity Research for Action. 4 Units.**

Focuses on community as a unit of identity, community, well-being, and social justice perspectives and initiatives to promote community health. Addresses community change and improvements in community well-being, with a focus on health equity research for action.

Prerequisite: PUBHLTH 1 or PUBHLTH 2 or CHC/LAT 61 or CHC/LAT 62 or CHC/LAT 63

Same as CHC/LAT 152B.

**PUBHLTH 119. Special Topics in Epidemiology and Genetics. 4 Units.**

Studies in selected areas of epidemiology and genetics. Topics addressed vary each quarter.

Prerequisite: PUBHLTH 1

Repeatability: Unlimited as topics vary.

**PUBHLTH 120. Nutrition and Global Health. 4 Units.**

Global issues related to nutrition and public health. Evaluation of nutritional risk factors associated with the development of chronic diseases and the role of nutritional medicine in prevention. Topics include food safety, communicable diseases, supplements, and regulatory issues.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 121. Introduction to Complementary and Alternative Medicine. 4 Units.**

Examines health and disease in contemporary American culture/society with definitions, models, and practices of what has come to be known as 'orthodox' or 'conventional' medicine. Selected 'alternative' or 'complementary' modes of promoting health and well-being including homeopathy, herbology, and chiropractic.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 122. Health Policy. 4 Units.**

Considers social and economic aspects of health and disease in the United States. What are the proper roles of the individual, community, and government in improving health and health care? International comparisons will be made wherever possible.

Same as UPPP 170.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**PUBHLTH 125. Foundations of Community Health. 4 Units.**

A social ecological framework for understanding community health is presented. Measures of individual and community health are compared, and the influence of personal and environmental factors on individual, group, and population health is examined. Community health promotion strategies are discussed.

Same as UPPP 112.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**PUBHLTH 126. Public Health Law: Fundamentals in Action. 4 Units.**

Addresses the relationship of U.S. public health law to health systems at the individual and population levels. Examines legislative and judicial concepts and how they are applied to disease prevention strategies, health services, management, and policy.

**PUBHLTH 127. Public Health Programs for the Corporate World. 4 Units.**

International perspective on workplace health promotion. Strategies for developing programs to improve employee health and to decrease risks of chronic degenerative diseases. Case studies include assessment of employee health, program design, implementation, and evaluation. Emphasis on disease prevention.

**PUBHLTH 129. Public Health Administration. 4 Units.**

Examines historical aspects of public health administration including policies, procedures, trends, and development of organizations. Addresses information and skills necessary to succeed in public health leadership roles. Discusses strategic planning, collaborations, and ethical considerations for successful management in public health.

Prerequisite: PUBHLTH 1

Restriction: Upper-division students only. Public Health Policy Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment.

**PUBHLTH 132. American Public Policy. 4 Units.**

Focuses on the development and implementation of public policy in the United States. Lectures cover theoretical models of the policy process as well as significant problems facing contemporary American decision-makers.

Same as POL SCI 121G, SOC SCI 152C, UPPP 129.

**PUBHLTH 135. Medical Sociology. 4 Units.**

Current problems in U.S. health-care system and proposals for reform. Examines financial barriers to access; problem of patient dumping; underinsurance; prenatal and perinatal care; child services; preventative care and needs of the elderly; minorities; low-income people; undocumented.

Same as SOCIOL 154.

Restriction: Upper-division students only. Sociology Majors have first consideration for enrollment.

**PUBHLTH 138. Tobacco Control Policy. 4 Units.**

Examines the challenges that governments encounter in regulating the marketing, sales and acquisition, and use of tobacco products. Students assess the supply and demand for tobacco from the perspectives of the industry and consumer.

Restriction: Public Health Majors only. Public Health Sciences Majors only. Public Health Policy Majors only.

**PUBHLTH 139. Special Topics in Health Policy and Administration. 4 Units.**

Studies in selected areas of health policy and administration. Topics addressed vary each quarter.

Prerequisite: PUBHLTH 1

Repeatability: Unlimited as topics vary.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 141. Clinical Health Psychology. 4 Units.**

Behavioral role in etiology, treatment, and prevention of certain diseases. Behavioral intervention including biofeedback, stress-, pain-management, health habit counseling, and other skills to assist patients make cognitive, emotional, and behavioral changes needed to cope with disease or achieve better health.

Prerequisite: PSCI 9 or PSCI 11C or PSYCH 7A or PSYCH 9C

Same as PSCI 141H.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PUBHLTH 144. Health Behavior Theory. 4 Units.**

Introduces theoretical perspectives from the social sciences to understand health behavior from the vantage point of individuals, their interpersonal contacts, communities, and ecological contexts. Application of theory to public health problems is a central focus.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 146. Health Promotion Programs. 4 Units.**

Examines ecological perspectives of health promotion programs and risk factors related to mortality/morbidity. Analyzes effectiveness of health promotion strategies and issues in the existing healthcare systems in light of sociocultural beliefs and economical/political conditions.

Prerequisite: PUBHLTH 1

Restriction: Upper-division students only. Public Health Policy Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment.

**PUBHLTH 147. Drug Abuse and Its Prevention. 4 Units.**

Theoretical and practical underpinnings of drug abuse and its prevention at the individual and population levels. Students practice developing drug abuse prevention schemes for specific populations. Recent developments in pharmacological and biobehavioral theories of drug dependence are explored.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 148. Public Health Communication. 4 Units.**

Theoretical underpinnings and practical applications of communication sciences in public health practice. Techniques of effective communication, including fear appeal and deterrence; social marketing; public-private partnerships; health service delivery; and outreach in rural and urban settings, and for international health strategies.

Prerequisite: PUBHLTH 1 and PUBHLTH 2

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 150. Public Health and Wellness. 4 Units.**

Presents information about wellness from both science and policy perspectives in order to demonstrate the role of wellness in public health. Emphasizes the conditions that create wellness in the individual, the community, the nation, and the world.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 151. Environmental Psychology. 4 Units.**

Impact of the physical environment on individual and group behaviour. Three basic concerns examined: (a) environmental determinants of behaviour at the individual and interpersonal level; (b) social planning and urban design; (c) methodological approaches to the study of environmental issues.

Prerequisite: ENVIRON E8 and (SOCECOL 10 or PP&D 4)

**PUBHLTH 159. Special Topics in Social and Behavioral Health Science. 4 Units.**

Studies in selected areas of social and behavioral health sciences. Topics addressed vary each quarter.

Prerequisite: PUBHLTH 1

Repeatability: Unlimited as topics vary.

**PUBHLTH 161. Environmental Geology. 4 Units.**

Introduction to geologic principles and applications to environmental problems. Topics include: tectonic processes, earth materials, soils, river processes, groundwater, the coastal environment, slope failures, seismic hazards, mineral resources, and land-use evaluation based on geologic conditions. Examples from case studies.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 163. Introduction to Environmental Health Science. 4 Units.**

Focuses on processes of exposure to environmental toxins/agents and their impact to human health and the environment. Media transport, exposure assessment, susceptibility, behavior, and health effect of several toxins are discussed.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 167. Air Pollution, Climate, and Health. 4 Units.**

Introduction to how air pollutants are emitted into the atmosphere, how people are most exposed to air pollutants in developed and developing areas, physical and meteorological processes that affect transport, and the influence of air pollutants on global warming.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 168. Nuclear Environments. 4 Units.**

Understanding the impact of the nuclear age on the environment and human health through interrelated developments of nuclear power and nuclear weapons. The early years of weapon development, catastrophic environmental pollution, perils of nuclear power in the U.S. and Russia.

Same as INTL ST 122, SOCECOL E127.

(VIII)

**PUBHLTH 170. Introduction to Global Health. 4 Units.**

Provides a foundational interdisciplinary understanding of global health issues and their importance to various societal goals, including poverty reduction, economic productivity, and peace promotion. Covers major communicable and non-communicable diseases and demographic patterns of disease burden.

Prerequisite: PUBHLTH 1

(VIII)

**PUBHLTH 171. Human Exposure to Environmental Contaminants. 4 Units.**

Introduces origins of human's realization that chemicals in the environment may adversely affect health. Introduces the theory and principles of exposure assessment. Covers estimation of exposure, variability of measures, the way exposure assessment is incorporated into the risk-assessment paradigm.

**PUBHLTH 172. Climate Change and Disaster Management. 4 Units.**

Examines the social, economic, environmental, and health impacts of anthropogenic climate change through engaged learning that integrates practice and theory.

**PUBHLTH 173. Health and Global Environmental Change . 4 Units.**

Overview of scientific underpinnings of global environmental change and human health consequences. Provides an understanding of the fundamental dependency of human health on global environmental integrity. Encourages disciplinary cross-fertilization through interaction of students in environmental, health, and policy sciences.

Prerequisite: One upper-division course in environmental science, public health, environmental policy, and/or environmental management.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 174. Global Health Ethics. 4 Units.**

Provides a foundation for understanding and application of key issues.

(VIII)

**PUBHLTH 176. War and Public Health. 4 Units.**

Explores how war impacts public health both globally and domestically in the United States. Focus on the link between war and the burden that it ultimately places on physical, mental, environmental, and societal health as well as on health systems.

**PUBHLTH 179. Special Topics in Environmental and Global Health Science. 4 Units.**

Studies in selected areas of environmental and global health sciences. Topics addressed vary each quarter.

Prerequisite: PUBHLTH 1

Repeatability: Unlimited as topics vary.

**PUBHLTH 180. Epidemiology of Infectious Disease. 4 Units.**

Examines the distribution of infectious disease and the health and disease risk among human populations. Introduces basic methods for infectious disease epidemiology. Case studies of important diseases, including HIV and malaria, are conducted.

Prerequisite: PUBHLTH 1

**PUBHLTH 181. Infectious Disease Dynamics. 4 Units.**

Learn how the immune system interacts with infectious diseases, in particular with viral infections. An introduction to basic virology and immunology, it concentrates on the way in which the immune system is critical to the prevention of infections.

Same as BIO SCI E124.

**PUBHLTH 182. Evolutionary and Ecological Principles in Medicine. 4 Units.**

Explore the dynamics of populations on an ecological, epidemiological, and medical level. Considers the dynamics of competition, predation, and parasitism; the spread and control of infectious diseases; and the in vivo dynamics of viral infections and the immune system.

Prerequisite: BIO SCI 93

Same as BIO SCI E151.

Concurrent with ECO EVO 251.

**PUBHLTH 189. Special Topics in Infectious Diseases. 4 Units.**

Studies in selected areas of infectious diseases. Topics addressed vary each quarter.

Prerequisite: PUBHLTH 1

Repeatability: Unlimited as topics vary.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment.

**PUBHLTH 190. Geographic Information Systems for Public Health. 4 Units.**

Provides a broad introduction to the use of Geographic Information Systems software to carry out projects for visualizing and analyzing spatial data to address significant issues of health care and policy-planning.

Concurrent with PUBHLTH 283.

**PUBHLTH 191A. Seminar: Advances and Challenges in Public Health. 2 Units.**

Forum for exploring recent advances and challenges in all disciplines of public health research and practice. Features case studies exemplifying the integration of core competencies with cross-cutting interdisciplinary themes of public health.

Grading Option: Pass/no pass only.

Concurrent with PUBHLTH 291A.

**PUBHLTH 191B. Seminar: Advances and Challenges in Public Health. 2 Units.**

Forum for exploring recent advances and challenges in all disciplines of public health research and practice. Features case studies exemplifying the integration of core competencies with cross-cutting interdisciplinary themes of public health.

Grading Option: Pass/no pass only.

Concurrent with PUBHLTH 291B.

**PUBHLTH 191C. Seminar: Advances and Challenges in Public Health. 2 Units.**

Forum for exploring recent advances and challenges in all disciplines of public health research and practice. Features case studies exemplifying the integration of core competencies with cross-cutting interdisciplinary themes of public health.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

Concurrent with PUBHLTH 291C.

**PUBHLTH H192A. Public Health Honors Seminar and Thesis I. 4 Units.**

Provides an opportunity for selected students to pursue advanced work in research and earn Public Health Honors. Students will conduct their honors research project with faculty through lectures, guest speakers, creating timelines and assignments.

Corequisite: PUBHLTH 199

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Public Health Policy Majors only. Public Health Sciences Majors only.

**PUBHLTH H192B. Public Health Honors Seminar and Thesis II. 4 Units.**

Students initiate and complete data collection for the honors thesis. In addition, students begin data analysis and summarize results at a class symposium at the end of the quarter. A faculty mentor provides supervision and feedback on thesis chapters.

Corequisite: PUBHLTH 199

Prerequisite: PUBHLTH H192A

Grading Option: Pass/no pass only.

Restriction: Public Health Policy Majors only. Public Health Sciences Majors only.

**PUBHLTH H192C. Public Health Honors Seminar and Thesis III. 4 Units.**

Students write their honors research project (PUBHLTH H192A-PUBHLTH H192B) and prepare an oral report to be presented at a class symposium at the end of the quarter. A faculty mentor provides supervision and feedback on thesis chapters.

Corequisite: PUBHLTH 199

Prerequisite: PUBHLTH H192B

Restriction: Public Health Policy Majors only. Public Health Sciences Majors only.

**PUBHLTH 193. Ethics and Responsible Conduct of Research in Public Health. 4 Units.**

Issues of scientific integrity and satisfies the requirements for training in public health ethics. Includes guidelines for responsible conduct of research, federal and international codes, administrative review and approval, conflict of interest, and privacy and safety of research participants. Course may be offered online.

Restriction: Upper-division students only. Public Health Sciences Majors only. Public Health Policy Majors only.

**PUBHLTH 194A. Clinical and Translational Research Preparatory I. 4 Units.**

Provides training for students with an interest in clinical and translational research in the health care setting. Cultivates skills for study design, research literature review, ethics, responsible conduct of research, and cultural competence while emphasizing professionalism and personal responsibility.

Prerequisite: BIO SCI 99 and BIO SCI 194S and CHEM 1C and CHEM 1LC and CHEM 1LD. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only.

**PUBHLTH 194B. Clinical and Translational Research Preparatory II. 1-4 Units.**

Provides opportunities for students to participate in clinical and translational research through rotations in at least two health care settings. Builds on preparation through the first course (194A) in the sequence to support exploration of various research topics.

Prerequisite: PUBHLTH 194A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only.

**PUBHLTH 194C. Clinical and Translational Research Preparatory III. 4 Units.**

Provides opportunities for students to work closely in a particular clinical and translational research setting. Builds on preparation through the didactic instruction presented in first course of the sequence (194A) to support deeper engagement on a particular research topic.

Prerequisite: PUBHLTH 194B. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**PUBHLTH 194D. Clinical and Translational Research Preparatory IV. 4 Units.**

Provides opportunities for students to participate in clinical and translational research through placement in a research laboratory. This course is a continuation of 194C in which students have the opportunity to participate in a permanent research rotation.

Prerequisite: PUBHLTH 194C

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.



**PUBHLTH 195W. Public Health Practicum and Culminating Experience. 8 Units.**

Provides direct opportunities for Public Health majors to observe and participate in public health activities and/or research; and to cultivate skills for verbal and written communication of contemporary public health topics for an integrative culminating experience.

Prerequisite: PUBHLTH 1 and PUBHLTH 2. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Public Health Sciences Majors only. Public Health Policy Majors only.

(lb)

**PUBHLTH 196A. Clinical and Translational Research Preparatory I - Community-Based Research and Evaluation. 4 Units.**

Provides training for students with an interest in clinical and translational research in a community-based setting. Cultivates skills for study design, research literature review, ethics, responsible conduct of research, and cultural competence while emphasizing professionalism and personal responsibility.

Overlaps with PUBHLTH 194A.

**PUBHLTH 196B. Clinical and Translational Research Preparatory II - Community-Based Research and Evaluation. 4 Units.**

Provides the unique opportunity for students to participate in research in two or more community-based settings. Builds on preparation through PUBHLTH 196A to support exploration of various research topics.

Prerequisite: PUBHLTH 196A

**PUBHLTH 196C. Clinical and Translational Research Preparatory III - Community-Based Research and Evaluation III. 4 Units.**

Final course in the 196 series where students have the unique opportunity to participate in permanent research rotation. Instructs students how to design, perform, interpret, and discuss independent research in a collaborative atmosphere.

Prerequisite: PUBHLTH 196B

**PUBHLTH 197. Field Studies in Public Health. 2-12 Units.**

For students who may either accompany faculty members on field trips or engage in post-practicum work at a field agency.

Prerequisite: PUBHLTH 1 and PUBHLTH 2

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 12 units.

**PUBHLTH 198. Directed Studies. 1-4 Units.**

Student participation in a series of research-related activities performed in an individual or small-group setting under the guidance of a faculty advisor.

Prerequisite: PUBHLTH 1

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**PUBHLTH 199. Undergraduate Research. 1-4 Units.**

Original research with Public Health faculty. Attendance at regular research group meetings is also generally expected, and a quarterly written report is required. Strongly recommended for students considering research careers and/or graduate degree programs.

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**PUBHLTH 200. Foundations of Public Health. 4 Units.**

Presents the overarching framework, principles, and core responsibilities of public health research and practice from a multidisciplinary perspective. Provides necessary foundation for further studies toward advanced cross-cutting approaches essential for public health practice.

Restriction: College of Health Sciences students only. Program in Public Health students only. Master of Public Health Degree students only. Graduate students only. Public Health Majors only.

**PUBHLTH 204. Biostatistics I: Introduction to Statistical Methods. 4 Units.**

Designed to help students develop an appreciation for statistician's view of the research process, emphasizing biomedical research. Instills an understanding of how statistical models are used to yield insights about data that form evidence-based understanding of the world around us.

Same as EPIDEM 204A.

Restriction: Graduate students only.

**PUBHLTH 204B. Biostatistics II: Intermediate Statistical Methods. 4 Units.**

Intended for graduate students in epidemiology, public health, and clinical research fields. Covers common regression-modeling techniques frequently used in biologic and medical applications.

Prerequisite: EPIDEM 204. EPIDEM 204 with a grade of B or better

Repeatability: May be taken for credit 2 times.

Same as EPIDEM 204B.

Restriction: Graduate students only.

**PUBHLTH 204C. Biostatistics III: Advanced Statistical Methods. 4 Units.**

Intended for graduate students in epidemiology, public health, and related fields. Introduces statistical methods for analyzing survival and longitudinal/clustered data, and techniques to resolve missing data.

Prerequisite: EPIDEM 204B. EPIDEM 204B with a grade of B or better

Repeatability: May be taken for credit 2 times.

Same as EPIDEM 204C.

Restriction: Graduate students only.

**PUBHLTH 206A. Principles of Epidemiology. 4 Units.**

Fundamental principles of epidemiology, biostatistics, and epidemiological research. Topics include research methods of measuring health problems in populations, disease control and prevention in populations, how epidemiology contributes to knowledge of disease etiology, and biostatistical analysis and interpretation of epidemiologic data.

Same as EPIDEM 200A.

Restriction: Graduate students only.

**PUBHLTH 206B. Intermediate Epidemiology. 4 Units.**

Learn to design and conduct epidemiologic studies using common designs. Determine why bias and measurement error arise in observational studies, and how they influence effect estimates. Perform and interpret epidemiologic data analyses using statistical software.

Prerequisite: PUBHLTH 206A. PUBHLTH 206A with a grade of B or better

Same as EPIDEM 200B.

Restriction: College of Health Sciences students only. Program in Public Health students only. Master of Public Health Degree students only. Graduate students only. Epidemiology Majors only.

**PUBHLTH 206C. Advanced Epidemiologic Methods. 4 Units.**

Advanced topics in the design and statistical analysis of epidemiologic studies. Topics include simulation methods, counter-matching and multiphase study designs, missing data, and Bayesian analysis. Published simulation studies are discussed and replicated using the R software package.

Prerequisite: EPIDEM 200A and EPIDEM 200B. EPIDEM 200A with a grade of B or better. EPIDEM 200B with a grade of B or better

Same as EPIDEM 200C.

**PUBHLTH 207A. Probability and Statistics in Public Health. 4 Units.**

An introduction to probability and statistical methods, using examples in public health. Topics include descriptive statistics, laws of probability, discrete and continuous probability distributions, estimation, confidence intervals, hypothesis testing, and power calculations for one- and two-sample comparisons.

Prerequisite: PUBHLTH 206A. PUBHLTH 206A with a grade of B or better

Restriction: Program in Public Health students only. Master of Public Health Degree students only. Graduate students only. Public Health Majors only.

**PUBHLTH 207B. Analysis of Public Health Data Using Statistical Software. 4 Units.**

Overview of common statistical methods in public health and how to implement them in R. Topics include linear regression, ANOVA, the Kruskal-Wallis test, logistic regression, missing data and censoring, Kaplan-Meier survival curves, log-rank tests, and Cox regression.

Prerequisite: PUBHLTH 207A. PUBHLTH 207A with a grade of B or better

Restriction: Program in Public Health students only. Master of Public Health Degree students only. Graduate students only. Public Health Majors only.

**PUBHLTH 208. Advances in Social Epidemiology. 4 Units.**

Advances understanding of social distribution and social determinants of disease through multiple risk factor models and mechanisms that emphasize developmental and socio-environmental risk factors on mental and physical health across the life span.

Restriction: Graduate students only.

**PUBHLTH 209. Methods of Demographic Analysis. 4 Units.**

Introduces basic demographic methods used in social science and public health research. Topics include sources and limitations of demographic data; components of population growth; measures of nuptiality, fertility, mortality, and population mobility projection methods; and demographic models.

Same as SOCIOL 226A.

Restriction: Graduate students only.

**PUBHLTH 210. Theory-Driven Secondary Data Analysis. 4 Units.**

Learn how to develop and test theoretically-driven research questions in secondary data sources. Logic of theory building and testing, how to conduct statistical analyses on testable research questions, and interpret results. There is also a lab component.

Restriction: Graduate students only. Environmental Health Sciences Majors only. Epidemiology Majors only. Public Health Majors only.

**PUBHLTH 211A. Latinos/Latinas and Medical Care: Contemporary Issues. 2 Units.**

Introduction to medical anthropological and social science perspectives on Latinos/Latinas in relation to a number of health and medically-related issues, i.e., immigration, gender, reproduction, culture, social structure, political economy, sexuality, utilization of medical services, and health beliefs.

Same as CHC/LAT 211A.

**PUBHLTH 211B. Latinos/Latinas and Medical Care: Contemporary Issues. 2 Units.**

Introduction to medical anthropological and social science perspectives on Latinos/Latinas in relation to a number of health and medically-related issues, i.e., immigration, gender, reproduction, culture, social structure, political economy, sexuality, utilization of medical services, and health beliefs.

Prerequisite: CHC/LAT 211A

Same as CHC/LAT 211B.

**PUBHLTH 213. Epidemiology in Global Health. 4 Units.**

Examines major topics in epidemiology and global health. Research topics within these two disciplines are focused on resource-poor communities, with an application to the global world.

Restriction: Graduate students only. Environmental Health Sciences Majors only. Epidemiology Majors only. Public Health Majors only.

**PUBHLTH 214. Surveillance Systems. 4 Units.**

Surveillance as a fundamental element of the practice of public health is examined in terms of the application and evaluation of monitoring systems. Topics include surveillance of infectious and chronic diseases, environmental constituents, and other indicators of population health.

Prerequisite: PUBH 206

Restriction: Graduate students only.

**PUBHLTH 219. Special Topics in Biostatistics, Epidemiology, and Health Informatics. 4 Units.**

Current research in biostatistics, epidemiology, and health informatics. Topics vary from quarter to quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PUBHLTH 222. Health Policy and Management. 4 Units.**

Multidisciplinary inquiry into theory and practice concerned with delivery, quantity, costs of health care for individuals and populations. Explores managerial and policy concerns regarding structure, process, outcomes of health services including the costs, financing, organization, outcomes, and accessibility of care.

Same as UPPP 243.

Restriction: Master of Public Health Degree students have first consideration for enrollment. Master of Public Policy Degree students have first consideration for enrollment. Graduate students only. Public Health Majors have first consideration for enrollment. Urban and Regional Planning Majors have first consideration for enrollment.

**PUBHLTH 223. Risk Communication. 4 Units.**

Examines theory and research related to the communication of scientific information in risk communication contexts, risk perceptions, and behavior as related to decision-making under risk.

Restriction: Graduate students only.

**PUBHLTH 239. Special Topics in Health Policy and Management. 4 Units.**

Current research in health policy and management. Topics vary from quarter to quarter.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PUBHLTH 241. Environmental Policy and Global Sustainability. 4 Units.**

Organized around four transcendent questions: does the world value sustainability, what challenges must be met to move toward it, what are the roots of inequality, and is capitalism compatible with sustainability.

Restriction: Graduate students only.

**PUBHLTH 242. Theories of Health Communication. 4 Units.**

Explores the concepts, constructs, and theories of communication in health and risk contexts. Examines interpersonal, family, organizational, and mediated communicative processes about health care and conditions from a global perspective.

Restriction: Graduate students only.

**PUBHLTH 244. Health Behavior Theory. 4 Units.**

Introduces the field of Health Behavior and segues into major theoretical perspectives. Focus on health behavior change from the vantage point of individual health behavior and theoretical abstraction. Explores how to relate theory to behavior-change intervention programs.

Restriction: Master of Public Health Degree students only. Graduate students only. Public Health Majors only.

**PUBHLTH 245. Health Promotion Planning. 4 Units.**

Introduces strategic planning integral to intervention planning in public health practice and research, emphasizing the fundamental domains of social and behavioral health science and practices. Students develop an intervention plan for a specific health problem, health behavior, and target population.

Restriction: Graduate students only.

**PUBHLTH 246. Social Research Methods. 4 Units.**

An interactive graduate seminar covering topics related to the research process and study design. Begins with conceptualizing research questions, hypotheses, and then turns to topics in measurement and concludes with experimental, quasi-experimental, and observational study designs.

Restriction: Graduate students only.

**PUBHLTH 247. Program Evaluation. 4 Units.**

Introduces methods, tools, and procedures for systematic investigation of the effectiveness of programs in health and social services for disease intervention, prevention, and health promotion. Includes development of program evaluation plans, logic models, contextual frameworks, study designs, and data analyses.

Restriction: Graduate students only.

**PUBHLTH 248. Fundamentals of Maternal and Child Health - Programs, Problems, and Policy. 4 Units.**

Overview of issues facing women, children, and families from a public health perspective. Discusses role of socio-economic, political, biological, environmental factors on population health. Studies historical foundations and current factors impacting Maternal Child Health programs and legislation in the US.

Restriction: Graduate students only.

**PUBHLTH 250. Health Status and Care Disparities. 4 Units.**

Expert health care providers present viewpoints and interdisciplinary strategies for addressing sociocultural, economic, gender, age, and other disparities in population health status and care provision.

Restriction: Graduate students only.

**PUBHLTH 251. Models of Practice and Intervention at the Community Level. 4 Units.**

Examines and critiques current models, frameworks, theories for.

Prerequisite: CHC/LAT 200A or PUBHLTH 246

Same as CHC/LAT 251.

Restriction: Graduate students only.

**PUBHLTH 259. Special Topics in Social and Behavioral Health Sciences. 4 Units.**

Current research in Social and Behavioral Health Sciences. Topics vary from quarter to quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PUBHLTH 260. Human Exposure Modeling. 4 Units.**

Explores the basic principles and methods in estimating human exposure to environmental pollutants. Topics include source emissions, spatial/temporal aspects of human exposures, air pollution exposure modeling, time-activity patterns, micro-environmental exposure assessment, the uncertainty/variability analysis.

Restriction: Graduate students only.

**PUBHLTH 264. Introduction to Environmental Health Science. 4 Units.**

Convergence of agents (chemical, physical, biological, or psychosocial) in environment can emerge as diseases influenced by social, political, and economic factors, allowing them to become rooted in society. How these agents from various spheres come together and impact human health.

Same as EPIDEM 264, EHS 264.

Restriction: Graduate students only. Environmental Health Sciences Majors only. Epidemiology Majors only. Public Health Majors only. Environ Health Sci and Policy Majors only.

**PUBHLTH 265. Advanced Environmental Health Science. 4 Units.**

Explores the complex relationships among exposure processes and adverse health effects of environmental toxins focusing on specific chemicals, sources, transport media, exposure pathways, and human behaviors. Techniques of environmental sampling for exposure assessment are discussed.

Same as EPIDEM 265.

Restriction: Graduate students only.

**PUBHLTH 269. Air Pollution, Climate, and Health. 4 Units.**

Emission of air pollutants into the atmosphere, physical and meteorological processes that affect transport, and influence on global warming. Concepts of how and where people are most exposed, and how exposures and health effects differ in developed and developing regions.

Same as EPIDEM 269, EHS 269.

**PUBHLTH 270. Human Exposure to Environmental Contaminants. 4 Units.**

Introduces founders of conceptual thought that environmental contaminants can impact health. Theory and principles of exposure assessment, the continuum from emissions of a contaminant into the environment to evidence of health effects in a population.

Same as EPIDEM 270, EHS 270.

**PUBHLTH 272. Occupational Health Psychology. 4 Units.**

Introduction to psychological and social factors in the workplace that affect health and productivity. Goal is to support redesign of the workplace and social situations that can reduce stress-related illness risks, and increase humane forms of productivity and competence development.

Same as EHS 294.

Restriction: Graduate students only.

**PUBHLTH 275. Environmental Modeling and Risk Management. 4 Units.**

Surveys the general principles, basic mathematical methods, and practices of environmental modeling and human health risk assessment. Topics include advection-dispersion models, risk management, and risk perception. Students conduct an original risk assessment as a final group project.

Prerequisite: MATH 2A and STATS 7

Same as EHS 275.

Restriction: Graduate students only.

Concurrent with PUBHLTH 175.

**PUBHLTH 277A. Target Organ Toxicology I. 4 Units.**

Mechanistic analysis of responses occurring in various organ systems of experimental animals and humans exposed to environmental and occupational chemicals and radiation. Review distinctive cellular and tissue structure and physiological function of the various organ systems.

Same as EHS 206A.

Restriction: Graduate students only.

**PUBHLTH 277B. Target Organ Toxicology II . 4 Units.**

Mechanistic analysis of responses occurring in various organ systems of experimental animals and humans exposed to environmental and occupational chemicals and radiation. Review of distinctive cellular and tissue structure and physiological function of the various organ systems.

Prerequisite: PUBHLTH 277A or EHS 206A

Same as EHS 206B.

Restriction: Graduate students only.

**PUBHLTH 278. Industrial Toxicology. 4 Units.**

Analysis of responsibilities toxicologists have in industry, including product safety, generating material safety, data sheets, animal testing, ecotoxicological testing, risk/hazard communication, and assisting industrial hygienists and occupational physicians; emphasis on interdisciplinary nature of industrial toxicology and communication skills.

Prerequisite: PUBHLTH 277B or EHS 206B

Same as EHS 220.

**PUBHLTH 279. Special Topics in Environmental & Occupational Health. 4 Units.**

Current research in environmental and occupational health. Topics vary from quarter to quarter.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PUBHLTH 280. Global Burden of Disease. 4 Units.**

Introduces composite measures of disease burden, including Disability Adjusted Life Years and their use in prioritizing disease burden at local, regional, and global levels. Focuses on WHO's landmark assessments and introduces DISMOD software for specific analyses.

Restriction: Graduate students only.

**PUBHLTH 281. Infectious Disease Epidemiology. 4 Units.**

Geographical distribution of infectious diseases and the health and disease risk in diverse human populations. Introduces basic methods for infectious disease epidemiology and case studies of important diseases. Includes surveillance, outbreak investigation, emerging pathogens, traditional and molecular epidemiology.

Restriction: Graduate students only.

**PUBHLTH 282. Climate Change and Global Health. 4 Units.**

Designed for students to examine major topics in climate change and global health. Draws heavily on the literature in order to develop an understanding of micro- and macro-level impacts and drivers with regard to climate change and health.

Restriction: Graduate students only. Environmental Health Sciences Majors only. Epidemiology Majors only. Public Health Majors only.

**PUBHLTH 283. Geographic Information Systems for Public Health. 4 Units.**

Provides a broad introduction to the use of Geographic Information Systems software to carry out projects for visualizing and analyzing spatial data to address significant issues of health care and policy-planning.

Prerequisite: PUBH 206

Restriction: Graduate students only.

Concurrent with PUBHLTH 190.

**PUBHLTH 286. Advanced Geographic Information Systems and Spatial Epidemiology. 4 Units.**

Students expand their current knowledge of the ArcGIS software to develop advanced geographic-related research questions, learn how to apply spatial epidemiologic methods to public health data, and integrate their skills in a GIS project of their design.

Prerequisite: PUBHLTH 283

Restriction: Graduate students only.

**PUBHLTH 287. Qualitative Research Methods in Public Health. 4 Units.**

General introduction to qualitative research methods for investigating public health questions at various scales from community level to global populations. Emphasizes systematic approaches to the collection, analysis, interpretation of qualitative data.

Restriction: Graduate students only.

**PUBHLTH 288. Research Proposal Writing in Global Health. 4 Units.**

Overview of financial support for research in global health and disease prevention. Collaborative agreements, guidelines for proposal writing, team building, budgeting, peer-review process, and transitioning from proposal to research project implementation.

Restriction: Graduate students only.

**PUBHLTH 289. Special Topics in Global Health and Disease Prevention. 4 Units.**

Current research in global health and disease prevention. Topics vary from quarter to quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PUBHLTH 290. Special Topics in Public Health. 4 Units.**

Studies in selected areas of public health. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PUBHLTH 291A. Seminar: Advances and Challenges in Public Health. 2 Units.**

Forum for exploring recent advances and challenges in all disciplines of public health research and practice. Features case studies exemplifying the integration of core competencies with cross-cutting interdisciplinary themes of public health.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

Concurrent with PUBHLTH 191A.

**PUBHLTH 291B. Seminar: Advances and Challenges in Public Health. 2 Units.**

Forum for exploring recent advances and challenges in all disciplines of public health research and practice. Features case studies exemplifying the integration of core competencies with cross-cutting interdisciplinary themes of public health.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

Concurrent with PUBHLTH 191B.

**PUBHLTH 291C. Seminar: Advances and Challenges in Public Health. 2 Units.**

Forum for exploring recent advances and challenges in all disciplines of public health research and practice. Features case studies exemplifying the integration of core competencies with cross-cutting interdisciplinary themes of public health.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

Concurrent with PUBHLTH 191C.

**PUBHLTH 292. Ethics and Responsible Conduct of Research in Public Health. 4 Units.**

Issues of scientific integrity and satisfies the requirements for training in public health ethics. Includes guidelines for responsible conduct of research, federal and international codes, administrative review and approval, conflict of interest, and privacy and safety of research participants.

Restriction: Graduate students only.

Concurrent with PUBHLTH 193.

**PUBHLTH 293. Foundations of Clinical and Translational Science. 4 Units.**

Introduces rationale and imperative for clinical translational science and various approaches being developed to speed-up discoveries and their transformation into health care practices. Compares and contrasts current impediments to clinical research with the potential and transformative power of translational science.

Restriction: Graduate students only.

**PUBHLTH 294. Research Communication in Public Health. 4 Units.**

Strategies for effective writing and oral presentation of research characteristics and results to various audiences. Includes exercises in writing for the public, for scholarly journals, and at conferences.

Restriction: Graduate students only.

**PUBHLTH 295. Graduate Practicum and Culminating Experience in Public Health. 8 Units.**

Provides opportunities for hands-on experience for graduate students at agencies or organizations engaged in public health practice. Students are matched with placement sites based on academic preparation and students' career goals. The practicum report is integrated into the culminating experience.

Prerequisite: PUBHLTH 200 and PUBHLTH 244 and PUBHLTH 222 and PUBHLTH 264 and PUBHLTH 207A. PUBHLTH 200 with a grade of B or better. PUBHLTH 244 with a grade of B or better. PUBHLTH 222 with a grade of B or better. PUBHLTH 264 with a grade of B or better. PUBHLTH 207A with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Public Health Majors only.

**PUBHLTH 296. Doctoral Dissertation Research and Writing. 1-12 Units.**

Dissertation research with Public Health faculty.

Prerequisite: Advancement to candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit for 12 units.

Restriction: Graduate students only. Public Health Majors only.

**PUBHLTH 297. Research Design and Proposal Writing. 4 Units.**

Evaluate strengths of research findings based on methods used by researchers to develop research proposals. Components such as collaborative agreements, guidelines for proposal writing, budgeting, peer-review process, and transitioning from proposal to research project implementation are addressed.

Restriction: College of Health Sciences students only. Program in Public Health students only. Master of Public Health Degree students only. Graduate students only. Public Health Majors only.



**PUBHLTH 298. Directed Studies in Public Health. 2-8 Units.**

Directed study with Public Health faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PUBHLTH 299. Independent Study in Public Health . 2-8 Units.**

Independent research with Public Health faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PUBHLTH 399. University Teaching. 2-4 Units.**

Limited to teaching assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Department of Environmental and Occupational Health

**Veronica Viera, Department Chair**

<http://www.publichealth.uci.edu>

The Department of Environmental and Occupational Health focuses on integrative and transdisciplinary health research using the three pillars of science: basic, clinical, and population science. Research with particular emphases on assessing exposures to and health risks from environmental and occupational factors include, but are not limited to contaminants in ambient air, water, food, and soil; green space and the built environment; radiation; noise; temperature; work organization; and community and workplace stressors. The multidisciplinary expertise of the faculty, students, and staff provides the department with the capability to address complex local, regional, and global environmental problems and to provide training in four critical areas, as described below.

- Exposure science research addresses questions such as: What concentrations of toxicants exposure science, toxicology, risk assessment, epidemiology, urban health, climate change, natural disasters, environmental health disparity, and related disciplines, are present in air, water, food, and soil, and what levels are present for other exposure sources such as noise and radiation? What sub-populations, activities, and circumstances are associated with exposures that can adversely impact health, or with exposures that can improve health? What are the relationships between exposure to one or multiple environmental agents (e.g., chemical toxicants, physical agents, biological agents), resulting organ and tissue concentrations, and the biologically-relevant dose a person receives?
- Toxicological research investigates molecular, cellular, and physiological endpoints, to reveal how exposures to toxic pollutants and other environmental factors affect the body, and investigates biological mechanisms for the development and exacerbation of diseases that might have an environmental etiology.
- Epidemiologic studies elucidate the connections between environmental and occupational exposures and resulting health outcomes, including disease and death among susceptible populations, sub-clinical health conditions, and health-related behaviors such as physical activity.
- Risk analyses integrate toxicological and epidemiologic findings to manage risks and contribute to sound environmental and occupational health policies that improve population health.

The Department offers an M.S. and Ph.D. in Environmental Health Sciences. The Ph.D. offers two tracks: Environmental Toxicology, and Exposure Sciences and Environmental Epidemiology. Faculty contribute directly to the M.P.H. emphasis in environmental health and the B.S. in Public Health Sciences.

- Environmental Health Sciences, M.S.
- Environmental Health Sciences, Ph.D.

## Environmental Health Sciences, M.S.

**Jun Wu, Graduate Program Director and Departmental Graduate Advisor**

100 Theory Drive, Suite 100, Irvine, CA 92617

<http://www.publichealthuci.edu>

The Department of Environmental and Occupational Health provides graduate training in environmental health sciences and offers the M.S. in Environmental Health Sciences. The program in Environmental Health Sciences provides students with the knowledge and skills necessary and appropriate to teach and/or conduct basic and applied research programs in inhalation/pulmonary toxicology, neurotoxicology, reproductive and

developmental toxicology, chemical pathology, toxicokinetics, radiation toxicology, exposure sciences, environmental epidemiology, and risk assessment.

Environmental Toxicology involves the scientific study of the entry, distribution, biotransformation, and mechanism of the action of chemical and physical agents that are harmful to the body. The graduate program interprets environmental toxicology as the study of the effects and mechanisms of action of hazardous chemical and physical agents in food, air, water, and soil in the home, the workplace, and the community. It considers experimentally and theoretically such diverse research problems as:

- new scientific approaches to toxicological evaluation of environmental chemicals (e.g. air and water pollutants, food additives, industrial wastes, and agricultural adjuvants) and physical agents (e.g. radiation) at the molecular, cellular, and organism levels
- mechanisms of action in the toxicity of chemical and physical environmental agents
- the molecular pathology of tissue injury in acute and chronic toxicity

Exposure Sciences involves the study of human exposures to chemical environmental contaminants in different media such as air, water, food, and soil and via multiple routes including inhalation, ingestion, and dermal absorption, as well as exposures to physical environmental agents such as radiation, temperature, noise, and other built environment factors. Environmental Epidemiology examines the effects of exposure to environmental agents and other factors on health outcomes. Research in the Exposure Sciences and Environmental Epidemiology Track includes:

- new approaches to the evaluation of human exposures to environmental chemicals, including exposure measurement, modeling, and biomonitoring
- assessing individual level exposures to chemical and physical environmental agents and examining associations of these exposures with health and disease outcomes
- exposure to chemical, physical, and psychosocial work environment hazards and health outcomes
- environmental health disparity issues

Students entering the program have varied backgrounds, including chemistry, biology, and physiology. The curriculum is based on a foundation of basic and health sciences with applications of scientific principles to environmental exposures and their potential health effects. Formal course work is enriched by a strong commitment to student-professor interaction throughout the program. An important and integral part of the learning process is an early and intensive involvement of the student in ongoing original research projects in environmental health sciences, especially inhalation/pulmonary toxicology, reproductive and developmental toxicology, biochemical toxicology, chemical pathology, neurotoxicology, exposure sciences, environmental epidemiology, and risk assessment.

In addition to meeting the general admission requirements set by the Graduate Division, applicants must be admitted by an Admissions Committee composed of faculty members of the graduate program. Candidates will be selected on the basis of a balanced evaluation of the following criteria, with no one factor having more influence (1) prior scholastic performance, including a consideration of grades, course load, nature of courses taken, and college attended; (2) recommendations by professors and others; (3) scores for the general Graduate Record Examination test (GRE); (4) an interview by members of the Admissions Committee and other faculty members, when feasible; and (5) experience in undergraduate and/or post-baccalaureate research.

Undergraduate preparation of applicants should include one year of biology (one quarter of molecular biology or biochemistry is strongly recommended) one year of mathematics (calculus and/or statistics), and one year of chemistry. Outstanding applicants who lack one or two of these prerequisites may be given an opportunity to take the required course(s) either before admission or during the first year in the graduate program; in such circumstances, none of these required undergraduate courses may be used to satisfy the program elective or core course requirements. Upper-division or graduate science courses may be considered as substitutes for the above prerequisites by the Admissions Committee.

## Master of Science in Environmental Health Sciences

All courses must be passed with an average grade of B or better.

A. Complete the following:

PUBHLTH 206A	Principles of Epidemiology
or EPIDEM 200A	Principles of Epidemiology
EPIDEM 204A	Biostatistics I: Introduction to Statistical Methods
or PUBHLTH 207A	Probability and Statistics in Public Health

B. Select two of the following:

EHS 202	Principles of Environmental Toxicology
EHS 206A	Target Organ Toxicology I
EHS 206B	Target Organ Toxicology II

C. Complete the following:

EHS 264	Introduction to Environmental Health Science
EHS 298	Seminar in Environmental Health Sciences <sup>1</sup>
EHS 299	Research Problems <sup>2</sup>

## EHS 290

Independent Study in Environmental Toxicology<sup>3</sup>

Eight units from the approved elective pool.

D. Complete one of the following plans:

Plan I:

Under the direction of a faculty advisor, prepare a thesis that is acceptable to the thesis committee

Plan II:

1. Under the supervision of a faculty member, prepare a scholarly paper based on individual study in an area of toxicology
2. Pass the written comprehensive examination.

- <sup>1</sup> All graduate students in the program will be required to take EHS 298 every academic quarter they are enrolled in the graduate program.
- <sup>2</sup> Applies to Plan I.
- <sup>3</sup> Applies to Plan II.

Opportunities for individual training and independent research experience exist in inhalation and pulmonary toxicology, atmospheric chemistry and aerosol science, neurochemistry and neurotoxicology, reproductive and developmental toxicology, toxicology of naturally occurring compounds, exposure modeling, risk assessment, chemical pathology, environmental microbiology, and environmental chemistry. Research grants and contracts are available to support qualified doctoral students as research assistants.

## Environmental Health Sciences, Ph.D.

**Jun Wu, Graduate Program Director and Departmental Graduate Advisor**

100 Theory Drive, Suite 100, Irvine, CA 92617

<http://www.publichealthuci.edu>

The Department of Environmental and Occupational Health provides graduate training in environmental health sciences and offers the Ph.D. in Environmental Health Sciences. The Ph.D. program offers tracks in Environmental Toxicology and in Exposure Sciences and Environmental Epidemiology. The program in Environmental Health Sciences provides students with the knowledge and skills necessary and appropriate to teach and/or conduct basic and applied research programs in inhalation/pulmonary toxicology, neurotoxicology, reproductive and developmental toxicology, chemical pathology, toxicokinetics, radiation toxicology, exposure sciences, environmental epidemiology, and risk assessment.

Environmental Toxicology involves the scientific study of the entry, distribution, biotransformation, and mechanism of the action of chemical and physical agents that are harmful to the body. The graduate program interprets environmental toxicology as the study of the effects and mechanisms of action of hazardous chemical and physical agents in food, air, water, and soil in the home, the workplace, and the community. It considers experimentally and theoretically such diverse research problems as:

- new scientific approaches to toxicological evaluation of environmental chemicals (e.g. air and water pollutants, food additives, industrial wastes, and agricultural adjuvants) and physical agents (e.g. radiation) at the molecular, cellular, and organism levels
- mechanisms of action in the toxicity of chemical and physical environmental agents
- the molecular pathology of tissue injury in acute and chronic toxicity

Exposure Sciences involves the study of human exposures to chemical environmental contaminants in different media such as air, water, food, and soil and via multiple routes including inhalation, ingestion, and dermal absorption, as well as exposures to physical environmental agents such as radiation, temperature, noise, and other built environment factors. Environmental Epidemiology examines the effects of exposure to environmental agents and other factors on health outcomes. Research in the Exposure Sciences and Environmental Epidemiology Track includes:

- new approaches to the evaluation of human exposures to environmental chemicals, including exposure measurement, modeling, and biomonitoring
- assessing individual level exposures to chemical and physical environmental agents and examining associations of these exposures with health and disease outcomes
- exposure to chemical, physical, and psychosocial work environment hazards and health outcomes
- environmental health disparity issues

Students entering the program have varied backgrounds, including chemistry, biology, and physiology. The curriculum is based on a foundation of basic and health sciences with applications of scientific principles to environmental exposures and their potential health effects. Formal course work is enriched by a strong commitment to student-professor interaction throughout the program. An important and integral part of the learning process is an early and intensive involvement of the student in ongoing original research projects in environmental health sciences, especially inhalation/pulmonary toxicology, reproductive and developmental toxicology, biochemical toxicology, chemical pathology, neurotoxicology, exposure sciences, environmental epidemiology, and risk assessment.

In addition to meeting the general admission requirements set by the Graduate Division, applicants must be admitted by an Admissions Committee composed of faculty members of the graduate program. Candidates will be selected on the basis of a balanced evaluation of the following criteria, with no one factor having more influence (1) prior scholastic performance, including a consideration of grades, course load, nature of courses taken, and

college attended; (2) recommendations by professors and others; (3) scores for the general Graduate Record Examination test (GRE); (4) an interview by members of the Admissions Committee and other faculty members, when feasible; and (5) experience in undergraduate and/or post-baccalaureate research.

Undergraduate preparation of applicants should include one year of biology (one quarter of molecular biology or biochemistry is strongly recommended) one year of mathematics (calculus and/or statistics), and one year of chemistry. Outstanding applicants who lack one or two of these prerequisites may be given an opportunity to take the required course(s) either before admission or during the first year in the graduate program; in such circumstances, none of these required undergraduate courses may be used to satisfy the program elective or core course requirements. Upper-division or graduate science courses may be considered as substitutes for the above prerequisites by the Admissions Committee.

## Doctor of Philosophy in Environmental Health Sciences

All courses must be passed with an average grade of B or better.

### Program-wide Core Curriculum

A. Select one of the following:

PUBHLTH 206A	Principles of Epidemiology
or EPIDEM 200A	Principles of Epidemiology

B. Select two of the following:

EHS 202	Principles of Environmental Toxicology
EHS 206A	Target Organ Toxicology I
EHS 206B	Target Organ Toxicology II

C. Complete the following:

EHS 264	Introduction to Environmental Health Science
EHS 298	Seminar in Environmental Health Sciences <sup>1</sup>
EHS 299	Research Problems <sup>2</sup>

### Select one track and complete track-specific requirements:

1. Environmental Toxicology Track

D. Select one of the following:

PUBHLTH 207A	Probability and Statistics in Public Health
or EPIDEM 204A	Biostatistics I: Introduction to Statistical Methods

E. Select one of the following (the one not taken to fulfill program-wide core course requirement):

EHS 202	Principles of Environmental Toxicology
EHS 206A	Target Organ Toxicology I
EHS 206B	Target Organ Toxicology II

F. Complete:

EHS 201	Case Studies in Environmental Toxicology
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G. Complete 16 units from the approved elective pool.

2. Exposure Sciences and Environmental Epidemiology Track:

H. Complete:

PUBHLTH 283	Geographic Information Systems for Public Health
PUBHLTH 207A- 207B	Probability and Statistics in Public Health and Analysis of Public Health Data Using Statistical Software
EPIDEM 205	Environmental Epidemiology

I. Select one of the following:

PUBHLTH 279	Special Topics in Environmental & Occupational Health (Human Exposure Modeling, course # pending)
EHS 275	Environmental Modeling and Risk Management

J. Complete 8 units from the approved elective pool.

### Approved elective pool for both tracks: <sup>3</sup>

EHS 203	Psychosocial Occupational Epidemiology
EHS 204	Neurotoxicology
EHS 212	Inhalation Toxicology
EHS 220	Industrial Toxicology
EHS 269	Air Pollution, Climate, and Health
EHS 270	Human Exposure to Environmental Contaminants

EHS 294	Occupational Health Psychology
EPIDEM 244	Toxic Chemicals in Environment
ANATOMY 203A	Human Microscopic Anatomy
ANATOMY 203B	Human Microscopic Anatomy
DEV BIO 231B	Cell Biology
MOL BIO 203	Nucleic Acid Structure and Function
MOL BIO 204	Protein Structure and Function
PHYSIO 206A	Introduction to Medical Physiology
PHYSIO 206B	Introduction to Medical Physiology
PUBHLTH 265	Advanced Environmental Health Science

K. Fulfill the following:

Comprehensive Exam

Qualifying Exam

Teaching Requirement

Research Dissertation

- 1 All graduate students in the program will be required to take EHS 298 every academic quarter they are enrolled in the graduate program.
- 2 Enroll during research rotations and dissertation research.
- 3 Track-specific core courses for one track may be taken as electives for other track.

The normative time for advancement to candidacy is three years. The normative time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

## Department of Epidemiology and Biostatistics

**Karen L. Edwards, Department Chair**

Anteater Instruction & Research Building, 3080-3090

949-824-0306

<https://www.publichealth.uci.edu> ([http://publichealth.uci.edu/ph/\\_home/](http://publichealth.uci.edu/ph/_home/))

[EpiGrad@uci.edu](mailto:EpiGrad@uci.edu) (%20EpiGrad@uci.edu)

Epidemiology is a quantitative, data-driven discipline that uses rigorous methods to collect, analyze, and interpret health-related data in human populations. Epidemiologists study the frequency, distribution, and determinants of disease in human populations and use this information to develop disease prevention strategies and improve population health. The faculty in the Department of Epidemiology and Biostatistics, Program in Public Health, at the University of California, Irvine has expertise in epidemiologic design and methods, biostatistics, and bioinformatics. Research in the Department largely focuses on, but is not limited to the interplay of genetic, other molecular, environmental, and nutritional factors on human health and disease, with an emphasis on diseases such as aging, cardiovascular disease, cancers, dementia, diabetes, liver and blood diseases, and obesity. Our active research programs provide our students with many outstanding opportunities to participate actively in cutting-edge research. See the Department website (<https://www.publichealth.uci.edu>) for specifics on the latest projects.

The Department provides rigorous training in the fundamentals and practice of epidemiology and biostatistics, and offers programs of study leading to the M.S. or Ph.D. in Epidemiology. Departmental faculty also provide guidance on curricular and programmatic activities for the M.P.H. in Epidemiology, the M.P.H. in Biostatistics and the B.S. in Public Health Sciences. The Department does offer undergraduate courses. In addition, undergraduates who would like additional experience in epidemiology and biostatistics may arrange to take directed-studies courses with Departmental faculty (EPIDEM 199). These undergraduate courses are primarily designed for upper-division undergraduates irrespective of their major. Diversity and inclusion are core values of the Department and reflects our mission to improve population health through research, education, community engagement and translation of discoveries to practice.

- Epidemiology, M.S.
- Epidemiology, Ph.D.

## Courses

### **EPIDEM 199. Undergraduate Research in Epidemiology. 2-4 Units.**

Provides disciplinary research participation. Original or existing research options provide undergraduates the opportunity for faculty/mentor interactions including access to appropriate facilities. Medical Epidemiology research areas: Cancer, Genetic/Molecular, Environmental, Occupational, Biostatistics, and Infectious Disease.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only.

### **EPIDEM 200A. Principles of Epidemiology. 4 Units.**

Fundamental principles of epidemiology, biostatistics, and epidemiological research. Topics include research methods of measuring health problems in populations, disease control and prevention in populations, how epidemiology contributes to knowledge of disease etiology, and biostatistical analysis and interpretation of epidemiologic data.

Same as PUBHLTH 206A.

Restriction: Graduate students only.

### **EPIDEM 200B. Intermediate Epidemiology. 4 Units.**

Learn to design and conduct epidemiologic studies using common designs. Determine why bias and measurement error arise in observational studies, and how they influence effect estimates. Perform and interpret epidemiologic data analyses using statistical software.

Prerequisite: PUBHLTH 206A. PUBHLTH 206A with a grade of B or better

Same as PUBHLTH 206B.

Restriction: College of Health Sciences students only. Program in Public Health students only. Master of Public Health Degree students only. Graduate students only. Epidemiology Majors only.

### **EPIDEM 200C. Advanced Epidemiologic Methods. 4 Units.**

Advanced topics in the design and statistical analysis of epidemiologic studies. Topics include simulation methods, counter-matching and multiphase study designs, missing data, and Bayesian analysis. Published simulation studies are discussed and replicated using the R software package.

Prerequisite: EPIDEM 200A and EPIDEM 200B. EPIDEM 200A with a grade of B or better. EPIDEM 200B with a grade of B or better

Same as PUBHLTH 206C.

### **EPIDEM 201. Cancer Epidemiology. 4 Units.**

Concentrates on understanding how epidemiology plays a role in the search for cancer etiology, prevention, control, and treatment; gives an overview of cancer research with an appreciation of the multidisciplinary nature of the field.

Prerequisite: EPIDEM 203 or PUBHLTH 203 or PUBH 206

Restriction: Graduate students only.

### **EPIDEM 202. Genetic Epidemiology. 4 Units.**

Concentrates on the role of genetic factors in the etiology of disease in human populations with an objective of disease control and prevention and the role of interactions of genetic factors and environmental exposures in the occurrence of disease.

Prerequisite: PUBHLTH 203 or EPIDEM 203 or PUBH 206

Restriction: Graduate students only.

### **EPIDEM 204A. Biostatistics I: Introduction to Statistical Methods. 4 Units.**

Designed to help students develop an appreciation for statistician's view of the research process, emphasizing biomedical research. Instills an understanding of how statistical models are used to yield insights about data that form evidence-based understanding of the world around us.

Same as PUBHLTH 204.

Restriction: Graduate students only.

**EPIDEM 204B. Biostatistics II: Intermediate Statistical Methods. 4 Units.**

Intended for graduate students in epidemiology, public health, and clinical research fields. Covers common regression-modeling techniques frequently used in biologic and medical applications.

Prerequisite: EPIDEM 204. EPIDEM 204 with a grade of B or better

Repeatability: May be taken for credit 2 times.

Same as PUBHLTH 204B.

Restriction: Graduate students only.

**EPIDEM 204C. Biostatistics III: Advanced Statistical Methods. 4 Units.**

Intended for graduate students in epidemiology, public health, and related fields. Introduces statistical methods for analyzing survival and longitudinal/clustered data, and techniques to resolve missing data.

Prerequisite: EPIDEM 204B. EPIDEM 204B with a grade of B or better

Repeatability: May be taken for credit 2 times.

Same as PUBHLTH 204C.

Restriction: Graduate students only.

**EPIDEM 205. Environmental Epidemiology. 4 Units.**

Concentrates on epidemiological approaches to the assessment of community environmental hazards; issues involved in environmental exposure estimation; interdisciplinary approaches to environmental epidemiology, including the use of biomarkers of exposures and susceptibility; epidemiological studies within the context of risk assessment.

Prerequisite: EPIDEM 200 and EPIDEM 204

Restriction: Graduate students only.

**EPIDEM 212. Methods for Design and Implementation of Epidemiologic Research. 2 Units.**

Intended for students in epidemiology, public health, and related fields, and covers topics in subject recruitment, data collection, quality assessment and control, and sample-size estimation.

Corequisite: PUBHLTH 206B

Prerequisite: EPIDEM 200A and EPIDEM 204A. EPIDEM 200A with a grade of B or better. EPIDEM 204A with a grade of B or better

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**EPIDEM 215. Introduction to Statistical Genetics. 4 Units.**

Provides students with knowledge of the basic principles, concepts, and methods used in statistical genetic research. Topics include principles of population genetics, and statistical methods for family- and population-based studies.

Prerequisite: Two quarters of upper-division or graduate training in statistical methods.

Same as STATS 257.

**EPIDEM 232. Chronic Disease Epidemiology & Prevention. 4 Units.**

Epidemiological aspects of chronic human diseases. Topics include methodologies for quantifying aspects of prevalent chronic diseases including risk factors, identification of susceptible groups, societal burdens, promising future research; and the intervention, prevention, and control of diseases in populations.

Restriction: Graduate students only.

**EPIDEM 244. Toxic Chemicals in Environment. 4 Units.**

Industrial ecology of toxicants and their impacts on environmental quality and human health. Explores theoretical basis of toxicity thresholds and regulatory issues. Uses classic and contemporary research articles to understand the legacy of traditional toxicants, and to identify emerging threats.

Restriction: Graduate students only.



**EPIDEM 264. Introduction to Environmental Health Science. 4 Units.**

Convergence of agents (chemical, physical, biological, or psychosocial) in environment can emerge as diseases influenced by social, political, and economic factors, allowing them to become rooted in society. How these agents from various spheres come together and impact human health.

Same as EHS 264, PUBHLTH 264.

Restriction: Graduate students only. Environmental Health Sciences Majors only. Epidemiology Majors only. Public Health Majors only. Environ Health Sci and Policy Majors only.

**EPIDEM 265. Advanced Environmental Health Science. 4 Units.**

Explores the complex relationships among exposure processes and adverse health effects of environmental toxins focusing on specific chemicals, sources, transport media, exposure pathways, and human behaviors. Techniques of environmental sampling for exposure assessment are discussed.

Same as PUBHLTH 265.

Restriction: Graduate students only.

**EPIDEM 269. Air Pollution, Climate, and Health. 4 Units.**

Emission of air pollutants into the atmosphere, physical and meteorological processes that affect transport, and influence on global warming. Concepts of how and where people are most exposed, and how exposures and health effects differ in developed and developing regions.

Same as EHS 269, PUBHLTH 269.

**EPIDEM 270. Human Exposure to Environmental Contaminants. 4 Units.**

Introduces founders of conceptual thought that environmental contaminants can impact health. Theory and principles of exposure assessment, the continuum from emissions of a contaminant into the environment to evidence of health effects in a population.

Same as EHS 270, PUBHLTH 270.

**EPIDEM 275. Special Topics in Epidemiology. 1-4 Units.**

Presents various topics and latest research in the broad field of epidemiology.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EPIDEM 280. Epidemiology Research Journal Club. 1 Unit.**

Research journal club is a group discussion of recent publications in epidemiology and related fields. Students rotate as lead discussants, guided by faculty. All attendees are expected to be familiar with the papers at the start of class.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EPIDEM 282. Epidemiology Department Seminar. 1 Unit.**

A forum for the presentation of recent research to epidemiology students, faculty, and other interested parties. The atmosphere is informal, yet rigorous. Speakers range from graduate students through distinguished visitors from other institutions.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EPIDEM 290. Introduction to Biostatistics and Epidemiology for Medical Fellows. 4 Units.**

Prepares medical fellows and other physicians for rotations in research programs. Understanding of basic biostatistics and study design, and interdependencies between the two. Application of principles in evaluation of medical literature for guidance on patient care and public health policy.

Prerequisite: Medical degree.

**EPIDEM 296. M.S. Thesis Research and Writing. 1-12 Units.**

Individual research and study necessary for a graduate student to prepare and complete the thesis required for the Master of Science (M.S.) degree.

Prerequisite: Advancement to candidacy.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.



**EPIDEM 297. PhD Degree Dissertation Research & Writing. 1-12 Units.**

Individual research and study necessary for a graduate student to prepare and complete the dissertation required for the Doctor of Philosophy (Ph.D.) degree.

Prerequisite: Advancement to candidacy.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EPIDEM 298. Directed Study in Epidemiology. 2-4 Units.**

Directed study with Epidemiology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EPIDEM 299. Independent Study in Epidemiology. 2-8 Units.**

Independent research with Epidemiology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EPIDEM 399. University Supervised Teaching. 2-4 Units.**

Limited to students with active Teaching Assistant (T.A.) appointments.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Epidemiology, M.S.

**Karen L. Edwards, Department Chair and Departmental Graduate Advisor**

Anteater Instruction & Research Building, 3080-3090

949-824-0306

<http://www.epi.uci.edu/>

EpiGrad@uci.edu

Epidemiology is the study of the frequency, distribution, and determinants of disease in human populations. The faculty in the Department of Epidemiology at UCI has expertise in epidemiologic design and methods, biostatistics, and bioinformatics. Research in the Department largely focuses on the interplay of genetic, other molecular, environmental, and nutritional factors on human health and disease, with an emphasis on diseases such as aging, cardiovascular disease, cancers, dementia, diabetes, liver and blood diseases, and obesity. Our strength in social epidemiology and community outreach is growing through the addition of new faculty with national reputations. Our active research programs provide our students with many outstanding opportunities to participate actively in cutting-edge research. See the Department website for specifics on the latest projects.

The Department offers programs of study leading to the M.S. or Ph.D. in Epidemiology. The Department does not offer an undergraduate degree, but undergraduates who would like some experience in epidemiology may arrange to take directed-studies courses with epidemiology faculty (EPIDEM 199). These courses are available to all upper-division undergraduates irrespective of their major. Several of our graduate-level courses are open to selected, upper-division undergraduate students.

### Master of Science in Epidemiology

The M.S. in Epidemiology is thesis-based, and students are expected to finish in two years. The first year is largely devoted to required course work and, with guidance from faculty, developing an area of interest within which the M.S. thesis research will be conducted. The second year is chiefly devoted to completing the Master's thesis. The final step is an oral presentation, open to the public, of the thesis research. The M.S. in Epidemiology is an academic degree, and graduates typically go on to further education or careers in research.

Applications to graduate study in the Department of Epidemiology at UCI are through the UCI Graduate Division website (<http://www.grad.uci.edu/>). For further questions, contact EpiGrad@uci.edu. In addition to the general requirements of the UCI Graduate Division, the Department of Epidemiology requires current, official GRE scores as part of the application.

The M.S. in Epidemiology is thesis-based, and students are expected to finish in two years. The first year is largely devoted to required course work and, with guidance from faculty, developing an area of interest within which the M.S. thesis research will be conducted. The second year is chiefly

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## Epidemiology, Ph.D.

**Karen L. Edwards, Department Chair**

Anteater Instruction & Research Building, 3080-3090

949-824-0306

<http://www.publichealthuci.edu>

EpiGrad@uci.edu

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### Doctor of Philosophy in Epidemiology

The Ph.D. program is intended to train well-qualified students to be independent contributors to epidemiology or related fields. Students are expected to finish in four to six years, and maximum time permitted is seven years. The first year is largely devoted to required course work and developing research interests, with the guidance of the faculty. There is a comprehensive exam at the end of the first year, to ensure the first-year content has been mastered. In the second and third years, students are expected to participate in faculty research, including manuscript preparation and presentation of results in public forums. The Ph.D. student is strongly encouraged to apply for fellowships and grants, as well as assist with teaching. Toward the end of the third year, the student is expected to defend a thesis proposal to the faculty. The remaining time with the program is largely devoted to completing the thesis. The formal defense of the thesis is a public event. Graduates typically go on to post-doctoral positions, faculty positions, or positions in government or industry.

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## Department of Health, Society, and Behavior

The Department of Health, Society, and Behavior (DHSB) is comprised of a multifaceted collective of faculty with diverse backgrounds and training. The thread which unifies the faculty in this department is that their research, teaching, and practice address the explication of complex pathways linking social contextual factors and health, with an emphasis on health equity research. Specifically, the DHSB will be composed of faculty with expertise in health disparities, health equity, social contextual risk factors and health, health behavior, community-based research, biobehavioral health, health communication, and the creation of multi-level interventions. The topical areas of emphasis in DHSB are central to and map directly onto the core discipline of public health in the area of the social and behavioral sciences. Research and teaching in this department integrate perspectives on health through the lens of the social sciences, utilizing major theoretical perspectives across disciplines in the social sciences order to understand the multiple levels of influence shaping health behavior, health status, and health-relevant interventions.

Faculty provide guidance on curricular and programmatic activities for the M.P.H. emphasis in Sociocultural Diversity and Health. Faculty also engage in providing guidance for the Ph.D. in Public Health, with its two concentrations: 1) Global Health and 2) Disease Prevention. Both concentrations are administered jointly by the Department of Health, Society, and Behavior, and the Department of Population Health and Disease Prevention. The concentration in Disease Prevention maps most directly onto the expertise and focus of the faculty in the DHSB.

# Department of Population Health and Disease Prevention

## Lisa Grant Ludwig, Department Chair

The mission of the Department of Population Health and Disease Prevention is to create, integrate, and translate population-based knowledge into preventive strategies to reduce the societal burden of human disease and disability through excellence in interdisciplinary research, education, and service. This is a forward-thinking mission that acknowledges and complements traditional discipline-based research and training in public health. It is a specific mission that is consistent with the "Framing the Future" exercise of the Association of Schools and Programs of Public Health, and increasingly recognized by eminent organizations such as the Institute of Medicine's Board on Population Health and Public Health Practice, and by agencies that fund public health research and education.

New sources of funding for research and education are firmly established, including the NIH's National Center for Advancing Translational Sciences, to support this multidisciplinary framework of population health sciences and public health. The societal challenges facing health care and the burden of diseases at the community, national, and international levels have increased the demand for experts capable of researching, developing, and implementing strategies to prevent disease and to improve population health. The Department hosts activities that bridge disciplinary perspectives, methods, and practices to nurture new leaders in public health through research and training on risk factors that render people vulnerable to diseases in their communities and the development of intervention approaches for preventing disease by separating risk factors from specific vulnerable populations.

- Public Health, Ph.D.

## Global Health, Minor

The minor in Global Health, through a concentrated portfolio of courses that provide a solid foundation in the environmental, biological, socio-cultural, and ethical domains of global health scholarship, allows students to develop interdisciplinary and alternative world perspectives on health. Upon completion of the minor, students will be able to identify and define the landscape and importance of prevalent global health issues, analyze and evaluate complex texts relating to global health through close reading, critical interpretation, assignments, class-presentations and discussions. The minor concludes with each student conducting independent research and communicating independent arguments about global health in research through a hands-on capstone project.

The minor in Global Health consists of eight courses (four of them being required, the remainder being chosen from a select list), and a capstone research project (PUBHLTH 198). No more than two courses (eight units) can overlap between a student's major and the global health minor. No more than eight units can be from Pass/No Pass course work (four pass/no pass units will automatically come from PUBHLTH 198/equivalent independent study). At least half of the courses used to meet these requirements must be upper-division courses.

### Requirements for the Minor

#### A. Complete:

PUBHLTH 1	Principles of Public Health
PUBHLTH 170	Introduction to Global Health
PUBHLTH 172	Climate Change and Disaster Management
PUBHLTH 174	Global Health Ethics

#### B. Select two courses from the following:

ANTHRO 30A	Global Issues in Anthropological Perspective
ANTHRO 41A	Global Cultures and Society
ANTHRO 134A	Medical Anthropology
ANTHRO 20A	People, Cultures, and Environmental Sustainability
ANTHRO 134G	HIV/AIDS in a Global Context
ANTHRO 134N	Disease, Health, and Inequality
INTL ST 11	Global Cultures and Society
INTL ST 115	Global Poverty and Inequality in the 21st Century
INTL ST 147CW	International Humanitarianism
INTL ST 163	Global Inequalities
PUBHLTH 100	Special Topics in Public Health
PUBHLTH 197	Field Studies in Public Health
PUBHLTH 189	Special Topics in Infectious Diseases
UPPP 115	Global Poverty and Inequality in the 21st Century

#### C. Select two courses from the following:

BIO SCI 9K	Global Change Biology
BIO SCI 9D	Diseases of the Twenty-First Century

BIO SCI 10	The Biology of Human Diseases
BIO SCI 12	Molecular Basis of Human Disease
BIO SCI E124	Infectious Disease Dynamics
BIO SCI M124A	Virology
BIO SCI M124B	Viral Pathogenesis and Immunity
BIO SCI M125	Molecular Biology of Cancer
BIO SCI M131	Innate Immunity, Infection, and Pathogenesis
BIO SCI N131	Human Neurodegenerative Diseases
BIO SCI M143	Human Parasitology
CHEM 12	Chemistry Around Us
PUBHLTH 90	Natural Disasters
PUBHLTH 161	Environmental Geology
PUBHLTH 163	Introduction to Environmental Health Science
PUBHLTH 173	Health and Global Environmental Change
PUBHLTH 180	Epidemiology of Infectious Disease

D. Capstone Project: <sup>1</sup>

PUBHLTH 198 Directed Studies (4 units)

or equivalent course offered if faculty is in another department

<sup>1</sup> By each student's junior year, they must identify and secure an independent study advisor for their capstone project. Students will work with this advisor for the duration of their project (1 unit of PUBHLTH 198 or equivalent independent study per quarter). The results from the capstone project will be presented at a symposium at the end of the graduating year.

## M.D./M.P.H. Dual Degree Program

The M.D./M.P.H. is a five-year program designed for medical students who wish to acquire competencies in public health and understand the broader determinants of health, including the environment, health promotion, preventive medicine, and health policy. Students in this program pursue a combined curriculum for an M.D. from the UC Irvine School of Medicine and an M.P.H. from the Program in Public Health.

In order to apply, students must be currently enrolled in the M.D. program. The MCAT, along with the completion of three years of medical school training in good standing, serves as a waiver for the GRE entrance examination usually required for application to the M.P.H. program. During their second or third year of medical school, interested students submit both the Application for Graduate Admission and the School of Public Health Application Service (SOPHAS) application in order to be considered for admission. Final acceptance to the program is granted by the Program in Public Health.

The total number of units required to graduate from each program separately are satisfied in the M.D./M.P.H. program. Enrollment in the M.D. program does not guarantee acceptance into the M.P.H. program.

M.P.H. coursework begins after the student's third year of medical school, and ends during their fourth year of medical school. Students begin the accelerated M.P.H. degree track, which includes three full-time quarters (18 units during the fall and winter quarters, and 16 units during the spring quarter), and one full-time or part-time quarter the following year's winter quarter where Graduate Practicum is taken.

Once all core competencies are complete, students take the M.P.H. comprehensive exam to advance to candidacy. Students incorporate their M.D. projects into their practicum requirement, which they present and write a report on during the spring quarter. Courses taken as part of a student's medical school training cannot apply towards a student's M.P.H. degree.

The only emphases allowed in an accelerated M.P.H. degree program are Environmental Health, Epidemiology, or Sociocultural Diversity and Health. These are the only three emphases eligible for dual degree, joint, or concurrent programs.

Medical school students in the Prime LC program are allowed, by the School of Medicine, to complete the remaining units of their M.P.H. degree during the winter quarter of their last year in the School of Medicine.

For more information, please contact the M.P.H. Academic Advisor at 949-824-7095.

## Master of Public Health

The distinctive mission of the UCI M.P.H. program is to create a motivated cadre of public health professionals who are prepared to implement effective strategies for reducing the burden of disease and disability in culturally diverse communities, and who are primed to draw from their broad training in the

global dimensions of public health principles to lead and work collaboratively on precise assessments of health-risk factors and on the management of evidence-based prevention strategies.

In addition to meeting all the training requirements in the core competency subjects recommended by the Association of Schools and Programs in Public Health (ASPPH), students enrolled in the UCI M.P.H. program will have the opportunity for in-depth pursuit of one of four emphasis areas: Biostatistics, Environmental Health, Epidemiology, or Sociocultural Diversity and Health. The M.P.H. for the Environmental, Epidemiology, and Sociocultural Diversity and Health emphases is a 64-unit program. The M.P.H. in Biostatistics is a 63-unit program. A full-time student must enroll in at least 12 units per quarter. Part-time enrollment is also allowed upon approval from the department and UCI Graduate Division. To maintain residency, part-time students must enroll in four to eight units per quarter. All students are required to complete 240 hours of fieldwork at an approved public health practicum site after advancing to candidacy with UCI Graduate Division. The Program is fully accredited by the Council on Education for Public Health (<http://ceph.org/>).

Further information may be obtained from the Public Health website (<http://publichealth.uci.edu/>), by calling 949-824-7095, or by sending an email to [phgo@uci.edu](mailto:phgo@uci.edu).

The M.P.H. program accepts students for the fall quarter only. Students are encouraged to begin the application process early to facilitate the timely submission of the application. The deadline for receipt of all application materials for the M.P.H. program is December 15. There are no specific course prerequisites needed to enroll, and the program is open to students with bachelor's degrees in a variety of disciplines. Individuals from diverse cultural, geographic, and socioeconomic backgrounds are encouraged to apply.

To be eligible to apply for the M.P.H. program, applicants must meet certain minimum academic requirements. Applicants must hold a bachelor's degree from an accredited academic institution, have earned a minimum grade point average of 3.0 (B average) in undergraduate course work, and possess strong verbal and quantitative skills as reflected by Graduate Record Examination (GRE) General Test scores. Applicants may also submit standardized test scores from the MCAT, GMAT, or LSAT in lieu of the GRE. If the applicant has, from a UC-equivalent university, a Ph.D. in a health-related field, a medical degree, or is currently enrolled in medical school, a test score must be submitted, but the test score's date does not need to be within the validity period. Evaluations of applicant files for admission to the M.P.H. program will consist of an assessment of transcripts of previous academic work, standardized graduate admission test scores, statement of purpose, letters of recommendation, and other relevant qualifications. Applicants must choose one of the four available emphases at the time of application.

Applicants must submit both the UCI Application for Graduate Admission and the School of Public Health Application Service (SOPHAS) application in order to be considered for admission. For more information on admissions, visit the Public Health website (<http://publichealth.uci.edu/>) or contact [phgo@uci.edu](mailto:phgo@uci.edu).

## Program Requirements

### M.P.H. with Emphases in Environmental Health, Epidemiology, or Sociocultural Diversity and Health

The M.P.H. with emphases in Environmental Health, Epidemiology, or Sociocultural Diversity and Health, is a 64-unit degree program consisting of 16 courses taken over five to six quarters. Ten courses must be taken by all students. In addition, students take three courses in their emphasis and three elective courses. All courses required for the M.P.H. must be taken for a letter grade and if a minimum grade of a B is not achieved, they must be re-taken.

**Required Courses.** All students begin the program with the introductory course Foundations of Public Health (PUBHLTH 200). The six core competency courses are Probability and Statistics in Public Health (PUBHLTH 207A), Analysis of Public Health Data Using Statistical Software (PUBHLTH 207B), Introduction to Environmental Health Science (PUBHLTH 264), Principles of Epidemiology (PUBHLTH 206A), Health Policy and Management (PUBHLTH 222), and Health Behavior Theory (PUBHLTH 244). Students must also complete at least two quarters (2 units each quarter) of the PUBHLTH 291 series, and the capstone course Graduate Practicum and Culminating Experience in Public Health (PUBHLTH 295) (eight units).

**Emphasis Courses.** Upon applying, students choose an emphasis for their M.P.H. degree. Three emphasis courses (four units each, all within the same emphasis) are required:

#### Environmental Health Emphasis

Select three from the following:

PUBHLTH 241	Environmental Policy and Global Sustainability
PUBHLTH 260	Human Exposure Modeling
PUBHLTH 265	Advanced Environmental Health Science
PUBHLTH 269	Air Pollution, Climate, and Health
PUBHLTH 275	Environmental Modeling and Risk Management
PUBHLTH 277A	Target Organ Toxicology I
PUBHLTH 277B	Target Organ Toxicology II
PUBHLTH 278	Industrial Toxicology
PUBHLTH 279	Special Topics in Environmental & Occupational Health
PUBHLTH 283	Geographic Information Systems for Public Health

PUBHLTH 286	Advanced Geographic Information Systems and Spatial Epidemiology
<b>Epidemiology Emphasis</b>	
PUBHLTH 206B	Intermediate Epidemiology
PUBHLTH 206C	Advanced Epidemiologic Methods
PUBHLTH 213	Epidemiology in Global Health
<b>Sociocultural Diversity and Health Emphasis</b>	
PUBHLTH 245	Health Promotion Planning
PUBHLTH 246	Social Research Methods
PUBHLTH 247	Program Evaluation

**Elective Courses.** Three elective courses (four units each) are required. Students select electives in light of their educational and career goals.

### **M.P.H. with an Emphasis in Biostatistics**

The M.P.H. with an emphasis in Biostatistics, is a 63-unit degree program consisting of seventeen courses taken over five to six quarters. Fourteen core competency courses must be taken by all students. In addition, students choose three elective courses. All courses required for the M.P.H. with an emphasis in Biostatistics must be taken for a letter grade. Any core competency course in which a minimum grade of B is not achieved must be re-taken.

#### **Required Courses**

A. Complete the following:

PUBHLTH 200	Foundations of Public Health
PUBHLTH 264	Introduction to Environmental Health Science
PUBHLTH 206A	Principles of Epidemiology
PUBHLTH 222	Health Policy and Management
PUBHLTH 244	Health Behavior Theory
STATS 201	Statistical Methods for Data Analysis I
STATS 202	Statistical Methods for Data Analysis II
STATS 203	Statistical Methods for Data Analysis III
STATS 295	Special Topics in Statistics (two quarters)
STATS 280	Seminar in Statistics (at least two quarters - .5 units each quarter)
A course from the PUBHLTH 291 series (2 units)	
PUBHLTH 295	Graduate Practicum and Culminating Experience in Public Health (8 units)

B. Complete three elective courses (4 units each). <sup>1</sup>

<sup>1</sup> Students select electives in light of their educational and career goals.

### **Students in all M.P.H. Emphases**

**Comprehensive Examination** - All M.P.H. students are required to pass the comprehensive exam in order to advance to candidacy. The comprehensive exam is the 'Certified in Public Health' (CPH) examination which covers the core areas of knowledge offered in CEPH-accredited schools and programs, as well as cross-cutting areas relevant to contemporary public health. Students who complete all of their core courses are required to take the CPH examination at the beginning of the fall quarter of their second year. Students who do not complete all of their core courses during their first year will be allowed an alternative testing date. In addition, by special petition, students may be approved to take the CPH examination during the spring quarter of their first year. Students must pass the CPH examination before they can be advanced to candidacy for the M.P.H. degree.

**Practicum and Culminating Experience.** Students are required to complete a supervised internship of 240 hours while registered in the Graduate Practicum and Culminating Experience in Public Health (PUBHLTH 295 (<http://catalogue.uci.edu/search/?P=PUBHLTH%20295>)). The practicum experience follows the completion of all core competency courses, the comprehensive exam, and advancement to candidacy. A compendium of approved practicum sites is available online to enrolled M.P.H. students. The student's work at the practicum site culminates in a comprehensive written report, with a presentation at the departmental poster seminar at the end of the academic year.

For students enrolled full-time, the normative time for completion of the M.P.H. degree is six quarters, and the maximum time permitted is nine quarters. For students enrolled part-time, the normative time is nine quarters, and the maximum is 15 quarters. Upon special petition, students admitted with advanced standing due to prior graduate-level training may receive credit for up to one-fifth of the total units required toward the M.P.H. degree. Students must be able to demonstrate competency associated with those courses. Such credits are not applicable to the graduate practicum and graduate seminar.



## Program in Law and Graduate Studies (J.D./Ph.D./M.P.H.)

Highly-qualified students interested in combining the study of law with graduate qualifications in Public Health are invited to undertake concurrent degree study under the auspices of UC Irvine's Program in Law and Graduate Studies (PLGS). Students in this program pursue a coordinated curriculum leading to a J.D. from the School of Law in conjunction with a Master's or Ph.D. in Public Health.

Additional information is available from the PLGS Program Director's Office at 949-824-9217, or by email at [plgs@law.uci.edu](mailto:plgs@law.uci.edu) (%20plgs@law.uci.edu). A full description of the program, with links to all relevant application information, can be found in the Law School section of the *Catalogue*.

Graduates of the UCI M.P.H. program will find employment in both public and private agencies committed to preventing disease and promoting health and wellness in all aspects of society. Earning a graduate degree gives new professionals a competitive edge over students who complete their education at the bachelor's degree level. In particular, the curriculum of the M.P.H. degree at UCI is designed to create students who can combine knowledge of the core disciplines in public health with leadership, communication, and problem-solving inter-professional skills to meet the needs of culturally-diverse communities locally and globally. Earning an M.P.H. will allow graduates to pursue supervisory positions and career advancement opportunities that may be unattainable without an advanced degree. Students may also wish to combine an M.P.H. with a medical or law degree to increase opportunities for employment.

Coursework and practicum experiences in the M.P.H. program can also prepare a student to pursue doctoral programs in public health. The Ph.D. is a research-based degree that prepares the candidate for research and teaching positions in institutions of higher education. The Dr.P.H. is a professional degree that prepares candidates for careers as practitioners in high-level administration or teaching. The UCI Program in Public Health offers a Ph.D. in Public Health with concentrations in Disease Prevention and Global Health. More information about careers and graduate school in public health can be obtained through the ASPPH (<http://www.aspph.org/discover/>) and the Council on Education for Public Health (<http://ceph.org/>).

## Public Health Policy, B.A.

The B.S. in Public Health Sciences and the B.A. in Public Health Policy degree programs train students in multidisciplinary approaches to public health practice and research. The degrees explore both quantitative and qualitative aspects of public health at all levels of analysis. Graduates will advance, through selective employment or further education, to become the new generation of public health professionals prepared to face the emerging challenges to human health from a population perspective using cutting-edge approaches for preventing diseases.

Students who are interested in pursuing a premedical program should note that additional courses will be needed beyond the requirements of the public health degrees to fulfill requirements for medical school.

Students considering the public health degrees should carefully evaluate their academic preparation and career goals before enrolling in either the B.S. or B.A. degree program. Changing from one degree program to the other is possible, but will require completion of the required lower- and upper-division courses specified for each degree. It is also possible for a student to enroll in both the B.S. and B.A. degree programs (double major), provided the student completes all the requirements outlined under each degree.

The Department also offers two undergraduate minors; one in Public Health and a second in Global Health. Students seeking advising on either minor should visit the Public Health Student Affairs Office.

## Academic Advising: Academic, Career, Public Health

AIRB Suite 2010

Program in Public Health Student Affairs Office ([http://publichealth.uci.edu/ph/\\_undergraduate/student\\_services/](http://publichealth.uci.edu/ph/_undergraduate/student_services/))

### Academic Advising

The Public Health Student Affairs Office coordinates the advising program and provides academic counseling. Undergraduate Public Health students should consult the Public Health Student Affairs Office for information on academic requirements for their degree(s), career opportunities, the Public Health 198/199 Research Program, the Public Health Honors Research Program, and student organizations such as the Public Health Association (<https://phauci.wixsite.com/phauci/>), Health & Justice Advocates at UCI, and Global Health Research, Education, and Translation (G.H.R.E.A.T. (<http://ghreat.uci.edu/gh/#/>)). Students can also visit the Public Health Student Affairs Office to process change-of-major requests, apply for graduation, obtain information about public health alumni, professional development, or for any other help they might need related to their academic career at UCI.

**Peer Academic Advisors.** The Peer Academic Advisors are upper-division Public Health majors who bring with them valuable academic, social, and professional experiences. Their functions include counseling students in matters of major selection, program planning, petitioning, tutoring, learning skills problems, and participation in co-curricular and extracurricular activities. The Peer Advisors are located in the Public Health Student Affairs Office. Office hours are posted at the beginning of each quarter.

### Career Advising

Information on graduate and professional schools in public health can be obtained from the Public Health Student Affairs Office. The UCI Career Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques.

Areas of opportunity open to those with a Bachelor of Science in Public Health Sciences degree include public health agencies, clinical laboratories, biotechnology and health care companies, not-for-profit organizations specializing in health care, health management organizations, advanced public health training programs in county, state, and federal agencies, and graduate and professional education in public health and related health-care disciplines. The bachelor's degree is necessary to pursue studies leading to the M.S. and Ph.D. degrees. The B.S. degree, plus short training periods, may prepare students for employment in education, medical technology (usually one year), allied health positions, and various other areas.

Areas of opportunity open to those with a Bachelor of Arts in Public Health Policy degree include population health management organizations, health care administration and planning, health insurance companies, public health agencies, public health advocacy groups, corporate planning, health promotion, health education (in hospitals, clinics, government agencies, etc.), mental health, chemical dependency, case managing, insurance, health strategizing, fundraising, community organization, social and legislative work for health, and graduate and professional education in public health and related health-care disciplines. The B.A. degree, plus brief training periods, may prepare students for employment in education, administration, nonprofit corporations, and various other areas.

Education (community colleges, state colleges, or private schools), medical illustration, and public health (which includes hospital administration, biostatistics, epidemiology, environmental health sciences, social work, public health education, maternal and child health, and chronic, infectious, and tropical diseases) are fields in which opportunities are available upon completion of a master's program. Other areas where advanced degrees are necessary include medicine, dentistry, law, nursing, actuary, optometry, podiatry, osteopathy, physical therapy, and veterinary medicine.

### Health Sciences Advising

Students desiring to enter the health sciences should have their majors checked in the Public Health Student Affairs Office. Admissions tests for medical, dental, pharmacy, nursing, veterinary medicine, and graduate schools should be taken in the spring, a year and one-half before the student plans to enter.

Administrators and academic leaders in nearly all health professional schools recommend that students preparing to seek admission to their schools plan to obtain a bachelor's degree. Students who plan to enter a school of dentistry, medicine, or other areas of the health sciences may receive the required pre-professional training at UCI. This pre-professional training may be accomplished by (1) completing a major in Public Health Sciences or Public Health Policy *and* specializing the degree to complete specific course requirements of the dental, medical, or other professional school the student expects to attend or (2) majoring in any school or department *and* fulfilling concurrently the specific course requirements of the dental, medical, or other professional school the student expects to attend.

Public Health Practicum and Culminating Experience (PUBHLTH 195W) is an 8-unit required course for students majoring in Public Health Policy or Public Health Sciences. The course allows students to gain hands-on experience at an approved organization in the field of public health. Preparation for the Practicum course requires that each student interview at one of the approved Practicum sites. There is an online catalog of approved organizations that have agreed to accept, train, and supervise Public Health students in the ongoing activities of the organization. Students must choose a placement site listed in the Practicum catalog. Unlisted sites may be considered at an approved organization through an application process. All students are required to spend 100 hours (10 hours per week) at the public health organization during the quarter in which they are enrolled in PUBHLTH 195W.

Practicum is open only to upper-division Public Health students who are in good academic standing, have completed all prerequisite course work, and have submitted a graduation application. Practicum must be taken for a letter grade. PUBHLTH 195W must be completed with a minimum letter grade of C. Additional information, including Practicum enrollment procedures and prerequisites, can be found at the Public Health website (<http://publichealth.uci.edu>).

**All students must meet the University Requirements.**

**All students must meet the Program Requirements.**

### Major Requirements

#### A. Lower-Division Requirements

PUBHLTH 1	Principles of Public Health
PUBHLTH 2	Case Studies in Public Health Practice
Select three of the following:	
PUBHLTH 30	Introduction to Urban Environmental Health
PUBHLTH 60	Environmental Quality and Health
PUBHLTH 80	AIDS Fundamentals
PUBHLTH 90	Natural Disasters
Complete:	
PUBHLTH 7A	Public Health Statistics I
PUBHLTH 7B	Public Health Statistics II
Select three of the following:	
<b>Psychology:</b>	
PSCI 9	Introduction to Psychology
<b>Sociology:</b>	



SOCIOL 1	Introduction to Sociology
SOCIOL 2	Globalization and Transnational Sociology
SOCIOL 3	Social Problems
<b>Economics:</b>	
ECON 1	Introduction to Economics
ECON 13	Global Economy
ECON 20A	Basic Economics I
ECON 20B	Basic Economics II
<b>Anthropology:</b>	
ANTHRO 2A	Introduction to Sociocultural Anthropology
ANTHRO 2B	Introduction to Biological Anthropology
ANTHRO 2C	Introduction to Archaeology
ANTHRO 2D	Introduction to Language and Culture
ANTHRO 41A	Global Cultures and Society
<b>Political Science:</b>	
POL SCI 31A	Introduction to Political Theory
POL SCI 51A	Introduction to Politics Around the World
<b>Social Ecology:</b>	
SOCECOL E8	
<b>International Studies:</b>	
INTL ST 11	Global Cultures and Society
INTL ST 13	Global Economy
<b>B. Upper-Division Requirements</b>	
PUBHLTH 101	Introduction to Epidemiology
PUBHLTH 122	Health Policy
PUBHLTH 144	Health Behavior Theory
PUBHLTH 170	Introduction to Global Health
PUBHLTH 139	Special Topics in Health Policy and Administration
or PUBHLTH 159	Special Topics in Social and Behavioral Health Science
Eight additional upper-division courses with at least two courses in each topic area selected from the following courses: <sup>1</sup>	
<b>Health Policy and Management:</b>	
ECON 123A- 123B-ECON 123C	Econometrics I and Econometrics II and <sup>2</sup>
MGMT 101	Management Science <sup>2</sup>
MGMT 107	Introduction to Management Information Systems
MGMT 165	U.S. Healthcare Systems <sup>2</sup>
MGMT 166	Business of Medicine <sup>2</sup>
UPPP 102	Urban Inequality
UPPP 103	Comparative Approaches to Urban Regions
UPPP 112	Foundations of Community Health
UPPP 166	Urban Politics and Policy
UPPP 169	
POL SCI 171A	<sup>2</sup>
PUBHLTH 120–139 <sup>2</sup>	
PUBHLTH 172	Climate Change and Disaster Management
PUBHLTH 174	Global Health Ethics
PUBHLTH 190	Geographic Information Systems for Public Health
PUBHLTH 193	Ethics and Responsible Conduct of Research in Public Health
SOCIOL 154	Medical Sociology
<b>Social and Behavioral Health Sciences:</b>	
ANTHRO 134A	Medical Anthropology

ANTHRO 134C	Medicine, Food, and Health <sup>3</sup>
ANTHRO 134F	Anthropology of the Body
ANTHRO 134G	HIV/AIDS in a Global Context
PSCI 137H	Human Stress <sup>2</sup>
PSCI 138H	Child Health Psychology <sup>2</sup>
PSCI 183S	Social Epidemiology <sup>2</sup>
PUBHLTH 102	Social Epidemiology <sup>2</sup>
PUBHLTH 140–159 <sup>2</sup>	
PUBHLTH 176	War and Public Health
<b>C. Practicum Requirement</b>	
PUBHLTH 195W	Public Health Practicum and Culminating Experience (8 units) <sup>3</sup>

<sup>1</sup> Upon petition, PUBHLTH 100 may also be taken to fulfill upper-division course work in specific topic areas, depending on course content.

<sup>2</sup> Note additional prerequisites.

<sup>3</sup> Taken for upper-division writing credit.

## Public Health Sciences, B.S.

The B.S. in Public Health Sciences and the B.A. in Public Health Policy degree programs train students in multidisciplinary approaches to public health practice and research. The degrees explore both quantitative and qualitative aspects of public health at all levels of analysis. Graduates will advance, through selective employment or further education, to become the new generation of public health professionals prepared to face the emerging challenges to human health from a population perspective using cutting-edge approaches for preventing diseases.

Students who are interested in pursuing a premedical program should note that additional courses will be needed beyond the requirements of the public health degrees to fulfill requirements for medical school.

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### Academic Advising: Academic, Career, Public Health

AIRB Suite 2010

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disciplines. The bachelor's degree is necessary to pursue studies leading to the M.S. and Ph.D. degrees. The B.S. degree, plus short training periods, may prepare students for employment in education, medical technology (usually one year), allied health positions, and various other areas.

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Practicum is open only to upper-division Public Health students who are in good academic standing, have completed all prerequisite course work, and have submitted a graduation application. Practicum must be taken for a letter grade. PUBHLTH 195W must be completed with a minimum letter grade of C. Additional information, including Practicum enrollment procedures and prerequisites, can be found at the Public Health website (<http://publichealth.uci.edu>).

## Requirements for the B.S. in Public Health Sciences

**All students must meet the University Requirements.**

**All students must meet the Program Requirements.**

### Major Requirements

#### A. Lower-Division Requirements

PUBHLTH 1	Principles of Public Health
PUBHLTH 2	Case Studies in Public Health Practice
CHEM 1A- 1B- 1C- 1LC- 1LD	General Chemistry and General Chemistry and General Chemistry and General Chemistry Laboratory and General Chemistry Laboratory
CHEM 51A- 51B- 51C- 51LB- 51LC	Organic Chemistry and Organic Chemistry and Organic Chemistry and Organic Chemistry Laboratory and Organic Chemistry Laboratory
BIO SCI 93	From DNA to Organisms
BIO SCI 94	From Organisms to Ecosystems
BIO SCI 97	Genetics
BIO SCI 98	Biochemistry

BIO SCI 99	Molecular Biology
MATH 2A- 2B	Single-Variable Calculus and Single-Variable Calculus
or	
MATH 5A- 5B	Calculus for Life Sciences and Calculus for Life Sciences
PUBHLTH 7A	Public Health Statistics I
Select three of the following:	
<b>Psychology:</b>	
PSCI 9	Introduction to Psychology
<b>Sociology:</b>	
SOCIOL 1	Introduction to Sociology
SOCIOL 2	Globalization and Transnational Sociology
SOCIOL 3	Social Problems
<b>Economics:</b>	
ECON 1	Introduction to Economics
ECON 13	Global Economy
ECON 20A	Basic Economics I
ECON 20B	Basic Economics II
<b>Anthropology:</b>	
ANTHRO 2A	Introduction to Sociocultural Anthropology
ANTHRO 2B	Introduction to Biological Anthropology
ANTHRO 2C	Introduction to Archaeology
ANTHRO 2D	Introduction to Language and Culture
ANTHRO 41A	Global Cultures and Society
<b>Political Science:</b>	
POL SCI 31A	Introduction to Political Theory
POL SCI 51A	Introduction to Politics Around the World
<b>Social Ecology:</b>	
SOCECOL E8	
<b>International Studies:</b>	
INTL ST 11	Global Cultures and Society
INTL ST 13	Global Economy
<b>B. Upper-Division Requirements</b>	
PUBHLTH 101	Introduction to Epidemiology
Select two of the following:	
BIO SCI D103	Cell Biology
BIO SCI D104	Developmental Biology
BIO SCI E109	Human Physiology
BIO SCI N110	Neurobiology and Behavior
Five additional upper-division courses with at least one course chosen from each of the three topic areas: <sup>1</sup>	
<b>Epidemiology, Genetics, and Health Informatics:</b>	
BIO SCI D137	Eukaryotic and Human Genetics <sup>2</sup>
BIO SCI D148	Development and Disease <sup>2</sup>
BIO SCI E106	Processes in Ecology and Evolution <sup>2</sup>
BIO SCI M123	Introduction to Computational Biology <sup>2</sup>
BIO SCI M137	Microbial Genetics <sup>2</sup>
COMPSCI 183	Introduction to Computational Biology <sup>2</sup>
PSCI 183S	Social Epidemiology
PUBHLTH 102–119 <sup>2</sup>	
<b>Environmental and Global Health Sciences:</b>	
ANTHRO 125B	Ecological Anthropology <sup>2</sup>

ANTHRO 128B	Race, Gender, and Science
ANTHRO 134A	Medical Anthropology
ANTHRO 134C	Medicine, Food, and Health <sup>2</sup>
ANTHRO 134F	Anthropology of the Body
ANTHRO 134G	HIV/AIDS in a Global Context
BIO SCI D124	Biology of Integrative Medicine
BIO SCI E179	Limnology and Freshwater Biology <sup>2</sup>
BIO SCI E179L	Field Freshwater Ecology <sup>2</sup>
BIO SCI E189	Environmental Ethics <sup>2</sup>
CHEM 125	Advanced Organic Chemistry <sup>2</sup>
CHC/LAT 176	Race, Gender, and Science
PUBHLTH 126	Public Health Law: Fundamentals in Action
PUBHLTH 127	Public Health Programs for the Corporate World
PUBHLTH 160–179 <sup>2</sup>	
PUBHLTH 190	Geographic Information Systems for Public Health <sup>2</sup>
PUBHLTH 193	Ethics and Responsible Conduct of Research in Public Health
SOCECOL E127	Nuclear Environments
<b>Infectious and Chronic Diseases:</b>	
BIO SCI D111L	Developmental and Cell Biology Laboratory <sup>2</sup>
BIO SCI E112L	Physiology Laboratory <sup>2</sup>
BIO SCI E124	Infectious Disease Dynamics <sup>2</sup>
BIO SCI E136	The Physiology of Human Nutrition <sup>2</sup>
BIO SCI M114	Advanced Biochemistry
BIO SCI M114L	Biochemistry Laboratory <sup>2</sup>
BIO SCI M116	Advanced Molecular Biology <sup>2</sup>
BIO SCI M116L	Molecular Biology Laboratory <sup>2</sup>
BIO SCI M118L	Experimental Microbiology Laboratory <sup>2</sup>
BIO SCI M121	Immunology with Hematology <sup>2</sup>
BIO SCI M121L	Advanced Immunology Laboratory <sup>2</sup>
BIO SCI M122	General Microbiology
BIO SCI M125	Molecular Biology of Cancer <sup>2</sup>
BIO SCI M143	Human Parasitology <sup>2</sup>
PHRMSCI 170A	Molecular Pharmacology I <sup>2</sup>
PHRMSCI 170B	Molecular Pharmacology II <sup>2</sup>
PUBHLTH 150	Public Health and Wellness
PUBHLTH 180–189 <sup>2</sup>	
<b>C. Practicum Requirement</b>	
PUBHLTH 195W	Public Health Practicum and Culminating Experience (8 units) <sup>3</sup>

<sup>1</sup> Upon petition, PUBHLTH 100 may also be taken to fulfill upper-division course work in specific topic areas, depending on course content.

<sup>2</sup> Note additional prerequisites.

<sup>3</sup> Taken for upper-division writing credit.

## Public Health, M.S.

The distinctive mission of the Master of Science in Public Health is to prepare the next generation of researchers for global health and disease population around the world in order to advance global health research and reduce the burden of disease, especially in the world's most vulnerable and at-risk associated populations. Graduates of the M.S. program will be prepared to contribute to the improvement of global health and the solution of disease prevention. Students who enroll in the Ph.D. program can earn the M.S. in Public Health en route to completing their Ph.D., but students cannot apply or enroll for the M.S. degree only.

### Thesis

Students admitted to the Ph.D. in Public Health, have the option of also earning an M.S. in Public Health (should they not already have a Master's degree), by additionally completing a masters-level thesis. M.S. students will engage in thesis research with their faculty advisor. The students' final

thesis will be submitted to a M.S. thesis committee. Students must submit thesis committee members and thesis topic to their faculty mentor for approval, before advancement to candidacy will be approved. The thesis should reflect an original research investigation and must be approved by a thesis committee of at least three full-time faculty members, all of which must be public health faculty. The final examination is an oral presentation of the thesis to the committee.

### Program Requirements

All M.S. students are required to complete 64 quarter-units according to the following modules:

#### A. Complete the Preparatory Module:

PUBHLTH 200	Foundations of Public Health
PUBHLTH 206B	Intermediate Epidemiology
PUBHLTH 207A	Probability and Statistics in Public Health
PUBHLTH 207B	Analysis of Public Health Data Using Statistical Software
PUBHLTH 283	Geographic Information Systems for Public Health
PUBHLTH 287	Qualitative Research Methods in Public Health
PUBHLTH 292	Ethics and Responsible Conduct of Research in Public Health
PUBHLTH 294	Research Communication in Public Health
PUBHLTH 298	Directed Studies in Public Health

#### B. Students must complete one of the following Concentration modules:

Concentration Module: Disease Prevention

PUBHLTH 208	Advances in Social Epidemiology
PUBHLTH 244	Health Behavior Theory
PUBHLTH 245	Health Promotion Planning
PUBHLTH 246	Social Research Methods

or

Concentration Module: Global Health

PUBHLTH 213	Epidemiology in Global Health
PUBHLTH 280	Global Burden of Disease
PUBHLTH 286	Advanced Geographic Information Systems and Spatial Epidemiology

#### C. Complete the Elective Module: Risk Factors and Vulnerable Population

Select three courses from the following:

BATS 210A	Introduction to Clinical Epidemiology
BATS 253	Disparities in Health and Health Care
CHC/LAT 210A	Cultural and Historical Precedents for Latinos and Medical Care
CHC/LAT 210B	Cultural and Historical Precedents for Latinos and Medical Care
CHC/LAT 211A	Latinos/Latinas and Medical Care: Contemporary Issues
CHC/LAT 211B	Latinos/Latinas and Medical Care: Contemporary Issues
CRM/LAW C219	Hate Crime
EHS 203	Psychosocial Occupational Epidemiology
EHS 294	Occupational Health Psychology
EPIDEM 201	Cancer Epidemiology
EPIDEM 202	Genetic Epidemiology
EPIDEM 205	Environmental Epidemiology
EPIDEM 215	Introduction to Statistical Genetics
EPIDEM 232	Chronic Disease Epidemiology & Prevention
EPIDEM 244	Toxic Chemicals in Environment
EARTHSS 200	Global Physical Climatology
MOL BIO 205	Molecular Virology
MOL BIO 218	Clinical Cancer
PSCI P258	Health Psychology
PSCI P273	Biobehavioral Aspects of Health and Illness
PUBHLTH 208	Advances in Social Epidemiology <sup>2</sup>
PUBHLTH 209	Methods of Demographic Analysis
PUBHLTH 206C	Advanced Epidemiologic Methods

PUBHLTH 213	Epidemiology in Global Health <sup>1</sup>
PUBHLTH 214	Surveillance Systems
PUBHLTH 222	Health Policy and Management
PUBHLTH 223	Risk Communication
PUBHLTH 241	Environmental Policy and Global Sustainability
PUBHLTH 242	Theories of Health Communication
PUBHLTH 244	Health Behavior Theory <sup>2</sup>
PUBHLTH 245	Health Promotion Planning <sup>2</sup>
PUBHLTH 246	Social Research Methods <sup>2</sup>
PUBHLTH 247	Program Evaluation
PUBHLTH 248	Fundamentals of Maternal and Child Health - Programs, Problems, and Policy
PUBHLTH 250	Health Status and Care Disparities
PUBHLTH 259	Special Topics in Social and Behavioral Health Sciences
PUBHLTH 260	Human Exposure Modeling
PUBHLTH 264	Introduction to Environmental Health Science
PUBHLTH 269	Air Pollution, Climate, and Health
PUBHLTH 270	Human Exposure to Environmental Contaminants
PUBHLTH 277A	Target Organ Toxicology I
PUBHLTH 277B	Target Organ Toxicology II
PUBHLTH 279	Special Topics in Environmental & Occupational Health
PUBHLTH 280	Global Burden of Disease <sup>1</sup>
PUBHLTH 281	Infectious Disease Epidemiology
PUBHLTH 286	Advanced Geographic Information Systems and Spatial Epidemiology <sup>1</sup>
PUBHLTH 289	Special Topics in Global Health and Disease Prevention <sup>1</sup>
PUBHLTH 290	Special Topics in Public Health
SOCIOL 230A	Race and Ethnicity
SOCIOL 239	Special Topics: Social Inequality
SOCIOL 269	Special Topics: Social Demography
SOCIOL 289	Special Topics

The M.S. in Public Health prepares graduates to pursue careers in policy analysis, monitoring and evaluation of public health programs, and academic and programmatic research. They will engage and develop global health research at national and international government agencies, NGOs, the private sector and academic institutions.

## Public Health, Minor

The minor in Public Health provides students with the fundamental knowledge of principles, applications, and skills needed to develop a firm appreciation of health and disease prevention at the population level, and to use this special knowledge to transform the experience of their major education into innovative approaches for solving problems in health care and assessment.

**Teaching and learning.** Public Health education demands interdisciplinary engagement. The minor curriculum is intended to engage students from majors across the campus by introducing them to the main concepts and branches of public health, while also giving them the skills and values needed to translate their major education into meaningful projects in population health assessment and disease prevention. In concert with the major degrees in public health, the minor emphasizes learning through the ecological model of public health where the linkages and relationships among multiple determinants affecting health are examined to identify critical nodes of opportunities to improve the health of populations at various scales of analysis.

**Service.** Public Health education also demands community engagement. All students of Public Health are encouraged to incorporate public health impacts and benefit assessments into societal functions that ground their understanding of public problems. Experience in public health service may be acquired through participation in learning opportunities and by reflecting critically on those experiences under the auspices of vigorous campus organizations such as the Public Health Association (<https://phauci.wixsite.com/phauci/>).

## Requirements for the Minor

Nine courses are required (36 units), no more than two of which may be taken on a Pass/Not Pass basis, distributed as follows:

A. Complete:

PUBHLTH 1	Principles of Public Health
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## PUBHLTH 2

## Case Studies in Public Health Practice

B. Seven upper-division courses in Public Health with at least one course from four of the five areas:

**Epidemiology, Genetics, and Health Informatics**

PUBHLTH 101–119

**Health Policy and Management**

PUBHLTH 120–139

**Social and Behavioral Health Sciences**

PUBHLTH 140–159

**Environmental and Global Health Sciences**

PUBHLTH 160–179

**Infectious and Chronic Diseases**

PUBHLTH 180–189

No more than two courses may overlap between the student's major degree and the minor in Public Health.

**Residence Requirement:** A minimum of six courses required for the minor must be completed at UCI. Approved courses taken in the UC Education Abroad Program are considered to be in-residence courses.

## Public Health, Ph.D.

The distinctive mission of the Ph.D. in Public Health is to train graduate students to conduct original research on the determinants of health status of populations, and the translation of such knowledge to improve strategies for preventing disease and disability. Graduates of the Ph.D. program will be prepared for independent and collaborative research careers, and to teach at advanced levels of instruction. Students enrolled in the Ph.D. in Public Health must concentrate in either Global Health or Disease Prevention.

Students enroll in the Ph.D. in Public Health in the fall quarter of each year. Applicants are encouraged to start the application process early by consulting with faculty members whose research activities align with the applicant's interests and academic background. The deadline for receipt of all application materials is December 1. Applicants must choose one of the two available concentrations at the time of application. Master's level degrees in health-related disciplines are the preferred preparation for admission to the Ph.D. in Public Health. Applicants to the Ph.D. in Public Health who come with undergraduate degrees from other related majors might be required to take supplementary courses in addition to the preparatory module of the Ph.D. program.

All applicants must have an overall grade point average of B (3.0 on a 4.0 scale) or better and take the Graduate Record Examination (GRE) general test. Applicants must meet the general admission requirements of the UCI Graduate Division and submit both the Application for Graduate Admission and the School of Public Health Application Service (SOPHAS) application in order to be considered for admission.

Each Ph.D. student must serve as a teaching assistant for at least two quarters during the graduate program. If English is not the student's first language, the student must pass a campus-approved oral English proficiency exam prior to serving as a teaching assistant.

For more information on admissions, visit the Public Health website (<http://publichealth.uci.edu/>) or contact [phgo@uci.edu](mailto:phgo@uci.edu).

### Concentration in Global Health

The focus of the Ph.D. research concentration in Global Health is to train excellence in research through engagement in hypothesis-driven projects to investigate the global context of disease burden and the improvement of population health status. The program will attract candidates who seek to analyze problems at the intersection of risk, vulnerability, and disease. Activities may include investigation of strategies to make research results that have already produced benefits in one country or region effective in underprivileged regions. The program trains students in integrative expertise essential for global health research with hypotheses in the nexus of content (risk analysis), context (vulnerability assessments), and process (translation of knowledge to reduce the burden of disease).

The specific learning objectives of the Concentration in Global Health are for graduates of the degree to:

1. Demonstrate knowledge of the major theoretical underpinnings of advances in global health research.
2. Explain the relationship between theory and research methods focused on understanding the association of risk, vulnerability, and outcome in global health.
3. Compare and contrast the health status of different populations with respect to their burden of disease.
4. Formulate research hypotheses in the intersection of risk factors, vulnerable populations, and burden of disease.



5. Compose research proposals and conduct original research resulting in discoveries that contribute to improved understanding of risk factors and variations in disease burden in a population, and strategies to alleviate the burden at the global level.

### Concentration in Disease Prevention

The focus of the Ph.D. concentration in Disease Prevention is to train excellence in research to discover insights into how human behavior, social constraints, and other contextual factors influence strategies to prevent disease in populations that are vulnerable to risk factors. The program emphasizes the ecological model of disease prevention, with research hypotheses emerging through multi-layered analysis of determinants of health status, including individual, interpersonal, organizational, community, and overarching policy. Students generate the hypotheses for their research in the nexus of risk factors, health behavior, and vulnerable populations.

The specific learning objectives of the Concentration in Disease Prevention are:

1. Demonstrate knowledge of the major theoretical underpinnings of strategies for disease prevention.
2. Explain the relationship between theory and research methods focused on understanding the association of risk, behavior, and vulnerability with respect to disease pathways.
3. Analyze interrelationships among the determinants of illness and maladaptive health behaviors using theories of health behavior.
4. Formulate research hypotheses in the intersection of health risk factors, health behavior, and health promotion and policies toward disease prevention.
5. Compose research proposals and conduct original research resulting in discoveries that contribute to improved understanding of the role of behavior and health promotion strategies in mitigating the vulnerability to health risk factors in specific populations, with the goals of applying the knowledge to disease prevention.

### Career Information

The Ph.D. in Public Health prepares graduates to initiate independent and collaborative research careers in academic institutions, to teach at advanced levels of instruction, and to lead research efforts at agencies dedicated to public health at all levels of organization. Graduates of the Ph.D. in Public Health will gain employment at research universities, government agencies, or private sector organizations including research institutes, hospitals, and public health foundations.

### General Admission Requirements

Students enroll in the Ph.D. in Public Health in the fall quarter of each year. Applicants are encouraged to start the application process early by consulting with faculty members whose research activities align with the applicant's interests and academic background. The deadline for receipt of all application materials is December 1. Applicants must choose one of the two available concentrations at the time of application. Master's level degrees in health-related disciplines are the preferred preparation for admission to the Ph.D. in Public Health. Applicants to the Ph.D. in Public Health who come with undergraduate degrees from other related majors might be required to take supplementary courses in addition to the preparatory module of the Ph.D. program.

All applicants must have an overall grade point average of B (3.0 on a 4.0 scale) or better and take the Graduate Record Examination (GRE) general test. Applicants must meet the general admission requirements of the UCI Graduate Division and submit both the Application for Graduate Admission and the School of Public Health Application Service (SOPHAS) application in order to be considered for admission.

Each Ph.D. student must serve as a teaching assistant for at least two quarters during the graduate program. If English is not the student's first language, the student must pass a campus-approved oral English proficiency exam prior to serving as a teaching assistant.

For more information on admissions, visit the Public Health website (<http://publichealth.uci.edu/>) or contact [phgo@uci.edu](mailto:phgo@uci.edu).

### Program Requirements

A main feature of the Ph.D. in Public Health is the situation of dissertation research in an ecological framework that considers multi-level analysis of public health questions. We integrate this feature in the two concentrations, each with knowledge modules and creative activity that must be satisfied in partial fulfillment of the degree requirements. All Ph.D. students are required to complete a minimum of 84 quarter-units according to the following modules:

#### Preparatory Module

PUBHLTH 200	Foundations of Public Health
PUBHLTH 206B	Intermediate Epidemiology
PUBHLTH 207A	Probability and Statistics in Public Health
PUBHLTH 207B	Analysis of Public Health Data Using Statistical Software
PUBHLTH 283	Geographic Information Systems for Public Health
PUBHLTH 287	Qualitative Research Methods in Public Health

PUBHLTH 292	Ethics and Responsible Conduct of Research in Public Health
PUBHLTH 294	Research Communication in Public Health
PUBHLTH 297	Research Design and Proposal Writing
PUBHLTH 298	Directed Studies in Public Health
<b>Concentration Module: Disease Prevention</b>	
PUBHLTH 208	Advances in Social Epidemiology
PUBHLTH 244	Health Behavior Theory
PUBHLTH 245	Health Promotion Planning
PUBHLTH 246	Social Research Methods
<b>Concentration Module: Global Health</b>	
PUBHLTH 213	Epidemiology in Global Health
PUBHLTH 280	Global Burden of Disease
PUBHLTH 286	Advanced Geographic Information Systems and Spatial Epidemiology
PUBHLTH 289	Special Topics in Global Health and Disease Prevention
<b>Elective Module: Risk Factors and Vulnerable Populations</b>	
Select four courses from the following:	
BATS 210A	Introduction to Clinical Epidemiology
BATS 253	Disparities in Health and Health Care
CHC/LAT 210A	Cultural and Historical Precedents for Latinos and Medical Care
CHC/LAT 210B	Cultural and Historical Precedents for Latinos and Medical Care
CHC/LAT 211A	Latinos/Latinas and Medical Care: Contemporary Issues
CHC/LAT 211B	Latinos/Latinas and Medical Care: Contemporary Issues
CRM/LAW C219	Hate Crime
EHS 203	Psychosocial Occupational Epidemiology
EHS 294	Occupational Health Psychology
EPIDEM 201	Cancer Epidemiology
EPIDEM 202	Genetic Epidemiology
EPIDEM 205	Environmental Epidemiology
EPIDEM 215	Introduction to Statistical Genetics
EPIDEM 232	Chronic Disease Epidemiology & Prevention
EPIDEM 244	Toxic Chemicals in Environment
EARTHSS 200	Global Physical Climatology
MOL BIO 205	Molecular Virology
MOL BIO 215	Integrative Immunology
MOL BIO 218	Clinical Cancer
PSCI P258	Health Psychology
PSCI P273	Biobehavioral Aspects of Health and Illness
PUBHLTH 208	Advances in Social Epidemiology <sup>2</sup>
PUBHLTH 209	Methods of Demographic Analysis
PUBHLTH 213	Epidemiology in Global Health <sup>1</sup>
PUBHLTH 206C	Advanced Epidemiologic Methods
PUBHLTH 214	Surveillance Systems
PUBHLTH 222	Health Policy and Management
PUBHLTH 223	Risk Communication
PUBHLTH 241	Environmental Policy and Global Sustainability
PUBHLTH 242	Theories of Health Communication
PUBHLTH 244	Health Behavior Theory <sup>2</sup>
PUBHLTH 245	Health Promotion Planning <sup>2</sup>
PUBHLTH 246	Social Research Methods <sup>2</sup>
PUBHLTH 247	Program Evaluation
PUBHLTH 248	Fundamentals of Maternal and Child Health - Programs, Problems, and Policy

PUBHLTH 250	Health Status and Care Disparities
PUBHLTH 259	Special Topics in Social and Behavioral Health Sciences
PUBHLTH 260	Human Exposure Modeling
PUBHLTH 264	Introduction to Environmental Health Science
PUBHLTH 269	Air Pollution, Climate, and Health
PUBHLTH 270	Human Exposure to Environmental Contaminants
PUBHLTH 277A	Target Organ Toxicology I
PUBHLTH 277B	Target Organ Toxicology II
PUBHLTH 279	Special Topics in Environmental & Occupational Health
PUBHLTH 280	Global Burden of Disease <sup>1</sup>
PUBHLTH 281	Infectious Disease Epidemiology
PUBHLTH 286	Advanced Geographic Information Systems and Spatial Epidemiology <sup>1</sup>
PUBHLTH 289	Special Topics in Global Health and Disease Prevention <sup>1</sup>
PUBHLTH 290	Special Topics in Public Health ((Global Health Law and Policy, Obesity Epidemiology, Theory Driven Data Analysis))
SOCIOL 230A	Race and Ethnicity
SOCIOL 239	Special Topics: Social Inequality
SOCIOL 269	Special Topics: Social Demography
SOCIOL 289	Special Topics

#### Research Module

1. Establish a dissertation committee of faculty members.
2. Submit a research proposal and advance to Ph.D. candidacy by defending the proposal.
3. At least three quarters of PUBHLTH 296 under the supervision of the Chair of the dissertation committee.

<sup>1</sup> Counts as a cluster course for Disease Prevention students only.

<sup>2</sup> Counts as a cluster course for Global Health students only.

The qualifying examination consists of two parts. The first part is submission of a written research proposal to a Candidacy Committee of five faculty members consisting of four members with formal appointments in Public Health, and an external member. The second part is a public presentation and oral defense of the student's dissertation research proposal before the same committee. Advancement to doctoral candidacy is contingent on passing both parts of the qualifying examination, as judged by the Candidacy Committee. The dissertation proposal must be at a level of quality such that its execution will advance knowledge and have the potential to yield original peer-reviewed publications.

Advancement to doctoral candidacy is contingent on passing the qualifying examination. We expect students to sit for the qualifying examination by the beginning of their third year in the program. Ph.D. completion requires submission of an acceptable dissertation and oral defense. The normative time to degree is six years, and the maximum time permitted is eight years.

#### Teaching Requirement

Students enrolled in the Ph.D. in Public Health are required to serve as Teaching Assistants in public health courses for two quarters during their graduate study. Teaching is an important component of graduate training, as it helps graduate students learn how to communicate effectively about their field of knowledge. In addition, teaching experience is valuable to those planning for a career in academia. Graduate students with comparable prior teaching experience (e.g., through postgraduate degrees earned at UC Irvine or other comparable institution) may request a waiver of the teaching requirement.

#### Program in Law and Graduate Studies (J.D./Ph.D./M.P.H.)

Highly-qualified students interested in combining the study of law with graduate qualifications in Public Health are invited to undertake concurrent degree study under the auspices of UC Irvine's Program in Law and Graduate Studies (PLGS). Students in this program pursue a coordinated curriculum leading to a J.D. from the School of Law in conjunction with a Master's or Ph.D. in Public Health.

Additional information is available from the PLGS Program Director's Office at 949-824-9217, or by email at [plgs@law.uci.edu](mailto:plgs@law.uci.edu) (%20plgs@law.uci.edu). A full description of the program, with links to all relevant application information, can be found in the Law School section of the (<http://catalogue.uci.edu/schooloflaw/#lawandgraduatestudies>) *Catalogue*.

The Ph.D. in Public Health prepares graduates to initiate independent and collaborative research careers in academic institutions, to teach at advanced levels of instruction, and to lead research efforts at agencies dedicated to public health at all levels of organization. Graduates of the Ph.D. in Public Health will gain employment at research universities, government agencies, or private sector organizations including research institutes, hospitals, and public health foundations.

# School of Biological Sciences

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## On This Page:

- Overview
- Biological Sciences Degrees
- Honors
  - Biological Sciences Honors
  - Scholarships, Prizes, and Awards
- Special Programs and Courses
- Special Research Resources
- Advising: Academic, Career, Health Sciences

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### Frank M. LaFerla, Dean

5120 Natural Sciences II

<http://www.bio.uci.edu/>

This is the ideal time to be studying biology. We are solving problems today whose solutions were unimaginable even a few years ago, and implications for our society, our health, and our environment are profound. The School of Biological Sciences is dedicated to providing students with a unique course of study that fosters a deep appreciation for the exciting facts and concepts in the field, an education that allows graduates to excel in their chosen careers.

The School has recently redesigned the curriculum to remain on the cutting edge of biological education. All first-year students are introduced to basic concepts in ecology and evolutionary biology, as well as cellular and molecular biology. The core set of courses in biology continues into the second year, featuring genetics, biochemistry, and molecular biology, followed in the third and fourth year by a choice of advanced courses in biology. Since biology is a laboratory discipline, students complete a series of laboratory courses in which they learn both the techniques and approaches needed to solve problems in biology.

Finally, the faculty expect that most students will engage in cutting-edge research in one of more than 250 laboratories and medical clinics in the School of Biological Sciences and the UCI School of Medicine. It is in these situations that faculty train students to think in a sophisticated way about real-world problems. There is also no feeling of excitement greater than finding out something about the world that no one has ever known before, a feeling afforded in biology only by participation in research. The Excellence in Research Program allows students to present their work and be recognized for their performance with a series of awards and publication of their reports in the School's online *Journal of Undergraduate Research*. The set of core classes that instructs students in the concepts of biology, the advanced classes that allow a deep understanding of specialized aspects of biology, the laboratory courses that convey the practical aspects of problem-solving in biology, and the research experiences that engage students in the real excitement in revealing new information about biology, come together to provide an extraordinary experience for students. The Honors Program in the School of Biological Sciences further enhances the educational experience for the best students.

Biology students with a broad interest in the area can opt to complete a major in Biological Sciences. Additionally, they have the option of specializing in areas of biology that best fit their interests, completing courses for degree programs in Biochemistry and Molecular Biology, Biology/Education, Developmental and Cell Biology, Ecology and Evolutionary Biology, Exercise Sciences, Genetics, Human Biology, Microbiology and Immunology, or Neurobiology.

Completion of any of these majors forms an excellent basis for application to either graduate or professional studies such as medical school, and graduates of the School of Biological Sciences are routinely accepted to the most prestigious programs in the country.

The quality of the faculty in the School of Biological Sciences has remained high while increasing steadily in number over the past few years, giving students a remarkable range of expertise in biology and with it, a large number of different advanced courses and research opportunities. In addition, their efforts have brought several high-impact research units to the campus, such as the Center for the Neurobiology of Learning and Memory, the Center for Virus Research, the Beckman Laser Institute, the Cancer Research Institute, the Developmental Biology Center, the Center for Immunology, the Institute for Memory Impairments and Neurological Disorders, the Macromolecular Structure Research Unit, the Organized Research Unit in Molecular and Mitochondrial Medicine and Genetics, the Institute for Genomics and Bioinformatics, the Center for Complex Biological Systems, and the Reeve-Irvine Research Center, all of which are accessible to undergraduates. The School of Biological Sciences also has close research and teaching collaborations with faculty in the Schools of Medicine, Physical Sciences, Social Ecology, and Social Sciences; the Donald Bren School of Information and Computer Sciences; and The Henry Samueli School of Engineering.

In addition to the regular University requirements for admission, students interested in the biological sciences should include in their high school curriculum, in addition to a course in biology, four years of mathematics, as well as courses in chemistry and physics, which are now an integral part of most contemporary biological work.

The School's professional counseling staff is always available for consultation to students regarding the many decisions in their academic program. They also are trained to provide guidance in the application process to both professional and graduate schools, a real advantage to the high proportion of students in the School of Biological Sciences who go on to pursue advanced degrees.

Opportunities are available at the graduate level to specialize in Developmental and Cell Biology, Ecology and Evolutionary Biology, Molecular Biology and Biochemistry, and Neurobiology and Behavior.

## Change of Major

Students who wish to declare any major within the School of Biological Sciences should contact the Biological Sciences Student Affairs Office in 1011 Biological Sciences III for information about change-of-major requirements, procedures, and policies. Information can also be found at UC Irvine Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>). Change of Major requests are accepted and reviewed by the School throughout the year.

## Honors Programs

### Honors Program in the School of Biological Sciences

The Honors Program in the School of Biological Sciences provides an opportunity for outstanding majors in the School to pursue advanced work in independent research via participation in the Excellence in Biological Sciences Research Program and earn Honors in Biological Sciences upon graduation. Admission to the program is based on an application to participate in the Excellence in Biological Sciences Research program filed during the middle part of the fall quarter of the year of the student's participation. Additionally, students must have a minimum overall 3.5 grade point average and a minimum 3.5 grade point average in all required Biological Sciences courses. The Program requires enrollment in research (BIO SCI 199) including successful completion of BIO SCI H195 and the Excellence in Biological Sciences Research program.

### Graduation with Honors

Of the graduating seniors, no more than 16 percent will receive Latin honors: approximately 2 percent *summa cum laude*, 4 percent *magna cum laude*, and 10 percent *cum laude*. The selection for these awards is based on spring quarter rank-ordered grade point averages. To be eligible for honors at graduation, the student must, by the end of spring quarter of the senior year, be officially declared a Biological Sciences major; submit an Application to Graduate by the end of winter quarter of the senior year; have completed at least 72 units in residence at a UC campus by the end of the spring quarter of the academic year in which they graduate; have all corrections to the academic record processed by the University Registrar's Office by the end of spring quarter; if completing the Language Other Than English general education requirement with a language exemption test, pass the test by the end of spring quarter; and be able to verify completion of all course work by the end of the spring quarter of the senior year. Other important factors are considered visit at Honors Recognition.

### Campuswide Honors Collegium

The Campuswide Honors Collegium is available to selected high-achieving students from all academic majors from their freshman through senior years. For more information contact the Campuswide Honors Collegium, 1200 Student Services II; 949-824-5461; [honors@uci.edu](mailto:honors@uci.edu); or visit the Campuswide Honors Collegium website (<http://honors.uci.edu/>).

**Dean's Honor List.** The quarterly Dean's Honor List is composed of students who have received a 3.5 grade point average while carrying a minimum of 12 graded units.

## Excellence in Research Program

The School of Biological Sciences believes that successful participation in creative research is one of the highest academic goals its undergraduates can attain. Students enrolled in Undergraduate Research (BIO SCI 199) and who meet the eligibility requirements have an opportunity to present the results of their research endeavors to peers and faculty. Those students awarded with "Excellence in Research" will then have their papers published in the School's online *Journal of Undergraduate Research in the Biological Sciences*.

The program begins each fall with a mandatory instructional workshop and continues through spring with students completing a scientific paper, poster presentation, and scientific talk. Contact the Biological Sciences Student Affairs Office, room 1011 Biological Sciences III, or visit the Excellence in Research website (<https://www.bio.uci.edu/undergraduates/research/excellence-in-research/>) for additional information.

## Biological Sciences Honors, Scholarships, Prizes, and Awards

The following honors, scholarships, prizes, and awards are presented at the annual Biological Sciences Honors Convocation held in June.

**Excellence in Research Award.** Undergraduates who have successfully completed the requirements for this program are presented with Excellence in Research certificates.

**Brian Atwood Scholarship.** The Brian Atwood Scholarship is awarded to junior Biological Sciences majors who demonstrate outstanding achievement in both scholarship and service to the UCI community.

**Robert H. Avnet Memorial Scholarship.** The Robert H. Avnet Memorial Scholarship has been established to assist a student interested in becoming a physician. The student must be a Biological Sciences major and demonstrate financial need.

**Carol Becker McGaugh Award.** This award is given to a junior with outstanding research in the area of neurobiology of learning and memory.

**Carol and James Becker McGaugh Award.** This award is given to a junior with strong moral character, integrity, and demonstrated potential for making a difference in neuroscience.

**Robert Ernst Prize for Excellence in Research in the Biological Sciences.** This prize is awarded to a student for meritorious research conducted in the field of biology.

**Robert Ernst Prize for Excellence in Student Research in Plant Biology.** This prize is awarded to a student for meritorious research conducted in plant biology.

**Kyle Farol Memorial Award.** The Kyle Farol Memorial Award is presented to an outstanding undergraduate Biological Sciences major who has dedicated their time as a volunteer in a clinical setting.

**M. Marlene Godoy Award.** This award is given to support a graduating senior in the Biological Sciences who is pre-medical or pre-dental. The recipient is one who is *actively* involved with philanthropic community service, University service, and in undergraduate research.

**James Tait Goodrich Award for Excellence in Neurobiology.** In honor of James McGaugh, the award recognizes an undergraduate student completing his/her junior year, for outstanding achievement in neurobiology.

**Dr. William F. Holcomb Scholarship.** The intent of the Dr. William F. Holcomb Scholarship is to support biomedical or marine biological studies. The Scholarship is to be used to support continuing academic work over a specific period.

**Laurence J. Mehlman Prize.** The Laurence J. Mehlman Prize is awarded to an undergraduate student in the School of Biological Sciences who has demonstrated outstanding achievement in both scholarship and service to the School.

**Edward Mittelman Memorial Fund Scholarship.** The Edward Mittelman Memorial Fund Scholarship is presented to an outstanding Biological Sciences student who will pursue a career in the medical field.

**Edward A. Steinhaus Memorial Award.** The Edward A. Steinhaus Memorial Award is given to outstanding Biological Sciences graduate student teaching assistants who demonstrate promise as future educators.

**Joseph H. Stephens Award for Outstanding Research in Ecology and Conservation.** This award is granted to a graduate student who has demonstrated outstanding research in ecology and conservation.

**Joseph H. Stephens Award for Outstanding Research in Biochemistry and Molecular Biology.** This award is granted to a graduate student who has demonstrated outstanding research in biochemistry and molecular biology.

**Krishna and Sujata Tewari Scholar Award.** This award will be comprised of two distinct scholarships given annually to one graduate recipient from the School of Biological Sciences and one from the School of Medicine. The recipients have demonstrated proclivity and aspirations in science and medicine.

**Jayne Unzelman Scholarship.** The Jayne Unzelman Scholarship is presented to an undergraduate student who has shown academic excellence and been of service to the School of Biological Sciences and/or the University, and to the community.

## Special Programs and Courses

### Biological Sciences 199

The (BIO SCI 199) Undergraduate Research Training Program provides students the opportunity to pursue independent research. Students conduct experimental laboratory, field, or clinical research as an apprentice scientist under the supervision of a professor in the School of Biological Sciences or the School of Medicine. BIO SCI 199 research students experience the challenge and excitement of the world of science. Students develop new scientific skills and knowledge while training with professors who are on the cutting edge of research and discovery in the biological and medical sciences. The research training may commence as early as the sophomore year.

To participate in this unique research training program, students must be in good academic standing, and completion of BIO SCI 94 From Organisms to Ecosystems is mandatory prior to enrollment. Students are encouraged to investigate the possibilities for research early to assure that all requirements and deadlines are met. It is recommended that students contact a faculty sponsor at least one quarter in advance for (BIO SCI 199) enrollment. Once a faculty sponsor is acquired, the student must submit the proposal form and enrollment packet to the Biological Sciences Student Affairs Office, 1011 Biological Sciences III. At the end of each quarter a Summary Report is required.

Students cannot participate in research involving human blood, body fluids, or tissue, unless special approval is granted. The faculty sponsor must submit a request for exception to the Biological Sciences Student Affairs Office.

Students conducting research directly with patients or other human subjects must comply with special enrollment procedures and the additional safety training required at the clinical site. The (BIO SCI 199) Undergraduate Research Training Program standards, procedures, enrollment packets, and announcements are available at the Biological Sciences Undergraduate Research website (<https://www.bio.uci.edu/undergraduates/research/>).



The (BIO SCI 199) Undergraduate Research Training Program can provide experience that is beneficial for the future pursuit of graduate school. Information regarding research careers in the biological sciences is best obtained from a faculty research mentor.

Students should be aware that for any one quarter, a maximum of five units of independent study courses (BIO SCI 197, BIO SCI 198 or BIO SCI 199) may be taken within the School of Biological Sciences.

### **Minority Sciences Programs in Biological Sciences**

The Minority Sciences Programs (MSP) in Biological Sciences is a UCI umbrella program that provides infrastructure and orchestration for the operation of minority research training grants supported by the National Institutes of Health (NIH) and other agencies. MSP seeks to increase the number of U.S. underrepresented groups in biomedical research careers. MSP participants benefit from early exposure, continuous research training, and faculty mentoring. Support is also provided through paid summer and year-round research internships, early research exposure, tutoring, academic advising, scientific writing, and participation at national conferences. Furthermore, MSP has established a campuswide, regional, national, and international network of committed faculty and resource programs to facilitate the transition from high school through community college, baccalaureate, and master's degrees to Ph.D. careers in biomedical research and related fields. Additional information is available from the MSP office, 1104 Biological Sciences III; 949-824-2589; or visit the Minority Sciences website (<http://port.bio.uci.edu/>).

### **Biological Sciences Tutoring Program**

The Tutoring Program provides free tutoring for most Biological Sciences courses and is available to all students in any major. Weekly small group tutoring sessions, reviews for midterms and finals, and a growing online database of worksheets and review materials are provided. In the Tutoring Program, UCI students tutor other UCI students. For the student tutor, this program provides opportunities to develop their teaching abilities, to meet and interact with faculty, and to perform a worthwhile and necessary service. Tutors also receive academic credit. For more information, contact the Biological Sciences Student Affairs Office in 1011 Biological Sciences III or visit the Bio Sci Peer Tutoring website (<https://sites.google.com/a/uci.edu/biotutor/>).

### **UC Education Abroad Program**

Upper-division students have the opportunity to experience a different culture while making progress toward degree objectives through the University's Education Abroad Program (UCEAP). UCEAP is an overseas study program which operates in cooperation with host universities and colleges throughout the world. Specifically, Biology majors should consider the UCEAP programs in the United Kingdom, Canada, Sweden, Australia, Denmark, and Costa Rica. Visit the Study Abroad Center website (<http://www.studyabroad.uci.edu/>) for additional information.

Students may wish to participate in the UCEAP Tropical Biology Quarter which is for undergraduates with at least one year of introductory biology, one quarter of upper-division biology, and a serious interest in biological studies. The program includes lectures, field laboratories, and independent research, with an emphasis on direct field experience. Students also take a course in Spanish language and Latin American culture.

### **Special Research Resources**

Special research resources include the Beckman Laser Institute and Medical Clinic, a research, training, and service facility in the area of laser microbeam technology; the School of Biological Sciences Biohazard (P-3) Facility, which provides laboratory facilities for working with biological agents or biological molecules such as recombinant DNA which would be hazardous when used in open laboratories; the Developmental Biology Center, devoted to analyzing the cellular and genetic mechanisms underlying growth, development, and regeneration; the Center for the Neurobiology of Learning and Memory, a research center for studies of the brain mechanisms underlying learning and memory; the Institute for Memory Impairments and Neurological Disorders; the Center for Virus Research, which includes the Viral Vector Design research group; the Conservation Biology Project; the Cancer Research Institute; the Center for Immunology; the Macromolecular Structure Research Unit; the UCI Arboretum, a botanical garden facility; the San Joaquin Marsh Reserve, which supports controlled marsh biota; the Burns Piñon Ridge Reserve, a high-desert habitat in San Bernardino County; and the UCI Ecological Preserve, which includes coastal hills on the campus, once under heavy grazing, but now returning to a more natural state. It is important to note that the School of Biological Sciences collaborates with the School of Medicine, thereby providing an opportunity for the sharing of both teaching and research activities. These collaborative efforts include the Institute for Genomics and Bioinformatics; the Reeve-Irvine Research Center; and the Bio-Imaging Interest Group.

### **Advising: Academic, Career, Health Sciences**

1011 Biological Sciences III  
<https://www.bio.uci.edu/undergraduates/>

#### **Academic Advising**

The Biological Sciences Student Affairs Office coordinates the advising program and provides academic counseling as well as special services particularly in the area of pre-professional career counseling. Undergraduate Biological Sciences students should consult the Biological Sciences Student Affairs Office for information on academic requirements for the degree, career opportunities, the BIO SCI 199 Research Program, available tutoring for Biological Sciences courses, Biological Sciences student organizations, and scholarship information. Students can also come to the Biological Sciences Student Affairs Office for questions regarding changing their major, applying for graduation, or for any other help they might need related to their academic career at UCI.

**Peer Academic Advisors.** The Peer Academic Advisors are upper-division Biological Sciences majors who bring with them valuable academic and social experiences. Their functions include counseling students in matters of major selection, program planning, petitioning, tutoring, learning skills problems, and participation in co-curricular and extracurricular activities.

The Peer Advisors are located in the Biological Sciences Student Affairs Office. Office hours are posted at the beginning of each quarter.

### **Career Advising**

Information on graduate and professional schools in the health sciences can be obtained from the Biological Sciences Student Affairs Office. The UCI Career Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See the Division of Career Pathways section (<http://career.uci.edu/>) for additional information.

Areas of opportunity open to those with a Bachelor of Science degree include laboratory technology, publishing, technical editing, pharmaceutical sales, and training programs in county, state, and federal agencies. The bachelor's degree is necessary to pursue studies leading to the M.S. and Ph.D. degrees.

The B.S. degree, plus short training periods, may prepare students for employment in education, medical technology (usually one year), allied health positions, and various other areas.

Education (community colleges, state colleges, or private schools), medical illustration, and public health (which includes hospital administration, biostatistics, epidemiology, environmental health sciences, social work, public health education, maternal and child health, and infectious and tropical diseases) are fields in which opportunities are available upon completion of a master's program.

The Ph.D. may lead to research in many areas, among them biochemistry, biometeorology, botany, cytology, ecology, evolutionary biology, fishery biology, genetics, microbiology, molecular biology, pathology, physiology, psychobiology, public health, range management, soil conservation, and zoology.

Other areas where advanced degrees are necessary include medicine, dentistry, law, optometry, podiatry, osteopathy, physical therapy, and veterinary medicine.

### **Health Sciences Advising**

Advising for careers in the health sciences is a specialty of the Biological Sciences Student Affairs Office. Students desiring to enter the health sciences should have their programs checked in the Office and should plan to enroll in BIO SCI 3A. Admissions tests for medical, dental, pharmacy, and other allied health programs should be taken in the spring, one and a half years before the student plans to enter.

Leaders in nearly all health professional schools recommend that students preparing to seek admission to their schools plan to obtain a bachelor's degree. Students who plan to enter a school of dentistry, medicine, or other areas of the health sciences may receive the required pre-professional training at UCI. This pre-professional training may be accomplished by (1) completing the major in Biological Sciences or (2) majoring in any school or department *and* fulfilling concurrently the specific course requirements of the dental, medical, or other professional school the student expects to attend.

Students interested in the health sciences should choose electives in the social sciences, possibly a foreign language, physical chemistry, or other specific courses required or recommended by graduate schools. See the Pre-Health Professional Advising website (<https://www.bio.uci.edu/undergraduates/careers/>) for additional information

### **Student Participation**

A wide variety of student associations, clubs, and groups provide opportunities for School of Biological Sciences students to participate in different types of activities and events. The groups are wide ranging and include nationally recognized honors societies such as Alpha Epsilon Delta, volunteer service organizations such as the Flying Sams, specialized groups such as the UCI Sports Medicine Club, and more. Detailed information about the numerous options is available at Biological Sciences Student Involvement Opportunities (<https://www.bio.uci.edu/undergraduates/events-deadlines/>).

## **Interdisciplinary Graduate Programs**

The School is structured in a manner that encourages an interdisciplinary approach to scientific problems. Interaction and cooperative efforts across traditional institutional boundaries are especially evident in the School's participation in various organized research units (described in the Office of Research section) and in the interdepartmental/interschool graduate programs described below.

### **Graduate Program in Cellular and Molecular Biosciences**

**Peter J. Donovan, Director**

Administrative Contact Information: Gary Roman  
4145 Natural Sciences II  
949-824-6226  
<http://cmb.uci.edu>

The combined graduate program in Cellular and Molecular Biosciences (CMB) provides the first year of instruction for graduate students entering Ph.D. programs in six departments within the School of Biological Sciences and the School of Medicine. Applicants should have significant laboratory



experience and be well prepared in biochemistry, molecular biology, cell biology, and genetics with appropriate course work in organic chemistry, calculus, and physics.

## Requirements

During the first year, students will select one of five focus areas: "Immunology and Microbiology," "Cancer and Cell Biology," "Structural Biology, Biochemistry, and Biophysics," "Developmental and Stem Cell Biology," or "Genetics, Epigenetics and Genomics." Students will select three didactic courses, one each quarter, from a menu of course options recommended for their focus area. Students with more general interests will be allowed to substitute courses to gain knowledge in different areas of biomedical science. Furthermore, any student may switch focus areas during the first year. Changes to course work or Focus Area can be achieved by simple petition to the CMB director. During the first year the students also complete three required 2-unit S/U courses (Ph.D. Fundamentals, Biomedical Research Methods, and Responsible Conduct of Research) that develop knowledge and skills not necessarily covered in the didactic courses. Students may take additional elective courses relevant to their area of specialization although this is not encouraged. Each Focus Area recommends elective courses for students in years two or later, to be taken after transfer to a departmental Ph.D. program.

The students also undertake introductory research in at least two laboratories during their first year. Students can select a laboratory rotation from over 100 faculty laboratories in the departments of Biological Chemistry, Developmental and Cell Biology, Microbiology and Molecular Genetics, Molecular Biology and Biochemistry, Pathology and Laboratory Medicine, and Physiology and Biophysics. Each faculty member's area of research is described on the department websites. Faculty also are associated with research areas that span departments, as shown on the CMB website (<http://cmb.uci.edu>). The year culminates in a comprehensive preliminary examination and evaluation.

At the end of the first academic year, students will select a thesis advisor in one of the departments. Students who select a thesis advisor in the School of Biological Sciences (Department of Developmental and Cell Biology or Molecular Biology and Biochemistry) will complete the doctoral degree in Biological Sciences. Students who select a thesis advisor in the School of Medicine (Departments of Biological Chemistry, Microbiology and Molecular Genetics, Pathology and Laboratory Medicine, and Physiology and Biophysics) will complete the doctoral degree in Biomedical Sciences.

During the second year and beyond, students participate in the departmental doctoral program. Students are required to meet all doctoral degree requirements associated with the thesis advisor's department or program, and may be required to take additional course work, and participate in journal club and seminar series. The normative time for completion of the Ph.D. is five years, and the maximum time permitted is seven years. Further information is available in the *Catalogue* sections of the participating departments and through the CMB program office.

## Graduate Program in Mathematical, Computational, and Systems Biology

The graduate program in Mathematical, Computational, and Systems Biology (MCSB) is designed to meet the interdisciplinary training challenges of modern biology and to function in concert with existing departmental programs or as an individually tailored program leading to an M.S. or Ph.D. Detailed information is available at the Mathematical, Computational, and Systems Biology website (<http://mcsb.uci.edu/>) and in the Interdisciplinary Studies section of the *Catalogue*.

## Interdepartmental Neuroscience Program

**Karina S. Cramer, Director**

4145 Natural Sciences II

949-824-6226

<http://www.inp.uci.edu>;

[gary.roman@uci.edu](mailto:gary.roman@uci.edu) (%20gary.roman@uci.edu)

The Interdepartmental Neuroscience Program (INP) is a first-year graduate program that brings together more than 90 faculty from the School of Biological Sciences and the School of Medicine, including participation from the Departments of Anatomy and Neurobiology, Developmental and Cell Biology, Molecular Biology and Biochemistry, Neurobiology and Behavior, Pharmacology, and Physiology and Biophysics. INP faculty have broad research interests in behavioral neuroscience, brain aging, developmental neurobiology, genetics, learning and memory, molecular neurobiology, cellular neurobiology, neural injury/disorders/repair, neuropharmacology, plasticity, and sensory neuroscience. Neuroscience as a discipline requires scientists to have a detailed understanding of at least one field, and a broad understanding of many other fields. INP provides breadth early on, followed by specialization in years two through five of predoctoral training.

INP organizes and coordinates a core curriculum that provides a foundation in neuroscience and forms the basis of future specialized instruction in a participating departmental degree-granting program. This curriculum includes course work and laboratory rotations. Each trainee is individually mentored in tailoring an appropriate course of study based on academic background, interests, and research foci. After successfully completing the academic requirements of the program, students identify a thesis advisor who is willing to accept them into their laboratory, and the student will transfer to the doctoral program in their advisor's home department. In this way, INP serves not as a degree-granting program, but as a gateway to further graduate training. Students are required to meet all doctoral degree requirements associated with the thesis advisor's department or program.

In particular, the program provides trainees with an opportunity: (1) to begin training in neuroscience with a broad academic introduction, (2) to receive individualized attention to curricular needs, (3) to conduct initial research projects with a large and diverse group of faculty in a wide variety of departments, and (4) to conduct dissertation research in any of a large and diverse group of laboratories in a wide variety of departments.

## Requirements

In the first year of study, students must successfully complete one course from each of the molecular, systems, and cellular neuroscience categories. All trainees also participate in a two-unit course called Foundations of Neuroscience (NEURBIO 202A-NEURBIO 202B). This mandatory course is intended to expose students to research in neuroscience and critical reading and analysis of the primary literature. Students are encouraged to carry out three laboratory rotations of 10 weeks each. With permission from the director and the dean, students may carry out fewer rotations. Rotations are graded on a Satisfactory/Unsatisfactory Only scale. Trainees are judged as having successfully completed the program provided that they have: (1) achieved at least a B+ (3.3) average in the core courses, (2) achieved a satisfactory grade in each quarter of Foundations of Neuroscience, (3) achieved satisfactory grades in all rotations, and (4) identified a participating faculty member who has agreed to serve as their thesis advisor.

The ideal INP candidate will have had a substantial subset of the following courses: biology, chemistry, physics, calculus, neuroscience, psychology, biochemistry, and genetics. Preference will be given to applicants who have had laboratory research experience.

Following completion of the INP and selection of a thesis mentor, students will become members of the faculty member's participating department. In addition to the INP course work requirements, each department has specific requirements to be fulfilled, indicated below. Students who select a thesis advisor in the School of Biological Sciences (Department of Developmental and Cell Biology, Molecular Biology and Biochemistry, or Neurobiology and Behavior) will complete the doctoral degree in Biological Sciences. Students who select an advisor in the School of Medicine (Department of Anatomy and Neurobiology, Pharmacology, or Physiology and Biophysics) will complete the doctoral degree in Biomedical Sciences.

**Developmental and Cell Biology (School of Biological Sciences):** Students entering the Developmental and Cell Biology program are required to enroll in and attend the weekly Department seminar series (DEV BIO 290A-DEV BIO 290B-DEV BIO 290C) and Developmental and Cell Biology journal club (DEV BIO 206A-DEV BIO 206B-DEV BIO 206C). Two quarters of teaching under the supervision of Departmental faculty are required. Student training will also be individually assessed for possible courses with an emphasis in molecular, developmental biology, or genetics as deemed necessary for successful completion of the thesis research project.

**Molecular Biology and Biochemistry (School of Biological Sciences):** Students entering the Molecular Biology and Biochemistry program are required to enroll in and attend the weekly Department seminar series (MOL BIO 201A-MOL BIO 201B-MOL BIO 201C) and the Research in Progress Seminar (MOL BIO 229), where they will present their own work annually. Students will enroll in University Teaching (DEV BIO 399) and teach (TA) beginning in their second year for at least two quarters. Student training will also be individually assessed to include at least one formal graduate course in each of the second through fifth years with an emphasis in molecular biology or biochemistry as deemed necessary for successful completion of the thesis research project. Necessary courses will include two core classes (MOL BIO 203-MOL BIO 204).

**Neurobiology and Behavior (School of Biological Sciences):** Neurobiology and Behavior accepts any of the INP core courses toward the requirement of one each from Cellular, Molecular, Systems, and Behavioral categories. INP students who enter Neurobiology and Behavior in their second year must complete the fourth category if they only fulfilled three as INP students. In addition, they will fulfill the requirements met by all continuing students, including teaching (TA) beginning in their second year for at least two quarters, advancing to candidacy in their third year, annual meetings with an advisory committee, and completing four advanced courses prior to defending their dissertation in their fifth year. They also participate in the regular Department colloquia. Students also present their research annually in the graduate student NeuroBlitz colloquium series.

**Anatomy and Neurobiology (School of Medicine):** Students entering the Anatomy and Neurobiology program are required to participate in the Current Topics in Neuroscience journal club (ANATOMY 227A-ANATOMY 227B-ANATOMY 227C) and attend all Department-sponsored seminars. They are also required to meet once each year with an advisory committee to monitor their progress and present their research at the annual "Grad Day" meeting. Individual advisors may require students to take other courses depending on their interests and research program.

**Pathology and Laboratory Medicine:** Students entering the Ph.D. program in Experimental Pathology through the INP must take one didactic graduate course each year; senior graduate students (year 4 and beyond) may waive this requirement with approval from the graduate advisor. To satisfy this requirement, students may take PATH 221, other approved courses offered by other departments, or any other relevant coursework with approval from the graduate advisor. In addition, students must attend weekly seminars and are encouraged to participate in the Experimental Pathology Journal Club. Graduate students in the program are also required to present in the seminar series, usually during the spring quarter; these oral presentations are an important part of the graduate training. Second year students are required to give a 30-minute 'research in progress' talk. In the third year and beyond, students are required to present research as formal one-hour seminars.

**Pharmacology (School of Medicine):** Students entering the Pharmacological Sciences program through the INP are required to complete Statistics (PHARM 256) and Ethics (PHARM 257) during the summer. They will also fulfill the requirements met by all continuing students including the seminar series (PHARM 298) and graduate research (PHARM 299). The seminar series includes a journal club and research presentation component. Students will also have the opportunity to present their research at an annual Departmental Research Symposium. Students are expected to advance to candidacy by year three and to meet with their thesis committee annually.

**Physiology and Biophysics (School of Medicine):** Students entering the Physiology program through the INP are required to enroll each quarter in Topics in Physiology (PHYSIO 290), which is graded by attendance and participation, and to attend all meetings of the Physiology and Biophysics journal club, all Physiology and Biophysics Departmental seminars and lunch meetings with the seminar speaker, and the Research in Progress seminars. All students are required to present their research once a year at the Research in Progress program. Students are encouraged, but not required, to enroll in Physiology of Ion Channels (PHYSIO 232) and Proteomics (PHYSIO 252). All students are required to hold meetings with their thesis committee annually, beginning in their second year. The Department has no formal teaching requirements, but students who wish to gain

experience as Teaching Assistants (TA) can make arrangements to do so in coordination with the director of Graduate Studies for the Department of Physiology and Biophysics.

- Department of Developmental and Cell Biology
- Department of Ecology and Evolutionary Biology
- Department of Molecular Biology and Biochemistry
- Department of Neurobiology and Behavior

## Requirements for the Bachelor's Degree

All School of Biological Sciences students must complete the following requirements.

**All students must meet the University Requirements.**

**All students must meet the School Requirements, as shown below:**

Complete:

BIO SCI 2A	Freshman Seminar
or BIO SCI 190	Transfer Student Seminar

Biological Sciences Core:

BIO SCI 93	From DNA to Organisms
or BIO SCI H93	Honors From DNA to Organisms
BIO SCI 94	From Organisms to Ecosystems
BIO SCI 97	Genetics
or BIO SCI H97	Honors Genetics
BIO SCI 98	Biochemistry
BIO SCI 99	Molecular Biology
BIO SCI 100	Scientific Writing

Select one of the following General Chemistry sequences:

CHEM 1A- 1B- 1C	General Chemistry and General Chemistry and General Chemistry
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and accompanying labs:

CHEM 1LC- 1LD	General Chemistry Laboratory and General Chemistry Laboratory
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or

CHEM H2A- H2B- H2C	Honors General Chemistry and Honors General Chemistry and Honors General Chemistry
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and accompanying labs:

CHEM H2LA- H2LB	Honors General Chemistry Laboratory and Honors General Chemistry Laboratory
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Select one of the following Organic Chemistry sequences:

CHEM 51A- 51B- 51C	Organic Chemistry and Organic Chemistry and Organic Chemistry
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and accompanying labs:

CHEM 51LB- 51LC	Organic Chemistry Laboratory and Organic Chemistry Laboratory
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CHEM H52LA- H52LB	Honors Organic Chemistry Laboratory and Honors Organic Chemistry Laboratory
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Complete:

MATH 5A	Calculus for Life Sciences
MATH 5B	Calculus for Life Sciences

Select one of the following:

STATS 7	Basic Statistics
STATS 8	Introduction to Biological Statistics
MATH 2D	Multivariable Calculus

MATH 3A	Introduction to Linear Algebra
Select one of the following Physics Series:	
<b>Series A</b>	
PHYSICS 3A- 3B- 3C	Basic Physics I and Basic Physics II and Basic Physics III
PHYSICS 3LB- 3LC	Basic Physics Laboratory and Basic Physics Laboratory
<b>Series B</b>	
PHYSICS 7C- 7D- 7E	Classical Physics and Classical Physics and Classical Physics
PHYSICS 7LC- 7LD	Classical Physics Laboratory and Classical Physics Laboratory

Prerequisites for all Biological Sciences Core courses are rigorously enforced. Students must have a 2.0 cumulative grade point average in the Biological Sciences Core Curriculum, four upper-division elective courses, and three upper-division laboratories.

#### Upper-Division Writing Requirement

Students in the School of Biological Sciences have the option to satisfy the upper-division writing requirement by completing BIO SCI 100 with a minimum grade of C, followed by the completion of three upper-division laboratories selected from the following:

BIO SCI D111L	Developmental and Cell Biology Laboratory
BIO SCI E106L	Habitats and Organisms
BIO SCI E112L	Physiology Laboratory
BIO SCI E115L	Evolution Laboratory
BIO SCI E131L	Image Analysis in Biological Research
BIO SCI E140L	Evolution and the Environment Laboratory
BIO SCI E160L	Biology of Birds Lab
BIO SCI E166L	Field Biology
BIO SCI E179L	Field Freshwater Ecology
BIO SCI E186L	Population and Community Ecology Lab
BIO SCI M114L	Biochemistry Laboratory
BIO SCI M116L	Molecular Biology Laboratory
BIO SCI M118L	Experimental Microbiology Laboratory
BIO SCI M121L	Advanced Immunology Laboratory
BIO SCI N123L	Human Neuroimaging Lab
BIO SCI M130L	Advanced Molecular Lab Techniques
BIO SCI N113L	Neurobiology Laboratory

Students must earn a grade of C or better in each of the three laboratories selected. Completion of the Excellence in Research in Biological Sciences program may count as one of the three-upper division labs.

#### School Residence Requirement

After matriculation, all courses required for the major must be successfully completed at UCI. Students must be a major in the School of Biological Sciences for the 3 academic quarters (excluding summer session) immediately preceding degree certification. The School of Biological Sciences strictly enforces the UCI residence requirement. At least 36 of the final 45 units completed by a student for the bachelor's degree must be earned in residence at the UCI campus. (The School considers courses taken in the UC Education Abroad Program to be in-residence courses.)

- Biochemistry and Molecular Biology, B.S.
- Biological Sciences, B.S.
- Biological Sciences, M.S.
- Biological Sciences, Minor
- Biological Sciences, Ph.D.
- Biology/Education, B.S.
- Biotechnology Management, M.S.
- Developmental and Cell Biology, B.S.
- Ecology and Evolutionary Biology, B.S.
- Ecology and Evolutionary Biology, Graduate Program

- Exercise Sciences, B.S.
- Genetics, B.S.
- Human Biology, B.S.
- Master of Conservation and Restoration Science
- Microbiology and Immunology, B.S.
- Neurobiology and Behavior, Graduate Program
- Neurobiology, B.S.

## Faculty

Nancy M. Aguilar-Roca, Ph.D. University of California, San Diego, *Associate Professor of Teaching of Ecology and Evolutionary Biology*

Steven D. Allison, Ph.D. Stanford University, *Professor of Ecology and Evolutionary Biology; Earth System Science*

Joseph Arditti, Ph.D. University of Southern California, *Professor Emeritus of Developmental and Cell Biology* (developmental physiology of orchids)

Kavita Arora, Ph.D. University of Bombay, *Professor of Developmental and Cell Biology* (Drosophila development; TGF- $\beta$  signal transduction; cell signaling)

Dana W. Aswad, Ph.D. University of California, Berkeley, *Professor Emeritus of Molecular Biology and Biochemistry*

Peter R. Atsatt, Ph.D. University of California, Los Angeles, *Professor Emeritus of Ecology and Evolutionary Biology*

Scott Atwood, Ph.D. University of Oregon, *Assistant Professor of Developmental and Cell Biology; Dermatology*

John C. Avise, Ph.D. University of California, Davis, *UCI Distinguished Professor of Ecology and Evolutionary Biology*

Manny Azizi, Ph.D. University of Massachusetts, *Associate Professor of Ecology and Evolutionary Biology*

Pierre F. Baldi, Ph.D. California Institute of Technology, *Director of the Institute for Genomics and Bioinformatics and Distinguished Professor of Computer Science; Biological Chemistry; Biomedical Engineering; Developmental and Cell Biology; Mathematics* (artificial intelligence and machine learning, biomedical informatics, databases and data mining, environmental informatics, statistics and statistical theory)

Alan G. Barbour, M.D. Tufts University, *Distinguished Professor of Microbiology and Molecular Genetics; Ecology and Evolutionary Biology; Medicine*

Lee Bardwell, Ph.D. Stanford University, *Professor of Developmental and Cell Biology* (intracellular signaling in development and disease)

Claudia Benavente, Ph.D. University of Arizona, *Assistant Professor of Pharmaceutical Sciences; Developmental and Cell Biology* (genetics, epigenetics, cancer, pediatric cancer, retinoblastoma, osteosarcoma)

Ruth M. Benca, M.D. Ph.D. University of Chicago, *Department Chair and Professor of Psychiatry and Human Behavior; Neurobiology and Behavior*

Albert F. Bennett, Ph.D. University of Michigan, *Professor Emeritus of Ecology and Evolutionary Biology*

Rudi C. Berkelhamer, Ph.D. University of California, Berkeley, *Professor of Teaching Emerita of Ecology and Evolutionary Biology*

Hans-Ulrich Bernard, Ph.D. University of Goettingen, *Professor Emeritus of Molecular Biology and Biochemistry; Program in Public Health*

Michael W. Berns, Ph.D. Cornell University, *Arnold and Mabel Beckman Chair in Laser Biomedicine and Professor of Surgery; Biomedical Engineering; Developmental and Cell Biology*

Bruce Blumberg, Ph.D. University of California, Los Angeles, *Professor of Developmental and Cell Biology; Biomedical Engineering; Environmental Health Sciences; Pharmaceutical Sciences* (gene regulation by nuclear hormone receptors in vertebrate development physiology, endocrine disruption)

Mathew M. Blurton-Jones, Ph.D. University of California, San Diego, *Associate Professor of Neurobiology and Behavior*

Hans R. Bode, Ph.D. Yale University, *Professor Emeritus of Developmental and Cell Biology* (molecular basis of pattern formation in Hydra)

Alexander D. Boiko, Ph.D. University of Illinois at Urbana–Champaign, *Assistant Professor of Molecular Biology and Biochemistry*

Peter A. Bowler, Ph.D. University of California, Irvine, *Professor of Teaching of Ecology and Evolutionary Biology*

Matthew E. Bracken, Ph.D. Oregon State University, *Professor of Ecology and Evolutionary Biology*

Timothy J. Bradley, Ph.D. University of British Columbia, *Professor Emeritus of Ecology and Evolutionary Biology*

Adriana D. Briscoe, Ph.D. Harvard University, *Professor of Ecology and Evolutionary Biology*



Peter J. Bryant, Ph.D. University of Sussex, *Research Professor and Professor Emeritus of Developmental and Cell Biology* (tumor-suppressor genes of *Drosophila* and humans)

Susan V. Bryant, Ph.D. University of London, *Professor Emerita of Developmental and Cell Biology* (molecular basis of limb development and regeneration)

Michael J. Buchmeier, Ph.D. McMaster University, *Professor of Medicine; Microbiology and Molecular Genetics; Molecular Biology and Biochemistry*

Nancy T. Burley, Ph.D. University of Texas at Austin, *Professor of Ecology and Evolutionary Biology*

Jorge A. Busciglio, Ph.D. Universidad Nacional de Córdoba, *Professor of Neurobiology and Behavior*

Robin M. Bush, Ph.D. University of Michigan, *Professor Emeritus of Ecology and Evolutionary Biology*

Lawrence F. Cahill, Ph.D. University of California, Irvine, *Professor of Neurobiology and Behavior; Psychological Science*

Anne L. Calof, Ph.D. University of California, San Francisco, *Professor of Anatomy and Neurobiology; Developmental and Cell Biology*

Diane R. Campbell, Ph.D. Duke University, *Professor of Ecology and Evolutionary Biology*

Richard D. Campbell, Ph.D. The Rockefeller University, *Professor Emeritus of Developmental and Cell Biology* (Morphogenesis; biology of *Hydra*; fractal geometry of biological forms)

F. Lynn Carpenter, Ph.D. University of California, Berkeley, *Professor Emerita of Ecology and Evolutionary Biology*

John Charles Chaput, Ph.D. University of California, Riverside, *Professor of Pharmaceutical Sciences; Chemistry; Molecular Biology and Biochemistry* (chemical and synthetic biology)

Ken W. Cho, Ph.D. University of Pennsylvania, *Professor of Developmental and Cell Biology* (TGF- $\beta$  signaling, gene regulatory networks in development)

Olivier Cinquin, Ph.D. University College London, *Associate Professor of Developmental and Cell Biology* (mathematical modeling of networks, systems biology)

Olivier Civelli, Ph.D. Swiss Federal Institute of Technology in Zurich, *Professor of Pharmaceutical Sciences; Developmental and Cell Biology* (novel neuroactive molecules, molecular neuropharmacology)

Michael T. Clegg, Ph.D. University of California, Davis, *Donald Bren Professor and Professor Emeritus of Ecology and Evolutionary Biology*

Melanie Cocco, Ph.D. Pennsylvania State University, *Associate Professor of Molecular Biology and Biochemistry; Pharmaceutical Sciences*

Susana Cohen-Cory, Ph.D. The Rockefeller University, *Professor of Neurobiology and Behavior*

Kwasi M. Connor, Ph.D. University of Southern California, *Assistant Professor of Ecology and Evolutionary Biology*

Carl W. Cotman, Ph.D. Indiana University, *Professor of Neurology; Neurobiology and Behavior*

Karina S. Cramer, Ph.D. California Institute of Technology, *Professor of Neurobiology and Behavior*

Michael G. Cumsy, Ph.D. University of California, Berkeley, *Professor of Teaching of Molecular Biology and Biochemistry*

Michelle Digman, Ph.D. University of Illinois at Chicago, *Associate Professor of Biomedical Engineering; Developmental and Cell Biology* (biophotonics, fluorescence Spectroscopy and microscopy, nano-scale imaging, mechanotransduction, cancer cell migration, fluorescence lifetime and metabolic mapping)

Peter J. Donovan, Ph.D. University College London, *Professor of Biological Chemistry; Developmental and Cell Biology*

Aimee Lara Edinger, Ph.D. University of Pennsylvania, *Associate Professor of Developmental and Cell Biology* (cancer biology and metabolism, growth control, protein trafficking)

James J. Emerson, Ph.D. University of Chicago, *Assistant Professor of Ecology and Evolutionary Biology*

German A. Enciso Ruiz, Ph.D. Rutgers, the State University of New Jersey, *Professor of Mathematics; Developmental and Cell Biology* (applied and computational mathematics, mathematical and computational biology)

Dae Seok Eom, Ph.D. The University of Texas at Austin, *Assistant Professor of Developmental and Cell Biology* (cellular projection mediated long-range cell-to-cell communication)

Celia Faiola, Ph.D. Washington State University, *Assistant Professor of Ecology and Evolutionary Biology; Chemistry*

- Hung Y. Fan, Ph.D. Massachusetts Institute of Technology, *Professor Emeritus of Molecular Biology and Biochemistry*
- Howard J. Federoff, M.D. Ph.D. Albert Einstein College of Medicine, *Professor of Neurobiology and Behavior; Neurology*
- Donald N. Forthal, M.D. University of California, Irvine, *Professor of Medicine; Molecular Biology and Biochemistry*
- Norbert Fortin, Ph.D. Boston University, *Associate Professor of Neurobiology and Behavior*
- Donald E. Fosket, Ph.D. University of Idaho, *Professor Emeritus of Developmental and Cell Biology* (regulation of cytoskeleton formation and function)
- Christie Fowler, Ph.D. Florida State University, *Assistant Professor of Neurobiology and Behavior*
- Steven A. Frank, Ph.D. University of Michigan, *Distinguished Professor and Donald Bren Professor of Ecology and Evolutionary Biology; Logic and Philosophy of Science*
- Ron D. Frostig, Ph.D. University of California, Los Angeles, *Professor of Neurobiology and Behavior; Biomedical Engineering*
- David A. Fruman, Ph.D. Harvard University, *Professor of Molecular Biology and Biochemistry*
- Christine M. Gall, Ph.D. University of California, Irvine, *Department Chair and Distinguished Professor of Anatomy and Neurobiology; Neurobiology and Behavior*
- Sunil P. Gandhi, Ph.D. University of California, San Diego, *Associate Professor of Neurobiology and Behavior*
- David M. Gardiner, Ph.D. University of California, San Diego, *Professor of Developmental and Cell Biology* (limb development and regeneration)
- Brandon S. Gaut, Ph.D. University of California, Riverside, *Biological Sciences Associate Dean for Research and Innovation and Professor of Ecology and Evolutionary Biology*
- Donovan German, Ph.D. University of Florida, *Associate Professor of Ecology and Evolutionary Biology*
- Paul David Gershon, Ph.D. University of Liverpool, *Professor of Molecular Biology and Biochemistry*
- Charles Glabe, Ph.D. University of California, Davis, *Professor of Molecular Biology and Biochemistry*
- Michael L. Goulden, Ph.D. Stanford University, *Professor of Earth System Science; Ecology and Evolutionary Biology*
- Celia Goulding, Ph.D. King's College London, *Professor of Molecular Biology and Biochemistry; Pharmaceutical Sciences*
- Enrico Gratton, Ph.D. University of Rome, *Distinguished Professor of Biomedical Engineering; Developmental and Cell Biology; Physics and Astronomy* (design of new fluorescence instruments, protein dynamics, single molecule, fluorescence microscopy, photon migration in tissues)
- Kim Green, Ph.D. University of Leeds, *Associate Professor of Neurobiology and Behavior*
- Michael T. Green, Ph.D. University of Chicago, *Professor of Molecular Biology and Biochemistry; Chemistry* (chemical, biology, inorganic and organometallic, physical chemistry and chemical physics, theoretical and computational)
- Joshua Grill, Ph.D. Wake Forest University School of Medicine, *Associate Professor of Neurobiology and Behavior; Neurobiology and Behavior*
- Steven P. Gross, Ph.D. University of Texas at Austin, *Professor of Developmental and Cell Biology; Physics and Astronomy* (force generation by molecular motors in living cells)
- John F. Guzowski, Ph.D. University of California, Irvine, *Associate Professor of Neurobiology and Behavior*
- Barbara A. Hamkalo, Ph.D. University of Massachusetts, *Professor Emerita of Molecular Biology and Biochemistry*
- Bradford A. Hawkins, Ph.D. University of California, Riverside, *Professor Emeritus of Ecology and Evolutionary Biology*
- Patrick L. Healey, Ph.D. University of California, Berkeley, *Professor Emeritus of Developmental and Cell Biology* (plant cellular differentiation and morphogenesis, ultrastructure and histochemistry of secretory systems, early reproductive development)
- L. R. Herman, B.S. University of California, Irvine, *Academic Coordinator of Biological Sciences*
- James W. Hicks, Ph.D. University of New Mexico, *Department Chair and Professor of Ecology and Evolutionary Biology*
- Franz J. Hoffmann, Ph.D. University of Hohenheim, *Professor of Teaching Emeritus of Developmental and Cell Biology* (regeneration of cultured plant cells, somatic cell genetics)
- Yilin Hu, Ph.D. Loma Linda University, *Assistant Professor of Molecular Biology and Biochemistry*

Bradley S. Hughes, Ph.D. University of California, Irvine, *Associate Professor of Teaching of Ecology and Evolutionary Biology; Education*

Christopher C. Hughes, Ph.D. University of London, *Director of Edwards Lifesciences Center for Advanced Cardiovascular Technology and Professor of Molecular Biology and Biochemistry; Biomedical Engineering* (tissue engineering, growth and patterning of blood vessels)

George L. Hunt, Jr., Ph.D. Harvard University, *Professor Emeritus of Ecology and Evolutionary Biology*

Travis E. Huxman, Ph.D. University of Nevada, *Professor of Ecology and Evolutionary Biology*

Matthew Inlay, Ph.D. University of California, San Diego, *Assistant Professor of Molecular Biology and Biochemistry*

Mahtab F. Jafari, Pharm.D. University of California, San Francisco, *Director of the Center for Healthspan Pharmacology and Professor of Pharmaceutical Sciences; Ecology and Evolutionary Biology* (anti-aging pharmacology and preventive medicine)

Anthony A. James, Ph.D. University of California, Irvine, *Distinguished Professor and Donald Bren Professor of Microbiology and Molecular Genetics; Molecular Biology and Biochemistry*

C. Sunny Jiang, Ph.D. University of South Florida, *Department Chair and Professor of Civil and Environmental Engineering; Ecology and Evolutionary Biology; Environmental Health Sciences* (water pollution microbiology, environmental biotechnology, aquatic microbial ecology)

Pavan Kadandale, Ph.D. Rutgers, The State University of New Jersey, *Assistant Professor of Teaching of Molecular Biology and Biochemistry*

Claudia H. Kawas, M.D. University of Louisville, *Nichols Term Chair in Neuroscience and Professor of Neurology; Neurobiology and Behavior*

Herbert P. Killackey, Ph.D. Duke University, *Professor Emeritus of Neurobiology and Behavior*

Daniel J. Knauer, Ph.D. University of Nebraska, *Professor Emeritus of Developmental and Cell Biology* (human antithrombins and related serine protease inhibitors)

Natalia Komarova, Ph.D. University of Arizona, *UCI Chancellor's Professor of Mathematics; Ecology and Evolutionary Biology* (applied and computational mathematics, mathematical and computational biology, mathematics of complex and social phenomena)

Mei Kong, Ph.D. McGill University, *Associate Professor of Molecular Biology and Biochemistry*

Harold Koopowitz, Ph.D. University of California, Los Angeles, *Professor Emeritus of Ecology and Evolutionary Biology*

Stuart M. Krassner, SCE Johns Hopkins University, *Professor Emeritus of Developmental and Cell Biology* (developmental transitions of hemoflagellates)

Young Jik Kwon, Ph.D. University of Southern California, *Professor of Pharmaceutical Sciences; Biomedical Engineering; Chemical and Biomolecular Engineering; Molecular Biology and Biochemistry* (gene therapy, drug delivery, cancer-targeted therapeutics, artificially-induced cellular vesicles, multi-modal therapies)

Frank M. LaFerla, Ph.D. University of Minnesota, *Dean of the School of Biological Sciences and Professor of Neurobiology and Behavior; Neurology*

Joleah B. Lamb, Ph.D. James Cook University, *Assistant Professor of Ecology and Evolutionary Biology*

Arthur D. Lander, Ph.D. University of California, San Francisco, *Donald Bren Professor and Professor of Developmental and Cell Biology; Biomedical Engineering; Logic and Philosophy of Science* (systems biology of development, pattern formation, growth control)

Michael Leon, Ph.D. University of Chicago, *Professor Emeritus of Neurobiology and Behavior*

Audrey Chen Lew, Ph.D. University of California, Los Angeles, *Assistant Professor of Teaching of Neurobiology and Behavior*

Shin Lin, Ph.D. University of California, Los Angeles, *Professor of Developmental and Cell Biology* (combined use of biochemistry, cell biology, molecular biology, molecular biophysics to study the structure and function of proteins involved in cytoskeletal/contractile functions and signal transduction in muscle and nonmuscle cells)

Chang C. Liu, Ph.D. Scripps Research Institute, *Assistant Professor of Biomedical Engineering; Chemistry; Molecular Biology and Biochemistry* (genetic engineering, directed evolution, synthetic biology, chemical biology)

Melissa Lodoen, Ph.D. University of California, San Francisco, *Associate Professor of Molecular Biology and Biochemistry*

Anthony D. Long, Ph.D. McMaster University, *Professor of Ecology and Evolutionary Biology; Pharmaceutical Sciences*

Catherine Loudon, Ph.D. Duke University, *Professor of Teaching of Ecology and Evolutionary Biology*



Ulrike Luderer, M.D., Ph.D. Northwestern University, *Director of the Environmental Health Sciences Graduate Program and Professor of Medicine; Developmental and Cell Biology; Environmental Health Sciences; Program in Public Health*

Ray Luo, Ph.D. University of Maryland, College Park, *Professor of Molecular Biology and Biochemistry; Biomedical Engineering; Chemical and Biomolecular Engineering; Materials Science and Engineering* (protein structure, noncovalent associations involving proteins)

Andrej Luptak, Ph.D. Yale University, *Professor of Pharmaceutical Sciences; Chemistry; Molecular Biology and Biochemistry* (chemical biology)

Gyorgy Lur, Ph.D. University of Liverpool, *Assistant Professor of Neurobiology and Behavior*

Grant R. MacGregor, Ph.D. University of Sussex, *Professor of Developmental and Cell Biology* (mouse reproduction, development, homeostasis)

Richard E. MacMillen, Ph.D. University of California, Los Angeles, *Professor Emeritus of Ecology and Evolutionary Biology*

Stephen V. Mahler, Ph.D. University of Michigan, *Assistant Professor of Neurobiology and Behavior*

Jerry E. Manning, Ph.D. University of Utah, *Professor Emeritus of Molecular Biology and Biochemistry*

J. Lawrence Marsh, Ph.D. University of Washington, *Professor Emeritus of Developmental and Cell Biology* (mechanisms of neurodegeneration and molecular genetics of development)

John F. Marshall, Ph.D. University of Pennsylvania, *Professor Emeritus of Neurobiology and Behavior*

Rachel Martin, Ph.D. Yale University, *Department Vice Chair and Professor of Chemistry; Molecular Biology and Biochemistry* (analytical, chemical biology, physical chemistry and chemical physics)

Adam Martiny, Ph.D. Technical University of Denmark, *Professor of Earth System Science; Ecology and Evolutionary Biology*

Jennifer Martiny, Ph.D. Stanford University, *UCI Chancellors' Fellow and Professor of Ecology and Evolutionary Biology*

Debra K. Mauzy-Melitz, Ph.D. Marquette University, *Assistant Professor of Teaching of Developmental and Cell Biology* (role of writing in scientific teaching)

James L. McGaugh, Ph.D. University of California, Berkeley, *Research Professor and Professor Emeritus of Neurobiology and Behavior; Logic and Philosophy of Science*

Matthew J. McHenry, Ph.D. University of California, Berkeley, *Professor of Ecology and Evolutionary Biology*

Bruce L. McNaughton, Ph.D. Carleton University, *UCI Distinguished Professor of Neurobiology and Behavior*

Alexander McPherson, Ph.D. Purdue University, *Professor Emeritus of Molecular Biology and Biochemistry*

Raju Metherate, Ph.D. McGill University, *Professor of Neurobiology and Behavior*

Ronald L. Meyer, Ph.D. California Institute of Technology, *Professor Emeritus of Developmental and Cell Biology* (development of nerve connections, nerve injury, and regeneration)

John Middlebrooks, Ph.D. University of California, San Francisco, *Professor of Otolaryngology; Biomedical Engineering; Cognitive Sciences; Neurobiology and Behavior*

Edwin S. Monuki, M.D., Ph.D. University of California, San Diego, *Department Chair and Warren L. Bostick Chair in Pathology and Professor of Pathology and Laboratory Medicine; Developmental and Cell Biology*

Kailen Mooney, Ph.D. University of Colorado Boulder, *Professor of Ecology and Evolutionary Biology*

Naomi Morrisette, Ph.D. University of Pennsylvania, *Associate Professor of Molecular Biology and Biochemistry*

Seyed Ali Mortazavi, Ph.D. California Institute of Technology, *Professor of Developmental and Cell Biology; Biological Chemistry* (functional genomics to study transcriptional regulation in development)

Laurence D. Mueller, Ph.D. University of California, Davis, *Professor of Ecology and Evolutionary Biology*

R. Michael Mulligan, Ph.D. Michigan State University, *Biological Sciences Associate Dean of Graduate Studies and Professor of Developmental and Cell Biology; Ecology and Evolutionary Biology* (RNA editing in plant mitochondria and chloroplasts)

Edward L. Nelson, M.D. University of Oregon, *Associate Professor of Medicine; Molecular Biology and Biochemistry*

Andrea C. Nicholas, Ph.D. University of Chicago, *Associate Professor of Teaching of Neurobiology and Behavior*

Diane K. O'Dowd, Ph.D. University of California, San Diego, *Professor of Developmental and Cell Biology; Anatomy and Neurobiology* (regulation of activity in developing and adult nervous systems)

Ian Parker, Ph.D. University College London, *Professor of Neurobiology and Behavior; Physiology and Biophysics*

Michael J. Parsons, Ph.D. University of London, *Associate Professor of Developmental and Cell Biology* (development and regeneration of the endocrine pancreas)

Maksim Plikus, Ph.D. University of Southern California, *Associate Professor of Developmental and Cell Biology* (mechanisms of regeneration, stem cell control)

Thomas L. Poulos, Ph.D. University of California, San Diego, *Distinguished Professor of Molecular Biology and Biochemistry; Chemistry; Pharmaceutical Sciences* (chemical biology)

Ilhem Messaoudi Powers, Ph.D. Weill Cornell Graduate School of Medical Sciences, *Associate Professor of Molecular Biology and Biochemistry; Microbiology and Molecular Genetics*

Jessica Pratt, Ph.D. University of California, Irvine, *Associate Professor of Teaching of Ecology and Evolutionary Biology*

Jennifer A. Prescher, Ph.D. University of California, Berkeley, *Professor of Chemistry; Molecular Biology and Biochemistry; Pharmaceutical Sciences* (chemical biology, organic and synthetic)

James T. Randerson, Ph.D. Stanford University, *UCI Chancellor's Professor of Earth System Science; Civil and Environmental Engineering; Ecology and Evolutionary Biology*

Jose Mari Ranz Navaltro, Ph.D. Universidad Autónoma de Madrid, *Associate Professor of Ecology and Evolutionary Biology*

Olga Razorenova, Ph.D. Institute of Molecular Genetics, *Assistant Professor of Molecular Biology and Biochemistry*

Elizabeth L. Read, Ph.D. University of California, Berkeley, *Assistant Professor of Chemical and Biomolecular Engineering; Molecular Biology and Biochemistry* (dynamics of complex biochemical systems, regulation of immune responses)

Markus W. Ribbe, Ph.D. University of Bayreuth, *UCI Chancellor's Professor of Molecular Biology and Biochemistry; Chemistry* (chemical biology, inorganic and organometallic)

Alejandra Rodriguez-Verdugo, Ph.D. University of California, Irvine, *Assistant Professor of Ecology and Evolutionary Biology*

Michael R. Rose, Ph.D. University of Sussex, *Professor of Ecology and Evolutionary Biology*

Ann K. Sakai, Ph.D. University of Michigan, *Professor of Ecology and Evolutionary Biology*

Brian Sato, Ph.D. University of California, San Diego, *Associate Professor of Teaching of Molecular Biology and Biochemistry; Education*

Thomas F. Schilling, Ph.D. University of Oregon, *Department Chair and Professor of Developmental and Cell Biology* (zebrafish development, vertebrate genetics, craniofacial development)

Donald F. Senear, Ph.D. University of Washington, *Professor of Molecular Biology and Biochemistry*

Albert Siryaporn, Ph.D. University of Pennsylvania, *Assistant Professor of Physics and Astronomy; Molecular Biology and Biochemistry*

Cascade J. Sorte, Ph.D. University of California, Davis, *Associate Professor of Ecology and Evolutionary Biology*

Robert Spitale, Ph.D. University of Rochester, *Director of the UCI Transcriptomics Core and Associate Professor of Pharmaceutical Sciences; Chemistry; Molecular Biology and Biochemistry* (chemistry, chemical biology, RNA biology)

Craig Stark, Ph.D. Carnegie Mellon University, *James L. McGaugh Chair in the Neurobiology of Learning and Memory and Professor of Neurobiology and Behavior*

Arnold Starr, M.D. New York University, *Research Professor of Neurobiology and Behavior*

Oswald Steward, Ph.D. University of California, Irvine, *Director, Reeve-Irvine Research Center and Reeve-Irvine Chair in Spinal Cord Injury Research and Distinguished Professor of Anatomy and Neurobiology; Neurobiology and Behavior*

Georg F. Striedter, Ph.D. University of California, San Diego, *Professor of Neurobiology and Behavior*

Christine Suetterlin, Ph.D. University of Basel, *Associate Professor of Developmental and Cell Biology* (centrosome and cilia regulation, Golgi, host-pathogen interaction)

Katumi Sumikawa, Ph.D. Imperial College London, *Professor of Neurobiology and Behavior*

Sha Sun, Ph.D. University of Chicago, *Assistant Professor of Developmental and Cell Biology* (long noncoding RNAs in epigenetic programming)

Vivek Swarup, Ph.D. University of Laval, *Assistant Professor of Neurobiology and Behavior*

Richard Symanski, Ph.D. Syracuse University, *Professor of Teaching of Ecology and Evolutionary Biology*

Celia Symons, Ph.D. University of California, San Diego, *Assistant Professor of Ecology and Evolutionary Biology*

Andrea Tenner, Ph.D. University of California, San Diego, *Professor of Molecular Biology and Biochemistry; Neurobiology and Behavior*

Leslie M. Thompson, Ph.D. University of California, Irvine, *Chancellor's Professor and Donald Bren Professor of Psychiatry and Human Behavior; Biological Chemistry; Neurobiology and Behavior*

Katherine L. Thompson-Peer, Ph.D. Harvard Medical School, *Assistant Professor of Developmental and Cell Biology* (investigating how neurons respond and recover after injury)

Kevin Thornton, Ph.D. University of Chicago, *Associate Professor of Ecology and Evolutionary Biology*

Roberto Tinoco, Ph.D. University of California, San Diego, *Assistant Professor of Molecular Biology and Biochemistry*

Kathleen K. Treseder, Ph.D. Stanford University, *UCI Chancellor's Fellow and Professor of Ecology and Evolutionary Biology*

Shiou-Chuan (Sheryl) Tsai, Ph.D. University of California, Berkeley, *Professor of Molecular Biology and Biochemistry; Chemistry; Pharmaceutical Sciences*

Luis P. Villarreal, Ph.D. University of California, San Diego, *Professor Emeritus of Molecular Biology and Biochemistry*

Craig Walsh, Ph.D. University of California, Los Angeles, *Professor of Molecular Biology and Biochemistry*

Wenqi Wang, Ph.D. Shanghai Institutes for Biological Sciences, *Assistant Professor of Developmental and Cell Biology* (the signaling networks underlying tissue homeostasis and organ size control)

Rahul Warrior, Ph.D. Yale University, *Associate Professor of Developmental and Cell Biology* (developmental genetics of transcription and proteoglycan synthesis)

Arthur Weis, Ph.D. University of Illinois at Urbana-Champaign, *Professor Emeritus of Ecology and Evolutionary Biology*

Gregory A. Weiss, Ph.D. Harvard University, *Professor of Chemistry; Molecular Biology and Biochemistry; Pharmaceutical Sciences* (analytical, chemical biology, organic and synthetic, polymer, materials, nanoscience)

Stephen G. Weller, Ph.D. University of California, Berkeley, *Professor Emeritus of Ecology and Evolutionary Biology*

Katrine Whiteson, Ph.D. University of Chicago, *Assistant Professor of Molecular Biology and Biochemistry*

Dominik Franz X. Wodarz, Ph.D. Oxford University, *Professor of Ecology and Evolutionary Biology; Mathematics*

Marcelo A. Wood, Ph.D. Princeton University, *UCI Chancellor's Fellow and Department Chair and Professor of Neurobiology and Behavior*

Clifford A. Woolfolk, Ph.D. University of Washington, *Professor Emeritus of Molecular Biology and Biochemistry*

Zeba Wunderlich, Ph.D. Harvard University, *Assistant Professor of Developmental and Cell Biology* (understanding the organization of regulatory information in the genome)

Xaiohui Xie, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Computer Science; Developmental and Cell Biology* (computational biology, bioinformatics, genomics, neural computation, machine learning)

Guiyun Yan, Ph.D. University of Vermont, *Professor of Program in Public Health; Ecology and Evolutionary Biology*

Michael Yassa, Ph.D. University of California, Irvine, *UCI Chancellor's Fellow and Director of the Center for the Neurobiology of Learning and Memory and Associate Professor of Neurobiology and Behavior*

## Biological Sciences Courses

### BIO SCI 1A. Life Sciences. 4 Units.

Designed to introduce nonmajors to the basic concepts of modern biology. Discussion of evolutionary biology, ecology, molecular biology, and genetics.

(II)

**BIO SCI 2A. Freshman Seminar. 2 Units.**

Weekly meetings consisting of presentations by faculty, professional staff, and Peer Academic Advisors provide information about the School of Biological Sciences, campus resources, learning skills, and special programs/opportunities.

Grading Option: Pass/no pass only.

Restriction: Freshmen only. School of Biological Sciences students only.

**BIO SCI 2B. Freshman Seminar . 1 Unit.**

Faculty presentations and readings focused on the structure, function, opportunities, and current issues in the biological sciences.

Grading Option: Pass/no pass only.

Restriction: Freshmen only. School of Biological Sciences students only.

**BIO SCI 2C. Solutions in Science. 1 Unit.**

Students will be introduced to approaches that can be used to solve scientific problems. These methods can be utilized in introductory to advanced classes and will allow students to become independent thinkers.

**BIO SCI 2D. EASE Seminar. 1 Workload Unit.**

Seminars designed to help students achieve success in STEM courses. Provides collaborative learning environment facilitated by undergraduate mentor. Students develop critical thinking and study skills. Also receive guidance to campus resources that assist acclimation to University.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**BIO SCI 3A. Career Decision Making. 1 Workload Unit.**

An introductory course designed to facilitate the career decision-making process. Decision-making processes, values, and standardized tests of aptitudes, interests, and values are utilized with non-test data in appraising biological sciences career options.

Grading Option: Workload Credit P/NP Only.

**BIO SCI 3B. Non-Health Sciences Career Exploration. 1 Workload Unit.**

A survey course designed to assist students in exploring non-health science career options. Lectures by professionals in various fields.

Grading Option: Workload Credit P/NP Only.

**BIO SCI 6. Tropical Biology: Race to Save the Tropics. 4 Units.**

Population growth combines with tropical resource consumption by industrialized nations to cause high rates of deforestation, pollution, habitat fragmentation, and extinction of species. Discusses tropical biomes, their population, community, ecosystem processes, and possible means of conservation of biodiversity.

(II)

**BIO SCI 9A. Nutrition Science. 4 Units.**

An introduction to nutrition science, integrating concepts from biology, biochemistry, microbiology, physiology, and psychology to explain the interaction between nutrients and the human body. Biological basis of nutrient standards is analyzed. Effects of nutrition, behavior, exercises on health/disease.

(II)

**BIO SCI 9B. Biology and Chemistry of Food and Cooking . 4 Units.**

The kitchen is used as a laboratory to introduce fundamental principles of biology, chemistry, and physics. A molecular/cellular analysis of cooking, including concepts such as protein structure, browning reactions, colloids, emulsions, carbohydrate metabolism, and development of flavor/texture through biochemical transformations.

(II)

**BIO SCI 9D. Diseases of the Twenty-First Century . 4 Units.**

Why do we get sick? An introduction to the biological basis of human disease, including diseases of the cardiovascular, respiratory, nervous, and reproductive systems. Case studies present diagnosis, treatment, and prevention protocols. Inheritable and infectious diseases also discussed.

Overlaps with BIO SCI 10, BIO SCI 12D.

(II)

**BIO SCI 9E. Horticulture Science . 4 Units.**

Scientific principles of horticulture at the UCI Arboretum. Taxonomy, plant life history strategies; experiments with seed dormancy; morphological adaptations for specialized sexual and clonal reproduction; basics of plant propagation and ecological restoration. Materials fee.

(II)

**BIO SCI 9G. Physiology of Fitness. 4 Units.**

An introduction to the organ systems of the human body, including muscle, cardiovascular, immune, and reproductive systems, with an emphasis on how the body responds to exercise, diet, and disease.

(II)

**BIO SCI 9J. Biology of Oriental Medicine. 4 Units.**

With lectures, demonstrations, and hands-on learning, the theory and practice of herbal medicine, acupuncture, qigong, and manipulative therapies are explained in Western biomedical terms. The latest basic and clinical research advances in each area are also described.

Overlaps with BIO SCI 9N, BIO SCI D124.

(II)

**BIO SCI 9K. Global Change Biology. 4 Units.**

Field trips and lectures that address ways in which humans are altering the global environment, with consequences for the ecology of animals, plants, and microbes.

(II)

**BIO SCI 10. The Biology of Human Diseases. 4 Units.**

Introduction to concepts of diagnosis, treatment, and prevention of major human infectious diseases. Covers some aspects of epidemiology. Scope and impact of infectious diseases in the present and past experiences in controlling infectious disease. Reviews biology of human organ systems.

Overlaps with BIO SCI 9D, BIO SCI 12D.

(II)

**BIO SCI 11. Topics in Biological Sciences. 4 Units.**

Studies in selected areas of biological sciences.

Repeatability: May be taken for credit 3 times.

**BIO SCI 12. Molecular Basis of Human Disease. 4 Units.**

Describes the cause and treatment of human diseases at the cutting edge of modern molecular understanding for non-science majors, including history, interviews, and stories.

(II)

**BIO SCI 14. California Teach 1: Introduction to Science and Mathematics Teaching. 3 Units.**

First in a series for students interested in becoming middle or high school teachers of mathematics or science. Students gain an understanding of effective, research-based teaching strategies. Includes supervised field experience in a K-12 classroom.

Same as PHY SCI 5.

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment. School of Engineering students have first consideration for enrollment.

**BIO SCI 17. Evolutionary Psychology. 4 Units.**

Introductory overview of the field of evolutionary psychology. Surveys topics operating at the interface of social sciences, i.e. behavioral psychology and evolutionary biology, while developing select aspects of the history of this developing field.

(II)

**BIO SCI 23. Sustainable Landscaping: Design and Practices. 4 Units.**

Through lectures and hands-on work, students learn how to design habitats around dwellings, within cities, and in rural environments. These include traditional/sustainable landscaping, restoration, stormwater/wastewater treatment, xeriscaping, and low impact development design. Sustainable landscape plant materials emphasized.

(II)

**BIO SCI 25. Biology of Cancer. 4 Units.**

Biological, clinical, and psychosocial nature of cancer through the perspectives of medical researchers, biologists, physicians, and health educators. For students of all majors, designed so that each can increase personal awareness of the biology of cancer.

Restriction: BIO SCI 25 may not be taken for credit if taken after BIO SCI M125.

**BIO SCI 35. The Brain and Behavior. 4 Units.**

Introduction to how the brain works. Biological processes underlying perception, movement, sleep-wake cycles, motivation, language, learning, and memory. Changes in the brain associated with sex differences, drug use, aging, seasons, and time of day. Fundamental properties of the nervous system.

(II)

**BIO SCI 36. Drugs and the Brain. 4 Units.**

Introduction to the actions of drugs on the brain. How studying drug action helps reveal normal functions of neurons. How drugs can correct neural disorders or disrupt neural function. Biological issues related to drug abuse, drug addiction, and drug seeking.

(II)

**BIO SCI 37. Brain Dysfunction and Repair . 4 Units.**

Introduction to the disruptions in brain function that underlie disorders such as Alzheimer's disease, Parkinsonism, schizophrenia, and depression, and the basis for drug therapies. The brain's ability to repair itself after damage and the pros and cons of that repair.

(II)

**BIO SCI 38. Mind, Memory, Amnesia, and the Brain. 4 Units.**

Introduction to neural mechanisms underlying learning and memory. Emphasis on molecular changes that mediate memory as well as structures involved in different forms of memory. Additionally, examines the biology of memory phenomena, from extraordinary memory to false memory to amnesia.

(II)

**BIO SCI 41. Aspects of Mood Disorder. 4 Units.**

There are significant differences in response to psychiatric illness across cultures. Delves into the neuroscience underlying mood disorder, investigating current pharmacological treatments and sociocultural influences on treatment outcomes.

(II)

**BIO SCI 43. Media on the Mind. 4 Units.**

Surveys an ever-increasing collection of research, suggesting modern technology and social media are changing in the way our brains function.

(II)

**BIO SCI 44. Stem Cells and Brain Repair. 4 Units.**

Students introduced to the field of regenerative neurobiology. Both basic stem cell discoveries and their potential clinical application to brain disorders examined. Discussion of opportunities, challenges, and implications of this research.

Overlaps with BIO SCI N172.

(II)

**BIO SCI 45. AIDS Fundamentals. 4 Units.**

Considers the biological and sociological bases of the AIDS epidemic. Topics include the history of AIDS, current medical knowledge, transmission, risk reduction, and how the community can respond.

Same as PUBHLTH 80.

(II)

**BIO SCI 46. Discussion and Literature Research in AIDS. 2-4 Units.**

Students carry out two activities: (1) leading discussions about HIV/AIDS (predominantly regarding sociological and personal reactions) among students taking the AIDS Fundamentals course and (2) literature research about biomedical aspects of AIDS.

Prerequisite: BIO SCI 45 or PUBHLTH 80



**BIO SCI 47. Stress. 4 Units.**

Investigates stress at a psychological, physiological, and molecular level, and provides a current overview of the field of stress research.

(II)

**BIO SCI 55. Introduction to Ecology. 4 Units.**

Principles of ecology; application to populations, communities, ecosystems, and humans.

Restriction: No Biological Sciences Majors. BIO SCI 55 may not be taken for credit if taken after BIO SCI 96 or BIO SCI E106.

(II)

**BIO SCI 56. Life Sciencing from Aristotle to Venter. 4 Units.**

History of biology from Aristotle through to the scientific revolutions precipitated by Darwin, geneticists, molecular biologists, and now genomics. Introduces the practices and achievements of biological research to both beginning biology students and non-majors.

Overlaps with BIO SCI H90, BIO SCI H90B.

(II)

**BIO SCI 75. Human Development: Conception to Birth. 4 Units.**

Processes leading to the birth of a healthy child and the avoidance of birth defects. Male and female reproductive systems, hormonal control of egg-sperm formations, sexual intercourse, contraception, venereal diseases, fertilization, cell division, embryonic development, fetal physiology.

(II)

**BIO SCI H90. The Idiom and Practice of Science. 4 Units.**

The importance of biological sciences in our world is discussed. Topics may include brain and behavior, health and disease, genetics and society, and conservation biology. Primary goal is to encourage students to understand better the world in which they live.

Restriction: Campuswide Honors Collegium students only.

(II)

**BIO SCI 92. Curriculum. 1-4 Units.**

Initiation, planning, and coordination of student-run courses.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 12 times.

Restriction: School of Biological Sciences students only.

**BIO SCI 93. From DNA to Organisms. 4 Units.**

Cell biology, biochemistry, genetics, and the biology of organ systems. Covers concepts of building blocks (nucleotides, amino acids, and cells) and of information flow (DNA to proteins, receptors to nuclei, the blood to distant organs, and DNA to offspring).

Restriction: BIO SCI 93 may not be taken for credit if taken after BIO SCI 97 or BIO SCI 98.

(II)

**BIO SCI H93. Honors From DNA to Organisms. 4 Units.**

Cell biology, biochemistry, genetics, and the biology of organ systems. Covers concepts of building blocks (nucleotides, amino acids, and cells) and of information flow (DNA to proteins, receptors to nuclei, the blood to distant organs, and DNA to offspring).

Restriction: BIO SCI H93 may not be taken for credit if taken after BIO SCI 97 or BIO SCI 98.

(II)

**BIO SCI 94. From Organisms to Ecosystems. 4 Units.**

Patterns of diversity, ecology, and evolutionary biology. Emphasis is on the Tree of Life and how its members are distributed and interact.

Prerequisite: BIO SCI 93 or BIO SCI H93

Restriction: BIO SCI 1A may not be taken for credit if taken after BIO SCI 94.

(II)

**BIO SCI 97. Genetics. 4 Units.**

Introduction to genetics. Basic features of replication and expression of DNA, cell division, and gene transmission. Recombination and mutation in diploid organisms.

Prerequisite: BIO SCI 94

Restriction: Pharmaceutical Sciences Majors have first consideration for enrollment. Public Health Majors have first consideration for enrollment. Nursing Science Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment.

**BIO SCI H97. Honors Genetics. 4 Units.**

Introduction to genetics. Basic features of replication and expression of DNA, cell division, and gene transmission. Recombination and mutation in diploid organisms.

Restriction: Campuswide Honors Collegium students only. BIO SCI H97 may not be taken for credit if taken after BIO SCI 97.

**BIO SCI 98. Biochemistry. 4 Units.**

Structure and properties of proteins; major biochemical pathways and mechanisms for their control.

Prerequisite or corequisite: BIO SCI 97 or BIO SCI H97 and CHEM 51B

Restriction: School of Biological Sciences students have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. Nursing Science Majors have first consideration for enrollment. Pharmaceutical Sciences Majors have first consideration for enrollment. Public Health Majors have first consideration for enrollment.

**BIO SCI 99. Molecular Biology. 4 Units.**

Biochemistry and replication of nucleic acids; molecular genetics; protein biosynthesis; genetic code; regulation of expression of genetic information; biochemical evolution.

Prerequisite: BIO SCI 98

Restriction: Pharmaceutical Sciences Majors have first consideration for enrollment. Public Health Majors have first consideration for enrollment. Nursing Science Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment.

**BIO SCI 100. Scientific Writing. 3 Units.**

Designed to give an overview of the basic aspects of scientific writing relevant to reporting research in the Biological Sciences.

Prerequisite: BIO SCI 99. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: School of Biological Sciences students have first consideration for enrollment. Bio Sci and Educ Media Design Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. Pharmaceutical Sciences Majors have first consideration for enrollment.

**BIO SCI 101. California Teach 2: Middle School Science and Mathematics Teaching. 3 Units.**

Second in a series for students interested in becoming middle or high school teachers of mathematics or science. Students gain an understanding of effective, research-based teaching strategies for grades 6-8. Includes supervised field experience in a middle school classroom.

Prerequisite: PHY SCI 5

Same as PHY SCI 105.

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment. School of Engineering students have first consideration for enrollment.

**BIO SCI D103. Cell Biology. 4 Units.**

Analysis of the basic structure and function of animal cells, with an emphasis on the regulation of cellular processes. The basic features of membranes, cellular compartmentalization, protein trafficking, vesicular transport, cytoskeleton, adhesion, signal transduction, and cell cycle are covered.

Prerequisite: BIO SCI 99

Restriction: Students who require this class for completion of their degree have first consideration for enrollment.



**BIO SCI D104. Developmental Biology. 4 Units.**

Cellular and molecular analysis of how a fertilized egg develops into an organism consisting of complex structures such as the eye, arms, and brain. Emphasis is on the key concepts of developmental processes underlying pattern formation, growth, and regeneration.

Prerequisite: BIO SCI 99

Restriction: Students who require this class for completion of their degree have first consideration for enrollment.

**BIO SCI D105. Cell, Developmental, and Molecular Biology of Plants . 4 Units.**

Emphasizes the special features of plant cells and plant development as compared to animals. Two central topics: plants' ability to fuel our planet through photosynthesis, and the interactions of plants with microorganisms in making nitrogen available to other life forms.

Prerequisite: BIO SCI 97 or BIO SCI H97

Restriction: Students who require this class for completion of their degree have first consideration for enrollment.

**BIO SCI E106. Processes in Ecology and Evolution. 4 Units.**

An in-depth study of the mechanisms that drive evolution and ecology including: natural selection, mutation, genetic drift, speciation, extinction, life history patterns, population dynamics, ecosystem and community structure, predator-prey and host pathogen interactions, and social behavior.

Prerequisite: BIO SCI 94

Restriction: Students who require this class for completion of their degree have first consideration for enrollment.

**BIO SCI E106L. Habitats and Organisms. 4 Units.**

Introduces students to local habitats and organisms through required field trips and applies ecological and evolutionary principles from BIO SCI E106. Students also explore related literature.

Prerequisite: (BIO SCI 100 or BIO SCI 108) and BIO SCI E106. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Seniors only. BIO SCI E106L may not be taken for credit concurrently with or after taking BIO SCI E166. Students who require this lab for completion of their degree have first consideration for enrollment.

**(Ib)****BIO SCI E107. Seminar in Ecology and Evolutionary Biology. 2 Units.**

Invited speakers, graduate students, and faculty present current research in ecology and evolutionary biology.

Grading Option: Pass/no pass only.

Restriction: Upper-division students only. Ecology and Evolutionary Biol Majors only.

**BIO SCI 108. Research Methods. 4 Units.**

Explores tools of inquiry for developing and implementing science research projects. Students undertake independent projects requiring data collection, analysis, and modeling, and the organization and presentation of results. Additional topics include ethical issues and role of scientific literature.

Prerequisite: BIO SCI 14 or PHY SCI 5

Same as PHYSICS 193, CHEM 193.

**BIO SCI E109. Human Physiology. 4 Units.**

Functional features of the major organ systems in the human body. Emphasis on homeostasis and the interactions of organ systems in health and disease. (Discussion of behavior and brain function deferred to BIO SCI N110.).

Prerequisite: (BIO SCI 93 or BIO SCI H93) and CHEM 1C

Overlaps with PHRMSCI 120.

Restriction: Students who require this class for completion of their degree have first consideration for enrollment.

**BIO SCI N110. Neurobiology and Behavior. 4 Units.**

Consideration of the evolution of behavior, including ethological and psychological aspects and analysis of neuroanatomical, neurochemical, neurophysiological, and neuroendocrine systems underlying basic behavioral processes.

Prerequisite or corequisite: BIO SCI 99

Restriction: Students who require this class for completion of their degree have first consideration for enrollment.

**BIO SCI D111L. Developmental and Cell Biology Laboratory. 4 Units.**

Covers the division of cells, isolate cellular organelles (chloroplasts, mitochondria, nuclei), and follows changes in cells undergoing programmed cell death. Development is demonstrated in experiments showing cooperation of individual cells in forming a multicellular organism. Materials fee.

Prerequisite or corequisite: (BIO SCI 100 or BIO SCI 108) and (BIO SCI D103 or BIO SCI D104 or BIO SCI D105)

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

**(Ib)**

**BIO SCI E112L. Physiology Laboratory. 4 Units.**

Laboratory with a focus on the whole organism and its organ systems. Examples of structure-function relationships are drawn from both animal and human physiology. Cellular and molecular aspects are introduced as required. Materials fee.

Prerequisite: (BIO SCI 100 or BIO SCI 108) and (BIO SCI E109 or BME 120) and BME 121.

Overlaps with PHRMSCI 120L.

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

**(Ib)**

**BIO SCI D113. Genetics Majors Seminar. 1 Unit.**

Genetics majors attend a weekly seminar to discuss current research techniques and career opportunities in the field. Students have the opportunity to present their own independent research.

Repeatability: May be taken for credit 2 times.

Restriction: Genetics Majors only.

**BIO SCI N113L. Neurobiology Laboratory. 3 Units.**

An in-depth exploration into biology and physiology of the nervous system. Labs include neuroanatomy, electrophysiology, pharmacology, behavior, experimental design, EEG, and scientific writing. Materials fee.

Prerequisite or corequisite: (BIO SCI 100 or BIO SCI 108) and (BIO SCI N110 or BIO SCI N115A)

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

**(Ib)**

**BIO SCI D114. Developmental and Cell Biology Majors Seminar. 1 Unit.**

Developmental and Cell Biology majors attend a weekly seminar to discuss current research techniques and career opportunities in the field. Students have the opportunity to present their own independent research.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

Restriction: Developmental and Cell Biology Majors only.

**BIO SCI M114. Advanced Biochemistry. 4 Units.**

Physical-chemical properties of macromolecules. Structure-function relationships in nucleic acids, protein, carbohydrates, and lipids. Integration and regulation of metabolism. Biochemistry of organs and biochemistry of diseases.

Prerequisite: BIO SCI 99

**BIO SCI M114L. Biochemistry Laboratory. 5 Units.**

Properties of enzymes and the culture and isolation of mutants of microorganisms. Materials fee.

Prerequisite: BIO SCI 99 and (BIO SCI 100 or BIO SCI 108)

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

**(Ib)**

**BIO SCI E115L. Evolution Laboratory. 4 Units.**

Students perform experiments which illustrate important concepts in evolutionary biology such as natural selection, random genetic drift, inbreeding, age-specific selection, sexual selection, and phylogenetic reconstruction. Materials fee.

Prerequisite: (BIO SCI 100 or BIO SCI 108) and BIO SCI E106. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

(Ib)

**BIO SCI N115A. Advanced Neurobiology I. 4 Units.**

In-depth coverage of neurobiology, ranging from molecular neurobiology to functional brain imaging. Discussion of molecular, cellular, and developmental neurobiology.

Prerequisite: BIO SCI 99

Restriction: Neurobiology Majors only.

**BIO SCI N115B. Advanced Neurobiology II. 4 Units.**

In-depth coverage of neurobiology, ranging from molecular neurobiology to functional brain imaging.

Prerequisite: BIO SCI N115A

Restriction: Neurobiology Majors only.

**BIO SCI M116. Advanced Molecular Biology. 4 Units.**

Mechanisms of gene expression; special emphasis on regulatory events that occur in Eukaryotic organisms other than initiation of transcription. Chromatin structure and rearrangement, RNA polymerases, cis- and trans-acting elements, RNA processing, transport and stability, protein synthesis, trafficking, and turnover.

Prerequisite: BIO SCI 99 and (BIO SCI M114L or BIO SCI M116L)

**BIO SCI M116L. Molecular Biology Laboratory. 5 Units.**

Students perform experiments which illustrate the chemical and biological properties of nucleic acids. Emphasis is placed on recent techniques in recombinant DNA technology including gene isolation and characterization. Materials fee.

Prerequisite: BIO SCI 99 and (BIO SCI 100 or BIO SCI 108)

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

(Ib)

**BIO SCI E117A. Exercise Sciences Seminar. 3 Units.**

Students are introduced to fundamental concepts and topics in exercise science with an emphasis on developing innovative approaches for exploring the biological response to physical activity/inactivity. Interactive course with robust discussion amongst faculty and students.

Prerequisite: BIO SCI E109 and BIO SCI E112L and BIO SCI E183

**BIO SCI E117B. Exercise Sciences Seminar. 3 Units.**

Students are introduced to fundamental concepts and topics in exercise science with an emphasis on developing innovative approaches for exploring the biological response to physical activity/inactivity. Interactive course with robust discussion amongst faculty and students.

Prerequisite: BIO SCI E109 and BIO SCI E112L and BIO SCI E183

**BIO SCI E117C. Exercise Sciences Seminar. 3 Units.**

Students are introduced to fundamental concepts and topics in exercise science with an emphasis on developing innovative approaches for exploring the biological response to physical activity/inactivity. Interactive course with robust discussion amongst faculty and students.

Prerequisite: BIO SCI E109 and BIO SCI E112L and BIO SCI E183

**BIO SCI N117. Introduction to Neuroscience Clinical Trials. 4 Units.**

Provides an overview of the science of clinical development of treatments for neurological disease and injury.

Prerequisite: BIO SCI 99

**BIO SCI E118. Ecosystem Ecology. 4 Units.**

A mechanistic perspective on ecosystem processes. Covers ecosystem development, element cycling, and interactions with plants and microbes. The role of ecosystems in environmental change is also addressed.

Prerequisite: BIO SCI E106 or EARTHSS 51 or EARTHSS 60A or CHEM 51C

Same as EARTHSS 164.

Restriction: Earth System Science Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Ecology and Evolutionary Biol Majors have first consideration for enrollment.

Concurrent with EARTHSS 264.

**BIO SCI M118L. Experimental Microbiology Laboratory. 5 Units.**

Introductory general microbiology designed for preprofessional biology majors. Includes microscopy, cultivation of bacteria, morphological and biochemical characterization of bacteria, microbial metabolism, growth and genetics, microorganisms and human disease, and interactions of microorganisms with the environment. Materials fee.

Prerequisite: BIO SCI 99 and (BIO SCI 100 or BIO SCI 108)

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

**(Ib)**

**BIO SCI N118. Clinical Psychophysiology. 4 Units.**

Psychophysiology investigates the relationships between physiological processes and psychological phenomena. Technologies examined include reaction times, heart rate variability, EEGs, ERPs, magnetoencephalography, and eye tracking. Applications include diagnosis, the longitudinal assessment, and the identification of individuals at risk of disease onset.

Prerequisite: BIO SCI N110 or BIO SCI N115A or PSYCH 9A or PSCI 11A

Same as PSYCH 122P.

**(II).**

**BIO SCI E119. Selfish DNA. 3 Units.**

Focuses on the genetics and evolution of selfish DNA, and introduces necessary background knowledge from molecular biology, cytogenetics, and bioinformatics.

Prerequisite: BIO SCI 94 and BIO SCI 97

**BIO SCI M119. Advanced Topics in Immunology. 4 Units.**

Literature-based, interactive discussions focused on review of seminal historic and recent immunology literature. Student responsibilities include reading, critical evaluation, and discussion of manuscripts.

Prerequisite: BIO SCI M121

Restriction: Microbiology and Immunology Majors have first consideration for enrollment.

**BIO SCI N119. History of Neuroscience. 4 Units.**

An overview of the conceptual and technical foundations of contemporary neuroscience from ancient times to the present. The subjects include synapses, neurons, brain organization, sensory, motor and regulatory systems, learning and memory, human brain function and dysfunction.

Prerequisite: BIO SCI 35 or BIO SCI N110 or BIO SCI N115A or PSY BEH 115D or (PSYCH 9A and PSYCH 9B and PSYCH 9C)

Restriction: Upper-division students only.

Concurrent with NEURBIO 255.

**BIO SCI E120. Marine Biology . 4 Units.**

Examines the biotic and abiotic factors influencing the physiology, distribution, abundances, interactions, and evolution of marine organisms and the roles of those organisms in mediating ecosystem services and functions. A field trip is required. Materials fee.

Prerequisite: BIO SCI 94

**BIO SCI M120. Signal Transduction in Mammalian Cells. 4 Units.**

Introduction to major biochemical pathways that transmit information from extracellular cues into changes in cell behavior. Focuses on kinases, phosphatases, G proteins, second messengers, and protein-protein interactions. Includes discussion of primary research articles and experimental techniques.

Prerequisite: BIO SCI D103

**BIO SCI N120A. Human Biology I. 4 Units.**

Provides an in-depth look at cutting-edge topics in physiology and epidemiology as they relate to global issues of ethics, anthropology, and socioeconomics, providing the student with an understanding of human health beyond basic biological function.

Prerequisite: BIO SCI 99

Restriction: Human Biology Majors only.

**BIO SCI N120B. Human Biology II. 4 Units.**

Provides an in-depth look at cutting-edge topics in physiology and epidemiology as they relate to global issues of ethics, anthropology, and socioeconomics, providing the student with an understanding of human health beyond basic biological function.

Prerequisite: BIO SCI 99

Restriction: Human Biology Majors only.

**BIO SCI N120C. Human Biology III. 4 Units.**

Provides an in-depth look at cutting-edge topics in physiology and epidemiology as they relate to global issues of ethics, anthropology, and socioeconomics, providing the student with an understanding of human health beyond basic biological function.

Prerequisite: BIO SCI 99

Restriction: Human Biology Majors only.

**BIO SCI M121. Immunology with Hematology. 4 Units.**

Antibodies, antigens, antigen-antibody reactions, cells and tissues of lymphoreticular and hematopoietic systems, and individual and collective components of cell-mediated and humoral immune response.

Prerequisite: BIO SCI 98

**BIO SCI M121L. Advanced Immunology Laboratory. 4 Units.**

Emphasis is placed on learning modern techniques in immunology such as ELISAs, western blotting, and immunofluorescent staining assays. Materials fee.

Prerequisite: (BIO SCI 100 or BIO SCI 108) and BIO SCI M116L and BIO SCI M121

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

Concurrent with MOL BIO 221L.

**(Ib)****BIO SCI N121. Drug Addiction. 4 Units.**

Provides a comprehensive overview of topics in the addiction field, including drug pharmacology, models/approaches to investigate addiction, brain circuits, genetics, epigenetics, and the cellular and molecular biology of drug addiction.

Prerequisite: BIO SCI 99

Concurrent with NEURBIO 233.

**BIO SCI E122. Physiology and Pathology of the Kidney. 4 Units.**

Examines the structure, function, and pathology of the kidney. Topics include anatomy of the kidney, cellular function, urine formation, and disease states of the kidney.

Prerequisite: BIO SCI E109

**BIO SCI M122. General Microbiology. 4 Units.**

Comparative metabolism of small molecules and cell structure and relationship to microbial classification. Macromolecule synthesis and regulation, sporulation, cell division, growth, and effect of antibiotics.

Prerequisite: BIO SCI 98

**BIO SCI M123. Introduction to Computational Biology. 4 Units.**

The use of theories and methods based on computer science, mathematics, and physics in molecular biology and biochemistry. Basics in biomolecular modeling. Analysis of sequence and structural data of biomolecules. Analysis of biomolecular functions.

Prerequisite: MATH 2D or MATH 3A or STATS 7 or STATS 8

Same as BME 132, COMPSCI 183.

Concurrent with MOL BIO 223 and BME 232.

**BIO SCI N123L. Human Neuroimaging Lab. 3 Units.**

Hands-on laboratory course in human neuroimaging, with particular emphasis on using MRI to understand brain function and how it changes over the course of the lifespan and with disease.

Prerequisite: BIO SCI 93 and (BIO SCI 100 or BIO SCI 108). Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

**(Ib)**

**BIO SCI D124. Biology of Integrative Medicine. 4 Units.**

Presentation of biological principles and the latest clinical and basic research on complementary and alternative therapies (e.g., mind-body medicine, energy medicine, herbal medicine, acupuncture, manipulative therapies) and their integration with Western medicine. Lectures supplemented by demonstrations and hands-on learning sessions.

Overlaps with BIO SCI 9J, BIO SCI 9N.

**BIO SCI E124. Infectious Disease Dynamics. 4 Units.**

Learn how the immune system interacts with infectious diseases, in particular with viral infections. An introduction to basic virology and immunology, it concentrates on the way in which the immune system is critical to the prevention of infections.

Same as PUBHLTH 181.

**BIO SCI M124A. Virology. 4 Units.**

Replication of viruses in populations, animals, and the host cell. The effects of viral infection on populations, individuals, and specific molecular effects on the target cell. Role of viral infections in cancer and degenerative diseases.

Prerequisite: BIO SCI 99

Restriction: School of Biological Sciences students only.

**BIO SCI M124B. Viral Pathogenesis and Immunity. 4 Units.**

The mechanisms of viral pathogenesis and of host resistance to viruses are explored in detail. HIV-1 and Influenza-A are used as examples. In each case, viral replication, cytopathic effects, immune response, and viral evasion are discussed.

Prerequisite: BIO SCI M121 or BIO SCI M124A. Recommended: BIO SCI M122.

**BIO SCI M125. Molecular Biology of Cancer. 4 Units.**

Molecular mechanisms of carcinogenesis. Consideration of transformation by DNA tumor viruses, RNA tumor viruses, and chemical carcinogens.

Prerequisite: BIO SCI 99

**BIO SCI M126. Learning to Read Primary Literature in Biochemistry and Molecular Biology. 4 Units.**

An introduction to primary literature focusing on methods to approach, understand, and analyze scientific papers.

Prerequisite: BIO SCI 99

**BIO SCI E127. Physiological Plant Ecology. 4 Units.**

An examination of the interactions between plants and their environment. Emphasis on the underlying physiological mechanisms of plant function, adaptations and responses to stress, and the basis of the distribution of plants and plant assemblages across the landscape.

Prerequisite: EARTHSS 51 or BIO SCI 94 or (EARTHSS 60A and EARTHSS 60C)

Same as EARTHSS 168.

Restriction: Biological Sciences Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**BIO SCI E128. Chemical Ecology. 4 Units.**

An introduction to the unspoken chemical language of nature. Emphasis on interactions between insects, plants, and microbes including plant defense, pollination, and microbial warfare.

Prerequisite or corequisite: BIO SCI 94 and CHEM 1C. CHEM 1C with a grade of C- or better

**BIO SCI N129. The Transparent Brain. 5 Units.**

Teaches students how to perform new 3-D histology techniques that reveal the complex circuitry of the brain in unprecedented detail. Students work with real brain samples as part of ongoing neuroscience research projects. Materials fee.

Prerequisite: BIO SCI 93 or BIO SCI H93

Restriction: Students who require this course for completion of their degree have first consideration for enrollment.

**BIO SCI D130. Photomedicine. 4 Units.**

Studies the use of optical and engineering-based systems (laser-based) for diagnosis, treating diseases, manipulation of cells and cell function. Physical, optical, and electro-optical principles are explored regarding molecular, cellular, organ, and organism applications.

Prerequisite: PHYSICS 3C or PHYSICS 7D

Same as BME 135.

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BIO SCI E130. Forensic Genetics. 4 Units.**

Covers techniques currently used for forensic identification and paternity testing. Topics include STR, Y-STR and mitochondrial DNA tests, database searches, mixtures, allelic drop out, likelihood ratios, laboratory errors and the interaction of science and the legal system.

Prerequisite: BIO SCI 93 and BIO SCI 94

**BIO SCI M130L. Advanced Molecular Lab Techniques. 6 Units.**

Discovery-driven experimentation in the fields of molecular biology, biochemistry, and cell biology. Also involves other aspects of the lab experience including group discussion of results, scientific paper analysis, and student presentations. Materials fee.

Prerequisite: BIO SCI 100 and (BIO SCI D111L or BIO SCI M114L or BIO SCI M116L or BIO SCI M118L)

Repeatability: May be taken for credit 3 times.

Restriction: Students who require this lab for completion of their degree have first consideration for enrollment.

(Ib)

**BIO SCI E131L. Image Analysis in Biological Research. 4 Units.**

Introduction to scientific image analysis including techniques such as high-speed, time-lapse, thermal imaging, and flow visualization. Students make movies using cameras, edit and analyze images using computers, and do a writing project.

Prerequisite: (BIO SCI E106 or BIO SCI E109) and (BIO SCI 100 or BIO SCI 108)

Restriction: Seniors only.

(Ib)

**BIO SCI M131. Innate Immunity, Infection, and Pathogenesis. 4 Units.**

Role of the innate immune system in health and disease. Molecular pathways of innate immune recognition, expression, and regulation of immune receptors, signal transduction, pathogen sensors, and detection of microbial ligands. Lecture and discussion of primary research articles.

Prerequisite: BIO SCI M121 or BIO SCI M122 or BIO SCI M124A or BIO SCI M124B or BIO SCI M143

**BIO SCI N131. Human Neurodegenerative Diseases. 4 Units.**

Clinical and epidemiological aspects of neurodegenerative diseases causing dementia are reviewed, including Alzheimer's disease, Parkinson's disease, Huntington's disease, and Frontotemporal Dementia. Seminar format includes student presentation and group discussion.

Prerequisite: BIO SCI 99

**BIO SCI D132. Introduction to Precision Medicine. 4 Units.**

Introduction to the use of genomic techniques for the study of individual genomes and transcriptomes in healthy and diseased samples. Covers GWAS, current sequencing techniques, cancer genomics, and biomarker discovery.

Prerequisite: BIO SCI 99

**BIO SCI D133. Advances in Regenerative Medicine. 4 Units.**

Introduces the rapidly growing field of regenerative medicine. New developments in stem cell research are discussed. Cellular, molecular, and engineering aspects of stem cell-based organ replacement strategies are examined, with emphasis on specific regenerative therapies.

Prerequisite: BIO SCI D103 or BIO SCI D104

Overlaps with BIO SCI N172.

**BIO SCI M133. High-Resolution Structures: NMR and X-ray. 4 Units.**

Basic principles of magnetic resonance and X-ray crystallography toward the determination of high-resolution biomolecular structures.

Prerequisite: MATH 2B or MATH 5B

Restriction: Upper-division students only.

Concurrent with MOL BIO 211.

**BIO SCI E134. Microbiomes. 4 Units.**

Students develop an understanding of microbiomes in the context of both their environment and their impact on host physiology. Discussions on how microbiomes interact with the human body.

Prerequisite: BIO SCI M122

**BIO SCI N134. Cognitive Neuroepigenetics. 4 Units.**

Current topics in the emerging field of cognitive neuroepigenetics focusing on understanding the underlying epigenetic mechanisms of memory formation and persistence. Primary literature is used to explore these processes.

Prerequisite: BIO SCI N110 or BIO SCI N115A

**BIO SCI D135. Cell Biology of Human Disease. 4 Units.**

Builds on prior biology courses about the underlying cell biological mechanisms and recent treatment advances of several model diseases. Emphasizes literature searches, reading primary literature, and student group work.

Prerequisite: BIO SCI D103

**BIO SCI D136. Human Anatomy. 4 Units.**

Presents a systems approach to the analysis of human structure. Molecular, cellular, tissue, organ, and organ system levels of structure and organization are integrated throughout.

Prerequisite: BIO SCI 99

Overlaps with BIO SCI D170.

**BIO SCI E136. The Physiology of Human Nutrition . 4 Units.**

Examines the biochemical basis of energy metabolism, physiological processes in digestion and uptake, and the biochemical transformation of carbohydrates, fats, and proteins in the human body. The emphasis is on expanding the students' understanding of physiology.

Prerequisite: BIO SCI 98 and BIO SCI E109

Overlaps with BIO SCI M150.

**BIO SCI D137. Eukaryotic and Human Genetics. 4 Units.**

Structure and function of genes in eukaryotes with emphasis on special problems of genetic studies in humans. Molecular methods of genetic analysis and gene transfer are discussed. Practical applications and ethical and social issues raised by genetic studies are addressed.

Prerequisite: BIO SCI 97 or BIO SCI H97

**BIO SCI M137. Microbial Genetics. 4 Units.**

Basic principles of microbial genetics are presented as lectures for the first half of the course. The second half is devoted to applications of these principles and requires reading review and original research papers and interactions with guest lecturers.

Prerequisite: BIO SCI 98



**BIO SCI D138. Critical Thinking in Cell Biology . 4 Units.**

Builds on prior biology courses about cell biology, and works to develop a deeper understanding of experimental techniques and interpretation of experiments. A key focus will be the question of how one moves from specific examples to general.

Prerequisite: BIO SCI 99

**BIO SCI E138. Comparative Animal Physiology. 4 Units.**

Maintenance aspects of physiology: water balance; feeding and digestion; metabolism; respiration and circulation.

Prerequisite: BIO SCI E109

**BIO SCI N138. Sex Differences in the Brain. 4 Units.**

Explores the neural bases of sex influences on brain function.

Prerequisite: BIO SCI 99

**BIO SCI E139. Animal Locomotion. 4 Units.**

The physiology, biomechanics, and neuroscience that determines how animals propel themselves and navigate through the world. Considers the principles that govern the walking, running, flying, and swimming of animals, including exercising humans.

Prerequisite: BIO SCI E109

**BIO SCI E140L. Evolution and the Environment Laboratory. 4 Units.**

Explores basic topics in ecology and evolutionary biology and applications to agriculture, conservation, environmental issues, and public health. Format involves lab activities and discussion of scientific journal articles, with focus on learning to evaluate scientific evidence.

Prerequisite or corequisite: (BIO SCI 100 or BIO SCI 108) and BIO SCI E106

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

**(Ib)**

**BIO SCI E142W. Writing/Philosophy of Biology. 4 Units.**

Philosophy of biology, e.g., scientific method in biology, the structure of evolutionary theory, teleology, ethics, and evolution. Course work includes one 4,000-word and four 1,000-word papers.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as LPS 142W, PHILOS 142W.

Restriction: Juniors only.

**(Ib)**

**BIO SCI M143. Human Parasitology. 4 Units.**

Introduction to human animal-parasitic diseases including worms and protozoan infections.

Prerequisite: BIO SCI 99

**BIO SCI M144. Cell Organelles and Membranes. 4 Units.**

Structure, function, and biogenesis of biological membranes and membrane-bound organelles.

Prerequisite: CHEM 51A

**BIO SCI D145. Genomics, Development, and Medicine. 4 Units.**

Focuses on the applications of genomics and proteomics to problems in genetics, cell, and developmental biology. Students will gain a comprehensive understanding of the techniques currently used for genomics analysis and how best to apply these tools to solve problems.

Prerequisite: BIO SCI 99

**BIO SCI E145. Animal Coloration and Vision. 4 Units.**

Physiological and behavioral mechanisms of color production and vision including crypsis, mimicry, aposematism, masquerade, sexual dimorphism, and predator-prey interactions through the lens of signals, receivers, and receptors; color and polarization vision in mate choice and visual adaptations to aquatic environments.

Prerequisite or corequisite: BIO SCI E106

**BIO SCI E146. Ecosystem Services. 4 Units.**

Covers what ecosystem services are, how to classify them, what the impacts of land degradation are on ecosystem services, how to quantify and value them, and the importance of mainstreaming ecosystem services in decision-making.

Prerequisite: (EARTHSS 70A and EARTHSS 70B) or (EARTHSS 51 and EARTHSS 53 and EARTHSS 55)

Same as EARTHSS 154.

**BIO SCI N147. Hearing and the Brain. 4 Units.**

An overview of brain mechanisms of hearing, including perception of simple sounds, speech, and music. Begins with sound itself, and looks at processing by the ear, auditory pathways, auditory cortex, and beyond. Also auditory development, learning, and clinical issues.

Prerequisite: PSYCH 160A or BIO SCI 93 or BIO SCI H93

Same as PSYCH 161H.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Biological Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**BIO SCI D148. Development and Disease. 4 Units.**

Development of animal embryos from a fertilized egg to a functioning organism. Topics include reproduction, body-axis formation, growth and differentiation of embryonic cells, and organogenesis, with an emphasis on congenital birth defects and diseases that disrupt these processes.

Prerequisite: BIO SCI D103 or BIO SCI D104

**BIO SCI E150. Conservation Biology. 4 Units.**

Genetic and ecological issues in conservation biology, including effects of human population growth, the value of biodiversity, conservation genetics, demography, metapopulation dynamics, community and ecosystem processes, species invasions, global climate change, and reserve design and management.

Prerequisite: BIO SCI E106

**BIO SCI N150. Brain Dysfunction and Repair. 4 Units.**

Introduction to the disruptions in brain function that underlie disorders such as Alzheimer's disease, Parkinsonism, schizophrenia, and depression, and the basis for drug therapies. The brain's ability to repair itself after damage and the pros and cons of that repair.

Prerequisite: BIO SCI N110 or BIO SCI N115A

Restriction: Neurobiology Majors only.

**BIO SCI E151. Evolutionary and Ecological Principles in Medicine. 4 Units.**

Explore the dynamics of populations on an ecological, epidemiological, and medical level. Considers the dynamics of competition, predation, and parasitism; the spread and control of infectious diseases; and the in vivo dynamics of viral infections and the immune system.

Prerequisite: BIO SCI 93

Same as PUBHLTH 182.

Concurrent with ECO EVO 251.

**BIO SCI N151. Neurobiology of Aging. 4 Units.**

Multidisciplinary overview of the functional capacity of the aging brain, its structural changes and the mechanisms underlying function and structure. Emphasis is on successful brain aging and those mechanisms which lead to the development of Alzheimer's disease.

Prerequisite: BIO SCI N110 or BIO SCI N115A

**BIO SCI N152. Developmental Neurobiology. 4 Units.**

The development of the nervous system is discussed with emphasis on the processes that underlie the appearance of complex and highly ordered neural circuits. Topics include neural induction, specification, migration and death; axon growth, and neural circuit formation.

Prerequisite: BIO SCI 93 or BIO SCI H93

**BIO SCI E153. Functional and Structural Evolutionary Genomics. 4 Units.**

Function and organization of genomes analyzed from an evolutionary perspective. Review of some of the most recent experimental approaches in genome analysis and comparative genomics. Relevant software to analyze DNA and expression data is used.

Prerequisite: BIO SCI 97 or BIO SCI H97

Concurrent with ECO EVO 253.

**BIO SCI N153. Neuropharmacology. 4 Units.**

Survey of neurotransmitter systems, focusing on how transmitters are made, how they interact with their receptors, and how drugs can influence these processes to alter neural function and behavior.

Prerequisite: BIO SCI N110 or BIO SCI N115A

**BIO SCI E154. Genetics and Human History. 4 Units.**

Explores topics in human health/history from an evolutionary perspective, with emphasis on genetics. Topics include the relationship between genetics and human disease as an evolutionary question, and how modern genetic techniques are used to study the history of human populations.

Prerequisite or corequisite: BIO SCI E106

**BIO SCI N154. Molecular Neurobiology. 4 Units.**

Nature and actions of genes/gene products that regulate the functioning of the nervous system and its interaction with muscles. Topics include neural control of gene expression; genetics and molecular biology of neural and neuromuscular diseases; gene therapies for neural disorders.

Prerequisite: BIO SCI 99

**BIO SCI E155. Physiology in Extreme Environments. 4 Units.**

An in-depth look at the physiological mechanisms that allow animals, including humans, to be physically active and survive in extreme environments. Physiological responses to high altitude, diving, microgravity, deserts, and extreme cold are examined.

Prerequisite: BIO SCI 94

**BIO SCI N155. Wiring the Developing Brain . 4 Units.**

The development of the nervous system is discussed with particular emphasis on the processes that underlie the appearance of complex and highly ordered neural circuits. Basic neurodevelopmental processes are discussed and correlated with normal brain function/dysfunction.

Prerequisite: BIO SCI N110 or BIO SCI N115A or BIO SCI N152

**BIO SCI N156. Molecular Mechanisms of Memory. 4 Units.**

Current topics focused on understanding the molecular mechanisms that contribute to synaptic plasticity, learning, and memory. Primary literature is used to explore the variety of molecular mechanisms underlying these processes.

Prerequisite: BIO SCI 99

**BIO SCI N158. Neurobiology of Learning and Memory. 4 Units.**

How the brain and behavior change as a result of experience, with an emphasis on identifying the neurochemical processes through which memory is stored and the parts of the brain that are involved.

Prerequisite: BIO SCI 35 or BIO SCI N110 or BIO SCI N115A

**BIO SCI N159. Animal Behavior. 4 Units.**

Explores why animals behave the way they do from evolutionary/mechanistic perspectives. Considers selective pressures and evolutionary constraints that shape animal behavior and the underlying neural and hormonal mechanisms by using examples such as why dogs bark, why some birds migrate.

Prerequisite: BIO SCI N110 or BIO SCI N115A

**BIO SCI E160. Biology of Birds. 4 Units.**

A thorough introduction to the biology of birds, covering topics ranging from avian anatomy and physiology to behavior, natural history, ecology, genetics, evolution, systematics, and conservation. Examples from both local and global avifauna.

Corequisite: BIO SCI E160L

Prerequisite: BIO SCI 94

**BIO SCI E160L. Biology of Birds Lab. 4 Units.**

The companion to Biology of Birds (E160). Consists primarily of field trips to identify local birds and study avian natural history. Students must provide their own transportation to field sites, some with entrance fees. Students must have field binoculars.

Corequisite: BIO SCI E160

Prerequisite: (BIO SCI 100 or BIO SCI 108)

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

**(Ib)**

**BIO SCI M160. Structure-Function Relationships of Integral Membrane Proteins. 4 Units.**

Integral membrane proteins such as voltage and ligand-gated ion channels, water channels, pumps, cotransporters, and receptors (e.g., GPCRs). The emphasis is on the relationship between atomic structure and the functional properties of these proteins.

Prerequisite: BIO SCI 98 and BIO SCI 99. BIO SCI 98 with a grade of B or better. BIO SCI 99 with a grade of B or better

Concurrent with MOL BIO 255.

**BIO SCI N160. Language and the Brain . 4 Units.**

Research analysis on biological bases of human linguistic capacity. Development, focusing on hemispheric specialization, plasticity; localization of specific linguistic functions in adults, with emphasis on study of aphasias; relation of linguistic capacity to general cognitive capacity, considering research on retardation.

Prerequisite: (PSYCH 7A or PSY BEH 9 or PSYCH 9A or PSY BEH 11A) and (PSYCH 9B or PSY BEH 11B or BIO SCI 35 or BIO SCI N110 or BIO SCI N115A)

Same as LSCI 158, PSYCH 161.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Biological Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**BIO SCI N165. Brain Disorders and Behavior. 4 Units.**

Examines the localization of human brain functions and the effects of neurological disorders on psychological functions such as perception, motor control, language, memory, and decision-making.

Prerequisite: (PSYCH 7A or PSY BEH 9) and (PSYCH 9A or PSY BEH 11A) and (PSYCH 9B or PSY BEH 11B) or BIO SCI 35 or BIO SCI N110

Same as PSYCH 160D.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Biological Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**BIO SCI E166L. Field Biology. 4 Units.**

Conducting group and independent studies in Southern California ecosystems, this course covers the fundamentals of experimental design, statistical analysis, communicating scientific findings (orally, visually, in writing), and other skills necessary for the scientific investigation of biological processes in the field. Materials fee.

Prerequisite: (BIO SCI 100 or BIO SCI 108) and BIO SCI E106. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Seniors only.

**(Ib)**

**BIO SCI N166. Introduction to Cognitive Neuroscience. 4 Units.**

Introduction to the neural basis of human perceptual, motor, and cognitive abilities. Topics include sensory perception, motor control, memory, language, attention, emotion, frontal lobe function, functional brain imaging, and neuropsychological disorders.

Prerequisite: PSYCH 7A or (PSYCH 9A and PSYCH 9B) or PSY BEH 9 or (PSY BEH 11A and PSY BEH 11B) or BIO SCI 35 or BIO SCI N110 or BIO SCI N115A

**BIO SCI E168. Evolution. 4 Units.**

An integrative treatment of evolutionary biology that covers evolutionary processes, basic research methods, and the history of life.

Prerequisite: BIO SCI E106

**BIO SCI D170. Applied Human Anatomy. 6 Units.**

Systems approach to analyze the form and function of the human body with an emphasis on applying anatomical concepts to evaluate clinical cases. The laboratory will use human models and a simulated cadaver dissection for structure. Materials fee.

Prerequisite: BIO SCI E109 or PHRMSCI 120. BIO SCI E109 with a grade of C or better. PHRMSCI 120 with a grade of C or better

Overlaps with BIO SCI D136.

**BIO SCI N170. Clinical Neuroscience. 4 Units.**

An introduction to the neuroclinical bases of human behavior, including neuropsychological approaches to mental disorders. Also includes case formulations, research articles, therapeutic approaches, and other discussions related to select psychopathology and other neurobehavioral topics.

Prerequisite: PSCI 9 or PSYCH 7A or PSCI 11A or PSYCH 9A or BIO SCI 99

Same as PSCI 160C.

Restriction: Psychological Science Majors have first consideration for enrollment. Biological Sciences Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**BIO SCI E172. Plant Diversity in a Changing World. 4 Units.**

Investigation of planet diversity in California and throughout the world, including basic systematic concepts, an introduction to major groups of flowering plants, and the effects of global biological change on plant diversity.

Prerequisite: BIO SCI E106

Concurrent with ECO EVO 272.

**BIO SCI N172. Regenerative Neurobiology. 4 Units.**

Explores the field of regenerative neurobiology. Both basic stem cell discoveries and their potential clinical application to brain disorders examined. Opportunities, challenges, and implications of this research also discussed.

Prerequisite: BIO SCI N110 or BIO SCI N115A

Overlaps with BIO SCI 44, BIO SCI D133.

**BIO SCI N173. Human Neuropsychology. 4 Units.**

A survey of human brain disorders using a clinical case study approach to illustrate fundamental issues in studying brain and behavior. Topics include sensory deficits, attentional neglect, amnesia, cortical organization, clinical psychopathology, and more.

Prerequisite: BIO SCI N110 or BIO SCI N115A or PSYCH 9A or PSCI 11A

Same as PSCI 163C, PSYCH 162N.

Restriction: School of Biological Sciences students have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**BIO SCI N174. Principles of Neural Computation. 4 Units.**

Introduction to the theoretical principles and biological mechanisms underlying how brains acquire, assimilate, store, and retrieve information, and how they compute adaptive responses to external inputs.

Prerequisite: BIO SCI N110 or BIO SCI N115A

Concurrent with NEURBIO 220.

**BIO SCI N176. Cerebral Cortex: Structure, Function, and Plasticity. 4 Units.**

The cerebral cortex is highly developed in mammals and is responsible for higher perceptual and cognitive functions. Explores some amazing aspects of cortical structure, function, and plasticity emphasizing primary literature.

Prerequisite: BIO SCI N110 or BIO SCI N115A

**BIO SCI E179. Limnology and Freshwater Biology. 4 Units.**

Biology of freshwater environments: lakes, ponds, rivers, their biota, and the factors which influence distribution of organisms.

Corequisite: BIO SCI E179L

Prerequisite: BIO SCI 94

**BIO SCI E179L. Field Freshwater Ecology. 4 Units.**

Analytical techniques for common water-quality variables of lakes, streams, and rivers. Benthic fauna, vertebrates and invertebrates, algae, and aquatic plants. Emphasis on field methods with an experimental approach; laboratory exercises. Field trips to marshes, vernal pools, rivers, and streams. Materials fee.

Corequisite: BIO SCI E179

Prerequisite or corequisite: (BIO SCI 100 or BIO SCI 108) and BIO SCI E179

Restriction: Seniors only. Students who require this lab for completion of their degree have first consideration for enrollment.

**(Ib)**

**BIO SCI M180. Biotechnological Applications of Energy and Environmental Research. 4 Units.**

Covers microbiological and biochemical background related to current biotechnological applications, case studies of biotech-companies, and basic information related to patents and start-up companies. Topics include biofuel, bioremediation, agricultural, and environmental applications.

Prerequisite: BIO SCI 98

**BIO SCI E182. Mediterranean Ecosystems: Biodiversity and Conservation. 4 Units.**

Biodiversity, history of human impacts, and conservation efforts are examined in the five Mediterranean-type ecosystems. Remaining natural habitat, approaches to ecological habitat restoration, control of exotic species, and predicted consequences of global climate change are described. Field trip required.

Prerequisite: BIO SCI 94

**BIO SCI N182. Vision. 4 Units.**

Visual perception and the anatomy and physiology of the visual system. Topics include the retina and the visual pathway; visual sensitivity; color vision; spatial vision; motion perception; and the development of the visual system.

Same as PSYCH 131A.

Overlaps with PSYCH 130A.

Restriction: Upper-division students only. Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment.

**BIO SCI E183. Exercise Physiology. 4 Units.**

Focus upon critical topics in the area of exercise biology using the comparative physiological approach. Specifically examine the physiological factors that limit the capacity of an organism to sustain high levels of aerobic metabolism.

Prerequisite: BIO SCI 98 and BIO SCI E109

**BIO SCI E184. Ecology and Diversity of Insects. 4 Units.**

Insects—representing two-thirds of all species—play fundamental roles in human health, agriculture, and natural ecosystems. Topics include insect morphology, development, physiology, taxonomy, ecology, and insects in human affairs. Lecture includes interactive demonstrations and an optional weekend trip. Materials fee.

Prerequisite: BIO SCI E106

**BIO SCI E186. Population and Community Ecology. 4 Units.**

Population structure, function, development, and evolution. Topics include population structure, population growth and regulation, metapopulations, predation, competition, species diversity, ecosystem function, macroecology, and island biogeography. Offered every other Winter.

Prerequisite: BIO SCI E106

**BIO SCI E186L. Population and Community Ecology Lab. 4 Units.**

Covers processes specific to groups of the same species (populations) and multiple species (communities). Includes growth, regulation, dynamics, and persistence of populations and community interactions, development, diversity, and macroecology. Lab activities focus on application of population prediction and biodiversity assessment.

Prerequisite: BIO SCI E106 and (BIO SCI 100 or BIO SCI 108). Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Seniors only.

**(Ib)**

**BIO SCI E187. Exercise as Medicine. 4 Units.**

Explores the link between regular physical activity and health, focusing on mechanistic insights into how regular exercise improves overall health and alters disease trajectories of cancer, type-II diabetes, depression, and other chronic illnesses.

Prerequisite: BIO SCI E109

**BIO SCI E188. Introduction to Insect Physiology. 4 Units.**

Physiology of insects. Insect respiration, digestion, excretion, and neurobiology, including sensory systems and effectors.

Prerequisite: BIO SCI E109

**BIO SCI E189. Environmental Ethics. 4 Units.**

History of evolution of environmental ethics in America. Management problems in national parks, wilderness areas, wild and scenic rivers, national forests. Contemporary and historical aspects/contributors to the field. Mitigation, endangered species, habitat restoration, biodiversity, and environmental activism. Field trips required.

Restriction: Upper-division students only.

**BIO SCI 190. Transfer Student Seminar. 1 Unit.**

Weekly meetings consisting of presentations by faculty, professional staff, and New Student Peer Academic Advisors provide information about the School of Biological Sciences, campus resources, and special programs/opportunities.

Grading Option: Pass/no pass only.

Restriction: New transfer students only.

**BIO SCI D190. Topics in Developmental and Cell Biology. 2-4 Units.**

Studies in selected areas of developmental and cell biology.

Prerequisite: BIO SCI D103

Repeatability: May be taken for credit 3 times as topics vary.

Restriction: Upper-division students only. School of Biological Sciences students only.

**BIO SCI E190. Topics in Ecology and Evolutionary Biology. 2-4 Units.**

Studies in selected areas of ecology and evolutionary biology.

Prerequisite: BIO SCI E106

Repeatability: May be taken for credit 3 times as topics vary.

**BIO SCI M190. Topics in Molecular Biology and Biochemistry. 2-4 Units.**

Studies in selected areas of Molecular Biology and Biochemistry.

Prerequisite: BIO SCI 98

Repeatability: May be taken for credit 3 times as topics vary.

**BIO SCI N190. Topics in Neurobiology and Behavior. 2-4 Units.**

Studies in selected areas of neurobiology and behavior.

Prerequisite: BIO SCI N110 or BIO SCI N115A

Repeatability: May be taken for credit 3 times as topics vary.

**BIO SCI 191A. Senior Seminar on Global Sustainability I. 2 Units.**

Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum is also required. Seminar utilized to analyze forum presentations. Prepare bibliography.

Same as SOCECOL 186A, EARTHSS 190A.

Restriction: Seniors only. Global Sustainability Minors have first consideration for enrollment.

**BIO SCI 191B. Senior Seminar on Global Sustainability II. 2 Units.**

Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum is also required. Seminar utilized to analyze forum presentations. Prepare research proposal.

Prerequisite: BIO SCI 191A or SOCECOL 186A or EARTHSS 190A

Same as SOCECOL 186B, EARTHSS 190B.

Restriction: Seniors only.

**BIO SCI 191CW. Writing/Senior Seminar on Global Sustainability III. 4 Units.**

Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum also is required. Seminar utilized to analyze Forum presentations and to prepare senior research paper. Prepare/write research paper under direction of faculty member.

Prerequisite: BIO SCI 191B or EARTHSS 190B or SOCECOL 186B. BIO SCI 191B or EARTHSS 190B or SOCECOL 186B. Satisfactory completion of the Lower-Division Writing requirement.

Same as EARTHSS 190CW, SOCECOL 186CW.

Restriction: Seniors only.

**(Ib)****BIO SCI 192. Tutoring in Biology. 2 Units.**

Tutoring program with Biological Sciences student peers.

Repeatability: May be taken for credit 6 times.

Restriction: Biological Sciences Peer Tutoring Program students only.

**BIO SCI 193A. Campus as a Living Lab I. 2-4 Units.**

Students study sustainability concepts and theories and how they apply to our most pressing environmental, social, and economic challenges. Concurrently, they work on hands-on projects to improve the sustainability of campus operations and systems.

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Upper-division students only.

**BIO SCI 193B. Campus as a Living Lab II. 2-4 Units.**

Students study sustainability concepts and theories and how they apply to our most pressing environmental, social, and economic challenges. Concurrently, they work on hands-on projects to improve the sustainability of campus operations and systems.

Prerequisite: BIO SCI 193A

Restriction: Upper-division students only.

**BIO SCI 193C. Campus as a Living Lab III. 2-4 Units.**

Students study sustainability concepts and theories and how they apply to our most pressing environmental, social, and economic challenges. Concurrently, they work on hands-on projects to improve the sustainability of campus operations and systems.

Prerequisite: BIO SCI 193B

Restriction: Upper-division students only.

**BIO SCI 194. Current Topics in Biology. 1 Unit.**

A seminar designed to discuss recent research findings and experimental issues in biology.

Corequisite: BIO SCI 199

Grading Option: Pass/no pass only.

Repeatability: Unlimited as topics vary.

**BIO SCI 194S. Safety and Ethics for Research. 1 Unit.**

Introduces students to the concepts, techniques, and ethics involved in biological sciences laboratory work.

Grading Option: Pass/no pass only.



**BIO SCI H195. Honors Topics in Biological Sciences. 4 Units.**

Varied course topics in Biological Sciences designed for students in Honors in Biological Sciences.

Repeatability: May be taken for credit 2 times.

Restriction: Biological Sciences Honors students only.

**BIO SCI 197. Special Study in Biological Sciences. 1-5 Units.**

Individualized instruction dealing with conceptual or theoretical problems in the biological sciences, rather than technical problems.

Prerequisite: BIO SCI 94

Repeatability: May be repeated for credit unlimited times.

Restriction: Maximum of 5 units (per quarter) between BIO SCI 197, BIO SCI 198, and BIO SCI 199.

**BIO SCI 198. Directed Group Studies. 1-5 Units.**

Small group experimental laboratory or field work performed under the direction of a faculty member.

Prerequisite: BIO SCI 94

Repeatability: May be repeated for credit unlimited times.

**BIO SCI 199. Independent Study in Biological Sciences Research. 1-5 Units.**

Individual experimental laboratory or field research under a professor's direction. Required for participation in the Excellence in Research Program.

Prerequisite: BIO SCI 94

Repeatability: Unlimited as topics vary.

**BIO SCI 285. Topics in Allied Health Microbiology. 4 Units.**

Basic microbiology with emphasis for allied health professions such as nursing. Emphasis is on micro-organisms involved in human health, disease and food safety.

Prerequisite: BIO SCI 98

Repeatability: May be taken for credit for 4 units as topics vary.

Overlaps with BIO SCI M122, BIO SCI M118L.

Restriction: Program in Nursing Science students only. Master of Nursing Degree students only.

## Developmental and Cell Biology Courses

**DEV BIO 200A. Research in Developmental and Cell Biology. 2-12 Units.**

Independent research with Developmental and Cell Biology faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**DEV BIO 200B. Research in Developmental and Cell Biology. 2-12 Units.**

Independent research with Developmental and Cell Biology faculty.

Prerequisite: DEV BIO 200A

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**DEV BIO 200C. Research in Developmental and Cell Biology . 2-12 Units.**

Independent research with Developmental and Cell Biology faculty.

Prerequisite: DEV BIO 200B

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**DEV BIO 200R. Research in Developmental & Cell Biology for First-year Students. 2-12 Units.**

Independent research within the laboratories of graduate training faculty in the Department of Developmental and Cell Biology for first-year Ph.D. students.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

**DEV BIO 203A. Graduate Tutorial in Developmental and Cell Biology. 4 Units.**

Advanced study in areas not represented by formal courses. May involve individual or small group study through discussion, reading, and composition. Time and subject matter arranged individually.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**DEV BIO 203B. Graduate Tutorial in Developmental and Cell Biology. 4 Units.**

Advanced study in areas not represented by formal courses. May involve individual or small group study through discussion, reading, and composition. Time and subject matter arranged individually.

Prerequisite: DEV BIO 203A

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**DEV BIO 203C. Graduate Tutorial in Developmental and Cell Biology. 4 Units.**

Advanced study in areas not represented by formal courses. May involve individual or small group study through discussion, reading, and composition. Time and subject matter arranged individually.

Prerequisite: DEV BIO 203B

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**DEV BIO 206A. Developmental and Cell Biology Journal Club. 2 Units.**

Advanced study of various topics in cell biology.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**DEV BIO 206B. Developmental and Cell Biology Journal Club. 2 Units.**

Advanced study of various topics in cell biology.

Prerequisite: DEV BIO 206A

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**DEV BIO 206C. Developmental and Cell Biology Journal Club. 2 Units.**

Advanced study of various topics in cell biology.

Prerequisite: DEV BIO 206B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**DEV BIO 207. Mouse Developmental Genetics. 4 Units.**

Introduction to using the mouse in contemporary biomedical research. The biology and development of the laboratory mouse, methods for manipulation of the mouse genome and embryos, and examples of application of these methods to understand mammalian development and homeostasis.

Same as BIOCHEM 215.

Restriction: Graduate students only.

**DEV BIO 212. Topics in Systems Biology. 2 Units.**

Studies in selected areas of Systems Biology.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**DEV BIO 214. Principles of Genomics. 4 Units.**

A survey course of the principal subfields of genomics and their applications to biological and health sciences that will cover genome assembly and annotation, genome structure, comparative genomics, population genomics, functional genomics, and medical genomics.

Same as MOL BIO 244.

Restriction: Graduate students only.

**DEV BIO 231B. Cell Biology. 4 Units.**

A broadly based course including topics in extracellular matrix, cytoskeleton, organelle biogenesis, receptor-mediated endocytosis, signal transduction, cell cycle, and developmental biology.

Concurrent with BIO SCI D154.

**DEV BIO 232. Systems Cell and Developmental Biology. 4 Units.**

Introduces concepts needed to understand cell and developmental biology at the systems level, i.e., how the parts (molecules) work together to create a complex output. Emphasis on using mathematical/computational modeling to expand/modify insights provided by intuition.

Same as BME 213.

Restriction: Graduate students only.

**DEV BIO 245. Stem Cell Biology. 4 Units.**

The basic characteristics and development roles of embryonic, adult, and cancer stem cells in the human body and in model systems and the use of experimental and genetic methods to analyze and manipulate their properties.

Restriction: Graduate students only.

**DEV BIO 290A. Colloquium in Developmental and Cell Biology. 2 Units.**

Contemporary research problems. Research students, faculty, and other invited speakers introduce research and review topics.

Restriction: Graduate students only.

**DEV BIO 290B. Colloquium in Developmental and Cell Biology. 2 Units.**

Contemporary research problems. Research students, faculty, and other invited speakers introduce research and review topics.

Prerequisite: DEV BIO 290A

Restriction: Graduate students only.

**DEV BIO 290C. Colloquium in Developmental and Cell Biology. 2 Units.**

Contemporary research problems. Research students, faculty, and other invited speakers introduce research and review topics.

Prerequisite: DEV BIO 290B

Restriction: Graduate students only.

**DEV BIO 292A. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**DEV BIO 292B. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Prerequisite: DEV BIO 292A

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**DEV BIO 292C. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Prerequisite: DEV BIO 292B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**DEV BIO 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## **Ecology and Evolutionary Bio Courses**

**ECO EVO 200A. Research in Ecology and Evolutionary Biology. 2-12 Units.**

Individual research with Ecology and Evolutionary Biological faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ECO EVO 200B. Research in Ecology and Evolutionary Biology. 2-12 Units.**

Individual research with Ecology and Evolutionary Biological faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ECO EVO 200C. Research in Ecology and Evolutionary Biology. 2-12 Units.**

Individual research with Ecology and Evolutionary Biological faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ECO EVO 201. Seminar in Ecology and Evolutionary Biology. 2 Units.**

Invited speakers, graduate students, and faculty present current research in ecology and evolutionary biology.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

Concurrent with BIO SCI E107.

**ECO EVO 203A. Graduate Tutorial in Ecology and Evolutionary Biology. 2-12 Units.**

Advanced study in areas not represented by formal courses. May involve individual or small group study through reading, discussion, and composition.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ECO EVO 203B. Graduate Tutorial in Ecology and Evolutionary Biology. 2-12 Units.**

Advanced study in areas not represented by formal courses. May involve individual or small group study through reading, discussion, and composition.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ECO EVO 203C. Graduate Tutorial in Ecology and Evolutionary Biology. 2-12 Units.**

Advanced study in areas not represented by formal courses. May involve individual or small group study through reading, discussion, and composition.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ECO EVO 204. Writing Grant Proposals. 4 Units.**

Provides students with hands-on experience writing proposals in the research areas of ecology, evolution, or physiology.

Restriction: Graduate students only.

**ECO EVO 205. Special Topics in Ecology. 4 Units.**

Survey of special topics in Ecology.

Restriction: Graduate students only.

**ECO EVO 206. Special Topics in Evolution. 4 Units.**

Extensive introduction to the primary literature of evolutionary biology. Topics include population genetics, quantitative genetics, neutralism, molecular evolution, evolution of genetic systems, genetic architecture of fitness, speciation, and macroevolution.

Restriction: Graduate students only.

**ECO EVO 207. Quantitative Methods in Ecology and Evolutionary Biology. 4 Units.**

Statistics for ecologists and evolutionary biologists. Emphasis on specific applications and underlying assumptions rather than on methods of calculation. Topics include experimental design, parametric and nonparametric methods, analysis of variance and covariance, and multiple regression.

Prerequisite: Completion of at least one quarter of statistics including regression and analysis of variance.

Restriction: Graduate students only.

**ECO EVO 208. Ecological and Evolutionary Physiology. 4 Units.**

A summary of information in organismal biology, comparative and ecological physiology, and the biophysical basis of organismal function. Course offered every other fall.

Restriction: Graduate students only.

**ECO EVO 210. Foundations of Physiology. 4 Units.**

Physical and functional principles common to many living forms. Course forms a basis for subsequent specialization in any of the subdisciplines of physiology. Course offered in even years.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 219. Advanced Topics in Ecological Genetics. 4 Units.**

Content and instructor will vary from year to year. Possible topics include coevolution, sex-ratio evolution, evolution senescence, plant population biology, and density-dependent selection.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 221. Advanced Topics in Ecology. 2-4 Units.**

Weekly discussion of current topics in ecology at the graduate level.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

**ECO EVO 222. Statistical Learning in Ecology and Evolution. 4 Units.**

Reviews basic principals of variance/bias trade-offs. Topics include models for prediction and classification, variable selection methods, cross-validation, tree based methods, unsupervised learning. Applications in ecology and evolution using R.

Prerequisite: ECO EVO 207. ECO EVO 207 with a grade of B or better

Restriction: Graduate students only.

**ECO EVO 227. Plant Physiological Ecology. 4 Units.**

Provides a summary of information on plant organismal biology, comparative and ecological physiology, and functional ecology. Offered every other fall.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 228. Seminar in Conservation Biology. 2 Units.**

Devoted to the application of basic ecological principles to the understanding and resolution of environmental problems of both local and global natures. Current problems approached through a combination of readings, group discussions, and visiting speakers.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 230. Topics in Microbial Ecology. 2-4 Units.**

Weekly discussion of current topics in ecology, biogeochemistry, evolution, and physiology of microbial organisms.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**ECO EVO 235. Experimental Evolution. 2 Units.**

Explores experimental evolution, which is now a well-established part of evolutionary biology. With the advent of genomics, it is now one of the most powerful tools for studying the genetic foundations of biology.

Prerequisite: BIO SCI E106

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Biological Sciences students only.

**ECO EVO 246. Seminar in Ecology and Evolution Education. 2 Units.**

Weekly discussion of teaching techniques and challenges that are specific to courses in ecology and evolutionary biology. Emphasis will be on using evidence-based pedagogy techniques. There will be a combination of readings, group discussions and speakers.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 251. Evolutionary and Ecological Principles in Medicine. 4 Units.**

Explore the dynamics of populations on an ecological, epidemiological, and medical level. Considers the dynamics of competition, predation, and parasitism; the spread and control of infectious diseases; and the in vivo dynamics of viral infections and the immune system.

Restriction: Graduate students only.

Concurrent with BIO SCI E151.

**ECO EVO 253. Functional and Structural Evolutionary Genomics. 4 Units.**

Function and organization of genomes analyzed from an evolutionary perspective. Review of some of the most recent experimental approaches in genome analysis and comparative genomics. Relevant software to analyze DNA and expression data is used.

Concurrent with BIO SCI E153.

**ECO EVO 262. Professional Workshop. 2 Units.**

Identify and attend professional or technical skill workshops to gain professional knowledge and certifications related to conservation and restoration science.

Repeatability: May be taken for credit 4 times.

Restriction: Graduate students only.

**ECO EVO 264. Conservation Biology. 4 Units.**

Explores concepts in ecology with potential for conserving biological diversity. Identifies creative applications of ecological research that mitigate impacts of rapid human population growth and habitat destruction on biodiversity.

Restriction: Graduate students only.

**ECO EVO 265. Restoration Ecology. 4 Units.**

Study of principles and practices that help recover degraded ecosystems including restoration in different ecological systems, restoration motives and intensities, implementation and monitoring, and scope and success of case studies.

Restriction: Graduate students only.

**ECO EVO 266L. Field Methods in Restoration. 4 Units.**

Laboratory experience performing field methods that help recover degraded ecosystems in different ecological systems. Emphasis on the plant community composition, soil, irrigation, maintenance, and monitoring of a project.

**ECO EVO 267. Science Communication. 2 Units.**

Develops students' abilities to convey information related to conservation and restoration in a way that has broad appeal and/or effective messaging for non-scientific audiences by assessing the audience, developing effective storytelling, and deploying a persuasive information campaign.

Repeatability: May be taken for credit 2 times.

**ECO EVO 268. Technical Writing. 2 Units.**

Practice developing key documents for restoration projects including a response to a request for proposal (RFP), a restoration project plan, and a monitoring and maintenance plan.

**ECO EVO 269. Project Management. 2 Units.**

Discover the planning, design, implementation, and aftercare phases of managing a conservation or restoration project. Students will project cost, manage risk, analyze sites, evaluate and review projects, and become familiar with common permitting and consultation requirements.

**ECO EVO 270. GIS for Environmental Science. 4 Units.**

Introduction to the fundamental principles of GIS. Topics include cartography, creating/editing GIS data, georeferencing, map projections, geospatial analysis, spatial statistics, and development of GIS models. Focuses on theory and practice.

Restriction: Graduate students only.

**ECO EVO 271. Marine Research and Conservation Methods. 4 Units.**

Field-based introduction to marine ecology and conservation management through the study of the ecology, resource management, and conservation of marine habitats and species, and the use of a variety of marine field research methods.

Restriction: Graduate students only.

**ECO EVO 272. Plant Diversity in a Changing World. 4 Units.**

Investigation of plant diversity in California and throughout the world, including basic systematic concepts, introduction to major groups of flowering plants, and the effects of global biological change on plant diversity. Students carry out a phylogenetic analysis using appropriate software.

Concurrent with BIO SCI E172.

**ECO EVO 275. Wildlife Ecology and Sampling. 4 Units.**

Field-based introduction to wildlife management through the study of the ecology, physiology, population biology management, and conservation of vertebrate wildlife species, and the use of a variety of different wildlife sampling techniques.

Restriction: Graduate students only.

**ECO EVO 282. Fundamentals of Informatics for Biologists. 4 Units.**

Students learn the fundamentals of bioinformatics and the unix operating system (including the shell and Sun Grid Engine) in order to assemble a eukaryotic genome.

Restriction: Graduate students only.

**ECO EVO 283. Advanced Informatics for Biologists. 4 Units.**

Students learn advanced informatics including the analysis of: Poolseq, RNAseq, ATACseq, and ChIPseq datasets using programs such as bwa, tophat, cufflinks, DEseq, Trinity, Augustus, etc., in a unix high-performance computing environment. Statistical tests carried out and publication quality.

Prerequisite: ECO EVO 282

Restriction: Graduate students only.

**ECO EVO 285. Topics in Evolutionary Genetics. 2 Units.**

Weekly discussion of recent research on evolutionary genetics.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 286. MCRS Capstone. 2-12 Units.**

Apply knowledge and skills in a practical professional setting, working with practitioners to identify a conservation or management problem and then to plan, implement, and evaluate a solution.

Repeatability: May be taken for credit for 12 units.

Restriction: Graduate students only.

**ECO EVO 287. Communicating Research Through Video. 4 Units.**

Students explore videography to develop basic production skills through practice with high interest special topics, such as laboratory experimental evolution and educational interdisciplinary field events, and then develop media to communicate their own research or other topics of interest.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 288. Documenting Research Through Cinematic Production. 4 Units.**

Students gain advanced media expertise by conceptualizing investigative research into publicly engaging video projects. Popularly accessible research topics will be adapted into documentary, television, or cinematic pieces that provide opportunities for developing professionally marketable skills in educationally effective media production.

Prerequisite: ECO EVO 287

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 341. Teaching Science in Secondary School. 4 Units.**

Prospective secondary science teachers learn how to teach science in grades 7-12. Covers State science requirements, a variety of teaching methods, criteria for selecting science curricular materials, and how to plan science lessons, units, experiments, projects, and demonstrations.

Same as EDUC 341.

Restriction: Master of Arts in Teaching Degree students only.

**ECO EVO 398. Teaching Assistant Seminar. 2 Units.**

Readings, lectures, workshops, and student presentations designed to help develop teaching skills of graduate students teaching university-level biology classes. Topics vary and may include: course organization, presentation styles, exam design, grading, motivating students, and commonly encountered problems.

Repeatability: May be repeated for credit unlimited times.

**ECO EVO 399. University Teaching. 4 Units.**

Mandatory course for Ecology and Evolutionary Biology Teaching Assistants, required in each quarter in which student has a Teaching Assistant position. Limited to Teaching Assistants.

Repeatability: May be repeated for credit unlimited times.



## Molecular Biology and Biochem Courses

### **MOL BIO 200A. Research in Molecular Biology and Biochemistry. 2-12 Units.**

Individual research with Molecular Biology and Biochemistry faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

### **MOL BIO 200B. Research in Molecular Biology and Biochemistry. 2-12 Units.**

Individual research with Molecular Biology and Biochemistry faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

### **MOL BIO 200C. Research in Molecular Biology and Biochemistry. 2-12 Units.**

Individual research with Molecular Biology and Biochemistry faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

### **MOL BIO 200R. Research in Developmental & Cell Biology for First-year Students. 2-12 Units.**

Independent research within the laboratories of graduate training faculty in the Department of Molecular Biology and Biochemistry for first-year Ph.D. students.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

### **MOL BIO 201A. Seminars in Molecular Biology & Biochemistry. 2 Units.**

Presentation of research from department laboratories or, when pertinent, of other recent developments.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

### **MOL BIO 201B. Seminars in Molecular Biology & Biochemistry. 2 Units.**

Presentation of research from department laboratories or, when pertinent, of other recent developments.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

### **MOL BIO 201C. Seminars in Molecular Biology & Biochemistry. 2 Units.**

Presentation of research from department laboratories or, when pertinent, of other recent developments.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

### **MOL BIO 202A. Tutorial in Molecular Biology and Biochemistry. 2 Units.**

Tutorials in the area of research of a particular professor which relate current research to the literature. May be conducted as journal clubs.

Repeatability: Unlimited as topics vary.

### **MOL BIO 202B. Tutorial in Molecular Biology and Biochemistry. 2 Units.**

Tutorials in the area of research of a particular professor which relate current research to the literature. May be conducted as journal clubs.

Repeatability: Unlimited as topics vary.

### **MOL BIO 202C. Tutorial in Molecular Biology and Biochemistry. 2 Units.**

Tutorials in the area of research of a particular professor which relate current research to the literature. May be conducted as journal clubs.

Repeatability: Unlimited as topics vary.

**MOL BIO 203. Nucleic Acid Structure and Function. 4 Units.**

Structure and chemistry of nucleic acids. Relationship between these properties and the mechanisms of fundamental processes such as replication and repair, RNA-mediated catalysis, formation and regulation of higher order chromatin structure and recombination.

Prerequisite: BIO SCI 98 and BIO SCI 99 and CHEM 51A and CHEM 51B and CHEM 51C

**MOL BIO 204. Protein Structure and Function. 4 Units.**

The structure and properties of proteins, enzymes, and their kinetic properties.

Prerequisite: BIO SCI 98 and BIO SCI 99 and CHEM 51C

**MOL BIO 205. Molecular Virology. 4 Units.**

Primary research data on the major DNA and RNA viruses emphasizing strategies of regulation of gene expression. Utilization of viruses as molecular biological tools. Graduate-level knowledge of the biochemistry and molecular biology of macromolecules is required.

Prerequisite: MOL BIO 203 and MOL BIO 204

Restriction: Graduate students only.

**MOL BIO 211. High-Resolution Structures: NMR and X-ray. 4 Units.**

Basic principles of magnetic resonance and x-ray crystallography toward the determination of high-resolution biomolecular structures.

Prerequisite: MATH 2B

Restriction: Graduate students only.

Concurrent with BIO SCI M133.

**MOL BIO 213. Literature in Nucleic Acid Structure and Function. 2 Units.**

Exploration and critical analysis of recent primary scientific literature in structure, properties, and biological mechanisms involving nucleic acids.

Corequisite: MOL BIO 203

Grading Option: Satisfactory/unsatisfactory only.

**MOL BIO 214. Literature in Protein Structure and Function. 2 Units.**

Exploration and critical analysis of recent primary scientific literature in structure and properties of proteins, enzymes, and their kinetic properties.

Corequisite: MOL BIO 204

Grading Option: Satisfactory/unsatisfactory only.

**MOL BIO 215. Integrative Immunology. 4 Units.**

Lectures and student presentations of primary literature. The main goal is to achieve a basic understanding of the cellular and molecular basis of innate and adaptive immunity, and how immune function is coordinated at a systems level.

Same as M&MG 215.

**MOL BIO 217A. Principles of Cancer Biology I. 4 Units.**

Oncogenes and tumor suppressor genes are studied from molecular viewpoints. Also studies their role in cancer; viral carcinogenesis. Designed for graduate students interested in cancer research. Format includes lectures and student-led discussions.

Prerequisite: MOL BIO 203 and MOL BIO 204

Restriction: Graduate students only.

**MOL BIO 217B. Principles of Cancer Biology II. 4 Units.**

Topics include cancer cell growth and metastasis, chemical carcinogenesis, and cancer genetics and epidemiology. Designed for graduate students interested in cancer research. Format includes lectures and student-led discussions.

Prerequisite: MOL BIO 203 and MOL BIO 204

Restriction: Graduate students only.

**MOL BIO 218. Clinical Cancer. 3 Units.**

Designed to acquaint students in basic life science with clinical cancer.

Restriction: Graduate students only.

**MOL BIO 220. Structure & Synthesis of Biological Macromolecules Journal Club. 2 Units.**

Advanced topics in macromolecular structure and synthesis as related to biological problems.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**MOL BIO 221. Advanced Topics in Immunology. 4 Units.**

Literature-based, interactive discussions focused on review of seminal historic and recent immunology literature. Student responsibilities include reading, critical evaluation, and discussion of manuscripts.

Prerequisite: M&MG 215

Restriction: Graduate students only.

**MOL BIO 221L. Advanced Immunology Laboratory. 4 Units.**

An advanced course in immunology for graduate students enrolled in the Biotechnology master's program. Emphasis is placed on learning modern techniques in immunology such as ELISAs, western blotting, immunofluorescent staining assays.

Restriction: Graduate students only.

Concurrent with BIO SCI M121L.

**MOL BIO 223. Introduction to Computational Biology. 4 Units.**

The use of theories and methods based on computer science, mathematics, and physics in molecular biology and biochemistry. Basics in biomolecular modeling. Analysis of sequence and structural data of biomolecules. Analysis of biomolecular functions.

Same as BME 232.

Restriction: Graduate students only.

Concurrent with BIO SCI M123 and COMPSCI 183 and BME 132.

**MOL BIO 227. Immunology Journal Club. 2 Units.**

Advanced topics in immunology as related to an understanding of human disease.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 15 times.

Restriction: Graduate students only.

**MOL BIO 229. Research-in-Progress Seminars. 1 Unit.**

Two half-hour presentations by graduate students and postdoctorals to the department on their current research projects.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 15 times.

Restriction: Graduate students only.

**MOL BIO 235. Literature in Chemical and Structural Biology. 1 Unit.**

Exploration and critical analysis of recent primary scientific literature in chemical and structural biology.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**MOL BIO 243. Topics in Stem Cells. 2-4 Units.**

Presentation by participating faculty or guest lecturer that is open to the science community, followed by discussion of the lecture topic or a related topic. Students are responsible for presentations and readings.

**MOL BIO 244. Principles of Genomics. 4 Units.**

A survey course of the principal subfields of genomics and their applications to biological and health sciences that will cover genome assembly and annotation, genome structure, comparative genomics, population genomics, functional genomics, and medical genomics.

Same as DEV BIO 214.

Restriction: Graduate students only.

**MOL BIO 248. Metallobiochemistry . 4 Units.**

A review of the biochemistry of metallic elements emphasizing: methods for studying metals in biological systems; the chemical basis for nature's exploitation of specific elements; structures of active sites; mechanisms; solid-state structures and devices; metals in medicine.

Prerequisite or corequisite: CHEM 131C or CHEM 132C

Same as CHEM 218.

**MOL BIO 250. Advanced Topics in Biotechnology - Nucleic Acids. 2 Units.**

Supplements laboratory curriculum with scientific background behind experimental methods. Format consists of lectures and the presentation and analysis of relevant papers from the scientific literature.

Corequisite: MOL BIO 250L

Restriction: Graduate students only. Biotechnology Majors only.

**MOL BIO 250L. Biotechnology Laboratory - Nucleic Acids. 8 Units.**

Nucleic acid techniques and recombinant DNA technology. Extraction and purification of nucleic acids, cloning and subcloning, PCR, site-directed mutagenesis, nucleic acid hybridization, additional associated procedures. Students must demonstrate accurate documentation of data (laboratory notebook) detailing experience and results.

Corequisite: MOL BIO 250

Restriction: Graduate students only. Biotechnology Majors only.

**MOL BIO 251. Advanced Topics in Biotechnology - Protein Purification and Characterization. 2 Units.**

Supplements laboratory curriculum with scientific background behind experimental methods. Format consists of lectures and the presentation and analysis of relevant papers from the scientific literature.

Corequisite: MOL BIO 251L

Prerequisite: MOL BIO 250L and MOL BIO 250

Restriction: Graduate students only. Biotechnology Majors only.

**MOL BIO 251L. Biotechnology Laboratory - Protein Purification and Characterization. 8 Units.**

Major techniques of handling proteins and antibodies. Protein engineering, expression and large-scale purification of recombinant proteins from bacteria, HPLC, antibody purification, western blotting, additional associated procedures. Students must demonstrate accurate documentation of data (laboratory notebook) detailing experience and results.

Corequisite: MOL BIO 251

Prerequisite: MOL BIO 250L and MOL BIO 250

Restriction: Graduate students only. Biotechnology Majors only.

**MOL BIO 252L. Biotechnology Management Laboratory. 8 Units.**

Overview of current methods in biotechnology, designed specifically for biotechnology graduate students. Organized into four distinct sections (nucleic acids, proteins, virology, and immunology). Students must demonstrate accurate documentation of data (laboratory notebooks) detailing experience and results.

Restriction: Graduate students only. Biotechnology Majors only.

**MOL BIO 253. Biotech Management . 5 Units.**

Taught jointly by Bio Sci and Merage School faculty, the course addresses fundamental aspects within, and associated with, the biotechnology industry. Curriculum is focused largely on management issues, including finance, product development, pharmaceuticals, project management, regulatory affairs, and ethics.

Same as MGMTMBA 293.

Restriction: Graduate students only. Biotechnology Majors only.

**MOL BIO 253L. Stem Cell Laboratory. 4 Units.**

Designed to prepare M.S. Biotechnology program students for a career in stem cell research. Laboratory training utilizes tissue culture, mouse and human embryonic stem cells, and is enhanced with didactic material and discussion.

Prerequisite: MOL BIO 250L and MOL BIO 251L

Restriction: Graduate students only. Biotechnology Majors only.

**MOL BIO 268. Seminar in Systems Microbiology Research. 1 Unit.**

A research and journal club seminar that covers topics on bacteria and phage using approaches and principles from biology, engineering, and physics.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Same as PHYSICS 268, ENGRMSE 267.

Restriction: Upper-division students only. Graduate students only.

**MOL BIO 270. Science Communication Skills. 2 Units.**

Development of effective communication skills, oral and written presentations. Topics range from the art of creating keynote slides to strategically crafting a personal story, culminating in a live presentation to an invited audience.

**MOL BIO 291. Graduate School Fundamentals. 2 Units.**

Lectures and discussions providing basic skills needed for success in Ph.D. graduate studies. Topics include formulating a hypothesis, experimental design, literature review, grant writing, oral communication, biostatistics, time management, and professional development.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Cellular and Molecular Biosci Majors only.

**MOL BIO 292A. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**MOL BIO 292B. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**MOL BIO 292C. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**MOL BIO 293A. Cancer Biology Journal Club. 1 Unit.**

Focuses on molecular mechanisms that underlie the development and progression of cancers. Covers a variety of cancer-related research areas, such as cell cycle control, apoptosis, DNA repair, metastasis, angiogenesis, and others.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**MOL BIO 293B. Cancer Biology Journal Club. 1 Unit.**

Focuses on molecular mechanisms that underlie the development and progression of cancers. Covers a variety of cancer-related research areas, such as cell cycle control, apoptosis, DNA repair, metastasis, angiogenesis, and others.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**MOL BIO 293C. Cancer Biology Journal Club. 1 Unit.**

Focuses on molecular mechanisms that underlie the development and progression of cancers. Covers a variety of cancer-related research areas, such as cell cycle control, apoptosis, DNA repair, metastasis, angiogenesis, and others.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**MOL BIO 295. Biomedical Research Methods. 2 Units.**

Lectures and interactive discussions of research methods in modern biomedical science. Each week will focus on a different class of techniques, including molecular, biochemical, immunological, genomic, bioinformatics, microscopy, cancer biology, genome editing. One hour per week, grading based on attendance.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Cellular and Molecular Biosci Majors only.

**MOL BIO 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Restriction: Graduate students only.

## **Neurobiology and Behavior Courses**

**NEURBIO 200A. Research in Neurobiology and Behavior. 2-12 Units.**

Individual research with Neurobiology and Behavior faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 200B. Research in Neurobiology and Behavior. 2-12 Units.**

Individual research with Neurobiology and Behavior faculty.

Prerequisite: NEURBIO 200A

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 200C. Research in Neurobiology and Behavior. 2-12 Units.**

Individual research with Neurobiology and Behavior faculty.

Prerequisite: NEURBIO 200B

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 201A. Research in Neurobiology and Behavior. 2-12 Units.**

Individual research with Neurobiology and Behavior faculty.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 201B. Research in Neurobiology and Behavior. 2-12 Units.**

Individual research with Neurobiology and Behavior faculty.

Prerequisite: NEURBIO 201A

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 201C. Research in Neurobiology and Behavior. 2-12 Units.**

Individual research with Neurobiology and Behavior faculty.

Prerequisite: NEURBIO 201B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 202A. Foundations of Neuroscience. 2 Units.**

Intended to expose students to critical reading and analysis of the primary neuroscience literature. Instructors from departments associated with the Interdepartmental Neuroscience Program participate and discuss topics of current interest.

Grading Option: Satisfactory/unsatisfactory only.

**NEURBIO 202B. Foundations of Neuroscience. 2 Units.**

Intended to expose students to critical reading and analysis of the primary neuroscience literature. Instructors from departments associated with the Interdepartmental Neuroscience Program participate and discuss topics of current interest.

Prerequisite: NEURBIO 202A

Grading Option: Satisfactory/unsatisfactory only.

**NEURBIO 206. Molecular Neuroscience. 5 Units.**

Surveys molecular and cellular mechanisms involved in neuronal function, including control of gene expression, post-transcriptional and post-translational processing, RNA and protein targeting, cell death mechanisms, and molecular genetic basis of neurological disorders. Overview of the molecular aspects of developmental neurobiology.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 207. Cellular Neuroscience. 5 Units.**

Neurophysiological and neurochemical mechanisms of electrical and chemical signaling in neurons. Topics include generation of resting- and action-potentials, voltage- and ligand-gated ion channels, second messenger systems, and synaptic transmission and integration.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 207L. Cellular Neuroscience Laboratory. 2 Units.**

Intensive hands-on laboratory experience of contemporary techniques for studying ion channels and synaptic function. Experiments include microelectrode recording, patch clamp, quantal analysis of synaptic transmission, heterologous expression of genes for channels and receptors, brain slice, and fluorescence calcium imaging.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 208. Systems Neuroscience. 5 Units.**

Study of the mammalian nervous system at the systems level. Anatomy and physiology of sensory, motor, and integrative functions.

Repeatability: May be taken for credit 2 times.

Same as ANATOMY 210A.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 209. Behavioral Neuroscience. 5 Units.**

Overview of fundamental conceptual and experimental issues in the neurobiology of learning and memory. The approach is a cross-level integration of research in molecular-genetic, cellular, circuit, systems, and behavioral analyses.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 220. Neural Coding, Computation, and Dynamics. 4 Units.**

Theoretical principles and biological mechanisms underlying how brains acquire, assimilate, store, and retrieve information, compute adaptive responses to external inputs, and how knowledge is extracted from experience to generate an internal model of the world.

Prerequisite: At least one upper-division course in the field of Neuroscience or one upper-division course in Cognitive Science or Machine Learning.

Concurrent with BIO SCI N174.

**NEURBIO 221. Scientific Presentation Skills. 1 Unit.**

A tutorial seminar on developing skills for presenting research to scientific audiences.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**NEURBIO 225. Rigor, Reproducibility, and Research Methods. 1 Unit.**

Understanding key concepts in experimental design, execution, and analysis that enhance or detract from scientific rigor.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**NEURBIO 227. Bioinformatics and Systems Biology. 4 Units.**

Students learn the fundamentals of bioinformatics, genomic approaches, and Linux and R program in order to analyze RNA-sequencing data.

Overlaps with ECO EVO 282, ECO EVO 283.

Restriction: Graduate students only.

**NEURBIO 228. Psychophysiological Methods in Clinical Research . 4 Units.**

Introduces the principal signals of psychophysiology and outlines how measures calculated from these signals can be applied in clinical research and practice.

Prerequisite: One graduate or undergraduate course in statistics.

Restriction: Graduate students only.

**NEURBIO 230. Epigenetics in Health and Disease . 4 Units.**

Focuses on the role of chromatin/nuclear structure organization (histone and DNA modification, chromatin remodeling, higher order chromatin structure and nuclear organization) on gene regulation, DNA replication and repair, relevant to development, metabolism, learning and memory, and human disease.

Prerequisite: MOL BIO 203 or MOL BIO 204 or NEURBIO 206

Same as BIOCHEM 225.

Restriction: Graduate students only.

**NEURBIO 231. Clinical and Epidemiological Aspects of Neurodegenerative Diseases. 4 Units.**

Clinical and epidemiological aspects of neurodegenerative disorders causing dementia will be reviewed, including AD, PD, FTD, HD and cerebrovascular disease. Seminar format will include student presentations and group discussion.

Restriction: Graduate students only.

**NEURBIO 232. Regenerative Neurobiology. 4 Units.**

Surveys the latest research on regenerative neurobiology. Both basic stem cell discoveries and their potential clinical application to brain disorders will be examined.

**NEURBIO 233. Neurobiology of Drug Addiction. 4 Units.**

Provides a comprehensive overview of topics in the addiction field, including drug pharmacology, models/approaches to investigate addiction, brain circuits, genetics, epigenetics, and the cellular and molecular biology of drug addiction.

Restriction: Graduate students only.

Concurrent with BIO SCI N121.



**NEURBIO 236. Cortex: Structure, Function, and Plasticity. 4 Units.**

Structured to include lectures and presentation of papers about cortex with emphasis on sensory-motor cortex. Both historical and current perspectives on cortical structure-function relationship will be critically evaluated.

**NEURBIO 237. Neurobiology of Brain Aging. 4 Units.**

Outlines some of the significant changes that occur in the aging brain, with a special emphasis on risk factors and protective strategies that promote successful brain aging. Topics include changes in synaptic plasticity, neurotrophic factors, and molecular mechanisms in aging.

Prerequisite: NEURBIO 209

**NEURBIO 239. Functional Imaging of the Nervous System. 4 Units.**

Overview of technical and applied aspects of imaging techniques available for studying the nervous system. The areas emphasized are cellular and subcellular imaging of neural function, systems-level imaging of brain function, and imaging of the human brain.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 240. Advanced Analysis of Learning and Memory. 4 Units.**

Advanced analysis of contemporary research concerning the nature and neurobiological bases of learning and memory. Special emphasis is given to time-dependent processes involved in memory storage.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 247. Programming for Neuroscience Research . 4 Units.**

A neuroscience-specific introduction to programming and data analysis using either MATLAB or Scientific PYTHON. Students will learn general programming skills and effective use of programming for data management, statistical analysis, and image analysis.

Overlaps with PSYCH 205A.

**NEURBIO 248. Topics in Neurobiology and Behavior. 4 Units.**

Studies in selected areas of Neurobiology and Behavior. Topics addressed vary each quarter.

Repeatability: May be taken for credit 3 times.

**NEURBIO 249. Electronics for Biologists. 4 Units.**

Basic principles of electricity; properties and use of discrete components and integrated circuits; circuit analysis and design. Intended for advanced students in the life sciences.

Same as PHYSIO 205.

**NEURBIO 254. Molecular Neurobiology. 4 Units.**

The application of genetic and recombinant DNA technology to neurobiology. Topics include the study of neuronal proteins which play important roles in the formation of synapses and synaptic transmission.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 255. Perspectives in Neuroscience: Past, Present, and Future. 4 Units.**

An overview of the conceptual and technical foundations of contemporary neuroscience from ancient times to the present. The subjects include synapses, neurons, brain organization, sensory, motor and regulatory systems, learning and memory, human brain function and dysfunction.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

Concurrent with BIO SCI N119.

**NEURBIO 257. Statistics for Neurobiologists. 4 Units.**

Introduction to common methods for statistical analysis used in neurobiology. Topics covered include t-tests, ANOVAs, correlations and regressions, general linear model, power analysis, and non-parametric tests.

Restriction: Graduate students only.

**NEURBIO 260. Auditory Neuroscience. 4 Units.**

Multidisciplinary overview of brain mechanisms of hearing. Emphasizes breadth of auditory function and research: single neurons to psychoacoustics, the cochlea to the cortex, and basic science to clinic.

Concurrent with BIO SCI N147.

**NEURBIO 290. Colloquium in Neurobiology and Behavior. 1.3 Unit.**

Presentation of contemporary research problems in neurobiology and behavior and related areas by invited speakers.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 292. Scientific Proposals for Neuroscience Trainees. 4 Units.**

Students learn how to effectively communicate scientific ideas and results. Activities include learning how to effectively write a scientific proposal, how to perform a coherent, persuasive slide presentation, and how to give meaningful, constructive review critiques.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 399. University Teaching. 1-4 Units.**

Limited to Teaching Assistants.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Biological Sciences, B.S.

The Biological Sciences major presents a unified, in-depth study of modern biology. The Biological Sciences Core is a five-quarter series of courses ranging from ecology and evolutionary biology, to genetics, biochemistry, and molecular biology. Important laboratory techniques and methodology are presented in upper-division laboratories. Advanced elective courses provide an opportunity to continue to diversify students' exposure to the biological sciences or to gain a much more in-depth study of a particular area of the biological sciences.

**NOTE:** Biological Sciences majors who successfully complete their second year of study may elect to apply for a change of major to one of the following: Biochemistry and Molecular Biology, Developmental and Cell Biology, Exercise Sciences, Genetics, Human Biology, Microbiology and Immunology, or Neurobiology. Students may apply directly to the Biology/Education major or the Ecology and Evolutionary Biology major when they apply for admission to UCI. Contact the Biological Sciences Student Affairs Office for more information.

In the event that the number of students who elect Biological Sciences as a major exceeds the number of positions available, applicants may be subject to screening beyond minimum University of California admissions requirements.

**Freshmen:** Preference will be given to those who rank the highest using the selection criteria as stated in the Undergraduate Admissions section of this *Catalogue*.

**Transfer students:** Junior-level applicants with the highest grades overall and who satisfactorily complete course prerequisites will be given preference for admission. All applicants must complete one year of general chemistry with laboratory with grades of C or better; one year of organic chemistry with laboratory with grades of C or better; one year of biology courses equivalent to BIO SCI 93, BIO SCI 94 at UCI with a grade of C or better in each course; and have a cumulative GPA of 3.0 or higher.

No student may enter as a double major, but Biological Sciences students interested in other areas may apply to become double majors after the first quarter, if the second school or program approves. A strong academic performance in the second area is requisite for acceptance as a double major.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Major Requirements

A. Required Major Courses:

Select three of the following:

BIO SCI D103	Cell Biology
BIO SCI D104	Developmental Biology
BIO SCI D105	Cell, Developmental, and Molecular Biology of Plants
BIO SCI E106	Processes in Ecology and Evolution
BIO SCI E109	Human Physiology
BIO SCI N110	Neurobiology and Behavior

B. Upper-Division Laboratories:

Select three of the following:

BIO SCI D111L	Developmental and Cell Biology Laboratory
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## Planning a Program of Study

Since biological sciences courses are built upon a base of the physical sciences, it is very important for students to take their required physical sciences early, particularly general and organic chemistry. Students who have not completed high school chemistry are well advised to complete a preparatory chemistry course before entering UCI. The academic program shown below is only a suggested program. Students should consult the Biological Sciences Student Affairs Office for individual academic planning.

Freshmen will normally take HUMAN 1A and HUMAN 1AS or lower-division writing courses, CHEM 1A, BIO SCI 93, and a freshman seminar (BIO SCI 2A) during the fall quarter. Students will then continue with BIO SCI 94, complete their general chemistry requirement, and continue with Humanities or lower-division writing during the remaining winter and spring quarters.

Sophomores begin organic chemistry (CHEM 51A) and continue the Biological Sciences Core with BIO SCI 97, BIO SCI 98, BIO SCI 99. Sophomores often begin taking courses in other disciplines to meet the UCI general education requirement and fulfill their mathematics requirement if they have not done so as freshmen.

During their junior year, most majors continue with the Biological Sciences electives and take physics. Students who intend to double major in Chemistry will be required to take PHYSICS 7C-PHYSICS 7D-PHYSICS 7E in place of PHYSICS 3A-PHYSICS 3B-PHYSICS 3C. Juniors may complete their general education requirements and usually start their research and their upper-division biology laboratory courses.

Finally, during their senior year, students continue their research and complete their remaining major requirements.

Students in the Biological Sciences major are required to make progress toward their degree, and their progress will be monitored. If normal academic progress toward the degree in Biological Sciences is not being met, students will be subject to probation.

## Sample Program — Biological Sciences

Freshman		
Fall	Winter	Spring
BIO SCI 93	BIO SCI 94	MATH 5A
CHEM 1A	CHEM 1B	CHEM 1C- 1LC
Lower-Division Writing <sup>1</sup>	Lower-Division Writing <sup>1</sup>	Lower-Division Writing <sup>1</sup>
BIO SCI 2A	General Education	
Sophomore		
Fall	Winter	Spring
BIO SCI 97	BIO SCI 98	BIO SCI 99
CHEM 51A	CHEM 51B- 51LB	CHEM 51C- 51LC
CHEM 1LD	General Education	STATS 7, 8, MATH 2D, or MATH 3A
MATH 5B		
BIO SCI 194S		
Junior		
Fall	Winter	Spring
Required Major course	Required Major course	Required Major course
PHYSICS 3A	PHYSICS 3B- 3LB	PHYSICS 3C- 3LC
Elective/Research	Elective/Research	Bio. Sci. elective
BIO SCI 100		Elective/Research
Senior		
Fall	Winter	Spring
Bio. Sci. elective	Bio. Sci. elective	Bio. Sci. elective
Bio. Sci. U-D Lab	Bio. Sci. U-D Lab	Bio. Sci. U-D Lab
Elective	Research	Research
	Electives	Electives

<sup>1</sup> Students have the option of taking HUMAN 1AS, HUMAN 1BS, HUMAN 1CS or WRITING 39A, WRITING 39B, WRITING 39C in order to fulfill the lower-division writing requirement.

## Biological Sciences, M.S.

The School of Biological Sciences offers both the Master of Science and Doctor of Philosophy, although emphasis at the graduate level is placed on the Ph.D. programs. Most training takes place within one of the departments, although full facilities and curricular offerings are available to all graduate students in all departments of the Biological Sciences. Interdisciplinary study and research are encouraged.

Students are expected to maintain a B average at all times. The normative time to degree is two years for the master's degree and five years for the doctoral degree. A master's degree is not a prerequisite for the Ph.D.

Students plan their academic program in consultation with the graduate advisor or a faculty committee. Faculty advisors may be changed to meet the needs and interests of the student. In addition, it is possible for students to transfer to another program in the School, subject to the approval of the dean of Graduate Studies, and acceptance into that program. Students are encouraged to consult with faculty members with regard to their research and academic interests.

During their graduate training, all doctoral students are required to serve at least two quarters as a 50-percent teaching assistant under the direction of laboratory coordinators or faculty. Advanced graduate students may work closely with faculty in the planning and execution of the teaching program. The amount and nature of the teaching experience varies with the department.

The Master of Science may be completed by submission of a research thesis (plan I) or by course work and a comprehensive examination (plan II).

### **Plan I: Thesis Plan**

The student is required to complete at least four didactic graduate courses (16 units) offered by the department, and elective course work with an additional eight units of graduate or upper-division undergraduate course work. In addition, the student will typically take additional seminar courses during the graduate study. Students in the M.S. program may be employed as teaching assistants, but units earned through enrollment in University Teaching (399) may not be counted toward degree completion. The student engages in thesis research with a faculty thesis advisor, and will prepare and submit a thesis to the thesis committee. The final examination is an oral presentation of the thesis to the committee. The normative time to degree is two years for the thesis M.S.

### **Plan II: Comprehensive Examination Plan**

The plan II M.S. is awarded based on completion of at least 36 units of course work and satisfactory completion of a comprehensive examination. The student is required to complete at least 16 units (four courses) of didactic graduate course work offered by the department. In addition, the student will take up to 12 units of research. An additional eight units or more of elective course work will be completed from other graduate courses offered by the department. A maximum of four units of upper-division undergraduate courses may be included in the program with the approval of the associate dean for Graduate Studies. Students in the M.S. program may be employed as teaching assistants, but units earned through enrollment in University Teaching (399) may not be counted toward degree completion. The comprehensive exam will be administered by a committee of at least three departmental faculty, and may include written and oral sections. The comprehensive examination format will include presentation of research or a capstone project and may include additional sections such as a research proposal, presentation of a project, critical analysis, or other components. The normative time to degree is two years for the M.S. by comprehensive examination.

## **Master of Science with a Concentration in Biotechnology**

Department of Molecular Biology and Biochemistry

### **Craig M. Walsh, Director**

3205 McGaugh Hall

949-824-6034

<http://www.bio.uci.edu/>

[morgano@uci.edu](mailto:morgano@uci.edu)

The field of biotechnology has developed explosively since the discovery of gene cloning and sequencing methods in the mid-1970s. The field is now represented by many active and successful companies who share an intense demand for well-trained people with up-to-date research skills in the manipulation of nucleic acids, proteins, immunological reagents, and pathogenic organisms. The program in Biotechnology is research based, and features two tracks leading to an M.S. in Biological Sciences. The first is the traditional program, and the second, which takes advantage of a defined area of campus research strength, provides an emphasis in stem cell biology. Both tracks incorporate extensive training from both teaching laboratories and actual research settings (individual faculty laboratories). Focus is placed on techniques relevant to industry and seminar exposure to the nature of industry. It is designed to train students to enter the field of biotechnology as skilled laboratory practitioners. Emphasis is placed on learning state-of-the-art technology in genomics, protein isolation and characterization, animal and microbial cell culture, virology, immunology, and/or stem cell biology. Students are trained in experimental rationales for solving actual research problems and are encouraged to take summer internships in industry between the first and second year of their studies.

### **Admissions**

The Department of Molecular Biology and Biochemistry evaluates applicants to the program on the basis of grades, letters of recommendation, GRE scores, and other relevant qualifications. Applicants should have successfully completed a B.S. or equivalent. Courses should include general chemistry with laboratory, calculus, physics, organic chemistry, genetics, biochemistry, molecular biology, microbiology, immunology, and virology, as well as laboratory courses in biochemistry, molecular biology, microbiology, and either animal virology or immunology. Enrollment in the stem cell biology emphasis is limited to eight continuing students per year. Biotechnology graduate students interested in this track apply for admission during the winter quarter of their first year in the program.

### **Requirements**

The traditional program emphasizes training in laboratory and research environments. First-year students are required to enroll in a series of laboratory courses:

MOL BIO 250L	Biotechnology Laboratory - Nucleic Acids
MOL BIO 251L	Biotechnology Laboratory - Protein Purification and Characterization
MOL BIO 221L or MOL BIO 227L	Advanced Immunology Laboratory

In the spring quarter of year one, students enroll in either MOL BIO 221L or, if offered, MOL BIO 227L. These courses are designed to teach techniques in recombinant DNA methodology, protein isolation and characterization, proteomics, animal and microbial cell culture, immunology, and virology. In addition, students are trained rigorously in data recording and presentation as the laboratory notebooks are reviewed and graded by laboratory course instructors. Students are taught formal coursework in nucleic acids, proteins, genetic engineering, and molecular/cellular biology. Emphasis during the second year is devoted exclusively to research projects in faculty laboratories, with the exception of one elective course each quarter from an approved list or by consent of the Director. The program concludes with a formal presentation of the student's research at the end of the second year.

Students enrolled in the stem cell biology emphasis take the same number of laboratory and lecture courses as those in the traditional track. However, in the spring quarter of their first year they must enroll in the stem cell laboratory (taught at the Stem Cell Research Core Facility), and their electives must include the following courses, if offered: Stem Cell Policy (M&MG 230), Stem Cell Biology (DEV BIO 245), and one other elective focused on stem cells. In addition, their individual research must be conducted in the laboratory of a faculty member utilizing stem cells.

While the Biotechnology program is designed to produce skilled laboratory practitioners for industrial positions, some students may wish to continue in a Ph.D. program. The Department of Molecular Biology and Biochemistry is a member of the interdisciplinary graduate program in Cellular and Molecular Biosciences, a program which offers the Ph.D. in Biological Sciences. Biotechnology program students who wish to enter the interdisciplinary graduate program upon completion of the M.S. should apply for admission during their second year.

### Program in Law and Graduate Studies (J.D./Ph.D.; J.D./M.S.)

Highly-qualified students interested in combining the study of law with graduate qualifications in Biotechnology are invited to undertake concurrent degree study under the auspices of UC Irvine's Program in Law and Graduate Studies (PLGS). Students in this program pursue a coordinated curriculum leading to a J.D. from the School of Law in conjunction with a Master's degree in Biological Sciences, Concentration in Biotechnology. Additional information is available from the PLGS Program Director's Office at 949-824-4158 or by email at [plgs@law.uci.edu](mailto:plgs@law.uci.edu) (%20plgs@law.uci.edu). A full description of the program, with links to all relevant application information, can be found at <http://www.plgs.uci.edu>.

## Biological Sciences, Minor

The Biological Sciences minor presents a unified, in-depth study of modern biology. The courses range from ecology and evolutionary biology to genetics, biochemistry and molecular biology.

Nine courses are required, no more than two of which may be taken on a Pass/Not Pass basis:

A. Select three of the following: <sup>1</sup>

BIO SCI 93	From DNA to Organisms
BIO SCI 94	From Organisms to Ecosystems
BIO SCI 97	Genetics
BIO SCI 98	Biochemistry
BIO SCI 99	Molecular Biology

B. Select six of the following: <sup>2</sup>

Three- or four-unit courses selected from BIO SCI 5–H90 (excluding 14 and 46), 93–99, and D103–D190, E106–E190, M114–M190, N110–N190.
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<sup>1</sup> Prerequisites are strictly enforced. Exceptions may be made for some majors that accept the above courses for degree requirements. Consult with the Biological Sciences Student Affairs Office or the academic counseling office of the major.

<sup>2</sup> Three courses must be upper-division. Prerequisites are strictly enforced. (Courses used to satisfy group A may not also be used to satisfy group B.)

**Residence requirement for the minor:** A minimum of six courses required for the minor must be completed at UCI. Approved courses taken in the Education Abroad Program are considered to be in-residence courses.

**NOTE:** Students in any of the majors within the School of Biological Sciences or students majoring in Public Health Sciences, Biomedical Engineering: Premedical, Nursing Science, or Pharmaceutical Sciences may not minor in Biological Sciences.



## Biological Sciences, Ph.D.

The School of Biological Sciences offers both the Master of Science and Doctor of Philosophy, although emphasis at the graduate level is placed on the Ph.D. programs. Most training takes place within one of the departments, although full facilities and curricular offerings are available to all graduate students in all departments of the Biological Sciences. Interdisciplinary study and research are encouraged.

Students are expected to maintain a B average at all times. The normative time to degree is two years for the master's degree and five years for the doctoral degree. A master's degree is not a prerequisite for the Ph.D.

Students plan their academic program in consultation with the graduate advisor or a faculty committee. Faculty advisors may be changed to meet the needs and interests of the student. In addition, it is possible for students to transfer to another program in the School, subject to the approval of the dean of Graduate Studies, and acceptance into that program. Students are encouraged to consult with faculty members with regard to their research and academic interests.

During their graduate training, all doctoral students are required to serve at least two quarters as a 50-percent teaching assistant under the direction of laboratory coordinators or faculty. Advanced graduate students may work closely with faculty in the planning and execution of the teaching program. The amount and nature of the teaching experience varies with the department.

### Master of Science

The Master of Science may be completed by submission of a research thesis (plan I) or by course work and a comprehensive examination (plan II).

#### Plan I: Thesis Plan

The student is required to complete at least four didactic graduate courses (16 units) offered by the department, and elective course work with an additional eight units of graduate or upper-division undergraduate course work. In addition, the student will typically take additional seminar courses during the graduate study. Students in the M.S. program may be employed as teaching assistants, but units earned through enrollment in University Teaching (399) may not be counted toward degree completion. The student engages in thesis research with a faculty thesis advisor, and will prepare and submit a thesis to the thesis committee. The final examination is an oral presentation of the thesis to the committee. The normative time to degree is two years for the thesis M.S.

#### Plan II: Comprehensive Examination Plan

The plan II M.S. is awarded based on completion of at least 36 units of course work and satisfactory completion of a comprehensive examination. The student is required to complete at least 16 units (four courses) of didactic graduate course work offered by the department. In addition, the student will take up to 12 units of research. An additional eight units or more of elective course work will be completed from other graduate courses offered by the department. A maximum of four units of upper-division undergraduate courses may be included in the program with the approval of the associate dean for Graduate Studies. Students in the M.S. program may be employed as teaching assistants, but units earned through enrollment in University Teaching (399) may not be counted toward degree completion. The comprehensive exam will be administered by a committee of at least three departmental faculty, and may include written and oral sections. The comprehensive examination format will include presentation of research or a capstone project and may include additional sections such as a research proposal, presentation of a project, critical analysis, or other components. The normative time to degree is two years for the M.S. by comprehensive examination.

### Doctor of Philosophy

#### Comprehensive Examination-First Year

Some departments and graduate programs require a comprehensive examination that is generally taken at the end of the first year of graduate study.

#### Advancement to Candidacy Exam

The advancement to candidacy examination is taken in the third year of graduate study. The student will prepare a written research proposal based on a federal granting agency format, and the proposal will be submitted to the advancement committee. The student will present the research proposal to a committee of five faculty members. At the time of advancement to candidacy, the student is expected to have identified an important and tractable dissertation topic, and to have demonstrated the technical and intellectual skills to complete doctoral thesis research.

Once the advancement to candidacy examination is completed, the student is expected to complete the doctoral degree within three years. The student must submit a dissertation on their research and defend the thesis in an oral examination during the final year of graduate study. The normative time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Graduate student status or consent of instructor is a prerequisite for all 200–299 courses.

## Biology/Education, B.S.

Majors in Biology/Education earn their bachelor's degree concurrently with a California Preliminary Single Subject Teaching Credential. Individuals who hold this credential are authorized to teach biology and general science in a middle school or high school.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

School requirement variation: BIO SCI 100, CHEM 51C, and CHEM 51LC are not required of Biology/Education majors.

### Major Requirements for the B.S. in Biology/Education

#### A. Required Major Courses:

Select three of the following:

BIO SCI D103	Cell Biology
BIO SCI D104	Developmental Biology
BIO SCI D105	Cell, Developmental, and Molecular Biology of Plants
BIO SCI E106	Processes in Ecology and Evolution
BIO SCI E109	Human Physiology
BIO SCI N110	Neurobiology and Behavior

#### B. Upper-Division Laboratories:

Select two of the following:

BIO SCI D111L	Developmental and Cell Biology Laboratory
BIO SCI E106L	Habitats and Organisms
BIO SCI E112L	Physiology Laboratory
BIO SCI E115L	Evolution Laboratory
BIO SCI E131L	Image Analysis in Biological Research
BIO SCI E140L	Evolution and the Environment Laboratory
BIO SCI E160L	Biology of Birds Lab
BIO SCI E166L	Field Biology
BIO SCI E179L	Field Freshwater Ecology
BIO SCI M114L	Biochemistry Laboratory
BIO SCI M116L	Molecular Biology Laboratory
BIO SCI M118L	Experimental Microbiology Laboratory
BIO SCI M121L	Advanced Immunology Laboratory
BIO SCI M130L	Advanced Molecular Lab Techniques
BIO SCI N113L	Neurobiology Laboratory

One laboratory can be satisfied with completion of Excellence in Research in the Biological Sciences.

#### C. Upper-Division Biology Electives:

Select two, four-unit courses from the following:

BIO SCI D103–D190, E106–E190, M114–M190, N110–N190 <sup>1</sup>	
PHRMSCI 170A	Molecular Pharmacology I
PHRMSCI 170B	Molecular Pharmacology II
PHRMSCI 171	Physical Biochemistry
PHRMSCI 173	Pharmacotherapy
PHRMSCI 174	Biopharmaceutics and Nanomedicine
CHEM 177	Medicinal Chemistry

The following courses can be used to partially satisfy the Upper-Division Biology Elective Requirement:

PHYSICS 147B	Techniques in Medical Imaging I: X-ray, Nuclear, and NMR Imaging
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Additionally, Psychology/Biological Sciences double majors may also use PSYCH 112A-PSYCH 112C to partially satisfy the Upper-Division Biology Elective Requirement.

#### D. Science Teaching Courses:

BIO SCI 14	California Teach 1: Introduction to Science and Mathematics Teaching
BIO SCI 101	California Teach 2: Middle School Science and Mathematics Teaching
BIO SCI 108	Research Methods
EDUC 55	Knowing and Learning in Mathematics and Science
EDUC 109	Reading and Writing in Mathematics and Science
EDUC 143AW	Classroom Interactions I
EDUC 143BW	Classroom Interactions II
EDUC 148	Complex Pedagogical Design



EDUC 158	Student Teaching Mathematics and Science in Middle/High School (two quarters)
LPS/HISTORY 60	The Making of Modern Science

- <sup>1</sup> BIO SCI D103, BIO SCI D104, BIO SCI D105, BIO SCI E106, BIO SCI E109, BIO SCI N110 may not be used to satisfy more than one requirement.

NOTE: Double majors within the School of Biological Sciences or with Public Health Sciences, Biomedical Engineering: Premedical, Nursing Science, or Pharmaceutical Sciences are not permitted.

### Requirements for the Teaching Credential

BIO SCI 14	California Teach 1: Introduction to Science and Mathematics Teaching
BIO SCI 101	California Teach 2: Middle School Science and Mathematics Teaching
BIO SCI 108	Research Methods
EDUC 55	Knowing and Learning in Mathematics and Science
EDUC 109	Reading and Writing in Mathematics and Science
EDUC 143AW	Classroom Interactions I
EDUC 143BW	Classroom Interactions II
EDUC 148	Complex Pedagogical Design
EDUC 158	Student Teaching Mathematics and Science in Middle/High School (two quarters)
LPS 60	The Making of Modern Science

Beyond course work, some additional requirements for teacher certification are described below. With careful, early planning, it is possible for students to complete their bachelor's degree and teacher certification in four years. This is a more time-efficient and cost-effective route than the traditional five-year teacher preparation model, which usually involves a full academic year of teacher education courses and clinical teaching experience after completion of a bachelor's degree.

After the School of Biological Sciences verifies the completion of all requirements for the bachelor's degree, students are awarded their degree from UC Irvine. By contrast, the Preliminary Single Subject Teaching Credential is awarded by the California Commission on Teacher Credentialing (CTC) upon completion of a bachelor's degree and the state-approved UCI teacher education program, which combines course work, student teaching, and a teaching performance assessment. The UCI School of Education must verify completion of all requirements for the teaching credential and then recommend that the credential be awarded to a candidate by the CTC.

**Additional Requirements for Teacher Certification.** In addition to the required course work for a California Preliminary Single Subject Teaching Credential, some additional requirements must be satisfied:

- The School of Biological Sciences requires a *cumulative* GPA of 2.0 (C) to graduate with the bachelor's degree.
 

BIO SCI 101	California Teach 2: Middle School Science and Mathematics Teaching
EDUC 55	Knowing and Learning in Mathematics and Science
EDUC 109	Reading and Writing in Mathematics and Science
EDUC 143AW	Classroom Interactions I
EDUC 143BW	Classroom Interactions II
EDUC 148	Complex Pedagogical Design
EDUC 158	Student Teaching Mathematics and Science in Middle/High School

  - However, students must earn a grade of *C or better* in the following courses in order to be recommended for the Preliminary Single Subject Credential:
  - In the final phase of teaching preparation, students enrolled in EDUC 158 gain teaching experience as a "student teacher" at a local middle school or high school, while also attending a weekly student teaching seminar at UCI. Each student teacher is paired with a highly qualified science teacher who acts as a mentor while the student teacher gradually takes on full responsibility for daily lesson planning, instruction, and assessment. Cal Teach program instructors select the mentor teachers and match them with student teachers. During the winter and spring quarters when students are enrolled in EDUC 158, they should expect to spend a minimum of four hours per day (typically mornings), five days per week, in their student teaching assignment at a middle school or high school.
- The following must be completed and verified prior to the start of student teaching in EDUC 158:
  - Pass the California Basic Education Skills Test (CBEST), a basic mathematics and literacy skills test. For more information, see [http://www.ctcexams.nesinc.com/PageView.aspx?f=GEN\\_Tests.html](http://www.ctcexams.nesinc.com/PageView.aspx?f=GEN_Tests.html).
  - Pass the California Subject Exam for Teachers (CSET) in science: biology/life science. Although secondary teachers are only required to pass the CSET exam in one discipline, those who pass the CSET exam in more than one disciplinary field (e.g. biology/life science

and chemistry) can be authorized to teach classes in each of those disciplines. For more information about the CSET exam, see [http://www.ctcexams.nesinc.com/PageView.aspx?f=GEN\\_Tests.html](http://www.ctcexams.nesinc.com/PageView.aspx?f=GEN_Tests.html).

- c. Secondary school science teachers in California are expected to have a broad range of general science knowledge in addition to their discipline of specialization, because their Single Subject Teaching Credential in one of the sciences also authorizes them to teach classes in general or integrated science. The general science subtests of the CSET exam cover foundational topics in astronomy, geodynamics, Earth resources, ecology, genetics and evolution, molecular biology and biochemistry, cellular and organismal biology, waves, forces and motion, electricity and magnetism, heat transfer and thermodynamics, and structure and properties of matter. Although students can prepare for the CSET exam's general science subtests through independent study, Biological Sciences students can also prepare by taking lower-division courses that cover the content. Here are some suggested courses for Biology/Education majors:

EARTHSS 1	Introduction to Earth System Science
EARTHSS 7	Physical Geology
PHYSICS 20A	Introduction to Astronomy

- d. Obtain a Certificate of Clearance from the State of California.
- e. Obtain a TB test with negative results.
- f. Demonstrate readiness for student teaching responsibilities as evidenced in course work and satisfactory observations of a candidate during the following required courses:

BIO SCI 101	California Teach 2: Middle School Science and Mathematics Teaching
EDUC 143AW	Classroom Interactions I
EDUC 148	Complex Pedagogical Design

3. The following must be completed and verified before the School of Education is able to recommend an individual for the Preliminary Single Subject Credential:

- a. Pass a state-approved teacher performance assessment, which is completed concurrently with student teaching in EDUC 158.
- b. Complete a college-level course or pass an examination on the U.S. Constitution. POL SCI 21A satisfies this requirement. Contact the UCI School of Education Student Affairs Office for information about the exam.
- c. Obtain a CPR certificate in adult, child, or infant training.

**Declaring Intention to Complete the Biology/Education Major and Teacher Certification.** Prospective teachers who want to complete their degree and a teaching credential in four years are encouraged to start planning early by reviewing the sample program for the Biology/Education major, and consulting with an academic counselor. Interested students are encouraged to get started on the suggested first- and second-year credentialing course work, including BIO SCI 14 and BIO SCI 101, and can do so without officially declaring their intention to complete the credential. However, students must declare their intention to complete requirements for the Biology/Education major and requirements for the Preliminary Single Subject Teaching Credential prior to enrolling in EDUC 55, which they would typically take in fall of their third year. Forms for declaring an intention to complete the teaching credential are available in the Biological Sciences Student Affairs Office or in the Cal Teach Science and Mathematics Resource and Advising Center (137 Biological Sciences Administration).

Freshman		
Fall	Winter	Spring
BIO SCI 93	BIO SCI 94	MATH 5A
CHEM 1A	CHEM 1B	CHEM 1C- 1LC
Lower-Division Writing <sup>1</sup>	Lower-Division Writing <sup>1</sup>	Lower-Division Writing <sup>1</sup>
BIO SCI 2A		BIO SCI 14
Sophomore		
Fall	Winter	Spring
BIO SCI 97	BIO SCI 98	BIO SCI 99
CHEM 51A	CHEM 51B- 51LB	HISTORY 60
BIO SCI 101	BIO SCI 108	MATH 5B
CHEM 1LD		
Junior		
Fall	Winter	Spring
Bio. Required Major course	Bio. Required Major course	Bio. Required Major course
PHYSICS 3A	PHYSICS 3B- 3LB	PHYSICS 3C- 3LC
EDUC 55	EDUC 143AW	EDUC 148
STATS 8	General Education	
Senior		
Fall	Winter	Spring
Bio. Sci. U-D elective	Bio. Sci. U-D elective	Bio. Sci. U-D lab
Bio. Sci. U-D lab	EDUC 158	EDUC 158

EDUC 143BW  
General Education

EDUC 109  
General Education

General Education

- <sup>1</sup> Students have the option of taking HUMAN 1AS, HUMAN 1BS, HUMAN 1CS or WRITING 39A, WRITING 39B, WRITING 39C in order to fulfill the lower-division writing requirement.

## Biotechnology Management, M.S.

### Michael G. Cumsky, Director

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<http://www.bio.uci.edu/>  
[morgano@uci.edu](mailto:morgano@uci.edu);

The M.S. in Biotechnology Management is a joint graduate degree that will prepare scientists for leadership roles in biotechnology, science, and engineering-based companies through a curriculum comprised of courses from the Department of Molecular Biology and Biochemistry (MB&B) in the School of Biological Sciences, the Department of Biomedical Engineering in The Henry Samueli School of Engineering, and The Paul Merage School of Business. Students will receive advanced training in biotechnology through course work, a teaching laboratory, and two quarters of independent research in a faculty laboratory of their choosing. They will also learn to think as a business manager by solving product development challenges through consulting projects, creating business plans, and by exposure to current issues within the biotechnology sector. Students will develop quantitative and qualitative skills along with business communication skills. Students will learn about business from the biotechnology perspective and biotechnology from the business perspective and will be taught to think about their work through the lens of innovation, a crucial view for their careers. Importantly, the MSBTM program is fully interdisciplinary, as students are immersed in the campus cultures of both science and business. They take their science courses with M.S. and Ph.D. students from several campus graduate programs, and they take their business/management courses with students in the full-time M.B.A. or FEMBA programs.

### Program Details

Some of the distinctive features of the MSBTM program include the following:

- Advanced training in biotechnology through course work and an eight-unit teaching laboratory;
- A research component whereby students will engage in research with a faculty member in either the School of Biological Sciences or the Department of Biomedical Engineering (requests to perform research in labs outside of Biological Sciences or Biomedical Engineering will be considered on a case-by-case basis). This research component is considered to be important for careers in the biotechnology industry and makes this program unique worldwide;
- An intensive course, Thinking Strategically in the Digital Age (MGMTMBA 200), which presents fundamental concepts, tools, and solutions from management to initiate students into the concrete challenges that managers in high-performing organizations typically confront. Students will be introduced to the pedagogical methods of case analysis, group problem solving, and group presentations as a means of developing the skills and strategies associated with effective managerial action. The course is structured as a full-time, in-residence intensive;
- An experiential learning component wherein student teams, under the guidance of The Paul Merage School of Business and Department of Molecular Biology and Biochemistry professors, act as a consulting team which works with managers of biotechnology or biological science-based companies on innovative solutions to current problems faced by the companies;
- A business plan component wherein students from biosciences and management prepare a formal business plan for an Entrepreneurship or New Venture Management course;
- A capstone course taught in the spring quarter of the second year by faculty in both Biological Sciences and The Paul Merage School of Business. The cross-listed course, Biotech Management (MOL BIO 253)/Biotech Management (MGMTMBA 293), will integrate the program's two-year curriculum and provide a format for the required comprehensive exam. The curriculum will address a number of management issues in the biotech industry, including finance, product development, pharmaceuticals, project management, regulatory affairs, and ethics. Guest lecturers from the biotech industry will also be invited to talk about both the scientific and management sides of their companies;
- "Proseminar" courses provide students with information and practical skills for success in the program and career planning.

Applicants will apply directly to the Graduate Division for the MSBTM program beginning each fall. The program uses rolling admission deadlines. The priority deadline is January 15; applications received by this date are read first, and we begin filling next fall's class from this group. March 15 is the normal deadline; the remainder of the class is filled by these applicants. If the class is not full after a review of the March 15 applicants, we will accept additional applications until June 1. Prerequisite requirements will be the same as those for the Graduate Program in Biotechnology, which include a B.A. or B.S. in Biological Sciences or related discipline and several specific elective and laboratory courses. Admission to graduate standing in MB&B is generally accorded to those possessing a B.S. in Biological Sciences or an allied field obtained with an acceptable level of scholarship from an institution of recognized standing. Those seeking admission without the prerequisite scholarship record may, in some cases, undertake remedial work; if such work is completed at the stipulated academic level, the applicant will be considered for admission. Those admitted from an allied field may be required

to take supplementary upper-division courses in basic engineering subjects. The Graduate Record Examination (GRE) General Test is required of all applicants, except for candidates whose undergraduate GPA is at, or above, 3.2.

Applicants will be evaluated on their prior academic record and their potential for management and leadership as demonstrated in the submitted application materials (university's transcripts, GRE test scores, letters of recommendation, applicable work experience, a Statement of Purpose, and an essay). In addition, there will be an interview by admissions counselors from The Paul Merage School of Business.

### Course Work and Examination Requirements

**M.S. Plan II:** Seventeen required courses, a minimum of 77 units, plus a zero-unit Proseminar sequence (defined below), and a comprehensive examination which will be administered during the jointly taught capstone course in the spring quarter of the second year.

**Required and Recommended Courses, Business:** A total of nine courses adding up to 36 units.

#### A. Complete

MGMTMBA 200	Thinking Strategically in the Digital Age
MGMTMBA 298	Merage Consulting Projects
MGMTMBA 214 or MGMTMBA 213	Entrepreneurship: Planning the New Venture New Venture Management

#### B. Select three of the following MBA core courses:

MGMTMBA 201A	Business Analytics: Decision-Making
MGMTMBA 202	Organizational Leadership for Management
MGMTMBA 203A	Financial Reporting
MGMTMBA 204A	Microeconomics for Management in the Digital Age
MGMTMBA 205	Marketing Principles
MGMTMBA 207	Competing with Digital: Technology, Analytics, and Platforms
MGMTMBA 208	Operational Excellence: Processes, Models, and Analytics
MGMTMBA 209A	Managerial Finance
MGMTMBA 210	Strategy: Foundations and Dynamics

#### C. Complete any three MBA elective courses

**Required and Recommended Courses, Biotechnology:** A total of seven courses adding up to 36 units. These include:

Two core biological science courses, Nucleic Acid Structure and Function (MOL BIO 203) and Protein Structure and Function (MOL BIO 204);

Two additional graduate-level elective courses in biological sciences or biomedical engineering;

One teaching laboratory course focusing on essential methods in biotechnology, Biotechnology Management Laboratory (MOL BIO 252L); and

Two quarters of research (four units in winter quarter of the second year and eight units in spring quarter of the second year) whereby students will engage in independent research with a faculty member of their choosing in the School of Biological Sciences or Department of Biomedical Engineering (requests to perform research in labs outside of Biological Sciences or Biomedical Engineering will be considered on a case by case basis).

### Proseminar Course

This six-quarter course, MBA Proseminar (MGMTMBA 211), provides students with information and practical skills for success in the program and career planning. The goal is to help clarify goals and develop skills and techniques to successfully manage the job search process for employment upon graduation and throughout one's career. This will be accomplished through workshops, presentations, webinars, and meetings with career counselors. Topics include resume writing, job interview coaching, company hiring practices, and career advice and counseling.

### Capstone Course (Year Two)

Biotech Management (Biotech Management (MOL BIO 253)/Biotech Management (MGMTMBA 293), five units), jointly taught by Biological Sciences and Business School faculty, is designed to integrate the program's two-year curriculum and provide a format for the required comprehensive exam. The curriculum will address a number of management issues in the biotech industry including finance, product development, pharmaceuticals, project management, regulatory affairs, and ethics. Guest lecturers from the biotech industry will also be invited to talk about both the scientific and management sides of their companies.

## Department of Developmental and Cell Biology

**Thomas Schilling, Department Chair**

**Kavita Arora, Department Vice Chair**

2212 Biological Sciences III

949-824-2458

<http://devcell.bio.uci.edu/>

Research programs of the Department of Developmental and Cell Biology focus on molecular aspects of the development of eukaryotic organisms, on the molecular interaction of cells in tissue differentiation, and expression and function of genes related to the biogenesis of organelles and cellular constituents. The main emphasis of research training is in the molecular aspects of cells and development, and the utilization of biotechnology. The Department maintains facilities for research that include genetic, molecular, and biochemical techniques and also has facilities in advanced electron optics, microsurgery, microinjection, and neurophysiology.

- Developmental and Cell Biology, B.S.
- Genetics, B.S.

## Graduate Program

The Department offers graduate study in conjunction with the program in Cellular and Molecular Biosciences (CMB), the Interdepartmental Neuroscience Program (INP), and the program in Mathematical and Computational Biology (MCB).

Students admitted into the combined program who select a research advisor in the Department begin following the Departmental requirements for the Ph.D. at the beginning of their second year. Students participate in the Developmental and Cell Biology Journal Club and the Departmental seminar series, which meet weekly during the academic year.

Students must complete the advancement-to-candidacy examination by the end of the third year of graduate study by presenting and defending a proposal for specific dissertation research. The normative time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

## Faculty

Joseph Arditti, Ph.D. University of Southern California, *Professor Emeritus of Developmental and Cell Biology* (developmental physiology of orchids)

Kavita Arora, Ph.D. University of Bombay, *Professor of Developmental and Cell Biology* (*Drosophila* development; TGF- $\beta$  signal transduction; cell signaling)

Scott Atwood, Ph.D. University of Oregon, *Assistant Professor of Developmental and Cell Biology; Dermatology*

Pierre F. Baldi, Ph.D. California Institute of Technology, *Director of the Institute for Genomics and Bioinformatics and Distinguished Professor of Computer Science; Biological Chemistry; Biomedical Engineering; Developmental and Cell Biology; Mathematics* (artificial intelligence and machine learning, biomedical informatics, databases and data mining, environmental informatics, statistics and statistical theory)

Lee Bardwell, Ph.D. Stanford University, *Professor of Developmental and Cell Biology* (intracellular signaling in development and disease)

Claudia Benavente, Ph.D. University of Arizona, *Assistant Professor of Pharmaceutical Sciences; Developmental and Cell Biology* (genetics, epigenetics, cancer, pediatric cancer, retinoblastoma, osteosarcoma)

Michael W. Berns, Ph.D. Cornell University, *Arnold and Mabel Beckman Chair in Laser Biomedicine and Professor of Surgery; Biomedical Engineering; Developmental and Cell Biology*

Bruce Blumberg, Ph.D. University of California, Los Angeles, *Professor of Developmental and Cell Biology; Biomedical Engineering; Environmental Health Sciences; Pharmaceutical Sciences* (gene regulation by nuclear hormone receptors in vertebrate development physiology, endocrine disruption)

Hans R. Bode, Ph.D. Yale University, *Professor Emeritus of Developmental and Cell Biology* (molecular basis of pattern formation in *Hydra*)

Peter J. Bryant, Ph.D. University of Sussex, *Research Professor and Professor Emeritus of Developmental and Cell Biology* (tumor-suppressor genes of *Drosophila* and humans)

Susan V. Bryant, Ph.D. University of London, *Professor Emerita of Developmental and Cell Biology* (molecular basis of limb development and regeneration)

Anne L. Calof, Ph.D. University of California, San Francisco, *Professor of Anatomy and Neurobiology; Developmental and Cell Biology*

Richard D. Campbell, Ph.D. The Rockefeller University, *Professor Emeritus of Developmental and Cell Biology* (Morphogenesis; biology of *Hydra*; fractal geometry of biological forms)

Ken W. Cho, Ph.D. University of Pennsylvania, *Professor of Developmental and Cell Biology* (TGF- $\beta$  signaling, gene regulatory networks in development)

Olivier Cinquin, Ph.D. University College London, *Associate Professor of Developmental and Cell Biology* (mathematical modeling of networks, systems biology)

Olivier Civelli, Ph.D. Swiss Federal Institute of Technology in Zurich, *Professor of Pharmaceutical Sciences; Developmental and Cell Biology* (novel neuroactive molecules, molecular neuropharmacology)

Michelle Digman, Ph.D. University of Illinois at Chicago, *Associate Professor of Biomedical Engineering; Developmental and Cell Biology* (biophotonics, fluorescence Spectroscopy and microscopy, nano-scale imaging, mechanotransduction, cancer cell migration, fluorescence lifetime and metabolic mapping)

Peter J. Donovan, Ph.D. University College London, *Professor of Biological Chemistry; Developmental and Cell Biology*

Aimee Lara Edinger, Ph.D. University of Pennsylvania, *Associate Professor of Developmental and Cell Biology* (cancer biology and metabolism, growth control, protein trafficking)

German A. Enciso Ruiz, Ph.D. Rutgers, the State University of New Jersey, *Professor of Mathematics; Developmental and Cell Biology* (applied and computational mathematics, mathematical and computational biology)

Dae Seok Eom, Ph.D. The University of Texas at Austin, *Assistant Professor of Developmental and Cell Biology* (cellular projection mediated long-range cell-to-cell communication)

Donald E. Fosket, Ph.D. University of Idaho, *Professor Emeritus of Developmental and Cell Biology* (regulation of cytoskeleton formation and function)

David M. Gardiner, Ph.D. University of California, San Diego, *Professor of Developmental and Cell Biology* (limb development and regeneration)

Enrico Gratton, Ph.D. University of Rome, *Distinguished Professor of Biomedical Engineering; Developmental and Cell Biology; Physics and Astronomy* (design of new fluorescence instruments, protein dynamics, single molecule, fluorescence microscopy, photon migration in tissues)

Steven P. Gross, Ph.D. University of Texas at Austin, *Professor of Developmental and Cell Biology; Physics and Astronomy* (force generation by molecular motors in living cells)

Patrick L. Healey, Ph.D. University of California, Berkeley, *Professor Emeritus of Developmental and Cell Biology* (plant cellular differentiation and morphogenesis, ultrastructure and histochemistry of secretory systems, early reproductive development)

Franz J. Hoffmann, Ph.D. University of Hohenheim, *Professor of Teaching Emeritus of Developmental and Cell Biology* (regeneration of cultured plant cells, somatic cell genetics)

Daniel J. Knauer, Ph.D. University of Nebraska, *Professor Emeritus of Developmental and Cell Biology* (human antithrombins and related serine protease inhibitors)

Stuart M. Krassner, SCE Johns Hopkins University, *Professor Emeritus of Developmental and Cell Biology* (developmental transitions of hemoflagellates)

Arthur D. Lander, Ph.D. University of California, San Francisco, *Donald Bren Professor and Professor of Developmental and Cell Biology; Biomedical Engineering; Logic and Philosophy of Science* (systems biology of development, pattern formation, growth control)

Shin Lin, Ph.D. University of California, Los Angeles, *Professor of Developmental and Cell Biology* (combined use of biochemistry, cell biology, molecular biology, molecular biophysics to study the structure and function of proteins involved in cytoskeletal/contractile functions and signal transduction in muscle and nonmuscle cells)

Ulrike Luderer, M.D., Ph.D. Northwestern University, *Director of the Environmental Health Sciences Graduate Program and Professor of Medicine; Developmental and Cell Biology; Environmental Health Sciences; Program in Public Health*

Grant R. MacGregor, Ph.D. University of Sussex, *Professor of Developmental and Cell Biology* (mouse reproduction, development, homeostasis)

J. Lawrence Marsh, Ph.D. University of Washington, *Professor Emeritus of Developmental and Cell Biology* (mechanisms of neurodegeneration and molecular genetics of development)

Debra K. Mauzy-Melitz, Ph.D. Marquette University, *Assistant Professor of Teaching of Developmental and Cell Biology* (role of writing in scientific teaching)

Ronald L. Meyer, Ph.D. California Institute of Technology, *Professor Emeritus of Developmental and Cell Biology* (development of nerve connections, nerve injury, and regeneration)

Edwin S. Monuki, M.D., Ph.D. University of California, San Diego, *Department Chair and Warren L. Bostick Chair in Pathology and Professor of Pathology and Laboratory Medicine; Developmental and Cell Biology*

Seyed Ali Mortazavi, Ph.D. California Institute of Technology, *Professor of Developmental and Cell Biology; Biological Chemistry* (functional genomics to study transcriptional regulation in development)



R. Michael Mulligan, Ph.D. Michigan State University, *Biological Sciences Associate Dean of Graduate Studies and Professor of Developmental and Cell Biology; Ecology and Evolutionary Biology* (RNA editing in plant mitochondria and chloroplasts)

Diane K. O'Dowd, Ph.D. University of California, San Diego, *Professor of Developmental and Cell Biology; Anatomy and Neurobiology* (regulation of activity in developing and adult nervous systems)

Michael J. Parsons, Ph.D. University of London, *Associate Professor of Developmental and Cell Biology* (development and regeneration of the endocrine pancreas)

Maksim Plikus, Ph.D. University of Southern California, *Associate Professor of Developmental and Cell Biology* (mechanisms of regeneration, stem cell control)

Thomas F. Schilling, Ph.D. University of Oregon, *Department Chair and Professor of Developmental and Cell Biology* (zebrafish development, vertebrate genetics, craniofacial development)

Christine Suetterlin, Ph.D. University of Basel, *Associate Professor of Developmental and Cell Biology* (centrosome and cilia regulation, Golgi, host-pathogen interaction)

Sha Sun, Ph.D. University of Chicago, *Assistant Professor of Developmental and Cell Biology* (long noncoding RNAs in epigenetic programming)

Katherine L. Thompson-Peer, Ph.D. Harvard Medical School, *Assistant Professor of Developmental and Cell Biology* (investigating how neurons respond and recover after injury)

Wenqi Wang, Ph.D. Shanghai Institutes for Biological Sciences, *Assistant Professor of Developmental and Cell Biology* (the signaling networks underlying tissue homeostasis and organ size control)

Rahul Warrior, Ph.D. Yale University, *Associate Professor of Developmental and Cell Biology* (developmental genetics of transcription and proteoglycan synthesis)

Zeba Wunderlich, Ph.D. Harvard University, *Assistant Professor of Developmental and Cell Biology* (understanding the organization of regulatory information in the genome)

Xiaohui Xie, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Computer Science; Developmental and Cell Biology* (computational biology, bioinformatics, genomics, neural computation, machine learning)

## Courses

### **DEV BIO 200A. Research in Developmental and Cell Biology. 2-12 Units.**

Independent research with Developmental and Cell Biology faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

### **DEV BIO 200B. Research in Developmental and Cell Biology. 2-12 Units.**

Independent research with Developmental and Cell Biology faculty.

Prerequisite: DEV BIO 200A

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

### **DEV BIO 200C. Research in Developmental and Cell Biology . 2-12 Units.**

Independent research with Developmental and Cell Biology faculty.

Prerequisite: DEV BIO 200B

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**DEV BIO 200R. Research in Developmental & Cell Biology for First-year Students. 2-12 Units.**

Independent research within the laboratories of graduate training faculty in the Department of Developmental and Cell Biology for first-year Ph.D. students.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

**DEV BIO 203A. Graduate Tutorial in Developmental and Cell Biology. 4 Units.**

Advanced study in areas not represented by formal courses. May involve individual or small group study through discussion, reading, and composition. Time and subject matter arranged individually.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**DEV BIO 203B. Graduate Tutorial in Developmental and Cell Biology. 4 Units.**

Advanced study in areas not represented by formal courses. May involve individual or small group study through discussion, reading, and composition. Time and subject matter arranged individually.

Prerequisite: DEV BIO 203A

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**DEV BIO 203C. Graduate Tutorial in Developmental and Cell Biology. 4 Units.**

Advanced study in areas not represented by formal courses. May involve individual or small group study through discussion, reading, and composition. Time and subject matter arranged individually.

Prerequisite: DEV BIO 203B

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**DEV BIO 206A. Developmental and Cell Biology Journal Club. 2 Units.**

Advanced study of various topics in cell biology.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**DEV BIO 206B. Developmental and Cell Biology Journal Club. 2 Units.**

Advanced study of various topics in cell biology.

Prerequisite: DEV BIO 206A

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**DEV BIO 206C. Developmental and Cell Biology Journal Club. 2 Units.**

Advanced study of various topics in cell biology.

Prerequisite: DEV BIO 206B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**DEV BIO 207. Mouse Developmental Genetics. 4 Units.**

Introduction to using the mouse in contemporary biomedical research. The biology and development of the laboratory mouse, methods for manipulation of the mouse genome and embryos, and examples of application of these methods to understand mammalian development and homeostasis.

Same as BIOCHEM 215.

Restriction: Graduate students only.



**DEV BIO 212. Topics in Systems Biology. 2 Units.**

Studies in selected areas of Systems Biology.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**DEV BIO 214. Principles of Genomics. 4 Units.**

A survey course of the principal subfields of genomics and their applications to biological and health sciences that will cover genome assembly and annotation, genome structure, comparative genomics, population genomics, functional genomics, and medical genomics.

Same as MOL BIO 244.

Restriction: Graduate students only.

**DEV BIO 231B. Cell Biology. 4 Units.**

A broadly based course including topics in extracellular matrix, cytoskeleton, organelle biogenesis, receptor-mediated endocytosis, signal transduction, cell cycle, and developmental biology.

Concurrent with BIO SCI D154.

**DEV BIO 232. Systems Cell and Developmental Biology. 4 Units.**

Introduces concepts needed to understand cell and developmental biology at the systems level, i.e., how the parts (molecules) work together to create a complex output. Emphasis on using mathematical/computational modeling to expand/modify insights provided by intuition.

Same as BME 213.

Restriction: Graduate students only.

**DEV BIO 245. Stem Cell Biology. 4 Units.**

The basic characteristics and development roles of embryonic, adult, and cancer stem cells in the human body and in model systems and the use of experimental and genetic methods to analyze and manipulate their properties.

Restriction: Graduate students only.

**DEV BIO 290A. Colloquium in Developmental and Cell Biology. 2 Units.**

Contemporary research problems. Research students, faculty, and other invited speakers introduce research and review topics.

Restriction: Graduate students only.

**DEV BIO 290B. Colloquium in Developmental and Cell Biology. 2 Units.**

Contemporary research problems. Research students, faculty, and other invited speakers introduce research and review topics.

Prerequisite: DEV BIO 290A

Restriction: Graduate students only.

**DEV BIO 290C. Colloquium in Developmental and Cell Biology. 2 Units.**

Contemporary research problems. Research students, faculty, and other invited speakers introduce research and review topics.

Prerequisite: DEV BIO 290B

Restriction: Graduate students only.

**DEV BIO 292A. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**DEV BIO 292B. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Prerequisite: DEV BIO 292A

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**DEV BIO 292C. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Prerequisite: DEV BIO 292B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**DEV BIO 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Developmental and Cell Biology, B.S.

The Developmental and Cell Biology major is intended to provide students with intensive training in cutting edge approaches to understanding the structure and function of cells and how they interact to produce a complex organism, starting with a fertilized egg. The focus of the B.S. in Developmental and Cell Biology is to provide students with intensive training aimed at preparing them for graduate programs in modern Developmental and Cell Biology or other biomedical sciences. In-depth training in the molecular basis of cell and developmental biology will be coupled with integrating knowledge obtained from the recent explosive advances in genomic technology to provide a strong working understanding of how to approach problems in basic research.

The major has distinctive features. The first is a reduction in the number of required courses, allowing students the opportunity to focus more deeply on training in Developmental and Cell Biology. The second is the implementation of a new course in Genomic and Proteomic analysis that is closely tied to problems in genetics, developmental, and cell biology. Understanding the connections among these disciplines and how to apply the appropriate tools for defining and answering fundamental questions in biomedical research is a critical tool for success in research. Another distinctive feature of the major is the opportunity to replace two upper-division laboratory courses with mentored BIO SCI 199 individual research in faculty laboratories. This offers students the opportunity to apply the tools they have acquired during formal course work to current problems at the frontiers of research. Lastly, students majoring in Developmental and Cell Biology have faculty advisors with whom they meet at least quarterly. The faculty advisors help students plan their curriculum, select appropriate 199 projects and sponsoring labs, and as a group grant petitions and certify the degree. The combination of new upper-division courses, more flexibility in the curriculum, the option for mentored research, and close interaction with faculty advisors will help the Developmental and Cell Biology majors to develop an appreciation of the nature of research and establish a strong foundation for future success in graduate or professional schools.

**Application Process to Declare the Major:** The major in Developmental and Cell Biology is open to junior- and senior-level students only. Applications to declare the major can be made at any time. Information can also be found at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>). Double majors within the School of Biological Sciences or with Public Health Sciences, Biomedical Engineering: Premedical, Nursing Science, or Pharmaceutical Sciences are not permitted.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Major Requirements

A. Required Major Courses:

BIO SCI D103	Cell Biology
BIO SCI D104	Developmental Biology
BIO SCI D114	Developmental and Cell Biology Majors Seminar
BIO SCI D145	Genomics, Development, and Medicine

B. Upper-Division Laboratories:

BIO SCI D111L	Developmental and Cell Biology Laboratory
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and select two of the following: <sup>1</sup>

BIO SCI E106L	Habitats and Organisms
BIO SCI E112L	Physiology Laboratory
BIO SCI E115L	Evolution Laboratory
BIO SCI E131L	Image Analysis in Biological Research
BIO SCI E140L	Evolution and the Environment Laboratory
BIO SCI E160L	Biology of Birds Lab
BIO SCI E166L	Field Biology
BIO SCI E179L	Field Freshwater Ecology
BIO SCI M114L	Biochemistry Laboratory
BIO SCI M116L	Molecular Biology Laboratory
BIO SCI M118L	Experimental Microbiology Laboratory
BIO SCI M121L	Advanced Immunology Laboratory
BIO SCI M130L	Advanced Molecular Lab Techniques
BIO SCI N113L	Neurobiology Laboratory

C. Upper-Division Biology Electives:

Select one of the following:

BIO SCI D136	Human Anatomy
BIO SCI D137	Eukaryotic and Human Genetics
BIO SCI D148	Development and Disease
BIO SCI D170	Applied Human Anatomy

and select one of the following:

BIO SCI D133	Advances in Regenerative Medicine
BIO SCI D135	Cell Biology of Human Disease
BIO SCI D190	Topics in Developmental and Cell Biology
BIO SCI M120	Signal Transduction in Mammalian Cells
BIO SCI M144	Cell Organelles and Membranes

and select three of the following:

BIO SCI D105	Cell, Developmental, and Molecular Biology of Plants
BIO SCI D130	Photomedicine
BIO SCI D132	Introduction to Precision Medicine
BIO SCI D133	Advances in Regenerative Medicine
BIO SCI D136	Human Anatomy
BIO SCI D137	Eukaryotic and Human Genetics
BIO SCI D138	Critical Thinking in Cell Biology
BIO SCI D148	Development and Disease
BIO SCI D170	Applied Human Anatomy
BIO SCI E109	Human Physiology
BIO SCI M114	Advanced Biochemistry
BIO SCI M116	Advanced Molecular Biology
BIO SCI M125	Molecular Biology of Cancer
BIO SCI M137	Microbial Genetics
BIO SCI M143	Human Parasitology
BIO SCI M144	Cell Organelles and Membranes
BIO SCI N110	Neurobiology and Behavior
BIO SCI N151	Neurobiology of Aging
BIO SCI N153	Neuropharmacology
BIO SCI N154	Molecular Neurobiology

NOTE: No course may be used to satisfy more than one requirement.

- <sup>1</sup> Students may petition to substitute Excellence in Research (BIO SCI 199) for two upper-division laboratories (other than BIO SCI D111L); 199 research is strongly encouraged. The 199 laboratory must be approved by the Department, and Excellence in Research must be successfully completed. Final approval is given by the Department.

**Application Process to Declare the Major:** The major in Developmental and Cell Biology is open to junior- and senior-level students only. Applications to declare the major can be made at any time. Information can also be found at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>). Double majors within the School of Biological Sciences or with Public Health Sciences, Biomedical Engineering: Premedical, Nursing Science, or Pharmaceutical Sciences are not permitted.

Freshman		
Fall	Winter	Spring
BIO SCI 93	BIO SCI 94	MATH 5A
CHEM 1A	CHEM 1B	CHEM 1C- 1LC
Lower-Division Writing <sup>1</sup>	Lower-Division Writing <sup>1</sup>	Lower-Division Writing <sup>1</sup>
BIO SCI 2A		BIO SCI 194S
Sophomore		
Fall	Winter	Spring
BIO SCI 97	BIO SCI 98	BIO SCI 99
CHEM 51A	CHEM 51B- 51LB	CHEM 51C- 51LC
CHEM 1LD	General Education	STATS 7, 8, MATH 2D, or MATH 3A
MATH 5B		
Junior		
Fall	Winter	Spring
BIO SCI D103	BIO SCI D104	BIO SCI D111L
PHYSICS 3A	PHYSICS 3B- 3LB	PHYSICS 3C- 3LC
BIO SCI 100	BIO SCI D145	BIO SCI D114
General Education		General Education
Senior		
Fall	Winter	Spring
BIO SCI 199 or U-D Lab	BIO SCI 199 or U-D Lab	U-D Lab or Bio. Sci. elective
U-D Bio. Sci. elective	U-D Bio. Sci. elective	U-D Bio. Sci. elective
U-D Bio. Sci. elective	BIO SCI 199 or General Education	BIO SCI 199 or General Education
		General Education

- <sup>1</sup> Students have the option of taking HUMAN 1AS, HUMAN 1BS, HUMAN 1CS or WRITING 39A, WRITING 39B, WRITING 39C in order to fulfill the lower-division writing requirement.

## Genetics, B.S.

Genetics pervades every aspect of modern society, from newspaper articles to talk shows, from discussions on health care to discussions on cloning. With the sequencing of the human genome, it is more important than ever for biology students to have a broad background in the study of heredity and evolution. The Genetics major is designed to benefit motivated undergraduates who have a particular interest in learning about developmental genetics, evolutionary genetics, and molecular genetics and to allow them to explore how our knowledge of genetic mechanisms contributes to our understanding of human development and disease. The Genetics major will accommodate students interested in the study of inheritance either as a basic discipline or in terms of its applied aspects in biotechnology, medicine, and agriculture, but will be especially attractive to those students desiring focused study and preparation for graduate training.

Genetics majors begin their study in the junior year with three required major courses (BIO SCI D103, BIO SCI D104) and (BIO SCI D113). In addition to these required major courses, students will choose six additional upper-division Biology Elective courses. Certain courses are designed to give students an understanding of genetic mechanisms and teach them how to define and answer fundamental questions in biomedical research. Additionally, students choose at least two electives that deal with topics such as the molecular biology of cancer, human genetic diseases, developmental genetics, and the genetics of aging. Finally, Genetics majors are encouraged to explore laboratory research by enrolling in BIO SCI 199. Laboratory research not only expands a student's technical skills, but is also designed to allow faculty members to mentor Genetics majors. All students majoring in Genetics have a faculty advisor with whom they meet at least quarterly. The faculty advisor helps students plan their curriculum and select appropriate Biological Sciences 199 research projects. Genetics majors also have an opportunity to meet with other Genetics majors on a regular basis and participate in research talks.

The Genetics major provides graduates with advanced training in the skills necessary to pursue graduate degrees in biomedical research. These include Ph.D. graduate programs, teacher-training programs, medical school, and veterinary school. Genetics graduates may also use their backgrounds effectively in planning careers in law, business, education, and public affairs.

**Application Process to Declare the Major:** The major in Genetics is open to junior- and senior-level students only. Applications to declare the major can be made at any time. Information can also be found at the UCI Change of Major Criteria (<http://www.changeofmajor.uci.edu/>). Double majors within

the School of Biological Sciences or with Public Health Sciences, Biomedical Engineering: Premedical, Nursing Science, or Pharmaceutical Sciences are not permitted.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Major Requirements

#### A. Required Major Courses:

BIO SCI D103	Cell Biology
BIO SCI D104	Developmental Biology
BIO SCI D113	Genetics Majors Seminar

#### B. Upper-Division Laboratories:

Select three of the following: <sup>1</sup>

BIO SCI D111L	Developmental and Cell Biology Laboratory
BIO SCI E106L	Habitats and Organisms
BIO SCI E112L	Physiology Laboratory
BIO SCI E115L	Evolution Laboratory
BIO SCI E131L	Image Analysis in Biological Research
BIO SCI E140L	Evolution and the Environment Laboratory
BIO SCI E160L	Biology of Birds Lab
BIO SCI E166L	Field Biology
BIO SCI E179L	Field Freshwater Ecology
BIO SCI M114L	Biochemistry Laboratory
BIO SCI M116L	Molecular Biology Laboratory
BIO SCI M118L	Experimental Microbiology Laboratory
BIO SCI M121L	Advanced Immunology Laboratory
BIO SCI M130L	Advanced Molecular Lab Techniques
BIO SCI N113L	Neurobiology Laboratory

#### C. Upper-Division Biology Electives:

Select two of the following:

BIO SCI D132	Introduction to Precision Medicine
BIO SCI D137	Eukaryotic and Human Genetics
BIO SCI D145	Genomics, Development, and Medicine
BIO SCI D148	Development and Disease
BIO SCI M137	Microbial Genetics

Select one from the following:

BIO SCI D133	Advances in Regenerative Medicine
BIO SCI D135	Cell Biology of Human Disease
BIO SCI D137	Eukaryotic and Human Genetics
BIO SCI D148	Development and Disease
BIO SCI E153	Functional and Structural Evolutionary Genomics
BIO SCI N152	Developmental Neurobiology

Select three from the following:

BIO SCI D105	Cell, Developmental, and Molecular Biology of Plants
BIO SCI D130	Photomedicine
BIO SCI D136	Human Anatomy
BIO SCI D138	Critical Thinking in Cell Biology
BIO SCI D170	Applied Human Anatomy
BIO SCI D190	Topics in Developmental and Cell Biology
BIO SCI E109	Human Physiology
BIO SCI M114	Advanced Biochemistry
BIO SCI M116	Advanced Molecular Biology
BIO SCI M120	Signal Transduction in Mammalian Cells
BIO SCI M125	Molecular Biology of Cancer

BIO SCI M143	Human Parasitology
BIO SCI M144	Cell Organelles and Membranes
BIO SCI N110	Neurobiology and Behavior
BIO SCI N151	Neurobiology of Aging
BIO SCI N154	Molecular Neurobiology

NOTE: No course may be used to satisfy more than one requirement.

- <sup>1</sup> Students may petition to substitute Excellence in Research (BIO SCI 199) for two upper-division laboratories; 199 research is strongly encouraged. The 199 laboratory must be approved by the Department, and Excellence in Research must be successfully completed. Final approval is given by the Department.

**Application Process to Declare the Major:** The major in Genetics is open to junior- and senior-level students only. Applications to declare the major can be made at any time. Information can also be found at the UCI Change of Major Criteria (<http://www.changeofmajor.uci.edu/>). Double majors within the School of Biological Sciences or with Public Health Sciences, Biomedical Engineering: Premedical, Nursing Science, or Pharmaceutical Sciences are not permitted.

Freshman		
Fall	Winter	Spring
BIO SCI 93	BIO SCI 94	MATH 5A
CHEM 1A	CHEM 1B	CHEM 1C- 1LC
Lower-Division Writing <sup>1</sup>	Lower-Division Writing <sup>1</sup>	Lower-Division Writing <sup>1</sup>
BIO SCI 2A		BIO SCI 194S
Sophomore		
Fall	Winter	Spring
BIO SCI 97	BIO SCI 98	BIO SCI 99
CHEM 51A	CHEM 51B- 51LB	CHEM 51C- 51LC
MATH 5B	General Education	STATS 7, 8, MATH 2D, or MATH 3A
CHEM 1LD		
Junior		
Fall	Winter	Spring
BIO SCI D103	BIO SCI D104	U-D Lab or BIO SCI 199
PHYSICS 3A	PHYSICS 3B- 3LB	PHYSICS 3C- 3LC
BIO SCI 100	U-D Bio. Sci. elective	U-D Bio. Sci. elective
General Education	BIO SCI D113	
	General Education	
Senior		
Fall	Winter	Spring
U-D Lab or BIO SCI 199	U-D Lab or BIO SCI 199	U-D Bio. Sci. elective
U-D Bio. Sci. elective	U-D Bio. Sci. elective	U-D Bio. Sci. elective
General Education	General Education	General Education

- <sup>1</sup> Students have the option of taking HUMAN 1AS, HUMAN 1BS, HUMAN 1CS or WRITING 39A, WRITING 39B, WRITING 39C in order to fulfill the lower-division writing requirement.

## Department of Ecology and Evolutionary Biology

### James Hicks, Department Chair

321 Steinhaus Hall  
949-824-6006  
<http://ecoevo.bio.uci.edu/>

### Catherine Loudon, Department Vice Chair

321 Steinhaus Hall  
<http://ecoevo.bio.uci.edu/>

Ecology and evolutionary biology deals with the establishment of adaptations over evolutionary time and with the organismal function in ecological time. Faculty in the Department of Ecology and Evolutionary Biology study questions pertinent at a variety of levels of biological organization, from molecular aspects of evolution, to organismal structure and performance, to the ecology of ocean ecosystems. Research is conducted in both the laboratory and field and includes work on a variety of organisms from phages and bacteria, to higher plants and animals. Primary attention is given to evolutionary, ecological, and functional questions rather than to particular habitats or taxa. Faculty and graduate student research is often collaborative and interdisciplinary in approach. Departmental research activities include physiological ecology energetics, plant-herbivore and plant-pollinator

interactions, microbial ecology and coevolution, quantitative genetics, life history evolution, population and reproductive ecology, community ecology and biogeography. These research endeavors provide a balance between empirical and theoretical approaches to evolutionary, organismal, and ecological problems.

- Ecology and Evolutionary Biology, B.S.
- Ecology and Evolutionary Biology, Graduate Program
- Master of Conservation and Restoration Science

## Faculty

Nancy M. Aguilar-Roca, Ph.D. University of California, San Diego, *Associate Professor of Teaching of Ecology and Evolutionary Biology*

Steven D. Allison, Ph.D. Stanford University, *Professor of Ecology and Evolutionary Biology; Earth System Science*

Peter R. Atsatt, Ph.D. University of California, Los Angeles, *Professor Emeritus of Ecology and Evolutionary Biology*

John C. Avise, Ph.D. University of California, Davis, *UCI Distinguished Professor of Ecology and Evolutionary Biology*

Manny Azizi, Ph.D. University of Massachusetts, *Associate Professor of Ecology and Evolutionary Biology*

Alan G. Barbour, M.D. Tufts University, *Distinguished Professor of Microbiology and Molecular Genetics; Ecology and Evolutionary Biology; Medicine*

Albert F. Bennett, Ph.D. University of Michigan, *Professor Emeritus of Ecology and Evolutionary Biology*

Rudi C. Berkelhamer, Ph.D. University of California, Berkeley, *Professor of Teaching Emerita of Ecology and Evolutionary Biology*

Peter A. Bowler, Ph.D. University of California, Irvine, *Professor of Teaching of Ecology and Evolutionary Biology*

Matthew E. Bracken, Ph.D. Oregon State University, *Professor of Ecology and Evolutionary Biology*

Timothy J. Bradley, Ph.D. University of British Columbia, *Professor Emeritus of Ecology and Evolutionary Biology*

Adriana D. Briscoe, Ph.D. Harvard University, *Professor of Ecology and Evolutionary Biology*

Nancy T. Burley, Ph.D. University of Texas at Austin, *Professor of Ecology and Evolutionary Biology*

Robin M. Bush, Ph.D. University of Michigan, *Professor Emeritus of Ecology and Evolutionary Biology*

Diane R. Campbell, Ph.D. Duke University, *Professor of Ecology and Evolutionary Biology*

F. Lynn Carpenter, Ph.D. University of California, Berkeley, *Professor Emerita of Ecology and Evolutionary Biology*

Michael T. Clegg, Ph.D. University of California, Davis, *Donald Bren Professor and Professor Emeritus of Ecology and Evolutionary Biology*

Kwasi M. Connor, Ph.D. University of Southern California, *Assistant Professor of Ecology and Evolutionary Biology*

James J. Emerson, Ph.D. University of Chicago, *Assistant Professor of Ecology and Evolutionary Biology*

Celia Faiola, Ph.D. Washington State University, *Assistant Professor of Ecology and Evolutionary Biology; Chemistry*

Steven A. Frank, Ph.D. University of Michigan, *Distinguished Professor and Donald Bren Professor of Ecology and Evolutionary Biology; Logic and Philosophy of Science*

Brandon S. Gaut, Ph.D. University of California, Riverside, *Biological Sciences Associate Dean for Research and Innovation and Professor of Ecology and Evolutionary Biology*

Donovan German, Ph.D. University of Florida, *Associate Professor of Ecology and Evolutionary Biology*

Michael L. Goulden, Ph.D. Stanford University, *Professor of Earth System Science; Ecology and Evolutionary Biology*

Bradford A. Hawkins, Ph.D. University of California, Riverside, *Professor Emeritus of Ecology and Evolutionary Biology*

James W. Hicks, Ph.D. University of New Mexico, *Department Chair and Professor of Ecology and Evolutionary Biology*

Bradley S. Hughes, Ph.D. University of California, Irvine, *Associate Professor of Teaching of Ecology and Evolutionary Biology; Education*

George L. Hunt, Jr., Ph.D. Harvard University, *Professor Emeritus of Ecology and Evolutionary Biology*

Travis E. Huxman, Ph.D. University of Nevada, *Professor of Ecology and Evolutionary Biology*



Mahtab F. Jafari, Pharm.D. University of California, San Francisco, *Director of the Center for Healthspan Pharmacology and Professor of Pharmaceutical Sciences; Ecology and Evolutionary Biology* (anti-aging pharmacology and preventive medicine)

C. Sunny Jiang, Ph.D. University of South Florida, *Department Chair and Professor of Civil and Environmental Engineering; Ecology and Evolutionary Biology; Environmental Health Sciences* (water pollution microbiology, environmental biotechnology, aquatic microbial ecology)

Natalia Komarova, Ph.D. University of Arizona, *UCI Chancellor's Professor of Mathematics; Ecology and Evolutionary Biology* (applied and computational mathematics, mathematical and computational biology, mathematics of complex and social phenomena)

Harold Koopowitz, Ph.D. University of California, Los Angeles, *Professor Emeritus of Ecology and Evolutionary Biology*

Joleah B. Lamb, Ph.D. James Cook University, *Assistant Professor of Ecology and Evolutionary Biology*

Anthony D. Long, Ph.D. McMaster University, *Professor of Ecology and Evolutionary Biology; Pharmaceutical Sciences*

Catherine Loudon, Ph.D. Duke University, *Professor of Teaching of Ecology and Evolutionary Biology*

Richard E. MacMillen, Ph.D. University of California, Los Angeles, *Professor Emeritus of Ecology and Evolutionary Biology*

Adam Martiny, Ph.D. Technical University of Denmark, *Professor of Earth System Science; Ecology and Evolutionary Biology*

Jennifer Martiny, Ph.D. Stanford University, *UCI Chancellors' Fellow and Professor of Ecology and Evolutionary Biology*

Matthew J. McHenry, Ph.D. University of California, Berkeley, *Professor of Ecology and Evolutionary Biology*

Kailen Mooney, Ph.D. University of Colorado Boulder, *Professor of Ecology and Evolutionary Biology*

Laurence D. Mueller, Ph.D. University of California, Davis, *Professor of Ecology and Evolutionary Biology*

R. Michael Mulligan, Ph.D. Michigan State University, *Biological Sciences Associate Dean of Graduate Studies and Professor of Developmental and Cell Biology; Ecology and Evolutionary Biology* (RNA editing in plant mitochondria and chloroplasts)

Jessica Pratt, Ph.D. University of California, Irvine, *Associate Professor of Teaching of Ecology and Evolutionary Biology*

James T. Randerson, Ph.D. Stanford University, *UCI Chancellor's Professor of Earth System Science; Civil and Environmental Engineering; Ecology and Evolutionary Biology*

Jose Mari Ranz Navaltro, Ph.D. Universidad Autónoma de Madrid, *Associate Professor of Ecology and Evolutionary Biology*

Alejandra Rodriguez-Verdugo, Ph.D. University of California, Irvine, *Assistant Professor of Ecology and Evolutionary Biology*

Michael R. Rose, Ph.D. University of Sussex, *Professor of Ecology and Evolutionary Biology*

Ann K. Sakai, Ph.D. University of Michigan, *Professor of Ecology and Evolutionary Biology*

Cascade J. Sorte, Ph.D. University of California, Davis, *Associate Professor of Ecology and Evolutionary Biology*

Richard Symanski, Ph.D. Syracuse University, *Professor of Teaching of Ecology and Evolutionary Biology*

Celia Symons, Ph.D. University of California, San Diego, *Assistant Professor of Ecology and Evolutionary Biology*

Kevin Thornton, Ph.D. University of Chicago, *Associate Professor of Ecology and Evolutionary Biology*

Kathleen K. Treseder, Ph.D. Stanford University, *UCI Chancellor's Fellow and Professor of Ecology and Evolutionary Biology*

Arthur Weis, Ph.D. University of Illinois at Urbana-Champaign, *Professor Emeritus of Ecology and Evolutionary Biology*

Stephen G. Weller, Ph.D. University of California, Berkeley, *Professor Emeritus of Ecology and Evolutionary Biology*

Dominik Franz X. Wodarz, Ph.D. Oxford University, *Professor of Ecology and Evolutionary Biology; Mathematics*

Guiyun Yan, Ph.D. University of Vermont, *Professor of Program in Public Health; Ecology and Evolutionary Biology*



## Courses

### **ECO EVO 200A. Research in Ecology and Evolutionary Biology. 2-12 Units.**

Individual research with Ecology and Evolutionary Biological faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

### **ECO EVO 200B. Research in Ecology and Evolutionary Biology. 2-12 Units.**

Individual research with Ecology and Evolutionary Biological faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

### **ECO EVO 200C. Research in Ecology and Evolutionary Biology. 2-12 Units.**

Individual research with Ecology and Evolutionary Biological faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

### **ECO EVO 201. Seminar in Ecology and Evolutionary Biology. 2 Units.**

Invited speakers, graduate students, and faculty present current research in ecology and evolutionary biology.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

Concurrent with BIO SCI E107.

### **ECO EVO 203A. Graduate Tutorial in Ecology and Evolutionary Biology. 2-12 Units.**

Advanced study in areas not represented by formal courses. May involve individual or small group study through reading, discussion, and composition.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

### **ECO EVO 203B. Graduate Tutorial in Ecology and Evolutionary Biology. 2-12 Units.**

Advanced study in areas not represented by formal courses. May involve individual or small group study through reading, discussion, and composition.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

### **ECO EVO 203C. Graduate Tutorial in Ecology and Evolutionary Biology. 2-12 Units.**

Advanced study in areas not represented by formal courses. May involve individual or small group study through reading, discussion, and composition.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

### **ECO EVO 204. Writing Grant Proposals. 4 Units.**

Provides students with hands-on experience writing proposals in the research areas of ecology, evolution, or physiology.

Restriction: Graduate students only.

### **ECO EVO 205. Special Topics in Ecology. 4 Units.**

Survey of special topics in Ecology.

Restriction: Graduate students only.

**ECO EVO 206. Special Topics in Evolution. 4 Units.**

Extensive introduction to the primary literature of evolutionary biology. Topics include population genetics, quantitative genetics, neutralism, molecular evolution, evolution of genetic systems, genetic architecture of fitness, speciation, and macroevolution.

Restriction: Graduate students only.

**ECO EVO 207. Quantitative Methods in Ecology and Evolutionary Biology. 4 Units.**

Statistics for ecologists and evolutionary biologists. Emphasis on specific applications and underlying assumptions rather than on methods of calculation. Topics include experimental design, parametric and nonparametric methods, analysis of variance and covariance, and multiple regression.

Prerequisite: Completion of at least one quarter of statistics including regression and analysis of variance.

Restriction: Graduate students only.

**ECO EVO 208. Ecological and Evolutionary Physiology. 4 Units.**

A summary of information in organismal biology, comparative and ecological physiology, and the biophysical basis of organismal function. Course offered every other fall.

Restriction: Graduate students only.

**ECO EVO 210. Foundations of Physiology. 4 Units.**

Physical and functional principles common to many living forms. Course forms a basis for subsequent specialization in any of the subdisciplines of physiology. Course offered in even years.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 219. Advanced Topics in Ecological Genetics. 4 Units.**

Content and instructor will vary from year to year. Possible topics include coevolution, sex-ratio evolution, evolution senescence, plant population biology, and density-dependent selection.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 221. Advanced Topics in Ecology. 2-4 Units.**

Weekly discussion of current topics in ecology at the graduate level.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

**ECO EVO 222. Statistical Learning in Ecology and Evolution. 4 Units.**

Reviews basic principals of variance/bias trade-offs. Topics include models for prediction and classification, variable selection methods, cross-validation, tree based methods, unsupervised learning. Applications in ecology and evolution using R.

Prerequisite: ECO EVO 207. ECO EVO 207 with a grade of B or better

Restriction: Graduate students only.

**ECO EVO 227. Plant Physiological Ecology. 4 Units.**

Provides a summary of information on plant organismal biology, comparative and ecological physiology, and functional ecology. Offered every other fall.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 228. Seminar in Conservation Biology. 2 Units.**

Devoted to the application of basic ecological principles to the understanding and resolution of environmental problems of both local and global natures. Current problems approached through a combination of readings, group discussions, and visiting speakers.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 230. Topics in Microbial Ecology. 2-4 Units.**

Weekly discussion of current topics in ecology, biogeochemistry, evolution, and physiology of microbial organisms.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**ECO EVO 235. Experimental Evolution. 2 Units.**

Explores experimental evolution, which is now a well-established part of evolutionary biology. With the advent of genomics, it is now one of the most powerful tools for studying the genetic foundations of biology.

Prerequisite: BIO SCI E106

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Biological Sciences students only.

**ECO EVO 246. Seminar in Ecology and Evolution Education. 2 Units.**

Weekly discussion of teaching techniques and challenges that are specific to courses in ecology and evolutionary biology. Emphasis will be on using evidence-based pedagogy techniques. There will be a combination of readings, group discussions and speakers.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 251. Evolutionary and Ecological Principles in Medicine. 4 Units.**

Explore the dynamics of populations on an ecological, epidemiological, and medical level. Considers the dynamics of competition, predation, and parasitism; the spread and control of infectious diseases; and the in vivo dynamics of viral infections and the immune system.

Restriction: Graduate students only.

Concurrent with BIO SCI E151.

**ECO EVO 253. Functional and Structural Evolutionary Genomics. 4 Units.**

Function and organization of genomes analyzed from an evolutionary perspective. Review of some of the most recent experimental approaches in genome analysis and comparative genomics. Relevant software to analyze DNA and expression data is used.

Concurrent with BIO SCI E153.

**ECO EVO 262. Professional Workshop. 2 Units.**

Identify and attend professional or technical skill workshops to gain professional knowledge and certifications related to conservation and restoration science.

Repeatability: May be taken for credit 4 times.

Restriction: Graduate students only.

**ECO EVO 264. Conservation Biology. 4 Units.**

Explores concepts in ecology with potential for conserving biological diversity. Identifies creative applications of ecological research that mitigate impacts of rapid human population growth and habitat destruction on biodiversity.

Restriction: Graduate students only.

**ECO EVO 265. Restoration Ecology. 4 Units.**

Study of principles and practices that help recover degraded ecosystems including restoration in different ecological systems, restoration motives and intensities, implementation and monitoring, and scope and success of case studies.

Restriction: Graduate students only.

**ECO EVO 266L. Field Methods in Restoration. 4 Units.**

Laboratory experience performing field methods that help recover degraded ecosystems in different ecological systems. Emphasis on the plant community composition, soil, irrigation, maintenance, and monitoring of a project.

**ECO EVO 267. Science Communication. 2 Units.**

Develops students' abilities to convey information related to conservation and restoration in a way that has broad appeal and/or effective messaging for non-scientific audiences by assessing the audience, developing effective storytelling, and deploying a persuasive information campaign.

Repeatability: May be taken for credit 2 times.

**ECO EVO 268. Technical Writing. 2 Units.**

Practice developing key documents for restoration projects including a response to a request for proposal (RFP), a restoration project plan, and a monitoring and maintenance plan.

**ECO EVO 269. Project Management. 2 Units.**

Discover the planning, design, implementation, and aftercare phases of managing a conservation or restoration project. Students will project cost, manage risk, analyze sites, evaluate and review projects, and become familiar with common permitting and consultation requirements.

**ECO EVO 270. GIS for Environmental Science. 4 Units.**

Introduction to the fundamental principles of GIS. Topics include cartography, creating/editing GIS data, georeferencing, map projections, geospatial analysis, spatial statistics, and development of GIS models. Focuses on theory and practice.

Restriction: Graduate students only.

**ECO EVO 271. Marine Research and Conservation Methods. 4 Units.**

Field-based introduction to marine ecology and conservation management through the study of the ecology, resource management, and conservation of marine habitats and species, and the use of a variety of marine field research methods.

Restriction: Graduate students only.

**ECO EVO 272. Plant Diversity in a Changing World. 4 Units.**

Investigation of plant diversity in California and throughout the world, including basic systematic concepts, introduction to major groups of flowering plants, and the effects of global biological change on plant diversity. Students carry out a phylogenetic analysis using appropriate software.

Concurrent with BIO SCI E172.

**ECO EVO 275. Wildlife Ecology and Sampling. 4 Units.**

Field-based introduction to wildlife management through the study of the ecology, physiology, population biology management, and conservation of vertebrate wildlife species, and the use of a variety of different wildlife sampling techniques.

Restriction: Graduate students only.

**ECO EVO 282. Fundamentals of Informatics for Biologists. 4 Units.**

Students learn the fundamentals of bioinformatics and the unix operating system (including the shell and Sun Grid Engine) in order to assemble a eukaryotic genome.

Restriction: Graduate students only.

**ECO EVO 283. Advanced Informatics for Biologists. 4 Units.**

Students learn advanced informatics including the analysis of: Poolseq, RNAseq, ATACseq, and ChIPseq datasets using programs such as bwa, tophat, cufflinks, DEseq, Trinity, Agustus, etc., in a unix high-performance computing environment. Statistical tests carried out and publication quality.

Prerequisite: ECO EVO 282

Restriction: Graduate students only.

**ECO EVO 285. Topics in Evolutionary Genetics. 2 Units.**

Weekly discussion of recent research on evolutionary genetics.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 286. MCRS Capstone. 2-12 Units.**

Apply knowledge and skills in a practical professional setting, working with practitioners to identify a conservation or management problem and then to plan, implement, and evaluate a solution.

Repeatability: May be taken for credit for 12 units.

Restriction: Graduate students only.

**ECO EVO 287. Communicating Research Through Video. 4 Units.**

Students explore videography to develop basic production skills through practice with high interest special topics, such as laboratory experimental evolution and educational interdisciplinary field events, and then develop media to communicate their own research or other topics of interest.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 288. Documenting Research Through Cinematic Production. 4 Units.**

Students gain advanced media expertise by conceptualizing investigative research into publicly engaging video projects. Popularly accessible research topics will be adapted into documentary, television, or cinematic pieces that provide opportunities for developing professionally marketable skills in educationally effective media production.

Prerequisite: ECO EVO 287

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ECO EVO 341. Teaching Science in Secondary School. 4 Units.**

Prospective secondary science teachers learn how to teach science in grades 7-12. Covers State science requirements, a variety of teaching methods, criteria for selecting science curricular materials, and how to plan science lessons, units, experiments, projects, and demonstrations.

Same as EDUC 341.

Restriction: Master of Arts in Teaching Degree students only.

**ECO EVO 398. Teaching Assistant Seminar. 2 Units.**

Readings, lectures, workshops, and student presentations designed to help develop teaching skills of graduate students teaching university-level biology classes. Topics vary and may include: course organization, presentation styles, exam design, grading, motivating students, and commonly encountered problems.

Repeatability: May be repeated for credit unlimited times.

**ECO EVO 399. University Teaching. 4 Units.**

Mandatory course for Ecology and Evolutionary Biology Teaching Assistants, required in each quarter in which student has a Teaching Assistant position. Limited to Teaching Assistants.

Repeatability: May be repeated for credit unlimited times.

## Ecology and Evolutionary Biology, B.S.

In the 21st century, biologists in fields ranging from medicine to global change biology increasingly incorporate ecological and evolutionary ideas in their research. The major in Ecology and Evolutionary Biology encourages students to understand and appreciate important linkages between biological disciplines. The major is very broad, including components of evolutionary biology, ecology, and physiology. Faculty interests are also broad and include the evolution of aging, conservation biology, restoration ecology, biogeography, plant and animal population and community ecology, the evolution of infectious disease, evolutionary physiology, behavioral ecology, host-disease interactions, evolutionary genetics, genetics of invasive species, and plant population biology. Following graduation, students will be especially well prepared to enter graduate programs in either ecology or evolution for advanced study. The major also provides the foundation to pursue careers in governmental and non-governmental environmental organizations, as well as professional schools. The Department considers undergraduate experience in research an integral component of a scientific education, and majors are encouraged to participate in BIO SCI 199, in which they will be mentored by an individual faculty member within the Department.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

**Major Requirements**

A. Required Major Courses:

BIO SCI E106	Processes in Ecology and Evolution
BIO SCI E107	Seminar in Ecology and Evolutionary Biology
STATS 8	Introduction to Biological Statistics

B. Upper-Division Laboratories:

BIO SCI E115L	Evolution Laboratory
BIO SCI E166L	Field Biology

and select one of the following:

BIO SCI D111L	Developmental and Cell Biology Laboratory
BIO SCI E106L	Habitats and Organisms
BIO SCI E112L	Physiology Laboratory
BIO SCI E131L	Image Analysis in Biological Research
BIO SCI E140L	Evolution and the Environment Laboratory
BIO SCI E160L	Biology of Birds Lab
BIO SCI E179L	Field Freshwater Ecology
BIO SCI M114L	Biochemistry Laboratory
BIO SCI M116L	Molecular Biology Laboratory
BIO SCI M118L	Experimental Microbiology Laboratory
BIO SCI M121L	Advanced Immunology Laboratory
BIO SCI M130L	Advanced Molecular Lab Techniques
BIO SCI N113L	Neurobiology Laboratory
One laboratory can be satisfied with completion of Excellence in Research in the Biological Sciences.	

## C. Upper-Division Biology Electives:

Select one of the following:

BIO SCI D103	Cell Biology
BIO SCI D104	Developmental Biology
BIO SCI D105	Cell, Developmental, and Molecular Biology of Plants
BIO SCI E109	Human Physiology
BIO SCI N110	Neurobiology and Behavior

and select three four-unit courses from the following:

BIO SCI E118–E190. BIO SCI 199 Research is strongly encouraged.

Double majors within the School of Biological Sciences or with Public Health Sciences, Biomedical Engineering: Premedical, Nursing Science, or Pharmaceutical Sciences are not permitted.

Freshman		
Fall	Winter	Spring
BIO SCI 93	BIO SCI 94	BIO SCI E106 <sup>2</sup>
CHEM 1A	CHEM 1B	CHEM 1C- 1LC
Lower-Division Writing <sup>1</sup>	Lower-Division Writing <sup>1</sup>	Lower-Division Writing <sup>1</sup>
BIO SCI 2A		
Sophomore		
Fall	Winter	Spring
BIO SCI 97	BIO SCI 98	BIO SCI 99
CHEM 51A	CHEM 51B- 51LB	CHEM 51C- 51LC
MATH 5A	MATH 5B	STATS 8
CHEM 1LD		
BIO SCI 194S		
Junior		
Fall	Winter	Spring
BIO SCI E107	U-D Bio. Sci. elective	BIO SCI E115L
PHYSICS 3A	PHYSICS 3B- 3LB	PHYSICS 3C- 3LC
Bio. Sci. research	Bio. Sci. research	U-D Bio. Sci. elective
BIO SCI 100	General Education	Bio. Sci. research
Senior		
Fall	Winter	Spring
BIO SCI E166L	U-D Bio. Sci. elective	U-D Bio. Sci. elective
U-D Lab	Bio. Sci. research	General Education
Bio.Sci. research	General Education	Bio. Sci. research
Elective		

<sup>1</sup> Students have the option of taking HUMAN 1AS, HUMAN 1BS, HUMAN 1CS or WRITING 39A, WRITING 39B, WRITING 39C in order to fulfill the lower-division writing requirement.

<sup>2</sup> BIO SCI E106 is offered in all three quarters, is a prerequisite for many upper-division courses and may be taken at any time after completion of BIO SCI 94.

## Ecology and Evolutionary Biology, Graduate Program

Graduate training provides students with unparalleled opportunities for scientific research and career development. Historically, most students have enrolled in the Ph.D. program, but a thesis-based M.S. program is also available. Graduate students conduct research under the supervision of a faculty advisory committee. The Ph.D. curriculum includes five graduate courses, an advancement examination with written and oral components, and an original dissertation with an oral defense typically completed within five years of enrollment. The M.S. program requires 28 units of coursework along with a research proposal, original thesis, and oral defense typically completed within two or three years.

Applicants for this program should have a solid undergraduate program in biology and ecology, emphasizing both research and fieldwork. In addition, course work in statistics, mathematics, and physical and chemical sciences is expected. The deadline for application is December 1.

The graduate program offers both the Plan I M.S. and the Ph.D. in Biological Sciences.

### Requirements

Students are required to complete a minimum of five core courses during their first six academic quarters. Two of those courses are required graduate-level courses that all students must take:

ECO EVO 204	Writing Grant Proposals (typically in the second year)
ECO EVO 207	Quantitative Methods in Ecology and Evolutionary Biology (typically in the first year)

In addition students must take one course each in the areas of Physiology (P), Ecology (EC), and Evolution (EV). Although all three courses can be taken at the graduate level (G), one of the three courses may be taken as an upper-division undergraduate course (U). The list of acceptable courses is currently limited to:

ECO EVO 208	Ecological and Evolutionary Physiology (GP)
ECO EVO 227	Plant Physiological Ecology (GP)
PHYSIO 206A	Introduction to Medical Physiology (GP)
PHYSIO 206B	Introduction to Medical Physiology (GP)
ANATOMY 201	Human Gross Anatomy (GP)
BIO SCI E109	Human Physiology (UP)
BIO SCI E127	Physiological Plant Ecology (UP)
BIO SCI E138	Comparative Animal Physiology (UP)
BIO SCI E139	Animal Locomotion (UP)
BIO SCI E145	Animal Coloration and Vision (UP)
BIO SCI E183	Exercise Physiology (UP)
BIO SCI E188	Introduction to Insect Physiology (UP)
ECO EVO 205	Special Topics in Ecology (GEC)
ECO EVO 251	Evolutionary and Ecological Principles in Medicine (GEC)
BIO SCI E118	Ecosystem Ecology (UEC)
BIO SCI E151	Evolutionary and Ecological Principles in Medicine (UEC)
BIO SCI E166L	Field Biology (UEC)
BIO SCI E186	Population and Community Ecology (UEC)
ECO EVO 206	Special Topics in Evolution (GEV)
BIO SCI E153	Functional and Structural Evolutionary Genomics (UEV)
BIO SCI E154	Genetics and Human History (UEV)
BIO SCI E168	Evolution (UEV)

If a student wishes to request an exception (an exemption or a substitution), the student must submit a written request justifying the reason to the Graduate Advisor. The Graduate Advisor and the student's Advisory Committee (or prior to the formation of the Advisory Committee, the Prescription Committee) will decide whether to grant the request.

Students who enter the program through the Gateway Program are required to take ECO EVO 204 and one additional course at either the undergraduate or graduate level in the dissertation topic area. The student and his/her thesis advisor should decide which particular course would be most appropriate.

Students are required to maintain a grade point average of B or greater in the five core courses required for that student. The grade of B- is not considered a passing grade for a graduate student. Students must pass the five core courses by the end of their second academic year. Students failing



to meet this requirement may be asked to leave the program. In the event a student receives an Incomplete in any of the core courses, the deficiency must be cleared by the deadline specified by the Graduate Advisor. Any extensions of this deadline require approval by the Graduate Advisor.

### Teaching Requirement

To ensure that all students gain teaching experience, all students are required to serve as Teaching Assistants for a minimum of one quarter for M.S. students and three quarters for Ph.D. students. These are minima, and students may teach additional quarters during their program.

### Research

Each entering graduate student chooses a faculty advisor and a three-person advisory committee for guidance, with whom the student meets at least twice each year. All students are encouraged to submit a research proposal to their advisory committee during their first year of residency. A comprehensive proposal is required before the end of the first year for M.S. students and before advancement to candidacy for Ph.D. students. The progress of each student is reviewed by the student's advisory committee, together with the Graduate Advisor, twice each academic year.

### Advancement to Candidacy and Normative Time for Completion

Doctoral students who Advance to Candidacy meet the M.S. degree requirements, and can receive the M.S. degree by submitting the M.S. degree advancement to candidacy paperwork, and then submitting the M.S. degree completion paperwork in a subsequent quarter.

The normative time for completion of the Ph.D. is five years, and the maximum time permitted is seven years. All requirements for the M.S. degree should be completed within two years, with a maximum of three years allowed for completion of the program. Advancement to doctoral candidacy by an oral examination is expected during the third year for students entering with a B.A. or B.S. or during the second year for those entering with an M.A. or M.S.

## Master of Conservation and Restoration Science

The Master of Conservation and Restoration Science (MCRS) is designed for professionals or recent graduates who wish to further their education and gain skills that will help them obtain or advance in careers related to environmental management. The MCRS program integrates academic scholarship in ecology and evolutionary biology, training in natural resource management and stewardship, professional development (leadership training in agency, non-profit and for-profit conservation), and community engagement (translational partnerships in research and education).

### Program Objectives

Upon completion of the program, graduates are able to lead and collaborate in the planning, design, implementation, and management of complex, large-scale environmental conservation and restoration activities, in agency, non-profit, and for-profit settings. MCRS graduates have the broad knowledge in applied ecosystem and community ecology, in addition to training in the use of Geographical Information Systems (GIS), remote sensing, and informatics (data analysis and management). Professional development training (e.g., project and personnel management) will position our graduates for leadership positions in environmental non-profits, agencies, and private consulting firms where managing teams of employees, volunteers, and stewards to conduct long-term and large-scale projects is often required.

A B.A. or B.S., preferably in Biology, Conservation Biology, Ecology, or Environmental Science (or comparable degree title) from a fully accredited academic institution, is required for admission. Applicants with undergraduate degrees in areas such as Social Ecology, Public Health, Environmental Policy, or other similar degree titles are considered, but must demonstrate proficiency in the natural sciences and/or practical experience working in the professional field as documented below:

- Undergraduate preparation should include a minimum of:
- One full year of biological sciences
- One full year of chemistry
- One semester or quarter of calculus or statistics

Experience from professional activities will be evaluated by faculty and staff in the program, but extended practical experience in ecology, conservation, restoration, or environmental engineering may be an acceptable substitute for one or more of the requirements above, depending on the nature of the experience. The GRE is not required.

Applicants must demonstrate that they possess academic potential for graduate study and meet the general requirements of the UCI Graduate Division. In addition to the requirements above, selection for admission is based on the following criteria:

1. A minimum overall grade point average of 3.0 in undergraduate academic course work
2. Two confidential letters of recommendation
3. A statement of purpose (describing the applicant's goals in seeking the Master's degree)
4. A resume (noting relevant work/academic experience)

Applicants apply directly to the Graduate Division for the MCRS program beginning each fall. The program uses rolling admission deadlines. The priority deadline is February 1; applications received by this date are read first, and next fall's class begins to fill from this group. April 1 is the normal deadline;



the remainder of the class is filled from these applicants. If the class is not full after each review of the April 1 applicants, additional applications will be accepted until July 1.

### Curriculum

This two-year program of study consists of a four-part curriculum: a first-year sequence of core topic and professional development courses, a summer research/policy internship, a second-year of elective courses, and a team-based capstone experience (that serves as the thesis project). The summer internship and capstone experience are focused on stakeholder-engaged scholarship with community partners, where students are embedded in real-world conservation and restoration settings.

The MCRS program provides curriculum that includes:

1. Experience in core ecological and evolutionary principles underlying conservation and restoration;
2. interdisciplinary training in the earth and environmental sciences vital for a modern perspective on system-based conservation and restoration;
3. training in professional skills required for effective practice and success in leadership positions in non-profit, institute, for-profit and agency settings;
4. research experiences in community-engaged research projects to build bridges between communities of research capacity (universities, institutes, agencies) and need (non-profits, land management agencies, private land-holders, and governments); and
5. exposure to social, political, and economic principles that guide the application of science to conservation and restoration.

### Required and Elective Course Work

This program consists of 11 required classes, four required workshops, four electives (selected across three categories), a recommended summer internship, and a group capstone project. There is no teaching requirement for the MCRS.

A. Complete the following:

ECO EVO 203B	Graduate Tutorial in Ecology and Evolutionary Biology ((Intro to Conservation and Restoration Science - 2 units))
ECO EVO 205	Special Topics in Ecology
ECO EVO 264	Conservation Biology
ECO EVO 265	Restoration Ecology
EARTHSS 264	Ecosystem Ecology
ECO EVO 207	Quantitative Methods in Ecology and Evolutionary Biology
EARTHSS 134	Fundamentals of GIS for Environmental Science
ECO EVO 266L	Field Methods in Restoration
ECO EVO 268	Technical Writing
ECO EVO 267	Science Communication
ECO EVO 269	Project Management

B. Select four courses from the following categories: <sup>1</sup>

Environmental Regulation and Policy
Organismal Biology and Diversity
Earth and Environmental Science

<sup>1</sup> View courses eligible for the elective requirements here (<http://mcrs.bio.uci.edu/elective-courses/>). Courses offered in each category may change each year. Two electives may be taken at the undergraduate level.

### Capstone Project for Degree Completion

In lieu of qualifying exams or a thesis requirement, students are required to complete 12 units of capstone course during their second year in the program. In the MCRS capstone course, groups of three to six students complete a project involving community-engaged scholarship in collaboration with a local partner/stakeholder to address a current management need and/or solve a real environmental problem.

Students demonstrate how the knowledge and skills learned in this program can be applied in a practical professional setting while gaining skills necessary to succeed in the professional arena upon degree completion.

Capstone projects require a written product. The format of this product is not specified, but it must demonstrate that the student can effectively integrate the skills that they have learned in the MCRS program. Programs may include habitat conservation, restoration, or species management plans; detailed reports to partners or stakeholders; or scholarly research papers. All written products must show originality and thoroughness in the conception and implementation of the project and effective integration of their project with the broader field of conservation and restoration science.

## Department of Molecular Biology and Biochemistry

Celia Goulding, Department Chair

**Michael Green, Department Vice Chair**  
**Melissa Lodoen, Department Vice Chair**  
 3205 McGaugh Hall  
 949-824-4915  
<http://mbb.bio.uci.edu/>

The core discipline of Molecular Biology and Biochemistry is the understanding of the molecular mechanisms that underlie all fundamental biological processes. To that end the faculty of the Department of Molecular Biology and Biochemistry represent diverse research interests that include structure and synthesis of proteins and nucleic acids, gene organization and regulation, cell signaling, immunology and host pathogen interactions, biochemical genetics, cell and developmental biology, microbiology and virology.

- Biochemistry and Molecular Biology, B.S.
- Microbiology and Immunology, B.S.

## Graduate Program

The Department offers graduate study in conjunction with the program in Cellular and Molecular Biosciences (CMB) and the Interdepartmental Neuroscience Program (INP). Students admitted into a combined program who select a research advisor in the Department begin following the departmental requirements for the Ph.D. at the beginning of their second year. Participation in an advanced topics seminar series and completion of at least one course per year for three years are expected of all students. Students must advance to candidacy in their third year. The normative time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

**Graduate Gateway Program in Medicinal Chemistry and Pharmacology (MCP).** The one-year MCP graduate gateway program is designed to function in concert with selected graduate programs, including the Ph.D. in Biological Sciences. Detailed information is available on the Pharmaceutical Sciences website (<http://pharmsci.uci.edu/current-students/graduate-students/>).

## Faculty

Dana W. Aswad, Ph.D. University of California, Berkeley, *Professor Emeritus of Molecular Biology and Biochemistry*

Hans-Ulrich Bernard, Ph.D. University of Goettingen, *Professor Emeritus of Molecular Biology and Biochemistry; Program in Public Health*

Alexander D. Boiko, Ph.D. University of Illinois at Urbana–Champaign, *Assistant Professor of Molecular Biology and Biochemistry*

Michael J. Buchmeier, Ph.D. McMaster University, *Professor of Medicine; Microbiology and Molecular Genetics; Molecular Biology and Biochemistry*

John Charles Chaput, Ph.D. University of California, Riverside, *Professor of Pharmaceutical Sciences; Chemistry; Molecular Biology and Biochemistry* (chemical and synthetic biology)

Melanie Cocco, Ph.D. Pennsylvania State University, *Associate Professor of Molecular Biology and Biochemistry; Pharmaceutical Sciences*

Michael G. Cumsy, Ph.D. University of California, Berkeley, *Professor of Teaching of Molecular Biology and Biochemistry*

Hung Y. Fan, Ph.D. Massachusetts Institute of Technology, *Professor Emeritus of Molecular Biology and Biochemistry*

Donald N. Forthal, M.D. University of California, Irvine, *Professor of Medicine; Molecular Biology and Biochemistry*

David A. Fruman, Ph.D. Harvard University, *Professor of Molecular Biology and Biochemistry*

Paul David Gershon, Ph.D. University of Liverpool, *Professor of Molecular Biology and Biochemistry*

Charles Glabe, Ph.D. University of California, Davis, *Professor of Molecular Biology and Biochemistry*

Celia Goulding, Ph.D. King's College London, *Professor of Molecular Biology and Biochemistry; Pharmaceutical Sciences*

Michael T. Green, Ph.D. University of Chicago, *Professor of Molecular Biology and Biochemistry; Chemistry* (chemical, biology, inorganic and organometallic, physical chemistry and chemical physics, theoretical and computational)

Barbara A. Hamkalo, Ph.D. University of Massachusetts, *Professor Emerita of Molecular Biology and Biochemistry*

Yilin Hu, Ph.D. Loma Linda University, *Assistant Professor of Molecular Biology and Biochemistry*

Christopher C. Hughes, Ph.D. University of London, *Director of Edwards Lifesciences Center for Advanced Cardiovascular Technology and Professor of Molecular Biology and Biochemistry; Biomedical Engineering* (tissue engineering, growth and patterning of blood vessels)

Matthew Inlay, Ph.D. University of California, San Diego, *Assistant Professor of Molecular Biology and Biochemistry*

- Anthony A. James, Ph.D. University of California, Irvine, *Distinguished Professor and Donald Bren Professor of Microbiology and Molecular Genetics; Molecular Biology and Biochemistry*
- Pavan Kadandale, Ph.D. Rutgers, The State University of New Jersey, *Assistant Professor of Teaching of Molecular Biology and Biochemistry*
- Mei Kong, Ph.D. McGill University, *Associate Professor of Molecular Biology and Biochemistry*
- Young Jik Kwon, Ph.D. University of Southern California, *Professor of Pharmaceutical Sciences; Biomedical Engineering; Chemical and Biomolecular Engineering; Molecular Biology and Biochemistry* (gene therapy, drug delivery, cancer-targeted therapeutics, artificially-induced cellular vesicles, multi-modal therapies)
- Chang C. Liu, Ph.D. Scripps Research Institute, *Assistant Professor of Biomedical Engineering; Chemistry; Molecular Biology and Biochemistry* (genetic engineering, directed evolution, synthetic biology, chemical biology)
- Melissa Lodoen, Ph.D. University of California, San Francisco, *Associate Professor of Molecular Biology and Biochemistry*
- Ray Luo, Ph.D. University of Maryland, College Park, *Professor of Molecular Biology and Biochemistry; Biomedical Engineering; Chemical and Biomolecular Engineering; Materials Science and Engineering* (protein structure, noncovalent associations involving proteins)
- Andrej Luptak, Ph.D. Yale University, *Professor of Pharmaceutical Sciences; Chemistry; Molecular Biology and Biochemistry* (chemical biology)
- Jerry E. Manning, Ph.D. University of Utah, *Professor Emeritus of Molecular Biology and Biochemistry*
- Rachel Martin, Ph.D. Yale University, *Department Vice Chair and Professor of Chemistry; Molecular Biology and Biochemistry* (analytical, chemical biology, physical chemistry and chemical physics)
- Alexander McPherson, Ph.D. Purdue University, *Professor Emeritus of Molecular Biology and Biochemistry*
- Naomi Morrisette, Ph.D. University of Pennsylvania, *Associate Professor of Molecular Biology and Biochemistry*
- Edward L. Nelson, M.D. University of Oregon, *Associate Professor of Medicine; Molecular Biology and Biochemistry*
- Thomas L. Poulos, Ph.D. University of California, San Diego, *Distinguished Professor of Molecular Biology and Biochemistry; Chemistry; Pharmaceutical Sciences* (chemical biology)
- Ilhem Messaoudi Powers, Ph.D. Weill Cornell Graduate School of Medical Sciences, *Associate Professor of Molecular Biology and Biochemistry; Microbiology and Molecular Genetics*
- Jennifer A. Prescher, Ph.D. University of California, Berkeley, *Professor of Chemistry; Molecular Biology and Biochemistry; Pharmaceutical Sciences* (chemical biology, organic and synthetic)
- Olga Razorenova, Ph.D. Institute of Molecular Genetics, *Assistant Professor of Molecular Biology and Biochemistry*
- Elizabeth L. Read, Ph.D. University of California, Berkeley, *Assistant Professor of Chemical and Biomolecular Engineering; Molecular Biology and Biochemistry* (dynamics of complex biochemical systems, regulation of immune responses)
- Markus W. Ribbe, Ph.D. University of Bayreuth, *UCI Chancellor's Professor of Molecular Biology and Biochemistry; Chemistry* (chemical biology, inorganic and organometallic)
- Brian Sato, Ph.D. University of California, San Diego, *Associate Professor of Teaching of Molecular Biology and Biochemistry; Education*
- Donald F. Senear, Ph.D. University of Washington, *Professor of Molecular Biology and Biochemistry*
- Albert Siryaporn, Ph.D. University of Pennsylvania, *Assistant Professor of Physics and Astronomy; Molecular Biology and Biochemistry*
- Robert Spitale, Ph.D. University of Rochester, *Director of the UCI Transcriptomics Core and Associate Professor of Pharmaceutical Sciences; Chemistry; Molecular Biology and Biochemistry* (chemistry, chemical biology, RNA biology)
- Andrea Tenner, Ph.D. University of California, San Diego, *Professor of Molecular Biology and Biochemistry; Neurobiology and Behavior*
- Roberto Tinoco, Ph.D. University of California, San Diego, *Assistant Professor of Molecular Biology and Biochemistry*
- Shiou-Chuan (Sheryl) Tsai, Ph.D. University of California, Berkeley, *Professor of Molecular Biology and Biochemistry; Chemistry; Pharmaceutical Sciences*
- Luis P. Villarreal, Ph.D. University of California, San Diego, *Professor Emeritus of Molecular Biology and Biochemistry*
- Craig Walsh, Ph.D. University of California, Los Angeles, *Professor of Molecular Biology and Biochemistry*

Gregory A. Weiss, Ph.D. Harvard University, *Professor of Chemistry; Molecular Biology and Biochemistry; Pharmaceutical Sciences* (analytical, chemical biology, organic and synthetic, polymer, materials, nanoscience)

Katrine Whiteson, Ph.D. University of Chicago, *Assistant Professor of Molecular Biology and Biochemistry*

Clifford A. Woolfolk, Ph.D. University of Washington, *Professor Emeritus of Molecular Biology and Biochemistry*

## Courses

### **MOL BIO 200A. Research in Molecular Biology and Biochemistry. 2-12 Units.**

Individual research with Molecular Biology and Biochemistry faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

### **MOL BIO 200B. Research in Molecular Biology and Biochemistry. 2-12 Units.**

Individual research with Molecular Biology and Biochemistry faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

### **MOL BIO 200C. Research in Molecular Biology and Biochemistry. 2-12 Units.**

Individual research with Molecular Biology and Biochemistry faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

### **MOL BIO 200R. Research in Developmental & Cell Biology for First-year Students. 2-12 Units.**

Independent research within the laboratories of graduate training faculty in the Department of Molecular Biology and Biochemistry for first-year Ph.D. students.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

### **MOL BIO 201A. Seminars in Molecular Biology & Biochemistry. 2 Units.**

Presentation of research from department laboratories or, when pertinent, of other recent developments.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

### **MOL BIO 201B. Seminars in Molecular Biology & Biochemistry. 2 Units.**

Presentation of research from department laboratories or, when pertinent, of other recent developments.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

### **MOL BIO 201C. Seminars in Molecular Biology & Biochemistry. 2 Units.**

Presentation of research from department laboratories or, when pertinent, of other recent developments.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

### **MOL BIO 202A. Tutorial in Molecular Biology and Biochemistry. 2 Units.**

Tutorials in the area of research of a particular professor which relate current research to the literature. May be conducted as journal clubs.

Repeatability: Unlimited as topics vary.

### **MOL BIO 202B. Tutorial in Molecular Biology and Biochemistry. 2 Units.**

Tutorials in the area of research of a particular professor which relate current research to the literature. May be conducted as journal clubs.

Repeatability: Unlimited as topics vary.

**MOL BIO 202C. Tutorial in Molecular Biology and Biochemistry. 2 Units.**

Tutorials in the area of research of a particular professor which relate current research to the literature. May be conducted as journal clubs.

Repeatability: Unlimited as topics vary.

**MOL BIO 203. Nucleic Acid Structure and Function. 4 Units.**

Structure and chemistry of nucleic acids. Relationship between these properties and the mechanisms of fundamental processes such as replication and repair, RNA-mediated catalysis, formation and regulation of higher order chromatin structure and recombination.

Prerequisite: BIO SCI 98 and BIO SCI 99 and CHEM 51A and CHEM 51B and CHEM 51C

**MOL BIO 204. Protein Structure and Function. 4 Units.**

The structure and properties of proteins, enzymes, and their kinetic properties.

Prerequisite: BIO SCI 98 and BIO SCI 99 and CHEM 51C

**MOL BIO 205. Molecular Virology. 4 Units.**

Primary research data on the major DNA and RNA viruses emphasizing strategies of regulation of gene expression. Utilization of viruses as molecular biological tools. Graduate-level knowledge of the biochemistry and molecular biology of macromolecules is required.

Prerequisite: MOL BIO 203 and MOL BIO 204

Restriction: Graduate students only.

**MOL BIO 211. High-Resolution Structures: NMR and X-ray. 4 Units.**

Basic principles of magnetic resonance and x-ray crystallography toward the determination of high-resolution biomolecular structures.

Prerequisite: MATH 2B

Restriction: Graduate students only.

Concurrent with BIO SCI M133.

**MOL BIO 213. Literature in Nucleic Acid Structure and Function. 2 Units.**

Exploration and critical analysis of recent primary scientific literature in structure, properties, and biological mechanisms involving nucleic acids.

Corequisite: MOL BIO 203

Grading Option: Satisfactory/unsatisfactory only.

**MOL BIO 214. Literature in Protein Structure and Function. 2 Units.**

Exploration and critical analysis of recent primary scientific literature in structure and properties of proteins, enzymes, and their kinetic properties.

Corequisite: MOL BIO 204

Grading Option: Satisfactory/unsatisfactory only.

**MOL BIO 215. Integrative Immunology. 4 Units.**

Lectures and student presentations of primary literature. The main goal is to achieve a basic understanding of the cellular and molecular basis of innate and adaptive immunity, and how immune function is coordinated at a systems level.

Same as M&MG 215.

**MOL BIO 217A. Principles of Cancer Biology I. 4 Units.**

Oncogenes and tumor suppressor genes are studied from molecular viewpoints. Also studies their role in cancer; viral carcinogenesis. Designed for graduate students interested in cancer research. Format includes lectures and student-led discussions.

Prerequisite: MOL BIO 203 and MOL BIO 204

Restriction: Graduate students only.

**MOL BIO 217B. Principles of Cancer Biology II. 4 Units.**

Topics include cancer cell growth and metastasis, chemical carcinogenesis, and cancer genetics and epidemiology. Designed for graduate students interested in cancer research. Format includes lectures and student-led discussions.

Prerequisite: MOL BIO 203 and MOL BIO 204

Restriction: Graduate students only.

**MOL BIO 218. Clinical Cancer. 3 Units.**

Designed to acquaint students in basic life science with clinical cancer.

Restriction: Graduate students only.

**MOL BIO 220. Structure & Synthesis of Biological Macromolecules Journal Club. 2 Units.**

Advanced topics in macromolecular structure and synthesis as related to biological problems.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**MOL BIO 221. Advanced Topics in Immunology. 4 Units.**

Literature-based, interactive discussions focused on review of seminal historic and recent immunology literature. Student responsibilities include reading, critical evaluation, and discussion of manuscripts.

Prerequisite: M&MG 215

Restriction: Graduate students only.

**MOL BIO 221L. Advanced Immunology Laboratory. 4 Units.**

An advanced course in immunology for graduate students enrolled in the Biotechnology master's program. Emphasis is placed on learning modern techniques in immunology such as ELISAs, western blotting, immunofluorescent staining assays.

Restriction: Graduate students only.

Concurrent with BIO SCI M121L.

**MOL BIO 223. Introduction to Computational Biology. 4 Units.**

The use of theories and methods based on computer science, mathematics, and physics in molecular biology and biochemistry. Basics in biomolecular modeling. Analysis of sequence and structural data of biomolecules. Analysis of biomolecular functions.

Same as BME 232.

Restriction: Graduate students only.

Concurrent with BIO SCI M123 and COMPSCI 183 and BME 132.

**MOL BIO 227. Immunology Journal Club. 2 Units.**

Advanced topics in immunology as related to an understanding of human disease.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 15 times.

Restriction: Graduate students only.

**MOL BIO 229. Research-in-Progress Seminars. 1 Unit.**

Two half-hour presentations by graduate students and postdoctorals to the department on their current research projects.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 15 times.

Restriction: Graduate students only.

**MOL BIO 235. Literature in Chemical and Structural Biology. 1 Unit.**

Exploration and critical analysis of recent primary scientific literature in chemical and structural biology.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**MOL BIO 243. Topics in Stem Cells. 2-4 Units.**

Presentation by participating faculty or guest lecturer that is open to the science community, followed by discussion of the lecture topic or a related topic. Students are responsible for presentations and readings.

**MOL BIO 244. Principles of Genomics. 4 Units.**

A survey course of the principal subfields of genomics and their applications to biological and health sciences that will cover genome assembly and annotation, genome structure, comparative genomics, population genomics, functional genomics, and medical genomics.

Same as DEV BIO 214.

Restriction: Graduate students only.

**MOL BIO 248. Metallobiochemistry . 4 Units.**

A review of the biochemistry of metallic elements emphasizing: methods for studying metals in biological systems; the chemical basis for nature's exploitation of specific elements; structures of active sites; mechanisms; solid-state structures and devices; metals in medicine.

Prerequisite or corequisite: CHEM 131C or CHEM 132C

Same as CHEM 218.

**MOL BIO 250. Advanced Topics in Biotechnology - Nucleic Acids. 2 Units.**

Supplements laboratory curriculum with scientific background behind experimental methods. Format consists of lectures and the presentation and analysis of relevant papers from the scientific literature.

Corequisite: MOL BIO 250L

Restriction: Graduate students only. Biotechnology Majors only.

**MOL BIO 250L. Biotechnology Laboratory - Nucleic Acids. 8 Units.**

Nucleic acid techniques and recombinant DNA technology. Extraction and purification of nucleic acids, cloning and subcloning, PCR, site-directed mutagenesis, nucleic acid hybridization, additional associated procedures. Students must demonstrate accurate documentation of data (laboratory notebook) detailing experience and results.

Corequisite: MOL BIO 250

Restriction: Graduate students only. Biotechnology Majors only.

**MOL BIO 251. Advanced Topics in Biotechnology - Protein Purification and Characterization. 2 Units.**

Supplements laboratory curriculum with scientific background behind experimental methods. Format consists of lectures and the presentation and analysis of relevant papers from the scientific literature.

Corequisite: MOL BIO 251L

Prerequisite: MOL BIO 250L and MOL BIO 250

Restriction: Graduate students only. Biotechnology Majors only.

**MOL BIO 251L. Biotechnology Laboratory - Protein Purification and Characterization. 8 Units.**

Major techniques of handling proteins and antibodies. Protein engineering, expression and large-scale purification of recombinant proteins from bacteria, HPLC, antibody purification, western blotting, additional associated procedures. Students must demonstrate accurate documentation of data (laboratory notebook) detailing experience and results.

Corequisite: MOL BIO 251

Prerequisite: MOL BIO 250L and MOL BIO 250

Restriction: Graduate students only. Biotechnology Majors only.

**MOL BIO 252L. Biotechnology Management Laboratory. 8 Units.**

Overview of current methods in biotechnology, designed specifically for biotechnology graduate students. Organized into four distinct sections (nucleic acids, proteins, virology, and immunology). Students must demonstrate accurate documentation of data (laboratory notebooks) detailing experience and results.

Restriction: Graduate students only. Biotechnology Majors only.

**MOL BIO 253. Biotech Management . 5 Units.**

Taught jointly by Bio Sci and Merage School faculty, the course addresses fundamental aspects within, and associated with, the biotechnology industry. Curriculum is focused largely on management issues, including finance, product development, pharmaceuticals, project management, regulatory affairs, and ethics.

Same as MGMTMBA 293.

Restriction: Graduate students only. Biotechnology Majors only.



**MOL BIO 253L. Stem Cell Laboratory. 4 Units.**

Designed to prepare M.S. Biotechnology program students for a career in stem cell research. Laboratory training utilizes tissue culture, mouse and human embryonic stem cells, and is enhanced with didactic material and discussion.

Prerequisite: MOL BIO 250L and MOL BIO 251L

Restriction: Graduate students only. Biotechnology Majors only.

**MOL BIO 268. Seminar in Systems Microbiology Research. 1 Unit.**

A research and journal club seminar that covers topics on bacteria and phage using approaches and principles from biology, engineering, and physics.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Same as PHYSICS 268, ENGRMSE 267.

Restriction: Upper-division students only. Graduate students only.

**MOL BIO 270. Science Communication Skills. 2 Units.**

Development of effective communication skills, oral and written presentations. Topics range from the art of creating keynote slides to strategically crafting a personal story, culminating in a live presentation to an invited audience.

**MOL BIO 291. Graduate School Fundamentals. 2 Units.**

Lectures and discussions providing basic skills needed for success in Ph.D. graduate studies. Topics include formulating a hypothesis, experimental design, literature review, grant writing, oral communication, biostatistics, time management, and professional development.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Cellular and Molecular Biosci Majors only.

**MOL BIO 292A. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**MOL BIO 292B. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**MOL BIO 292C. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**MOL BIO 293A. Cancer Biology Journal Club. 1 Unit.**

Focuses on molecular mechanisms that underlie the development and progression of cancers. Covers a variety of cancer-related research areas, such as cell cycle control, apoptosis, DNA repair, metastasis, angiogenesis, and others.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**MOL BIO 293B. Cancer Biology Journal Club. 1 Unit.**

Focuses on molecular mechanisms that underlie the development and progression of cancers. Covers a variety of cancer-related research areas, such as cell cycle control, apoptosis, DNA repair, metastasis, angiogenesis, and others.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.



**MOL BIO 293C. Cancer Biology Journal Club. 1 Unit.**

Focuses on molecular mechanisms that underlie the development and progression of cancers. Covers a variety of cancer-related research areas, such as cell cycle control, apoptosis, DNA repair, metastasis, angiogenesis, and others.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**MOL BIO 295. Biomedical Research Methods. 2 Units.**

Lectures and interactive discussions of research methods in modern biomedical science. Each week will focus on a different class of techniques, including molecular, biochemical, immunological, genomic, bioinformatics, microscopy, cancer biology, genome editing. One hour per week, grading based on attendance.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Cellular and Molecular Biosci Majors only.

**MOL BIO 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Restriction: Graduate students only.

## Biochemistry and Molecular Biology, B.S.

Few areas of Biological Sciences remain that are not impacted by studies at the chemical and molecular level. The major in Biochemistry and Molecular Biology is designed to provide a comprehensive background in this modern, conceptual understanding of biology. Students who wish to begin in-depth study of the molecular basis in any of a variety of fields, including development, gene expression, immunology, pathogenesis, disease, virology, and evolution, can do so through this major. This program will be especially attractive to those students who intend to pursue an advanced degree in biological or medical sciences.

The Biochemistry and Molecular Biology major is based upon required courses in Advanced Biochemistry and Advanced Molecular Biology (BIO SCI M114 and BIO SCI M116 ). These courses, together with a wide variety of elective course offerings, provide majors the choice to either explore the breadth of the field or follow a more in-depth study of any of its subdisciplines. For students interested in the interface between biology and chemistry, this program articulates well with a second major in Chemistry.

The program of study emphasizes laboratory experience and its integration with basic theory. This is accomplished in three ways: first, through coordination between the advanced courses in Biochemistry (BIO SCI M114 ) and Molecular Biology (BIO SCI M116 ), and laboratory courses in Biochemistry (BIO SCI M114L ) and Molecular Biology (BIO SCI M116L ) which provide students with the basic laboratory skills and an appreciation for the experimental foundations of the field; second, through advanced laboratories in Immunology (BIO SCI M121L ) and Virology which provide students with the opportunity to develop cutting edge research skills; and third, by emphasizing independent research sponsored by a participating faculty member. The program encourages the research interests of students in subdisciplines other than immunology or virology by offering the opportunity to substitute one year of independent research for the advanced laboratory.

The major in Biochemistry and Molecular Biology is designed to provide students with the appropriate tools and training to successfully pursue graduate degrees that emphasize basic scientific research, including Ph.D. and M.S. training as well as combined M.D./Ph.D. programs. In addition, and particularly with the explosive growth in biotechnology and its significant influence in everyday life, graduates could use their backgrounds very effectively to pursue careers in business, education, law, and public affairs.

**Application Process to Declare the Major:** The major in Biochemistry and Molecular Biology is open to junior- and senior-level students only. Applications to declare the major can be made at any time, but typically in the spring of the sophomore year. Review of applications submitted at that time and selection to the major by the Biochemistry and Molecular Biology Faculty Board is completed during the summer. Information can also be found at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>). Double majors within the School of Biological Sciences or with Public Health Sciences, Biomedical Engineering: Premedical, Nursing Science, or Pharmaceutical Sciences are not permitted.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Major Requirements

#### A. Required Major Courses:

BIO SCI M114	Advanced Biochemistry
BIO SCI M116	Advanced Molecular Biology

#### B. Upper-Division Laboratories:

BIO SCI M114L	Biochemistry Laboratory
BIO SCI M116L	Molecular Biology Laboratory

Select one of the following:

BIO SCI M121L	Advanced Immunology Laboratory
BIO SCI M130L	Advanced Molecular Lab Techniques
BIO SCI 199 Study in Biological Science Research (Approved by the Biochemistry and Molecular Biology Faculty Board.)	

C. Upper-Division Biology Electives:

Select three of the following:

BIO SCI M119–M189

Select one of the following:

BIO SCI D137	Eukaryotic and Human Genetics
BIO SCI D145	Genomics, Development, and Medicine
BIO SCI M119–M190	
CHEM 128	Introduction to Chemical Biology
PHRMSCI 170A	Molecular Pharmacology I
PHRMSCI 171	Physical Biochemistry

Select two four-unit courses from the following:

BIO SCI D103–D189, E106–E189, M119–M190, N110–N189	
CHEM 128	Introduction to Chemical Biology
PHRMSCI 170A	Molecular Pharmacology I
PHRMSCI 171	Physical Biochemistry

No course may be used to satisfy more than one requirement.

**Application Process to Declare the Major:** The major in Biochemistry and Molecular Biology is open to junior- and senior-level students only. Applications to declare the major can be made at any time, but typically in the spring of the sophomore year. Review of applications submitted at that time and selection to the major by the Biochemistry and Molecular Biology Faculty Board is completed during the summer. Information can also be found at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>). Double majors within the School of Biological Sciences or with Public Health Sciences, Biomedical Engineering: Premedical, Nursing Science, or Pharmaceutical Sciences are not permitted.

Freshman		
Fall	Winter	Spring
BIO SCI 93	BIO SCI 94	MATH 5A
CHEM 1A	CHEM 1B	CHEM 1C- 1LC
Lower-Division Writing <sup>1</sup>	Lower-Division Writing <sup>1</sup>	Lower-Division Writing <sup>1</sup>
BIO SCI 2A		
Sophomore		
Fall	Winter	Spring
BIO SCI 97	BIO SCI 98	BIO SCI 99
CHEM 51A	CHEM 51B- 51LB	CHEM 51C- 51LC
CHEM 1LD	General Education	STATS 7, 8, MATH 2D, or MATH 3A
MATH 5B		
BIO SCI 194S		
Junior		
Fall	Winter	Spring
Biochem./Mol. elective	BIO SCI M114	BIO SCI M116
Research/Elective	Biochem./Mol. elective	BIO SCI M116L
BIO SCI 100	BIO SCI M114L	PHYSICS 3C- 3LC
PHYSICS 3A	PHYSICS 3B- 3LB	
Senior		
Fall	Winter	Spring
Biochem./Mol. elective	Bio. Sci. elective or lab	Bio. Sci. elective or lab
Biochem./Mol. elective	Research/Elective	Research/Elective
Research/Elective	General Education/Elective	General Education/Elective
General Education/Elective		

<sup>1</sup> Students have the option of taking HUMAN 1AS, HUMAN 1BS, HUMAN 1CS or WRITING 39A, WRITING 39B, WRITING 39C in order to fulfill the lower-division writing requirement.

## Microbiology and Immunology, B.S.

Microbiology and immunology are well-established disciplines within the life sciences. Microbiology addresses the biology of bacteria, viruses, and unicellular eukaryotes such as fungi and protozoa. Studies of microorganisms reveal basic information about processes in evolution, genetics, biochemistry, molecular biology, cell biology, structural biology, and ecology. Many bacteria, viruses, and protozoa cause disease in plants and animals. Hence, major areas of medicine and public health focus on these microorganisms.

Immunology encompasses efforts to understand how multicellular organisms have evolved to survive a variety of challenges to health and survival, including threats by pathogens and cancer cells. Basic questions of how immunity functions are entwined with a fundamental understanding of the consequences of microbial infection. Immunology also refers to the study of autoimmunity, the attack of the host by its own immune system.

The study of viruses (virology) is an important branch of microbiology that has contributed to our understanding of most of the fundamental processes in eukaryotic molecular biology, including the discovery of oncogenes. Viruses provide an excellent tool for the study of disease, cancer, and mechanisms of gene control. With the growing threat of emerging diseases and the potential for viral-based biological weapons, the study of virology was recently intensified and gained new perspectives.

The major is designed primarily for students who are serious about pursuing careers in microbiology and immunology and is intended to provide its graduates with the appropriate tools and training to successfully pursue professional and graduate degrees emphasizing these disciplines. These include Ph.D., M.D., and combined M.D./Ph.D. programs. Majoring in Microbiology and Immunology will also provide resources for serious students wishing to use a solid background in these disciplines for career goals in business, law, public and environmental policy, education, and other pursuits.

**Application Process to Declare the Major:** The major in Microbiology and Immunology is open to junior- and senior-level students only. Applications to declare the major can be made at any time, but typically in the spring of the sophomore year. Review of applications submitted at that time and selection to the major by the Microbiology and Immunology Faculty Board is completed during the summer. Information can also be found at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>). Double majors within the School of Biological Sciences or with Public Health Sciences, Biomedical Engineering: Premedical, Nursing Science, or Pharmaceutical Sciences are not permitted.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Major Requirements for Microbiology and Immunology

#### A. Required Major Courses:

BIO SCI M121	Immunology with Hematology
BIO SCI M122	General Microbiology
BIO SCI M124A	Virology

#### B. Upper-Division Laboratories:

BIO SCI M116L	Molecular Biology Laboratory
and either	
BIO SCI M118L	Experimental Microbiology Laboratory
or BIO SCI M121L	Advanced Immunology Laboratory

#### C. Upper-Division Biology Electives:

Select at least four from the following:

BIO SCI E124	Infectious Disease Dynamics
BIO SCI M119	Advanced Topics in Immunology
BIO SCI M120	Signal Transduction in Mammalian Cells
BIO SCI M124B	Viral Pathogenesis and Immunity
BIO SCI M125	Molecular Biology of Cancer
BIO SCI M131	Innate Immunity, Infection, and Pathogenesis
BIO SCI M137	Microbial Genetics
BIO SCI M143	Human Parasitology
BIO SCI M180	Biotechnological Applications of Energy and Environmental Research
MOL BIO 205	Molecular Virology

and two can be selected from the following:

BIO SCI D103	Cell Biology
BIO SCI D137	Eukaryotic and Human Genetics
BIO SCI M114	Advanced Biochemistry

BIO SCI M116

Advanced Molecular Biology

BIO SCI M144

Cell Organelles and Membranes

**Application Process to Declare the Major:** The major in Microbiology and Immunology is open to junior- and senior-level students only. Applications to declare the major can be made at any time, but typically in the spring of the sophomore year. Review of applications submitted at that time and selection to the major by the Microbiology and Immunology Faculty Board is completed during the summer. Information can also be found at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>). Double majors within the School of Biological Sciences or with Public Health Sciences, Biomedical Engineering: Premedical, Nursing Science, or Pharmaceutical Sciences are not permitted.

**Freshman**

Fall	Winter	Spring
BIO SCI 93	BIO SCI 94	MATH 2A or 5A
CHEM 1A	CHEM 1B	CHEM 1C- 1LC
Lower-Division Writing <sup>1</sup>	Lower-Division Writing <sup>1</sup>	Lower-Division Writing <sup>1</sup>
General Education	General Education	
BIO SCI 2A		

**Sophomore**

Fall	Winter	Spring
BIO SCI 97	BIO SCI 98	BIO SCI 99
CHEM 51A	CHEM 51B- 51LB	CHEM 51C- 51LC
CHEM 1LD	General Education	General Education
MATH 2B or 5B		STATS 7, 8, MATH 2D, or MATH 3A
BIO SCI 194S		

**Junior**

Fall	Winter	Spring
PHYSICS 3A	PHYSICS 3B- 3LB	PHYSICS 3C- 3LC
BIO SCI M124A	U-D Bio Elective	BIO SCI M122
BIO SCI 100	BIO SCI M121	General Education or U-D Lab
BIO SCI 199	BIO SCI 199	BIO SCI 199

**Senior**

Fall	Winter	Spring
U-D Biology Elective	U-D Biology Elective	U-D Biology Elective
BIO SCI M116L	U-D Biology Elective	U-D Biology Elective
BIO SCI 199	BIO SCI 199	BIO SCI 199

<sup>1</sup> Students have the option of taking HUMAN 1AS, HUMAN 1BS, HUMAN 1CS or WRITING 39A, WRITING 39B, WRITING 39C in order to fulfill the lower-division writing requirement.

## Department of Neurobiology and Behavior

**Marcelo Wood, Department Chair**

**Kim Green, Department Vice Chair**

2205 McGaugh Hall

949-824-8519

<http://neurobiology.uci.edu/>

The Department of Neurobiology and Behavior programs provide a broad foundation in neuroscience combined with proficiency in a specific area of research. Faculty members in the Department address questions in neuroscience at the molecular, cellular, systems, and behavioral levels. Research focuses on a range of topics including learning and memory, neurodegenerative disorders, addiction, sensory neurobiology, developmental neurobiology, and neural plasticity.

- Neurobiology and Behavior, Graduate Program
- Neurobiology, B.S.

## Faculty

Ruth M. Benca, M.D. Ph.D. University of Chicago , *Department Chair and Professor of Psychiatry and Human Behavior; Neurobiology and Behavior*

Mathew M. Blurton-Jones, Ph.D. University of California, San Diego, *Associate Professor of Neurobiology and Behavior*

Jorge A. Busciglio, Ph.D. Universidad Nacional de Córdoba, *Professor of Neurobiology and Behavior*

Lawrence F. Cahill, Ph.D. University of California, Irvine, *Professor of Neurobiology and Behavior; Psychological Science*

Susana Cohen-Cory, Ph.D. The Rockefeller University, *Professor of Neurobiology and Behavior*

Carl W. Cotman, Ph.D. Indiana University, *Professor of Neurology; Neurobiology and Behavior*

Karina S. Cramer, Ph.D. California Institute of Technology, *Professor of Neurobiology and Behavior*

Howard J. Federoff, M.D. Ph.D. Albert Einstein College of Medicine, *Professor of Neurobiology and Behavior; Neurology*

Norbert Fortin, Ph.D. Boston University, *Associate Professor of Neurobiology and Behavior*

Christie Fowler, Ph.D. Florida State University, *Assistant Professor of Neurobiology and Behavior*

Ron D. Frostig, Ph.D. University of California, Los Angeles, *Professor of Neurobiology and Behavior; Biomedical Engineering*

Christine M. Gall, Ph.D. University of California, Irvine, *Department Chair and Distinguished Professor of Anatomy and Neurobiology; Neurobiology and Behavior*

Sunil P. Gandhi, Ph.D. University of California, San Diego, *Associate Professor of Neurobiology and Behavior*

Kim Green, Ph.D. University of Leeds, *Associate Professor of Neurobiology and Behavior*

Joshua Grill, Ph.D. Wake Forest University School of Medicine, *Associate Professor of Neurobiology and Behavior; Neurobiology and Behavior*

John F. Guzowski, Ph.D. University of California, Irvine, *Associate Professor of Neurobiology and Behavior*

Claudia H. Kawas, M.D. University of Louisville, *Nichols Term Chair in Neuroscience and Professor of Neurology; Neurobiology and Behavior*

Herbert P. Killackey, Ph.D. Duke University, *Professor Emeritus of Neurobiology and Behavior*

Frank M. LaFerla, Ph.D. University of Minnesota, *Dean of the School of Biological Sciences and Professor of Neurobiology and Behavior; Neurology*

Michael Leon, Ph.D. University of Chicago, *Professor Emeritus of Neurobiology and Behavior*

Audrey Chen Lew, Ph.D. University of California, Los Angeles, *Assistant Professor of Teaching of Neurobiology and Behavior*

Gyorgy Lur, Ph.D. University of Liverpool, *Assistant Professor of Neurobiology and Behavior*

Stephen V. Mahler, Ph.D. University of Michigan, *Assistant Professor of Neurobiology and Behavior*

John F. Marshall, Ph.D. University of Pennsylvania, *Professor Emeritus of Neurobiology and Behavior*

James L. McGaugh, Ph.D. University of California, Berkeley, *Research Professor and Professor Emeritus of Neurobiology and Behavior; Logic and Philosophy of Science*

Bruce L. McNaughton, Ph.D. Carleton University, *UCI Distinguished Professor of Neurobiology and Behavior*

Raju Metherate, Ph.D. McGill University, *Professor of Neurobiology and Behavior*

John Middlebrooks, Ph.D. University of California, San Francisco, *Professor of Otolaryngology; Biomedical Engineering; Cognitive Sciences; Neurobiology and Behavior*

Andrea C. Nicholas, Ph.D. University of Chicago, *Associate Professor of Teaching of Neurobiology and Behavior*

Ian Parker, Ph.D. University College London, *Professor of Neurobiology and Behavior; Physiology and Biophysics*

Craig Stark, Ph.D. Carnegie Mellon University, *James L. McGaugh Chair in the Neurobiology of Learning and Memory and Professor of Neurobiology and Behavior*

Arnold Starr, M.D. New York University, *Research Professor of Neurobiology and Behavior*

Oswald Steward, Ph.D. University of California, Irvine, *Director, Reeve-Irvine Research Center and Reeve-Irvine Chair in Spinal Cord Injury Research and Distinguished Professor of Anatomy and Neurobiology; Neurobiology and Behavior*

Georg F. Striedter, Ph.D. University of California, San Diego, *Professor of Neurobiology and Behavior*

Katumi Sumikawa, Ph.D. Imperial College London, *Professor of Neurobiology and Behavior*

Vivek Swarup, Ph.D. University of Laval, *Assistant Professor of Neurobiology and Behavior*

Andrea Tenner, Ph.D. University of California, San Diego, *Professor of Molecular Biology and Biochemistry; Neurobiology and Behavior*

Leslie M. Thompson, Ph.D. University of California, Irvine, *Chancellor's Professor and Donald Bren Professor of Psychiatry and Human Behavior; Biological Chemistry; Neurobiology and Behavior*

Marcelo A. Wood, Ph.D. Princeton University, *UCI Chancellor's Fellow and Department Chair and Professor of Neurobiology and Behavior*

Michael Yassa, Ph.D. University of California, Irvine, *UCI Chancellor's Fellow and Director of the Center for the Neurobiology of Learning and Memory and Associate Professor of Neurobiology and Behavior*

## Courses

### **NEURBIO 200A. Research in Neurobiology and Behavior. 2-12 Units.**

Individual research with Neurobiology and Behavior faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

### **NEURBIO 200B. Research in Neurobiology and Behavior. 2-12 Units.**

Individual research with Neurobiology and Behavior faculty.

Prerequisite: NEURBIO 200A

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

### **NEURBIO 200C. Research in Neurobiology and Behavior. 2-12 Units.**

Individual research with Neurobiology and Behavior faculty.

Prerequisite: NEURBIO 200B

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

### **NEURBIO 201A. Research in Neurobiology and Behavior. 2-12 Units.**

Individual research with Neurobiology and Behavior faculty.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

### **NEURBIO 201B. Research in Neurobiology and Behavior. 2-12 Units.**

Individual research with Neurobiology and Behavior faculty.

Prerequisite: NEURBIO 201A

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

### **NEURBIO 201C. Research in Neurobiology and Behavior. 2-12 Units.**

Individual research with Neurobiology and Behavior faculty.

Prerequisite: NEURBIO 201B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 202A. Foundations of Neuroscience. 2 Units.**

Intended to expose students to critical reading and analysis of the primary neuroscience literature. Instructors from departments associated with the Interdepartmental Neuroscience Program participate and discuss topics of current interest.

Grading Option: Satisfactory/unsatisfactory only.

**NEURBIO 202B. Foundations of Neuroscience. 2 Units.**

Intended to expose students to critical reading and analysis of the primary neuroscience literature. Instructors from departments associated with the Interdepartmental Neuroscience Program participate and discuss topics of current interest.

Prerequisite: NEURBIO 202A

Grading Option: Satisfactory/unsatisfactory only.

**NEURBIO 206. Molecular Neuroscience. 5 Units.**

Surveys molecular and cellular mechanisms involved in neuronal function, including control of gene expression, post-transcriptional and post-translational processing, RNA and protein targeting, cell death mechanisms, and molecular genetic basis of neurological disorders. Overview of the molecular aspects of developmental neurobiology.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 207. Cellular Neuroscience. 5 Units.**

Neurophysiological and neurochemical mechanisms of electrical and chemical signaling in neurons. Topics include generation of resting- and action-potentials, voltage- and ligand-gated ion channels, second messenger systems, and synaptic transmission and integration.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 207L. Cellular Neuroscience Laboratory. 2 Units.**

Intensive hands-on laboratory experience of contemporary techniques for studying ion channels and synaptic function. Experiments include microelectrode recording, patch clamp, quantal analysis of synaptic transmission, heterologous expression of genes for channels and receptors, brain slice, and fluorescence calcium imaging.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 208. Systems Neuroscience. 5 Units.**

Study of the mammalian nervous system at the systems level. Anatomy and physiology of sensory, motor, and integrative functions.

Repeatability: May be taken for credit 2 times.

Same as ANATOMY 210A.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 209. Behavioral Neuroscience. 5 Units.**

Overview of fundamental conceptual and experimental issues in the neurobiology of learning and memory. The approach is a cross-level integration of research in molecular-genetic, cellular, circuit, systems, and behavioral analyses.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 220. Neural Coding, Computation, and Dynamics. 4 Units.**

Theoretical principles and biological mechanisms underlying how brains acquire, assimilate, store, and retrieve information, compute adaptive responses to external inputs, and how knowledge is extracted from experience to generate an internal model of the world.

Prerequisite: At least one upper-division course in the field of Neuroscience or one upper-division course in Cognitive Science or Machine Learning.

Concurrent with BIO SCI N174.

**NEURBIO 221. Scientific Presentation Skills. 1 Unit.**

A tutorial seminar on developing skills for presenting research to scientific audiences.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.



**NEURBIO 225. Rigor, Reproducibility, and Research Methods. 1 Unit.**

Understanding key concepts in experimental design, execution, and analysis that enhance or detract from scientific rigor.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**NEURBIO 227. Bioinformatics and Systems Biology. 4 Units.**

Students learn the fundamentals of bioinformatics, genomic approaches, and Linux and R program in order to analyze RNA-sequencing data.

Overlaps with ECO EVO 282, ECO EVO 283.

Restriction: Graduate students only.

**NEURBIO 228. Psychophysiological Methods in Clinical Research . 4 Units.**

Introduces the principal signals of psychophysiology and outlines how measures calculated from these signals can be applied in clinical research and practice.

Prerequisite: One graduate or undergraduate course in statistics.

Restriction: Graduate students only.

**NEURBIO 230. Epigenetics in Health and Disease . 4 Units.**

Focuses on the role of chromatin/nuclear structure organization (histone and DNA modification, chromatin remodeling, higher order chromatin structure and nuclear organization) on gene regulation, DNA replication and repair, relevant to development, metabolism, learning and memory, and human disease.

Prerequisite: MOL BIO 203 or MOL BIO 204 or NEURBIO 206

Same as BIOCHEM 225.

Restriction: Graduate students only.

**NEURBIO 231. Clinical and Epidemiological Aspects of Neurodegenerative Diseases. 4 Units.**

Clinical and epidemiological aspects of neurodegenerative disorders causing dementia will be reviewed, including AD, PD, FTD, HD and cerebrovascular disease. Seminar format will include student presentations and group discussion.

Restriction: Graduate students only.

**NEURBIO 232. Regenerative Neurobiology. 4 Units.**

Surveys the latest research on regenerative neurobiology. Both basic stem cell discoveries and their potential clinical application to brain disorders will be examined.

**NEURBIO 233. Neurobiology of Drug Addiction. 4 Units.**

Provides a comprehensive overview of topics in the addiction field, including drug pharmacology, models/approaches to investigate addiction, brain circuits, genetics, epigenetics, and the cellular and molecular biology of drug addiction.

Restriction: Graduate students only.

Concurrent with BIO SCI N121.

**NEURBIO 236. Cortex: Structure, Function, and Plasticity. 4 Units.**

Structured to include lectures and presentation of papers about cortex with emphasis on sensory-motor cortex. Both historical and current perspectives on cortical structure-function relationship will be critically evaluated.

**NEURBIO 237. Neurobiology of Brain Aging. 4 Units.**

Outlines some of the significant changes that occur in the aging brain, with a special emphasis on risk factors and protective strategies that promote successful brain aging. Topics include changes in synaptic plasticity, neurotrophic factors, and molecular mechanisms in aging.

Prerequisite: NEURBIO 209

**NEURBIO 239. Functional Imaging of the Nervous System. 4 Units.**

Overview of technical and applied aspects of imaging techniques available for studying the nervous system. The areas emphasized are cellular and subcellular imaging of neural function, systems-level imaging of brain function, and imaging of the human brain.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.



**NEURBIO 240. Advanced Analysis of Learning and Memory. 4 Units.**

Advanced analysis of contemporary research concerning the nature and neurobiological bases of learning and memory. Special emphasis is given to time-dependent processes involved in memory storage.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 247. Programming for Neuroscience Research . 4 Units.**

A neuroscience-specific introduction to programming and data analysis using either MATLAB or Scientific PYTHON. Students will learn general programming skills and effective use of programming for data management, statistical analysis, and image analysis.

Overlaps with PSYCH 205A.

**NEURBIO 248. Topics in Neurobiology and Behavior. 4 Units.**

Studies in selected areas of Neurobiology and Behavior. Topics addressed vary each quarter.

Repeatability: May be taken for credit 3 times.

**NEURBIO 249. Electronics for Biologists. 4 Units.**

Basic principles of electricity; properties and use of discrete components and integrated circuits; circuit analysis and design. Intended for advanced students in the life sciences.

Same as PHYSIO 205.

**NEURBIO 254. Molecular Neurobiology. 4 Units.**

The application of genetic and recombinant DNA technology to neurobiology. Topics include the study of neuronal proteins which play important roles in the formation of synapses and synaptic transmission.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 255. Perspectives in Neuroscience: Past, Present, and Future. 4 Units.**

An overview of the conceptual and technical foundations of contemporary neuroscience from ancient times to the present. The subjects include synapses, neurons, brain organization, sensory, motor and regulatory systems, learning and memory, human brain function and dysfunction.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

Concurrent with BIO SCI N119.

**NEURBIO 257. Statistics for Neurobiologists. 4 Units.**

Introduction to common methods for statistical analysis used in neurobiology. Topics covered include t-tests, ANOVAs, correlations and regressions, general linear model, power analysis, and non-parametric tests.

Restriction: Graduate students only.

**NEURBIO 260. Auditory Neuroscience. 4 Units.**

Multidisciplinary overview of brain mechanisms of hearing. Emphasizes breadth of auditory function and research: single neurons to psychoacoustics, the cochlea to the cortex, and basic science to clinic.

Concurrent with BIO SCI N147.

**NEURBIO 290. Colloquium in Neurobiology and Behavior. 1.3 Unit.**

Presentation of contemporary research problems in neurobiology and behavior and related areas by invited speakers.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 292. Scientific Proposals for Neuroscience Trainees. 4 Units.**

Students learn how to effectively communicate scientific ideas and results. Activities include learning how to effectively write a scientific proposal, how to perform a coherent, persuasive slide presentation, and how to give meaningful, constructive review critiques.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**NEURBIO 399. University Teaching. 1-4 Units.**

Limited to Teaching Assistants.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Neurobiology and Behavior, Graduate Program

The Department of Neurobiology and Behavior offers the Ph.D. in Biological Sciences. Graduate students must complete a sequence of core courses (lectures and laboratories) during their first year, and maintain an overall GPA of 3.3 or better.

Ideally, applicants for this program should have taken undergraduate courses in biology (one introductory year plus some advanced work), and/or psychology (experimental, physiological), chemistry through biochemistry, introductory physics, calculus, and statistics. Because graduate training emphasizes research, preference is given to applicants having laboratory research experience. Applicants with substantial outside commitments that would curtail laboratory research or prolong the time to degree are not accepted. The deadline for application is December 2.

### Graduate Program

The Department of Neurobiology and Behavior offers the Ph.D. in Biological Sciences. Graduate students must complete a sequence of core courses (lectures and laboratories) during their first year, and maintain an overall GPA of 3.3 or better.

Ideally, applicants for this program should have taken undergraduate courses in biology (one introductory year plus some advanced work), and/or psychology (experimental, physiological), chemistry through biochemistry, introductory physics, calculus, and statistics. They also must submit GRE Aptitude test scores. Because graduate training emphasizes research, preference is given to applicants having laboratory research experience. Applicants with substantial outside commitments that would curtail laboratory research or prolong the time to degree are not accepted. The deadline for application is December 2.

### Course Work

Most students will spend their first year at UCI in the INP gateway program, and transfer to the Neurobiology and Behavior graduate program at the end of that year. Entry into the Neurobiology and Behavior program requires satisfactory completion of each part of the core curriculum, performing at a higher standard than satisfactory level in at least some courses.

#### Core Curriculum

A. Complete:

NEURBIO 206	Molecular Neuroscience
NEURBIO 207	Cellular Neuroscience
NEURBIO 207L	Cellular Neuroscience Laboratory
NEURBIO 208	Systems Neuroscience
NEURBIO 209	Behavioral Neuroscience

Students in the INP gateway program who envisage transferring to the Neurobiology and Behavior graduate program are thus strongly advised to take the above courses in fulfilling the Molecular, Cellular, and Systems requirements of the INP program. If NEURBIO 209 is not taken during the first year, it must be taken during the second year, after entering the program.

In their second year, students are required to take NEURBIO 257. For those students who already have a strong grounding in statistics this may be substituted by a more advanced class offered by another department with the approval of the graduate advisor.

Students who enter through other gateway programs are similarly required to satisfy all requirements of that program and will generally be required to take all of the core courses during their second year; although an exception may be granted by the graduate advisor to substitute one or more core courses taken in that program.

Students are encouraged to satisfactorily complete at least two advanced graduate courses, of which NEURBIO 257 (or a substituted class in statistics and experimental design) counts as one, before advancing to candidacy and are required to complete at least four before the dissertation defense. These courses must be taken for a letter grade, not on an S/U basis, to count toward the required minimum of four advanced classes. With the consent of the graduate advisor, graduate courses from other departments may satisfy part of this requirement if they are not primarily introductory or technically-oriented.

### Advancement to Candidacy

Students will advance to candidacy for the Ph.D. at the end of their third year by means of a written critical review of the literature in the area in which they plan to do their dissertation, a research proposal, and an oral examination. Graduation depends on successful preparation and oral defense of a

dissertation based on the student's research. The normative time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

## Neurobiology, B.S.

The Neurobiology major is designed to teach students how neurobiologists apply cellular, molecular, systems, and behavioral analyses in understanding how the nervous system works. The hallmark of the major is a year-long, in-depth exploration of the intellectual tools used to create, advance, and disseminate knowledge about the nervous system. Through neurobiology satellite courses, students acquire advanced factual knowledge about neurobiology. In addition, Neurobiology majors may choose to participate in research through BIO SCI 199, where they will learn technical skills and receive mentoring from faculty members.

Students completing the Neurobiology major will be well qualified for admission to graduate or professional schools in preparation for careers in biological research, medicine, dentistry, veterinary medicine, nursing, and other related fields. Even without additional education, they will be competitive for positions in the pharmaceutical industry, the health care delivery industry, or in medically or biologically related technologies. The major also provides valuable preparation for students interested in entering other disciplines that increasingly interface with biology and biotechnology, such as law, business administration, and government policy. Additionally, the major provides excellent preparation for students who wish to become high school science teachers.

**Application Process to Declare the Major:** The major in Neurobiology is open to junior- and senior-level students only. Applications to declare the major can be made at any time, but typically in the spring of the sophomore year. Review of applications submitted at that time and selection to the major by the Neurobiology Faculty Board is completed during the summer. Information can also be found at the <http://www.changeofmajor.uci.edu>. Double majors within the School of Biological Sciences or with Public Health Sciences, Biomedical Engineering: Premedical, Nursing Science, or Pharmaceutical Sciences are not permitted.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Major Requirements

#### A. Upper-Division Core:

Select one of the following:

BIO SCI D103	Cell Biology
BIO SCI D104	Developmental Biology
BIO SCI E109	Human Physiology

#### B. Required Major Courses:

BIO SCI N115A- N115B	Advanced Neurobiology I and Advanced Neurobiology II
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#### C. Upper-Division Laboratories:

BIO SCI N113L	Neurobiology Laboratory
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and select two of the following:

BIO SCI D111L	Developmental and Cell Biology Laboratory
BIO SCI E106L	Habitats and Organisms
BIO SCI E112L	Physiology Laboratory
BIO SCI E115L	Evolution Laboratory
BIO SCI E131L	Image Analysis in Biological Research
BIO SCI E140L	Evolution and the Environment Laboratory
BIO SCI E160L	Biology of Birds Lab
BIO SCI E166L	Field Biology
BIO SCI E179L	Field Freshwater Ecology
BIO SCI M114L	Biochemistry Laboratory
BIO SCI M116L	Molecular Biology Laboratory
BIO SCI M118L	Experimental Microbiology Laboratory
BIO SCI M121L	Advanced Immunology Laboratory
BIO SCI M130L	Advanced Molecular Lab Techniques

One of these two laboratories can be satisfied by completion of Excellence in Research in the Biological Sciences.

#### D. Upper-Division Biology Electives:

Select three of the following:

BIO SCI N119–N190
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and select one four-unit course from the following:

BIO SCI D103–D190, E106–E190, M114–M190, N110–N190

No course may be used to satisfy more than one requirement.

E. Honors Track of the Neurobiology Major: BIO SCI H195 in the area of neurobiology and Excellence in Research in the Biological Sciences - presenting neurobiology related research.<sup>1</sup>

- <sup>1</sup> Requirements to enter the Honors Track: A 3.3 or better average GPA in BIO SCI N115A-BIO SCI N115B and a 3.0 or better average GPA in all required biology courses.  
If the number of eligible students who apply for the Honors Track exceeds the number that can be accommodated in the neurobiology related H195, the department will try to open an additional section. If this is not feasible, the Neurobiology Major Faculty Advisory Committee will select the top applicants, based mainly on the students' BIO SCI N115A-BIO SCI N115B grades and biology GPA.

**Application Process to Declare the Major:** The major in Neurobiology is open to junior- and senior-level students only. Applications to declare the major can be made at any time, but typically in the spring of the sophomore year. Review of applications submitted at that time and selection to the major by the Neurobiology Faculty Board is completed during the summer. Information can also be found at the <http://www.changeofmajor.uci.edu>. Double majors within the School of Biological Sciences or with Public Health Sciences, Biomedical Engineering: Premedical, Nursing Science, or Pharmaceutical Sciences are not permitted.

Freshman		
Fall	Winter	Spring
BIO SCI 93	BIO SCI 94	MATH 5A
CHEM 1A	CHEM 1B	CHEM 1C- 1LC
Lower-Division Writing <sup>1</sup>	Lower-Division Writing <sup>1</sup>	Lower-Division Writing <sup>1</sup>
BIO SCI 2A	General Education	
Sophomore		
Fall	Winter	Spring
BIO SCI 97	BIO SCI 98	BIO SCI 99
CHEM 51A	CHEM 51B- 51LB	CHEM 51C- 51LC
CHEM 1LD	STATS 7, 8, MATH 2D, or MATH 3A	BIO SCI N110
MATH 5B		
BIO SCI 194S		
Junior		
Fall	Winter	Spring
BIO SCI N115A	BIO SCI N115B	Bio. Sci. Elective
Bio. Sci. Elective	BIO SCI N113L	PHYSICS 3C- 3LC
BIO SCI 100	PHYSICS 3B- 3LB	Research/Elective
PHYSICS 3A	Research/Elective	
Senior		
Fall	Winter	Spring
Bio. Sci. Elective	Bio. Sci. Lab	Bio. Sci. Lab
Research/Elective	Bio. Sci. Elective	Research/Elective
General Education/Elective	General Education/Elective	General Education/Elective

- <sup>1</sup> Students have the option of taking HUMAN 1AS, HUMAN 1BS, HUMAN 1CS or WRITING 39A, WRITING 39B, WRITING 39C in order to fulfill the lower-division writing requirement.

## Exercise Sciences, B.S.

Virtually every organism is dependent on movement (both intracellular and extracellular) in one form or another. With respect to humans, physical activity imposes unique stresses on a broad spectrum of cell types, tissues, and organ systems. In so doing, physical activity plays a key role in shaping fundamental biological processes necessary for maintaining health and preventing disease. While both human and nonhuman species exhibit many common biological phenomenon, there are also many unique aspects of their physiology. This major will also highlight some of the unique physiological traits of nonhuman species and how such unique phenomenon may provide important insights into human health. Upper-division courses in this major are designed to integrate fundamental principles of biology, chemistry, and physics into a coherent understanding of how physical activity/inactivity impacts human health under healthy and diseased states.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Major Requirements for the B.S. in Exercise Sciences

A. Required Major Courses:

BIO SCI D103	Cell Biology
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BIO SCI E109	Human Physiology
BIO SCI E117A- E117B- E117C	Exercise Sciences Seminar and Exercise Sciences Seminar and Exercise Sciences Seminar
BIO SCI E136	The Physiology of Human Nutrition
BIO SCI E139	Animal Locomotion
BIO SCI E155	Physiology in Extreme Environments
or BIO SCI D170	Applied Human Anatomy
BIO SCI E183	Exercise Physiology
BIO SCI N110	Neurobiology and Behavior
B. Upper-Division Laboratories:	
BIO SCI E112L	Physiology Laboratory
BIO SCI M116L	Molecular Biology Laboratory
and either	
BIO SCI N113L	Neurobiology Laboratory
or BIO SCI M114L	Biochemistry Laboratory

**Application Process to Declare the Major:** The major in Exercise Sciences is open to junior- and senior-level students only. Applications to declare the major can be submitted during the spring of the sophomore year. Review of applications submitted at that time and selection to the major by the Exercise Science Faculty Board is completed at the end of the sophomore year. Information can also be found at UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>). Double majors within the School of Biological Sciences or with Public Health Sciences, Biomedical Engineering: Premedical, Nursing Science, or Pharmaceutical Sciences are not permitted.

Freshman		
Fall	Winter	Spring
BIO SCI 93	BIO SCI 94	MATH 5A
CHEM 1A	CHEM 1B	CHEM 1C- 1LC
Lower-Division Writing <sup>1</sup>	Lower-Division Writing <sup>1</sup>	Lower-Division Writing <sup>1</sup>
BIO SCI 2A	General Education	
Sophomore		
Fall	Winter	Spring
BIO SCI 97	BIO SCI 98	BIO SCI 99
CHEM 51A	CHEM 51B- 51LB	CHEM 51C- 51LC
CHEM 1LD	General Education	STATS 7 or 8
MATH 5B		General Education
BIO SCI 194S		
Junior		
Fall	Winter	Spring
BIO SCI D103	BIO SCI E183	BIO SCI N110
PHYSICS 3A	PHYSICS 3B- 3LB	BIO SCI E139
BIO SCI E109	BIO SCI E112L	PHYSICS 3C- 3LC
BIO SCI 100		BIO SCI 199
Senior		
Fall	Winter	Spring
BIO SCI E155	BIO SCI E136	BIO SCI M114L or N113L
BIO SCI M116L	General Education	General Education
BIO SCI 199	BIO SCI 199	BIO SCI 199
BIO SCI E117A	BIO SCI E117B	BIO SCI E117C

<sup>1</sup> Students have the option of taking HUMAN 1AS, HUMAN 1BS, HUMAN 1CS or WRITING 39A, WRITING 39B, WRITING 39C in order to fulfill the lower-division writing requirement.

## Human Biology, B.S.

Understanding normal and disordered human function both require a broad integration of human physiology, behavior, and culture that is provided in this major. Students in this major will receive a unified, in-depth study of modern biology that includes ecology, evolutionary biology, genetics, biochemistry, molecular biology, cell biology, human physiology, neurobiology, and behavior. In addition, the skills and concepts needed to pursue this field are presented in upper-division laboratories. Advanced elective courses provide an opportunity to diversify exposure to the biological sciences. Additional

courses in the humanities and social sciences focus on the relevance of these areas to the human condition. Given the focus on human biology, this major will serve as an ideal preparation for the health science professions.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### **Major Requirements for the B.S. in Human Biology**

#### **A. Required Major Courses:**

BIO SCI D103	Cell Biology
BIO SCI E109	Human Physiology
BIO SCI N110	Neurobiology and Behavior
BIO SCI N120A- N120B- N120C	Human Biology I and Human Biology II and Human Biology III

#### **B. Upper-Division Laboratories:**

Select three of the following:

BIO SCI D111L	Developmental and Cell Biology Laboratory
BIO SCI E106L	Habitats and Organisms
BIO SCI E112L	Physiology Laboratory
BIO SCI E115L	Evolution Laboratory
BIO SCI E131L	Image Analysis in Biological Research
BIO SCI E140L	Evolution and the Environment Laboratory
BIO SCI E160L	Biology of Birds Lab
BIO SCI E166L	Field Biology
BIO SCI E179L	Field Freshwater Ecology
BIO SCI M114L	Biochemistry Laboratory
BIO SCI M116L	Molecular Biology Laboratory
BIO SCI M118L	Experimental Microbiology Laboratory
BIO SCI M121L	Advanced Immunology Laboratory
BIO SCI M130L	Advanced Molecular Lab Techniques
BIO SCI N113L	Neurobiology Laboratory

One laboratory can be satisfied with completion of Excellence in Research in the Biological Sciences.

#### **C. Upper-Division Biology Electives:**

Select two upper-division, four-unit courses from the following:

BIO SCI D103-D190, E106-E190, M114-M190, N110-N190 <sup>2</sup>	
PHRMSCI 170A	Molecular Pharmacology I
PHRMSCI 170B	Molecular Pharmacology II
PHRMSCI 171	Physical Biochemistry
PHRMSCI 173	Pharmacotherapy
PHRMSCI 174	Biopharmaceutics and Nanomedicine
PHRMSCI 177	Medicinal Chemistry

The following course can be used to partially satisfy the Upper-Division Biology Elective Requirement:

PHYSICS 147B	Techniques in Medical Imaging I: X-ray, Nuclear, and NMR Imaging
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Additionally, Psychology/Biological Sciences double majors may also use PSYCH 112A-PSYCH 112C to partially satisfy the Upper-Division Biology Elective Requirement.

#### **D. Behavioral Science Courses (choose 1 option):**

##### **Option 1**

ANTHRO 2A	Introduction to Sociocultural Anthropology
PSYCH 7A	Introduction to Psychology
SOCIOL 1	Introduction to Sociology

##### **Option 2**

SOC SCI H1E- H1F- H1G	Honors: Critical Issues on the Social Sciences and Honors: Critical Issues on the Social Sciences and Honors: Critical Issues on the Social Sciences
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E. HUMAN 1A-HUMAN 1AS-HUMAN 1B-HUMAN 1BS-HUMAN 1C-HUMAN 1CS.

or Humanities Core Alternative (including MED HUM 1 and MED HUM 3)

- <sup>1</sup> One laboratory can be satisfied with completion of Excellence in Research in the Biological Sciences.
- <sup>2</sup> BIO SCI D103, BIO SCI D104, BIO SCI D105, BIO SCI E106, BIO SCI E109, BIO SCI N110 may not be used to satisfy more than one requirement.

**Application Process to Declare the Major:** The major in Human Biology is open to junior- and senior-level students only. Applications to declare the major can be made at any time, but typically in the spring of the sophomore year. Review of applications submitted at that time and selection to the major by the Human Biology Faculty Board is completed during the summer. Information can also be found at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>). Double majors within the School of Biological Sciences or with Public Health Sciences, Biomedical Engineering: Premedical, Nursing Science, or Pharmaceutical Sciences are not permitted.

Freshman		
Fall	Winter	Spring
BIO SCI 93	BIO SCI 94	MATH 5A
CHEM 1A	CHEM 1B	CHEM 1C- 1LC
HUMAN 1A	HUMAN 1B	HUMAN 1C
HUMAN 1AS	HUMAN 1BS	HUMAN 1CS
BIO SCI 2A		
Sophomore		
Fall	Winter	Spring
BIO SCI 97	BIO SCI 98	BIO SCI 99
CHEM 51A	CHEM 51B- 51LB	CHEM 51C- 51LC
CHEM 1LD	PSYCH 7A	STATS 7 or 8
MATH 5B		
BIO SCI 194S		
Junior		
Fall	Winter	Spring
BIO SCI N120A	BIO SCI 3A	BIO SCI N120C
PHYSICS 3A	BIO SCI N120B	BIO SCI N110
BIO SCI 100	BIO SCI E109	PHYSICS 3C- 3LC
SOCIOL 1	PHYSICS 3B- 3LB	ANTHRO 2A
	Research	BIO SCI 199
Senior		
Fall	Winter	Spring
BIO SCI D103	Bio. Sci. Elective	Bio. Sci. Elective
Bio. Sci. Lab	Bio. Sci. Lab	Bio. Sci. Lab
BIO SCI 199	BIO SCI 199	BIO SCI 199

# School of Education

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## Richard Arum, Dean

3200 Education Building  
 General Information: 949-824-5118  
 Fax: 949-824-9103  
<http://education.uci.edu>  
[educadvising@uci.edu](mailto:educadvising@uci.edu)

The School of Education is a unique interdisciplinary academic unit committed to promoting educational success in and out of school for ethnically and economically diverse learners from preschool through college through collective research, teaching, and service activities. The multidisciplinary faculty includes scholars in psychology, sociology, economics, linguistics, language and literacy, policy, race and ethnicity, and the achievement gap. Their research addresses core issues in contemporary education: (1) equity of opportunity for ethnically, linguistically, and economically diverse learners; (2) teaching and learning in science and math; (3) language and literacy development; (4) early childhood education and development; (5) out-of-school learning; and (6) effective interfaces between technology and education.

The School integrates the themes of Learning, Cognition, and Development; Educational Policy and Social Context; and Language, Literacy, and Technology across its programs, including the minor in Education, the B.A. in Education Sciences, the Ph.D. in Education, and the Master of Arts in Teaching/Credential program. Scholarly work arises from the common belief that education environments, both in and out of school, are the sites of change in the quality of life and the availability of productive life choices for learners of all ages.

## Honors

**Graduation with Honors.** Honors at graduation, e.g., *cum laude*, *magna cum laude*, *summa cum laude*, are awarded to approximately the top 16 percent of the graduating seniors. To be eligible for honors, a general criterion is that students must have completed at least 72 units in residence at the University of California. The student's cumulative record at the end of the final quarter is the basis for consideration for awarding Latin honors. Other important factors are considered visit at Honors Recognition.

- Education Sciences, B.A.
- Education, Minor
- Education, Ph.D.
- Elementary and Secondary Education, M.A.T.

## Requirements for the Undergraduate CalTeach Science and Mathematics Single Subject Credential Program

The CalTeach Science and Mathematics Single Subject Credential Program is jointly sponsored by the Schools of Biological Sciences, Physical Sciences and Education.

The following academic units offer undergraduates an option to earn a bachelor's degree while concurrently satisfying requirements for a Single Subject Teaching Credential in Biological Sciences, Chemistry, Earth System Sciences, Mathematics, and Physics. Interested students should consult degree program options described in this *Catalogue* or talk with a counselor in the CalTeach Resource and Advising Center (137 Bison Modular). With careful, early planning, it is possible for students to complete their bachelor's degree and teaching credential in four years. More information is also available at the UCI CalTeach website (<https://calteach.uci.edu/>).

### Prior to Entry in the CalTeach Single Subject Credential Program:

- Declare one of the following majors: Biology/Education, Physics, Chemistry, Mathematics or Earth System Science with a Concentration in Education and Secondary Teaching Certification;
- Complete a CalTeach Program enrollment form, indicating intent to complete requirements for the Single Subject Teaching Credential for mathematics or one of the science disciplines. This must be done by the end of an undergraduate's second year at the latest, and prior to enrolling in EDUC 55, which would typically be completed in fall of the third year. Enrollment forms are available in the CalTeach Science and Mathematics Resource and Advising Center (137 Bison Modular).

### Prior to the Start of Student Teaching:

- Pass the California Basic Education Skills Test (CBEST);
- Pass the California Subject Exam for Teachers (CSET) or complete a subject-matter preparation program (available for Mathematics only);
- Hold a current Certificate of Clearance from the State of California;
- Hold a current TB test with negative results.



## Courses and Fieldwork

Candidates who enroll in the undergraduate CalTeach Single Subject Teacher Credential program at UCI are generally required to take the following courses.

PHY SCI 5/BIO SCI 14	California Teach 1: Introduction to Science and Mathematics Teaching
PHY SCI 105/BIO SCI 101	California Teach 2: Middle School Science and Mathematics Teaching <sup>1</sup>
CHEM/PHYSICS 193/BIO SCI 108	Research Methods
MATH 8	Explorations in Functions and Modeling (Mathematics candidates)
LPS 60	The Making of Modern Science (Science candidates)
or	
MATH 184- 184L	History of Mathematics and History of Mathematics Lesson Lab (Mathematics candidates)
EDUC 55	Knowing and Learning in Mathematics and Science <sup>1</sup>
EDUC 109	Reading and Writing in Mathematics and Science <sup>1</sup>
EDUC 143AW	Classroom Interactions I
EDUC 143BW	Classroom Interactions II
EDUC 148	Complex Pedagogical Design <sup>1</sup>
EDUC 158	Student Teaching Mathematics and Science in Middle/High School <sup>1</sup>

<sup>1</sup> In order to be recommended for the Preliminary Single Subject Credential, a grade of C or better is required in the following CalTeach teacher credential program courses: PHY SCI 105/BIO SCI 101; EDUC 55, EDUC 109, EDUC 143AW, EDUC 143BW, and EDUC 148. A grade of C or better is required for all sections of EDUC 158 (a repeatable course) that students complete, including all EDUC 158 sections with a student teaching requirement.

Student teaching for Single Subject candidates in the undergraduate CalTeach program is defined as a minimum of four hours per day, five days per week for at least one full public school semester in an appropriate classroom setting in middle or high school.

Readiness for student teaching shall be determined by, but not be limited to, the candidate's academic work, professional conduct, and potential for success in teaching. Failure to be advanced to student teaching will be considered good cause for removal and/or a leave of absence from the program.

## Applying for a California Credential

In addition to fulfilling all of the above requirements, an applicant must:

- Show evidence of a college-level course, or pass an approved examination on the U.S. Constitution;
- Obtain a CPR certificate in Adult, Child, and Infant resuscitation training;
- Pass the Teacher Performance Assessment
- Official UCI transcript must show that bachelor's degree has been awarded.

If competence has been demonstrated by the conclusion of the student teaching program, and all other CTC and Departmental requirements are met, the undergraduate candidate is eligible for a preliminary credential through UCI.

**Supplementary and Additional Teaching Authorizations.** After acquiring a basic credential, it is possible to add further teaching authorizations. Consult an academic counselor in the School of Education for details.

### On This Page:

- Multiple Subject Teaching Credential
- Single Subject Teaching Credential
- Administrative Services Credential

## Teaching and Service Credential Programs

The School of Education is authorized by the Commission on Teacher Credentialing to offer teacher and school administrator professional preparation programs for California teaching and service credentials. The School offers programs for multiple and single subject credentials through the Master of Arts in Teaching Program. Also, in partnership with the School of Biological Sciences and the School of Physical Sciences, the School of Education offers the Cal Teach Science and Mathematics Program, an undergraduate Student Teacher Credential program for aspiring science or mathematics teachers. Additionally, in cooperation with UCI Division of Continuing Education, the School offers Administrative Services Credential programs and a Reading Certificate program.

## Multiple Subject Teaching Credential

The Multiple Subject Teacher Credential pathway is embedded in the UCI Master of Arts in Teaching/Credential Program.

## Single Subject Teaching Credential

The Single Subject Teacher Credential pathway is embedded in the UCI Master of Arts in Teaching/Credential Program. The program supports preparation to teach secondary art, English, mathematics, social science, science(s), and world languages.

## Undergraduate CalTeach Science and Mathematics Single Subject Credential Program

The CalTeach Science and Mathematics Single Subject Credential Program is jointly sponsored by the Schools of Biological Sciences, Physical Sciences, and Education. The following academic disciplines: Biological Sciences, Chemistry, Earth System Sciences, Mathematics, and Physics offer undergraduates an option to earn a bachelor's degree while concurrently satisfying requirements for a Single Subject Teaching Credential. Interested students should consult degree program options described in this Catalogue or talk with a counselor in the CalTeach Resource and Advising Center (137 Bison Modular). With careful, early planning, it is possible for students to complete their bachelor's degree and teaching credential in four years. More information is also available in the CalTeach section of the Catalogue.

## Administrative Services Credential

The School of Education sponsors a program through UCI Division of Continuing Education leading to the Administrative Services Credential. The Preliminary Administrative Services Credential is obtained by completing the approved program of 36 quarter units and the California Administrator Performance Assessment (CalAPA). This credential also requires a valid basic credential, five years of full-time teaching or services experience, and passage of the basic skills requirement.

The Clear Administrative Services Credential begins when an administrative position is obtained. The UCI Clear Administrative Services program requires the successful completion of two years of full-time school administrative experience, the Preliminary Administrative Services Credential, and 10 quarter units (Education X399A-Induction and Education X399B-Final Evaluation) which provide structured mentoring, self-assessment, and formative/summative evaluation of the candidate. Those interested in these credentials should visit the UCI Division of Continuing Education website (<https://ce.uci.edu>) or email [education@ce.uci.edu](mailto:education@ce.uci.edu) (%20education@ce.uci.edu).

## Faculty

June Ahn, Ph.D. University of Southern California, *Associate Professor of Education*

Jonathan Alexander, Ph.D. Louisiana State University, *Associate Dean, Division of Undergraduate Education and Campus Writing Coordinator and Chancellor's Professor of English; Culture and Theory; Education; Gender and Sexuality Studies; Informatics* (writing studies, sexuality studies, queer theory, new media studies)

Richard Arum, Ph.D. University of California, Berkeley, *Dean of the School of Education and Professor of Education; Criminology, Law and Society; Sociology*

Drew Bailey, Ph.D. University of Missouri, *Associate Professor of Education; Cognitive Sciences; Psychological Science*

Rachel Baker, Ph.D. Stanford University, *Assistant Professor of Education*

Frank D. Bean, Ph.D. Duke University, *UCI Distinguished Professor of Sociology; Economics; Education* (international migration, demography, Mexican immigration, racial and ethnic relations, economic sociology, family)

Robert J. Beck, Ph.D. University of Chicago, *Senate Emeritus of Education*

Henry J. Becker, Ph.D. Johns Hopkins University, *Professor Emeritus of Education*

Rebecca W. Black, Ph.D. University of Wisconsin-Madison, *Associate Professor of Informatics; Education* (digital media and learning, fan studies)

Liane R. Brouillette, Ph.D. University of Colorado Boulder, *Professor of Education* (educational policy, arts-based learning)

Andres Bustamante, Ph.D. University of Miami, *Assistant Professor of Education*

Shanyce L. Campbell, Ph.D. University of North Carolina at Chapel Hill, *Assistant Professor of Education*

Elizabeth E. Cauffman, Ph.D. Temple University, *Professor of Psychological Science; Criminology, Law and Society; Education; School of Law* (adolescent development, mental health, juvenile justice, legal and social policy)

Vanitha Chandrasekhar, Ed.D. University of California, Irvine, *Lecturer of Education* (education technology)

Chuansheng Chen, Ph.D. University of Michigan, *UCI Chancellor's Professor of Psychological Science; Education* (cross-cultural psychology, adolescent development, cognitive neuroscience, genes and behavior)

Penelope R. Collins, Ph.D. University of Toronto, *Associate Professor of Education*

Gilberto Q. Conchas, Ph.D. University of Michigan, *Professor of Education; Asian American Studies; Sociology* (urban education, sociology of education, comparative race and ethnicity)

AnneMarie M. Conley, Ph.D. University of Michigan, *Associate Professor of Education*

Helen De La Maza, M.A. Oregon State University, *Lecturer of Education*

Shayan Doroudi, Ph.D. Carnegie Mellon University, *Assistant Professor of Education; Informatics* (learning analytics, learning sciences, educational technology)

Nia Dowell, Ph.D. The University of Memphis and Institute for Intellect Systems, *Assistant Professor of Education* (learning analytics, online group interaction, computational linguistics, technology, STEM)

Greg Duncan, Ph.D. University of Michigan, *UCI Distinguished Professor of Education; Economics; Psychological Science* (economics of education, program evaluation, child development)

Jacquelynne S. Eccles, Ph.D. University of California, Los Angeles, *UCI Distinguished Professor of Education; Psychological Science* (academic motivation and achievement, school and family influences on adolescent development, gender and ethnicity in STEM fields)

Dennis Evans, Ed.D. University of Southern California, *Non-Senate Academic Emeritus of Education*

George Farkas, Ph.D. Cornell University, *UCI Distinguished Professor of Education; Sociology* (educational achievement gaps, interventions, educational policy)

David John Frank, Ph.D. Stanford University, *Professor of Sociology; Education; Political Science* (globalization, sexuality, the natural environment, higher education)

Brandy Gatlin-Nash, Ph.D. Florida State University, *Assistant Professor of Education; Language Science*

Wendy A. Goldberg, Ph.D. University of Michigan, *Professor Emerita of Psychological Science; Education* (developmental psychology, work and family, infant sleep, transition to parenthood, autism)

Shane Goodridge, Ph.D. University of Victoria, *Assistant Professor of Teaching of Education*

Elizabeth Greeban, M.A. University of California, Irvine, *Lecturer of Education*

Jody Guarino, Ed.D. Azusa Pacific University, *Lecturer and Supervisor of Teacher of Education*

Susan Guilfoyle, M.S. University of Southern California, *Lecturer of Education* (reading, language and literacy)

Janice L. Hansen, Ph.D. University of California, Irvine, *Lecturer of Education*

Gillian Hayes, Ph.D. Georgia Institute of Technology, *Robert A. and Barbara L. Kleist Professor of Informatics; Education* (interactive and collaborative technology, human-computer interaction, computer-supported cooperative work, educational technology, ubiquitous computing)

Jutta Heckhausen, Ph.D. University of Strathclyde, *Professor of Psychological Science; Education* (life-span developmental psychology, motivation, individual agency and social context)

Alan R. Hoffer, Ph.D. University of Michigan, *Professor Emeritus of Education*

Kristine Houston, M.S. National University, *Lecturer of Education*

Jeffrey J. Hruby, M.A. California State University, Fullerton, *Lecturer of Education*

Bradley S. Hughes, Ph.D. University of California, Irvine, *Associate Professor of Teaching of Ecology and Evolutionary Biology; Education*

Karajeane Hyde, M.A. Vanguard University, *Lecturer of Education* (mathematics education)

Constance Iloh, Ph.D. University of Southern California, *Assistant Professor of Education*

Susanne M. Jaeggi, Ph.D. University of Bern, *Associate Professor of Education; Cognitive Sciences* (working memory, executive functions, cognitive training, lifespan development aging, individual differences)

Susan C. Jarratt, Ph.D. University of Texas at Austin, *Professor Emerita of Comparative Literature; Education* (histories and theories of rhetoric, ancient Greek rhetoric, writing studies)

Jade Marcus Jenkins, Ph.D. University of North Carolina at Chapel Hill, *Assistant Professor of Education*

Jeffrey M. Johnston, M.A. University of Southern California, *Lecturer of Education*

Hosun Kang, Ph.D. Michigan State University, *Associate Professor of Education*

Young-Suk Kim, Ed.D. Harvard University, *Professor of Education; Asian American Studies*

Kimberly Lakes, Ph.D. University of Wisconsin-Madison, *Associate Professor in Residence of Pediatrics; Education*

Jenel Lao, Ed.D. University of California, Irvine and Los Angeles, *Lecturer of Education*

Glenn S. Levine, Ph.D. University of Texas at Austin, *German Language Program Director and Professor of German; Education; Language Science* (applied linguistics, foreign language pedagogy, German-Jewish culture and history, Yiddish language and culture, European culinary history)

Julia R. Lupton, Ph.D. Yale University, *Associate Dean for Research and Professor of English; Comparative Literature; Education; Religious Studies* (Renaissance literature, literature and psychology)

Virginia Mann, Ph.D. Massachusetts Institute of Technology, *Professor of Language Science; Education* (reading ability: phoneme awareness, developmental dyslexia, phonological skills, early intervention, precocious readers; speech perception: context effects, cross-linguistic comparisons)

Jack R. McCullough, Ph.D. United States International University, *Associate Professor of Teaching Emeritus of Education*

Carol Booth Olson, Ph.D. University of California, Los Angeles, *Professor Emerita of Education*

Elizabeth Pena, Ph.D. Temple University, *Professor of Education; Language Science*

Emily K. Penner, Ph.D. University of California, Irvine, *Assistant Professor of Education*

Kylie Peppler, Ph.D. University of California, Los Angeles, *Associate Professor of Informatics; Education* (learning sciences, design, maker culture, arts, game design, computer programming, wearables)

Stephanie Reich, Ph.D. Vanderbilt University, *Associate Professor of Education; Informatics; Psychological Science* (child development, parenting, peer interactions, media, program evaluation)

Katherine Rhodes, Ph.D. Georgia State University, *Assistant Professor of Education* (mathematical cognition and achievement, linguistic minority equity and inclusion, child development, psychometrics, latent trait modeling)

Lindsey Richland, Ph.D. University of California, Los Angeles, *Associate Professor of Education*

Fernando Rodriguez, Ph.D. University of Michigan, *Assistant Professor of Teaching of Education*

Ruben G. Rumbaut, Ph.D. Brandeis University, *Distinguished Professor of Sociology; Chicano/Latino Studies; Criminology, Law and Society; Education* (international migration, immigration laws, criminalization, incarceration, social inequality and mobility, race and ethnicity)

Judith Haymore Sandholtz, Ph.D. Stanford University, *Professor of Education*

Rossella Santagata, Ph.D. University of California, Los Angeles, *Professor of Education* (teacher preparation and professional development, teaching and learning in STEM fields, video technologies, teaching and learning as cultural practices, equity and education)

Brian Sato, Ph.D. University of California, San Diego, *Associate Professor of Teaching of Molecular Biology and Biochemistry; Education*

Robin C. Scarcella, Ph.D. University of Southern California, *Professor of Academic English/English as a Second Language; Education*

Sabrina E. Schuck, Ph.D. University of California, Riverside, *Health Sciences Assistant Clinical Professor of Pediatrics; Education; Psychological Science*

Sandra Simpkins, Ph.D. University of California, Riverside, *Professor of Education* (organized after-school activities, motivation, family influences, diversity and equity, immigration and culture, STEM)

Padhraic J. Smyth, Ph.D. California Institute of Technology, *Professor of Computer Science; Education; Statistics* (artificial intelligence and machine learning, pattern recognition, applied statistics, data mining, information theory)

Kurt Squire, Ph.D. Indiana University, *Professor of Informatics; Education* (video game design, games for learning, mobile technologies, civic engagement, place-based learning)

Constance Steinkuehler, Ph.D. University of Wisconsin-Madison, *Professor of Informatics; Education* (video games for impact, game-mediated cognition and learning, online social interaction, video games and policy)

Jeanne M. Stone, M.A. California State University, Long Beach, *Lecturer of Education*

Timothy M. Tift, M.A. Pepperdine University, *Associate Professor of Teaching Emeritus of Education*

William M. Tomlinson, Ph.D. Massachusetts Institute of Technology, *Professor of Informatics; Education* (environmental informatics, educational technology, computer graphics/visualization/digital arts)

Deborah Lowe Vandell, Ph.D. Boston University, *Chancellor's Professor Emerita of Education; Psychological Science* (longitudinal studies of development, early childhood education, after-school programs, summer learning, child development, adolescent development)

Adriana Villavicencio, Ph.D. New York University, *Assistant Professor of Education*

Mark J. Warschauer, Ph.D. University of Hawaii at Manoa, *Professor of Education; Informatics* (language, literacy, technology, STEM)

Dolores Wirth, M.A. California State University, Fullerton, *Lecturer of Education*

Di Xu, Ph.D. Columbia University, *Associate Professor of Education*

Elizabeth van Es, Ph.D. Northwestern University, *Associate Professor of Education* (teacher cognition, pre-service teacher education, in-service teacher professional development, teacher learning communities, uses of video in teacher learning)

## Courses

### **EDUC 10. Educational Research Design. 4 Units.**

Designed to help students become intelligent consumers of research and independent researchers, and provides an introduction to the basic principles of educational research. Topics include research questions, literature reviews, and qualitative and quantitative research designs.

Overlaps with SE 10.

Restriction: Education Sciences Majors have first consideration for enrollment.

(III)

### **EDUC 15. Statistics for Education Research . 4 Units.**

Provides an introduction to the use of statistics in educational research. Focuses on testing and measurement, and provides basic tools to read, interpret, and draw conclusions from quantitative educational research.

Prerequisite: EDUC 10

Overlaps with SE 13.

Restriction: Education Sciences Majors have first consideration for enrollment.

(Va)

### **EDUC 25. Introduction to Education: Disciplinary Perspectives. 4 Units.**

Provides insights into educational organizations and processes by developing understanding of concepts used by four different disciplines (economics, history, psychology, and sociology) to analyze key issues and phenomenon in the field of education that profoundly influence individual life course outcomes.

Restriction: Education Sciences Majors have first consideration for enrollment.

(III)

### **EDUC 30. 21st Century Literacies. 4 Units.**

Provides an overview of literacies required for academic and career success in the 21st century. Issues addressed include reading, writing, academic language, research skills, media and technology skills, scientific literacy, critical thinking, communication, collaboration, and creativity.

Restriction: Education Sciences Majors have first consideration for enrollment.

(III)

### **EDUC 40. Theories of Development and Learning Applied to Education. 4 Units.**

Provides an introductory examination of central theories of human development and learning in their application to contemporary educational settings.

Restriction: Education Sciences Majors have first consideration for enrollment.

(III)

**EDUC 50. Origins, Purposes, and Central Issues in K-12 Education. 4 Units.**

An introduction to the role of education in U.S. society and to central issues in K–12 education. Education is studied from four different perspectives: social, historical, philosophical, and political.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 52. Foundations of Bilingual Education and Bilingualism. 4 Units.**

Provides a comprehensive overview of current issues in bilingual education and bilingualism. Topics include dimensions of bilingualism, the effects of bilingualism on children's linguistic and cognitive development, bilingual education programs, literacy, special needs, and assessment.

Same as LSCI 51B, HUM 52.

**EDUC 55. Knowing and Learning in Mathematics and Science. 5 Units.**

Multidisciplinary study of knowing and learning in secondary school mathematics and science. Topics include standards for knowing, scientific epistemologies, mental representations, problem solving, expert-novice studies, assessment, and domain-specific thinking, learning, and teaching. Applied analysis of learning through clinical interviews.

Prerequisite: PS 5 or BIOL 14

**(III)**

**EDUC 100. Educational Strategies for Tutoring and Teacher Aiding. 4 Units.**

Placement in a public elementary or secondary school to gain experience as a tutor or teacher aide. Emphasis on cognitive learning and the development of instructional strategies and resources which can be used in effective cross-age and cross-cultural experiences.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 101. Strategies for Tutoring and Teacher Aiding in a Bilingual Classroom. 4 Units.**

Placement in a dual immersion school setting to gain experience as a bilingual (Spanish) tutor or teacher aide. Emphasis on cognitive learning and the development of instructional strategies and resources which can be used in effective cross-age and cross-cultural experiences.

Prerequisite: Must be able to communicate in Spanish.

Grading Option: Pass/no pass only.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 104D. The Arts and Human Development. 4 Units.**

Students use various arts disciplines (e.g. studio art, music, dance, drama, and media arts) to investigate how visual and performing arts support individual human development. Introduction to pedagogy for integrating the arts in K-12 settings. Materials fee.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 104E. Multimedia and the Arts in the Multicultural Classroom. 4 Units.**

Multiculturalism and under-represented U.S. minorities and the visual and performing arts: perspectives in artistic perception, creative expression, historical and cultural context, aesthetic valuing, and media literacy in the interpretation and production of multimedia arts products and applications for K-12 classrooms.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 106. Early Childhood Education Curriculum and Instruction. 4 Units.**

Designed to provide an introductory survey of the nature, needs, and education of young children. Explores questions such as 'What should we teach young children?' and 'How should we teach?'.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 107. Child Development in Education. 4 Units.**

Explores the pathways of normally developing children's growth and change over time. In particular, focuses on how cognitive and social development impact and are driven by educational contexts.

Restriction: Education Sciences Majors have first consideration for enrollment.



**EDUC 108. Adolescent Development and Education. 4 Units.**

Explores the physical, cognitive, emotional, and social development of adolescents, with an emphasis on the practical implications of developmental theory and research findings for teachers and other professionals who work with adolescents in middle or high school contexts.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 109. Reading and Writing in Mathematics and Science. 4 Units.**

Emphasis is placed on understanding the literacy processes (listening, speaking, viewing, thinking, reading, and writing) as they relate to middle and high school mathematics and science. Students integrate literacy-related strategies with curriculum-based goals supported in the California State Frameworks.

Corequisite: EDUC 158

**EDUC 122A. Foundations of Elementary Mathematics Learning I. 4 Units.**

Provides understanding of fundamental mathematics necessary to teach for conceptual understanding and higher-level reasoning and problem solving. Conceptual understanding of place value, fractions, proportionality, geometry, algebra, functions, probability, statistics, and measurement. Instructional applications of these concepts in grades K-8 teaching.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 122B. Foundations of Elementary Mathematics Learning II. 4 Units.**

Provides understanding of fundamental mathematics necessary to teach for conceptual understanding and higher-level reasoning and problem solving. Conceptual understanding of place value, fractions, proportionality, geometry, algebra, functions, probability, statistics, and measurement. Instructional applications of these concepts in grades K-8 teaching.

Prerequisite: EDUC 122A

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 122C. Foundations of Elementary Mathematics Learning III. 4 Units.**

Provides understanding of fundamental mathematics necessary to teach for conceptual understanding and higher-level reasoning and problem solving. Conceptual understanding of place value, fractions, proportionality, geometry, algebra, functions, probability, statistics, and measurement. Instructional applications of these concepts in grades K-8 teaching.

Prerequisite: EDUC 122B

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 124. Multicultural Education in K-12 Schools. 4 Units.**

Provides a theoretical and empirical overview of educational issues affecting low-income immigrant and U.S. born minority student populations in an increasingly diverse and changing society.

Same as CHLT 183.

**(VII)****EDUC 125. Children, Schools, and Cinema. 4 Units.**

Through popular films, analyzes aspects of school dynamics and interaction of schools with students, teachers, and public. Melding educational studies and film studies provides deeper understanding of methods used to transmit information and attitudes about schools to the lay public.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 126. Ethics and Education. 4 Units.**

Ethics in education and how ethicists frame moral problems. Presents major ethical themes that affect education. Analysis of models for dealing with ethical goals and developing morality for K–12 students. Models for solving ethical dilemmas within an educational context.

Prerequisite: EDUC 50

**EDUC 127A. Moral Education for Youth Development I. 2 Units.**

The first of a two-course series that examines research-based theories for how school settings and adult mentors contribute to the moral development of adolescents. Students examine theory in the context of real-world application in four program observations.

Prerequisite: EDUC 126

Restriction: Education Sciences Majors only.

**EDUC 127B. Moral Education for Youth Development II. 2 Units.**

Continuation of EDUC 127A. Allows students from 127A to experience the role of adults in the moral development of youth. Students receive training to deliver curriculum and apply research-based theories and methods in real-world youth settings.

Prerequisite: EDUC 126 and EDUC 127A

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 128. Exceptional Learners. 4 Units.**

An introductory survey of the nature, needs, and education of K–12 children with exceptionalities. Covers the categories and characteristics of exceptionalities, relevant state and federal legislation, and the role of general education teachers in special education.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 130. Children's Learning and Media. 4 Units.**

Examines how popular media may impact how young people learn, develop, and communicate by looking at research related to the impacts of a wide range of popular media including television, video games, digital environments, mobile devices, and other multimedia.

Same as INF 164.

Restriction: Education Sciences Majors only. Informatics Majors only. Informatics Minors only.

**EDUC 131. Educational Technology. 4 Units.**

Presents an overview of the types and uses of educational technology to support and enhance the K–12 learning experience. Familiarizes students with lesson planning, instructional design, learning theory, and integrating technology into the curriculum.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 132. Reading and Writing Enrichment for After-School Programs. 4 Units.**

Examines literacy development and the implementation of research-based practices to enrich learners' reading and writing skills in after-school programs. A minimum of 20 hours of after-school program fieldwork is required in order to design and implement literacy enrichment activities.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 134. Teaching English Internationally. 4 Units.**

Covers methods of teaching English as a foreign language, basic language knowledge for English teachers, the social context of English language teaching around the world, and essential information about securing international employment as an English teacher.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 137. Arts for Elementary Learners. 4 Units.**

Theory and practice in art education for the elementary school classroom. Includes content and pedagogy for future teachers and others interested in the relationship between child development and the production of visual art. Materials fee.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 138. Children's Literature in the Elementary Classroom. 4 Units.**

Explores the wealth of children's literature that can be integrated into the elementary classroom. Surveys traditional literature, fiction, nonfiction, and poetry that make curriculum accessible to all students. Focuses on literary elements for both reading and creating text.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 140. Courts, Classrooms, and Controversies in Education Policy . 4 Units.**

Examines policies and laws defining the K-12 U.S. education system and the politics and controversies surrounding the political decision-making process at the federal, state, and local levels. Discusses original intent versus effects on organization of schools and educational equity.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 142. American History and Education Policy: An Intimate Relationship. 4 Units.**

Examines the interplay between history, politics, and policy. Students examine the interactions between sociopolitical development and environmental contexts (e.g. familial, social, school, cultural) and contemplate the power of normative values in the formulation of education policy.

Restriction: Education Sciences Majors have first consideration for enrollment.



**EDUC 143. Controversies in College. 4 Units.**

Explores the fascinating world of postsecondary education. Every week students dive deeper into controversies that make college more than just where students attend class, but rather, one of the most important social institutions shaping our world.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 143AW. Classroom Interactions I. 4 Units.**

Focuses on research-based instructional strategies for enhancing the learning of secondary mathematics and science. Students learn about adolescent and second-language development to assist them in developing analyzing, teaching, and critiquing lessons for secondary classrooms.

Prerequisite: (PS 105 or BIOL 101) and EDUC 55. Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**EDUC 143BW. Classroom Interactions II. 4 Units.**

Focuses on equity and multicultural education research, special education, and research-based instructional and assessment strategies to assist students in designing, teaching, and assessing lessons that meet the needs of all secondary mathematics and science students.

Prerequisite: (PS 105 or BIOL 101) and EDUC 55 and EDUC 143AW and EDUC 148. Satisfactory completion of the Lower-Division Writing requirement.

(IB AND VII ).

**EDUC 144. The American Charter School. 4 Units.**

Explores the legitimacy of the charter school as a viable educational reform movement. Critical themes include the role of choice and privatization in public education and charter schools as a vehicle for fulfilling the promise of educational equality.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 145. Theories and Pedagogies of Race in Education. 4 Units.**

Introduces theoretical frameworks to examine the role of race in American education. Emphasis is placed on introducing students to different race and ethnicity paradigms.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 146. Education, Learning, and Culture. 4 Units.**

Exploration of learning and development through a cultural lens, drawing from a range of research traditions and disciplines to broaden understandings of theories that inform teaching and learning in formal and informal settings.

Restriction: Education Sciences Majors only.

**EDUC 147. Poverty, Education, and Social Change. 4 Units.**

Explores how institutional and demographic changes in the U.S. have shaped disparities in education, the mechanisms through which poverty and social class influence families, and students, and promising programs and interventions to address inequity. Includes community service.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 148. Complex Pedagogical Design. 6 Units.**

In this Cal Teach capstone course, students design lesson plans and complex instructional units, using approaches such as mathematics and science integration, problem-based instruction, project-based learning, technology, representations, scientific and mathematical analysis/modeling, authentic assessment, contextualization, and designing equitable learning environments.

Prerequisite: (PS 105 or BIOL 101) and EDUC 55 and EDUC 143AW

**EDUC 149. Family, School, and Community in Early Childhood. 4 Units.**

Focuses on the many socializing aspects of young children's social worlds. Through the use of ecological perspectives, explores the role of families, schools, and communities on children's social development, especially in early childhood.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 150. Changing the High School Experience. 4 Units.**

Analysis of problems in high school education (e.g., student disengagement and underachievement of disadvantaged) and proposals for changing curriculum, instruction, and school organization. Students suggest own reforms and analyze effective/ineffective school practices.

Prerequisite: Recommended: 1 unit of EDUC 199.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 151. Language and Literacy. 4 Units.**

Addresses the linguistic principles and processes that underlie oral and written language proficiency. Emphasis is on how to use phonology, morphology, orthography, semantics, syntax, and pragmatics to support literacy and oral language development for K-12 students.

Same as PSCI 192V, LSCI 182V.

Restriction: Language Science Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Education Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**EDUC 152. Theory and Practice of Reading Interventions for Students At-Risk for Reading Failure. 4 Units.**

Examines the research concerning reading failure in young children and interventions used to support them. Topics include reading development and reading intervention. Students critically evaluate the relation between their fieldwork experience and the research and evaluation literature.

Repeatability: May be taken for credit 2 times.

Restriction: Education Sciences Majors only.

**EDUC 156. Introduction to Field Methods in Education. 4 Units.**

Introduces students to methods for studying human behavior in context. It prepares students for conducting applied educational research, including designing needs assessments; conducting observations, interviews and focus groups; organizing and analyzing data; and synthesizing and presenting research findings.

Prerequisite: EDUC 10

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 157. Educational Research and Evaluation. 4 Units.**

Covers qualitative and quantitative research methods relevant for the evaluation of educational programs. Students have the opportunity to plan, execute, and write-up a small evaluation project.

Prerequisite: EDUC 10 and EDUC 15

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 158. Student Teaching Mathematics and Science in Middle/High School. 6 Units.**

Student teaching includes orientation, seminars, preparation, and assumption of secondary school classroom instructional responsibilities in accordance with State credentialing requirements and in conjunction with the public school calendar. Five days/week and a minimum four hours/day over two quarters.

Corequisite: EDUC 109

Prerequisite: (PS 105 or BIOL 101) and EDUC 55 and EDUC 143AW and EDUC 143BW and EDUC 148

Repeatability: May be taken for credit 2 times.

**EDUC 158F. Advanced Fieldwork in Middle/High School Math and Science. 3 Units.**

Advanced fieldwork for math and science teacher credential candidates over two quarters, prior to starting a fall student teaching assignment. Requires a minimum of 40 hours per quarter of fieldwork in a K-12 classroom and attendance at weekly seminars.

Prerequisite: (PS 105 or BIOL 101) and EDUC 55 and EDUC 143AW and EDUC 143BW and EDUC 148

Repeatability: May be taken for credit for 6 units.

**EDUC 159. Experimental Research Methods. 4 Units.**

Designed to help students to develop the ability to think critically about research, and to develop an understanding of how to design and conduct experiments. The overall goal is to prepare students to independently plan and implement a research study.

Prerequisite: EDUC 10 and EDUC 15

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 160. Foundations of Out-of-School Learning. 4 Units.**

Provides an overview of child and adolescent learning through participation in out-of-school activities and settings. Recognizes the importance of matching out-of-school experiences with the interests, needs, and development level of students. Observation-based fieldwork included.

Repeatability: May be taken for credit 2 times.

Restriction: Education Sciences Majors have first consideration for enrollment. May be taken a second time if student is a candidate for Certificate in After-School Education, and the first time was prior to Fall 2008.

**EDUC 161. Discovering Science in Out-of-School Hours. 4 Units.**

Examines the design principles and teaching techniques that science museums and other out-of-school science programs use to motivate children and youth to learn science through discovery. Includes field experience at a science learning center or after-school program. Materials fee.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 173. Cognition and Learning in Educational Settings. 4 Units.**

Foundational concepts in cognition and development as applied to student learning. Primary topics include historical behaviorism, basic cognitive structure and processes, complex cognition, cognitive development, and motivation.

Same as PSCI 192T.

Restriction: Psychological Science Majors have first consideration for enrollment. Education Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**EDUC 174. Education and the American Dream: Historical Perspectives on Democracy and Education. 4 Units.**

Examines the relationship between public schooling and the promotion of democratic ideals in American society over the past two centuries.

Same as HIST 147.

**EDUC 175. Foundations of Education. 4 Units.**

Foundational questions of education are viewed from newly emerging developmental perspectives which treat cognition as embodied action and learning as cultural recapitulation. Historical, sociological, psychological, and philosophical implications of views toward aspects of teaching, learning, curriculum, and pedagogy are considered.

Restriction: Education Sciences Majors only.

**EDUC 176. Psychology of Learning, Abilities, and Intelligence. 4 Units.**

Overview of classic positions on the mind, human abilities, and intelligence, especially as related to academic achievement. Contrasting views: psychometric versus information processing; experimental versus correlational research.

Prerequisite: PSYC 7A or PSCI 9 or PSCI 11A or PSCI 11B or PSCI 11C

Same as PSCI 192U.

Restriction: Psychological Science Majors have first consideration for enrollment. Education Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**EDUC 179W. Advanced Writing for Education Sciences. 4 Units.**

Writing for multiple audiences and purposes about central concepts in education sciences, such as schools as organizations; social structures in education and stratification; individual decision making, government regulation and markets; human development and learning.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Seniors only. Education Sciences Majors have first consideration for enrollment.

**(Ib)****EDUC 180. Interdisciplinary Topics in Education. 4 Units.**

Analysis of issues in education from interdisciplinary perspectives. Topics covered vary with interests of instructor.

Repeatability: Unlimited as topics vary.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 181A. Principles and Practices of Coaching Sports I. 4 Units.**

Focuses on foundational theories and instructional practices in coaching sports from fourth grade to the collegiate level. Prepares students for the coach's mandatory state certification examination for high school sports in California.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 185. Social Development in Education. 4 Units.**

Examination of contextual, psychosocial, and biological factors contributing to the social development of children and adolescents. Theoretical perspectives, empirical findings, and methodological issues are emphasized. Implications of the scientific evidence for practical and policy decision-making surrounding development are discussed.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 190. Principles and Practices of K–6 After School Sports and Fitness. 4 Units.**

Focuses on foundational theories and instructional practices in after-school sports and fitness for K–6 students. Includes a 20-hour field experience in an after-school setting.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 191. Advanced Fieldwork in After-School Education. 4 Units.**

Capstone fieldwork experience for students seeking to earn the Department of Education-sponsored Certificate in After-School Education. Students are required to complete 50 or more hours of fieldwork and related assignments at an instructor-approved after-school program.

Prerequisite: EDUC 160

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 193. Directed Studies in Early Childhood Education. 2-4 Units.**

Advanced study of early childhood education under the direction of a faculty member, coupled with a community-based practicum.

Repeatability: May be repeated for credit unlimited times.

Restriction: Education Sciences Majors have first consideration for enrollment.

**EDUC 198. Directed Research in Education. 2-8 Units.**

Individually or in small groups, students are exposed to or participate in work related to a faculty member's research. Students also attend a weekly seminar and complete a research paper or comparable project.

Repeatability: May be taken for credit for 12 units.

Restriction: Sophomores only. Upper-division students only.

**EDUC 199. Individual Study. 1-4 Units.**

Intensified advanced study in areas in which a student has considerable background, under the direction of a faculty member who will guide and evaluate the study.

**EDUC 202. Outcomes of Schooling/Student Assessment. 4 Units.**

Focuses on establishment of learning goals and assessment tools that are valid for all students, inform educational decisions, and promote educational success. Provides critical examination of different forms of assessment used in K–12 schools, including developmental assessments and appropriate interventions.

Restriction: Graduate students only. Education-MA/PhD Majors only.

**EDUC 203. Advanced Concepts in Learning and Cognition. 4 Units.**

Theories of cognition and their application to thinking and learning in school settings. Topics include memory, information processing, knowledge representation, problem solving, meta-cognition, and intelligence.

Prerequisite: EDUC 173

Restriction: Graduate students only. Education-MA/PhD Majors only.

**EDUC 205. Critical Assessment of Teaching Practice and Learning. 4 Units.**

Student articulates a problem in instructional practice and uses research on cognition, assessment, and other tools to understand the problem. Capstone course emphasizes practices of teacher inquiry, reflection, and professional collaboration. Student's written analyses are evaluated as program's Comprehensive Examination.

Restriction: Graduate students only. Education-MA/PhD Majors only.

**EDUC 206. Design of Learning Environments for Teachers in Secondary School Subjects. 4 Units.**

Research on comprehension, conceptual understanding, reasoning, critical thinking, and problem solving with applications to pedagogy in secondary school subjects. Required for M.A.T. single subject students, unless substitution of Education 207 is authorized.

**EDUC 207. Cognition and Pedagogy in Quantitative Literacy. 4 Units.**

Reviews research on cognition in elementary mathematics, including numeracy, fractions, probability, proportionality, measurement, geometry, algebra. Emphasizes instructional approaches consistent with this research knowledge. Required for M.A.T. multiple subjects students, unless substitution of Education 206 is authorized by the Department.

**EDUC 208. Reading and Writing Development . 4 Units.**

Covers major theories and evidence about mechanisms and factors that contribute to development and difficulties with reading and writing skills. These include language, cognition, biological and environmental factors, bilingual and second language acquisition, and educational implications.

Restriction: Graduate students only.

**EDUC 210. Language, Literacy, and Discourse. 4 Units.**

Introduces students to the interdisciplinary study of language, literacy, and discourse across historical and educational contexts. Addresses theories of how people learn, interact, and make meaning through a variety of semiotic resources, including oral communication, print, and digital media.

Restriction: Graduate students only.

**EDUC 211. Writing Theory and Practice. 4 Units.**

Offers an overview of histories, theories, and research in the field of composition studies from 1950 to the present. Addresses the influences of theory and research on teaching practice at K–12 and college levels.

Restriction: Graduate students only.

**EDUC 212. Literacy and Technology. 4 Units.**

Examines theoretical, historical, and contemporary relationships of technology and literacy. Topics include online communication, multimodality, video games, the use of technology for literacy instruction in schools, and research approaches for investigating literacy development with technology.

Restriction: Graduate students only.

**EDUC 217. Foundations of Digital Learning. 4 Units.**

Students are introduced to historical, constructionist, instructionist, and new literacies perspectives through reading major works in educational technology and discussing how they apply to both teaching and research.

Restriction: Graduate students only.

**EDUC 218. Special Topics in Teaching, Learning, and Educational Improvement. 4 Units.**

Advanced seminar designed to engage students in highly interactive examination of current issues in teaching and learning. Topics and content vary by quarter, depending upon research interests of the faculty and students.

Repeatability: May be taken for credit 10 times as topics vary.

Restriction: Graduate students only.

**EDUC 220. Developing Adolescent Literacy. 4 Units.**

Examines how adolescents leverage vocabulary knowledge, word-reading skills, background understanding, and knowledge of content-specific text features to master an increasing range of texts both independently and for subject-area learning.

Restriction: Graduate students only.

**EDUC 221. Longitudinal and Advanced Structural Equation Modeling. 4 Units.**

Covers advanced and longitudinal structural equation models. Topics include measurement invariance, growth curve models, measurement models, mixture models, and missing data.

Prerequisite: Recommended: EDUC 288B.

Restriction: Graduate students only.

**EDUC 222. Research Epistemologies and Methodologies. 4 Units.**

Introduction to epistemological underpinnings of educational research and to a range of research methodologies in education. Includes examination of quantitative and qualitative studies through reading and analyzing contemporary research. Critique of selected research studies pertinent to educational practice and policy.

Restriction: Ed.D. Program students only.

**EDUC 223. Oral Language Acquisition and Education. 4 Units.**

Learn about research on domains of development in oral language (phonology, vocabulary, grammar, and extended discourse), bilingual development, and second language acquisition with attention to cognitive, biological, and environmental factors. Focus on learning in school settings and educational implications.

Restriction: Graduate students only.

**EDUC 224A. Learning Analytics Fundamentals. 4 Units.**

Provides students with a survey of learning analytics (LA), emphasizing its application across educational contexts, rather than its underlying algorithmic details. A comprehensive overview orients students to this nascent field and prepares them for advanced research in LA.

Restriction: Graduate students only.

**EDUC 224B. Learning Analytics Practicum. 4 Units.**

Helps students gain hands-on experience working as educational data scientists, while simultaneously learning some of the key guiding principles behind effectively using data to make predictions and decisions. Culminates in an interdisciplinary group research project.

Prerequisite: EDUC 288A

Restriction: Graduate students only.

**EDUC 225. Learning, Development, and Culture. 4 Units.**

Explores issues of learning and development through a cultural lens. The interplay between culture and learning and culture and development is analyzed through the discussion of relevant readings from both psychological and anthropological research traditions.

Restriction: Graduate students only.

**EDUC 226. University Teaching: Concepts and Practices. 4 Units.**

Prepares doctoral students for course design and instruction at the university level. Addresses topics including the university teaching context, preparing a syllabus, and inclusive teaching and learning.

Restriction: Graduate students only.

**EDUC 228. Science Education for the 21st-Century Classroom. 4 Units.**

Aims to develop foundational understanding about science education research. Contemporary research from early childhood through high school is introduced. Issues of equity, social justice, pedagogy, professional development, and innovation in and out of school settings are addressed.

Restriction: Graduate students only.

**EDUC 229. Theories of Human Development. 4 Units.**

Examines developmental theory as a guide for research and practice in education. The evolution of classical development theories and the emergence of new theoretical models are considered. Theoretical perspectives include ecological systems, life course, psychobiology, attachment, and social-cognitive theories.

Restriction: Graduate students only.

**EDUC 229A. Theories and Issues in Human Development - Part I. 4 Units.**

Examines seminal concepts, issues, and theories that underlie contemporary developmental science. Students develop an understanding of these concepts, and develop their skills in using theory as a guide in their own research and practice.

Restriction: Graduate students only.

**EDUC 230. The History and Culture of Schooling in the United States. 4 Units.**

Considers the historical, cultural, and structural processes that contextualize American schooling. In particular, examines the roles of race, class, and gender in the context of public education in the United States.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 231. Interrogating Race and Education. 4 Units.**

Critically explores how race is a socially constructed concept and how it manifests itself in American society. Attention is given to African American, Asian, and Mexican communities throughout U.S. history, with particular emphasis on educational inequality.

Restriction: Graduate students only.

**EDUC 232. Mathematics Cognition and Learning. 4 Units.**

Study of mathematical cognition, learning, and development. Combines readings from cognitive and developmental psychology, education, and learning sciences with the purpose of identifying the most useful applications of cognitive theory and methods for educational research and practice.

Restriction: Graduate students only.

**EDUC 233A. Special Topics in Atypical Development. 4 Units.**

Includes advanced examination of current issues in theories of atypical development, assessment, and intervention as applied to special needs. Understanding physical and/or cognitive mechanisms of child development and disorders. Knowledge and skills for areas of disability.

Repeatability: May be taken for credit 5 times as topics vary.

Restriction: Graduate students only.

**EDUC 234. Measurement and Psychometrics. 4 Units.**

Focuses on appraisal and development of measures, measurement theory, and its application using a classical test theory approach. Topics include scaling, construction, reliability and validity assessment, and item analysis; as well as cross-cultural and cross-linguistic considerations in test development.

Restriction: Graduate students only.

**EDUC 235. Psychology of Reading Acquisition. 4 Units.**

Surveys theory and empirical evidence concerning acquisition, cognitive processes, and consequences of skilled reading. Explores psychological models of skilled reading, how children acquire reading and writing skills in their home and second languages, cognitive consequences of acquiring literacy skills.

Restriction: Graduate students only.

**EDUC 236. Applied Linguistics and Literacy. 4 Units.**

Examines research in applied linguistics as related to teaching literacy. Overview of language knowledge required to understand development and instruction of literacy. Topics include English language structures, psychological processing of these structures, and methodologies to study language and literacy.

Restriction: Graduate students only.

**EDUC 237. Foundations of Teaching and Learning. 4 Units.**

Situates learning in relation to teaching, content, and context. Locates the work of teaching and learning as a cultural practice and considers the limitations of existing theories for advancing learning opportunities for historically under-served and under-resourced communities.

Restriction: Graduate students only.

**EDUC 238. Special Topics in Human Development in Context. 4 Units.**

An advanced seminar designed to engage students in highly interactive examination of current issues in human development. Topics and content vary by quarter, depending upon the research interests of the faculty and students.

Repeatability: May be taken for credit 10 times as topics vary.

Restriction: Graduate students only.

**EDUC 239. Cognitive Neuroscience and Human Development. 4 Units.**

Focuses on the latest empirical work at the intersection of neuroscience, cognitive psychology, developmental science, and educational practice; explores how educational neuroscience fits within those fields; and discusses the main conceptual and practical challenges facing the field.

Restriction: Graduate students only.

**EDUC 241. Children's Sense Making in Science. 2 Units.**

Investigates elementary students as individuals who construct understanding of concepts through their interactions with others and the world around them. Observations of children in informal settings to analyze learning in context.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 243. The Policy Environment of Teaching. 2 Units.**

Examines research and public perceptions about school-based educational processes, the influence of institutional structures and educational policy on the lives of teachers, and the challenges of school reform at the local and classroom levels.

Restriction: Master of Arts in Teaching Degree students only.



**EDUC 245. Learning Inside and Outside of School. 2 Units.**

A field-based course focused on observing adolescents in out-of-school contexts to examine adolescent learning and development in a range of contexts, how out-of-school contexts motivate learning and development, and consider the implications for teaching.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 246. Teaching Investigations: Identifying Dilemmas of Practice. 4 Units.**

Focuses on identifying problems of teaching practice that arise in student teaching, examining the theoretical foundations that underlie problems of practice, and developing approaches for inquiring into strategies to systematically address instructional challenges.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 247. Teaching Investigations: Exploring Dilemmas of Practice. 4 Units.**

Focuses on exploring problems of teaching practice that arise in student teaching, drawing on research to examine the theoretical foundations that underlie problems of practice, and to propose courses of action to address and study educational interventions.

Prerequisite: EDUC 246

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 248. Understanding Teacher Agency. 4 Units.**

Considers how teachers can become agents of change within their school contexts, through their participation in professional organizations and via social media. Candidates experiment with using different avenues for sharing images of practice and action research.

Prerequisite: EDUC 246

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 250. Research Practice Partnerships. 4 Units.**

An introduction to research-practice partnerships (RPPs). It examines the distinctive characteristics of this approach to education improvement by discussing examples of established partnerships and inviting students to become familiar with methods and tools to advance RPP work.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**EDUC 251. Educational Policy and Politics. 4 Units.**

An in-depth study of topics relevant to educational reform and policy-making. Topics include: the policy-making process, the role of values and interest groups, policy analysis, equality of educational opportunity, systemic reform, implementation, and politics at the school site.

Restriction: Graduate students only.

**EDUC 252. Social Organization of Schools and Classrooms. 4 Units.**

Examines how schools are organizations with ambiguous goals, faced with challenges around effective leadership and cooperation, part of loosely coupled systems, and subject to coercive, normative, and mimetic pressures from organizational environments, shaping institutional practices and structures.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EDUC 253. Foundations of Educational Policy. 4 Units.**

Reviews disciplinary models that economists and sociologists employ in approaching education-related policy issues, including markets as emergent systems, human capital, social and cultural capital, and rational choice and institutional models of administrators and teachers.

Restriction: Graduate students only.

**EDUC 254. College Access and Persistence. 4 Units.**

Introduction to how social, political, and economic forces impact college access and persistence in the U.S. higher education system. Investigates historical perspectives and theoretical underpinnings of college access and retention research and the link between K–12 schooling and postsecondary stratification.

Restriction: Graduate students only.



**EDUC 255. Immigration and the New Second Generation. 4 Units.**

Focuses on Asian, Latino, and Black children of immigrants. Investigates how today's second generation adapts, incorporates into the U.S. social structure, transforms the social and economic landscape. Explores assimilation, immigrant families/communities, language, racial/ethnic identities, gender, education, changing U.S. racial structure.

Restriction: Graduate students only.

**EDUC 258. Special Topics in Educational Policy and Social Context. 4 Units.**

An advanced seminar designed to engage students in highly interactive examination of current issues in educational policy and social context. Topics and content will vary by quarter, depending upon the research interests of the faculty and students.

Repeatability: May be taken for credit 10 times.

Restriction: Graduate students only.

**EDUC 259. Community Research and Action. 4 Units.**

Introduces the theoretical underpinnings and research approaches of the field of Community Psychology. Project-based course focused on research and action in communities, organizations, and other extra-individual units (e.g., schools).

Restriction: Graduate students only.

**EDUC 260. The Arts, Human Development, and Social Context. 4 Units.**

Examines the state of empirical knowledge on the impact of visual and performing arts education on the development of academic, communication, and social-emotional skills. The role of the arts in forming personal and cultural identity is discussed.

Restriction: Graduate students only.

**EDUC 261. Social and Cultural Foundations of Education. 4 Units.**

Provides a critical understanding of the social and cultural foundations of education through reproduction theory. Explores the unique ways in which culture and power intersect within schools and schooling systems to reproduce and resist educational inequality.

Restriction: Graduate students only.

**EDUC 264. Economic Foundations of Education and Social Policy. 4 Units.**

Beginning/intermediate microeconomics course provides students with an introduction to how economists think about household decision-making, markets, benefit-cost analysis, social policy issues in general and education policy in particular.

Restriction: Graduate students only.

**EDUC 265. Applied Regression Analysis for Education and Social Research. 4 Units.**

Provides students with a working knowledge of multiple regression and the statistical analysis of longitudinal data. Topics include a review of the OLS regression model, event-history methods, and various other techniques for analyzing longitudinal data.

Prerequisite: EDUC 288B

Restriction: Graduate students only.

**EDUC 266. Design-Based Implementation Research. 4 Units.**

Explores design-based implementation research (DBIR) to organize research and improvement efforts in education. Delves deeper into different techniques of partnership development, design, implementation, and improvement science to build a repertoire of practices for students' studies.

Restriction: Graduate students only.

**EDUC 267. Classroom Research Methods. 4 Units.**

Uses students' research problems as the basis for exploring methods—teacher and student observation, interview, case studies, think alouds. Intended for doctoral students with a specific research question and very good grounding in the literature related to their question.

Restriction: Graduate students only.

**EDUC 268. Out-of-School Learning and Development. 4 Units.**

Examines theory, research, and policy concerning out-of-school time and youth development. Several out-of-school contexts are considered (e.g., unsupervised care, informal leisure activities, and organized activities). A range of developmental outcomes are considered (e.g., achievement, social-emotional competence, and physical health).

Restriction: Graduate students only.

**EDUC 274. Studies of Professional and Staff Development. 2-4 Units.**

Research and theory of effective strategies for professional and staff development. Topics include: adult learning as related to professional growth of teachers, staff development as vehicle for systemic reform, reforms to enhance teacher professionalization and empowerment.

Restriction: Doctoral students only.

**EDUC 276. Early Childhood Education Policy. 4 Units.**

Covers core topics in the field of early education policy. Integrates research from the various perspectives relevant to child policy in a practical way to understand the mechanisms of intervention and to develop policy solutions.

Restriction: Graduate students only.

**EDUC 278. Experimental Designs in Educational Research. 4 Units.**

Designed to enable students to think critically about experimental research, and to develop an understanding of how to design and conduct experiments. The overall goal is to prepare students to independently plan and implement an experimental research study.

Prerequisite: EDUC 222

Restriction: Graduate students only.

**EDUC 279. Advanced Qualitative Methods. 4 Units.**

Further developing qualitative inquiry skills for examining human interaction and studying lived experiences of individuals and communities. Practices and techniques for collecting, working with, and analyzing qualitative data to develop and justify claims.

Prerequisite: EDUC 283A or EDUC 283B

Restriction: Graduate students only.

**EDUC 280. Research Methods: Hierarchical Linear Modeling. 4 Units.**

Research data often have a hierarchical structure, which require multi-level models. Students learn to use HLM; conduct appropriate analyses; and write the methods and results section for a peer-reviewed journal article. Previous coursework in regression is required.

Restriction: Doctor of Philosophy Degree students only. Graduate students only.

**EDUC 283A. Qualitative Research Methods in Education I. 4 Units.**

Introduces students to qualitative research methodologies and methods and explores strengths and challenges of this research tradition. Topics include logistical and ethical issues, reliability, validity and generalizability, and the role of reflexivity. Students will also engage in fieldwork.

Prerequisite: EDUC 222

Restriction: Graduate students only.

**EDUC 283B. Qualitative Research Methods in Education II. 4 Units.**

Provides methods for conducting and analyzing qualitative research in educational settings. Topics include data collection, coding, representing qualitative data, and using software for qualitative data analysis.

Prerequisite: EDUC 283A

Restriction: Graduate students only.

**EDUC 284. Mixed Methods in Educational Research . 4 Units.**

Provides an overview of mixed methods research for students familiar with both quantitative and qualitative research. Consists of defining mixed methods research, describing its history and foundations, and examining various types of mixed methods designs.

Restriction: Graduate students only.

**EDUC 285. Theories of Learning Cognition. 4 Units.**

Overview of theories applicable to learning in schools and extracurricular contexts. Cognitive, psychometric, behavioral, and neuroscience perspectives are applied to such topics as memory, knowledge structures, problem solving, motivation, self-referent beliefs, expertise, assessment, and cognitive abilities, including intelligence.

Restriction: Graduate students only.

**EDUC 287A. Quantitative Data Analysis in Education Research and Evaluation. 4 Units.**

Statistical aspects of survey-based evaluations and quantitative research in education. Includes sampling, coding open-ended information, data management, scale construction, statistical analysis, and presentation of findings. Students analyze data sets - a district-based evaluation and a national survey - using SPSS.

Prerequisite: EDUC 281

Restriction: Graduate students only.

**EDUC 287B. Causal Inference: Methods for Program Evaluation and Policy Research. 4 Units.**

Provides students with a comprehensive overview of how to perform some more advanced statistical methods useful in answering policy questions using observational or experimental data.

Restriction: Graduate students only.

**EDUC 288A. Educational, Social, and Behavioral Statistics. 4 Units.**

Designed for graduate students with previous course work in statistics, including experience with statistical software such as SPSS. The emphasis is on regression analysis and the general linear model. Students learn to analyze real data using Stata software.

Prerequisite: Prior coursework in statistics, and experience with statistical software such as SPSS.

Restriction: Graduate students only.

**EDUC 288B. Structural Equation Modeling for Educ, Soc & Behavioral Analysis. 4 Units.**

Rigorous introduction to structural equation modeling for students with strong prior course work in statistics. Topics include path diagrams, SEM with observed variables, factor analysis, SEM with latent variables. Maximum likelihood estimating, goodness-of-fit measures, nested models, related topics.

Prerequisite: EDUC 288A

Restriction: Graduate students only.

**EDUC 289. Use of Video in Educational Research. 4 Units.**

Provides students with conceptual and methodological tools for using video in educational research. Students work with their own video data or with publicly accessible databases.

Restriction: Graduate students only.

**EDUC 295. Pre-Dissertation Research. 1-12 Units.**

Independent study course taken under the direction of a faculty member who guides the student's research. May include guidance on data collection, methodology, human subjects protocol, conference presentation, scholarly publication, program benchmark activities.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**EDUC 296A. Professional Writing in Educational Research I. 2 Units.**

First of a two-course series designed to extend students' knowledge of conducting and publishing educational research. Topics include the logic of research and how to effectively communicate research findings, with particular emphasis on proficient scientific writing.

**EDUC 296B. Professional Writing in Educational Research II. 2 Units.**

Second of a two-course series designed to extend students' knowledge of conducting and publishing educational research. Topics include the logic of research and how to effectively communicate research findings, with particular emphasis on proficient scientific writing.

**EDUC 298. Independent Study. 1-8 Units.**

Independent research on topics related to education.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EDUC 299. Dissertation Research. 1-12 Units.**

Specifically designed for students researching and writing their dissertations.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Doctoral students only.

**EDUC 301. Directed Elementary Field Experiences in Diverse Schools. 2 Units.**

Fieldwork experiences and seminars to provide introduction to the California Teaching Performance Expectations, including guidelines for professional expectations, observation and participation in classrooms, instructional planning, classroom management, and formative experiences and preparation for the state-mandated Teaching Performance Assessment.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 302. Directed Secondary Field Experiences. 2 Units.**

Field work experiences and seminars to provide introduction to the California Teaching Performance Expectations, including guidelines for professional expectations, observation and participation in classrooms, instructional planning, classroom management, and formative experiences and preparation for the State-mandated Teaching Performance Assessment.

Restriction: Master of Arts Degree students only.

**EDUC 304. Student Teaching in the Elementary Schools. 8-12 Units.**

Student teaching seminars prepare candidates for assumption of classroom instructional responsibilities in accordance with State credentialing requirements. Four full days a week of student teaching in public school elementary classrooms in winter quarter and five full days in spring quarter.

Repeatability: May be repeated for credit unlimited times.

Restriction: Master of Arts Degree students only.

**EDUC 305. Learning to Learn from Teaching in Secondary Schools. 4 Units.**

Analytic tools for (1) observing and reflecting on observed instruction; (2) examining student thinking and the relationship between teaching and learning; (3) understanding particular components of the teaching/learning process; and (4) planning effective instruction including innovative teaching practices.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 306. Supervised Teaching in Bilingual Education, Elementary. 8-12 Units.**

Student teaching experiences in bilingual public school classrooms to include orientation, regular seminars, and preparation for bilingual classroom instructional responsibilities in accordance with State credentialing requirements and in conjunction with the public school calendar.

Repeatability: May be repeated for credit unlimited times.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 307. Student Teaching in Intermediate/Secondary School. 8-12 Units.**

Student teaching includes orientation, seminars, and preparation for and assumption of secondary school classroom instructional responsibilities in accordance with State credentialing requirements and in conjunction with public school calendar. Five full days a week in both winter and spring quarters.

Repeatability: May be repeated for credit unlimited times.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 320. Teaching Physical and Health Education in Elementary School. 4 Units.**

Methods of teaching physical education for the elementary classroom teacher. Through an interactive environment, students experience the California Physical Education and Health content standards with appropriate pedagogy. Concepts address motor skills, physical fitness, and personal responsibility for lifelong health.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 322A. Curriculum and Methods for Elementary School Mathematics I. 4 Units.**

Scope, sequence, and methods of teaching mathematics at all levels of elementary school. Presented through lectures, discussions, demonstrations, and exploration of a variety of materials. Covers how to plan lessons, motivate students, diagnose difficulties, and evaluate learning in mathematics.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 322B. Curriculum and Methods for Elementary School Mathematics II. 4 Units.**

Part two of a course addressing pedagogical methods for elementary mathematics. Lectures, discussions, and exploration of instructional strategies and materials support preservice teacher development in the critical areas of planning, instruction, and assessment for conceptual understanding in mathematics.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 323A. Curriculum Methods in Elementary Science. 2 Units.**

Prospective elementary teachers learn how to teach science in grades K-8. Covers state science requirements, a variety of teaching methods, and criteria for selecting science curriculum materials.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 323B. Curriculum Methods in Elementary Science. 2 Units.**

Prospective elementary teachers learn how to teach science in grades K-8. Covers state science requirements, a variety of teaching methods, criteria for selecting science curriculum materials, and how to plan science lessons, units, experiments, projects, and demonstrations.

Prerequisite: EDUC 323A

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 325. Teaching the Visual and Performing Arts in Elementary School. 2 Units.**

Introduction to the issues and practices — including student diversity, academic literacy, and interdisciplinary content — involved in integrating the California visual and performing arts curriculum framework and academic content standards with developmentally appropriate teaching strategies for the elementary classroom. Materials fee.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 326. Curriculum and Methods for Elementary School Reading. 4 Units.**

Teaching an integrated reading/language arts program in the elementary classroom. Implementing theories, principles, and methods which are research and reality-based. Creating a child-centered, language-rich program to meet needs of children in multicultural/multilingual settings.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 336. Methods of Teaching Languages other than English in Secondary Schools. 4 Units.**

Prepares future teachers of foreign language or primary/home language. Emphasizes hands-on, practical strategies for communication-based instruction and authentic assessment in reading, writing, listening, speaking, and culture.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 337. Methods of Teaching Social Science in the Secondary School. 4 Units.**

Theories, strategies, and methodologies related to the teaching of history and social science in the secondary school. Emphasis on the planning, delivery, and assessment of lessons reflecting an understanding of the History-Social Science Framework for California.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 338. Methods of Teaching English in the Secondary School. 2-4 Units.**

Introduction to teaching reading, writing, and speaking skills in secondary school. Emphasis upon integrative approach to teaching literature, composition, and grammar consistent with the California State Framework. Practice in the design of lesson plans that are both integrated and cumulative.

Repeatability: May be taken for credit 2 times.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 339. Methods of Teaching Visual Arts in Secondary Schools. 4 Units.**

Theory, curriculum, and strategies for teaching visual arts in the secondary school. Emphasis on the planning, delivery, and assessment of lessons consistent with California State Framework and content standards.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 340. Methods of Teaching Mathematics in Secondary School. 2-4 Units.**

Theories, strategies, and methodologies related to the teaching of mathematics in the secondary school. Emphasis on the planning, delivery, and assessment of lessons reflecting an understanding of the Mathematics Framework for California and the recommendations of professional organizations.

Repeatability: May be taken for credit for 4 units.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 341. Teaching Science in Secondary School. 4 Units.**

Prospective secondary science teachers learn how to teach science in grades 7-12. Covers State science requirements, a variety of teaching methods, criteria for selecting science curricular materials, and how to plan science lessons, units, experiments, projects, and demonstrations.

Same as EEB 341.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 342A. Applied Instructional Strategies in Secondary Schools. 2 Units.**

Application of pedagogy and research to practice teaching experiences in the secondary schools. A continuation of the methodology course series with an emphasis on the needs of students with culturally diverse backgrounds. Conducted in a five-week format.

Repeatability: May be taken for credit 2 times.

Overlaps with EDUC 342.

Restriction: Master of Arts in Teaching Degree students only. EDUC 342 and EDUC 342A may not both be taken for credit.

**EDUC 342B. Applied Instructional Strategies in Secondary Schools. 2 Units.**

Application of pedagogy and research to practice teaching experiences in the secondary schools. A continuation of the methodology course series with an emphasis on the needs of students with culturally diverse backgrounds. Conducted in a five-week format.

Repeatability: May be taken for credit 2 times.

Overlaps with EDUC 342.

Restriction: Master of Arts in Teaching Degree students only. EDUC 342 and EDUC 342B may not both be taken for credit.

**EDUC 346. Reading and Writing in Middle School and High School Classrooms. 4 Units.**

Emphasis is placed upon understanding the literacy processes (listening, speaking, viewing, reading, and writing) as they relate to all Single Subject areas. Teachers are guided to integrate literacy-related strategies with curriculum-based goals supported in the California State Frameworks.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 347. Culture, Diversity, and Educational Equity . 4 Units.**

Survey of the history of and social theories about the origins and consequences of U.S. racial, gender, and social inequality, and the effects of poverty and racism on the educational opportunities and outcomes of minority groups in the United States.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 348. Educational Equity and the Exceptional Learner. 2 Units.**

Knowledge, skills, and strategies to teach exceptional learners in the general education classroom. Legislation pertaining to the education of exceptional learners. Role of general education teacher in the special education process. Inclusive curriculum to provide equal access to content.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 348A. Educational Equity and the Exceptional Learner I. 2 Units.**

Focuses on knowledge, skills, and strategies needed to teach special populations in general education secondary classrooms. Covers categories and characteristics of disability and exceptionality, state and federal legislation, and the role of general education teachers in the special education process.

Restriction: Graduate students only. Education-MA/PhD Majors only.

**EDUC 348B. Educational Equity and the Exceptional Learner II. 2 Units.**

Emphasizes the use of differentiated instruction to meet special needs and the creation of a positive, inclusive learning environment that provides access to the core curriculum for special needs students.

Restriction: Graduate students only. Education-MA/PhD Majors only.

**EDUC 349. Theories and Methods of English Language Development Applied to Secondary Students. 4 Units.**

Theories and methods of English language development and instruction of English language learners, with focus on secondary students. Includes language acquisition theory, language and content, assessment strategies, and preparation of curricula and instruction for grades 7–12 English language learners.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 358. Media and Information Literacy in the Secondary Classroom. 2 Units.**

Focuses on how teachers can help their students to become critical, ethical, and effective users of technological resources in the secondary classroom. Students learn tools for evaluating, selecting, and incorporating appropriate learning technologies into the secondary classroom.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 359. Curriculum and Methods for Elementary Social Science and Information Literacy. 4 Units.**

Methods of instruction for Social Science at the K–6 level. Includes integration of the use of technology, development of content literacy, and use of evidence to construct arguments.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 361. The Adolescent Learner . 4 Units.**

Issues of adolescent development and learning in family, school, and community contexts from biological, psychological, cognitive, and social perspectives. Focuses on how adolescents learn, what motivates them to learn, and how schools and teachers contribute to adolescents' growth.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 362. Curriculum and Methods for Elementary Language Arts and English Language Development. 4 Units.**

Methods, instructional practices, and assessment strategies for teaching English-Language Arts, with a focus on instructional practices for supporting English Language Learners. Focuses on core language arts topics, including composition of persuasive, expository, and narrative texts; speaking; and listening.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 364. Instructional Design and Education Technology for the Elementary Classroom. 2 Units.**

Focuses on how teachers can effectively integrate educational technologies for teaching and learning in the elementary school classroom. Students learn tools for evaluating, selecting, and incorporating appropriate technologies into their classroom activities.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 374. Learning and Child Development . 4 Units.**

Issues of child development and learning in family, school, and community contexts from biological, psychological, cognitive, and social perspectives. Focuses on how young children learn and develop, how schools and teachers contribute to children's growth, and implications for instruction.

Restriction: Master of Arts in Teaching Degree students only.

**EDUC 399. University Teaching. 1-4 Units.**

Limited to teaching assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Education Sciences, B.A.

The major in Education Sciences provides a foundation for the interdisciplinary nature of education, focused on five domains. These include (a) human development, (b) learning, (c) social structures and stratification, (d) policymaking in education and (e) schools as organizations.

The B.A. in Education Sciences includes content from applied linguistics, cognitive science, developmental psychology, economics, informatics, media studies, policy analytics, social neuroscience, and sociology. Graduates can choose from a variety of career opportunities including public education, government, community-based non-profits, research institutions, higher education, and education software development. Many graduates will pursue advanced degrees leading to K-12 teaching, public policy, social work, education research and school leadership.

The B.A. in Education Sciences is not a professional degree. However, graduates are well prepared to pursue teacher training (see UC Irvine School of Education M.A.T. program). Students interested in teaching middle or high school are encouraged to meet with an Academic Advisor to combine the major with a minor or second major, aiming for proficiency in the content area in which they plan to teach (e.g. History). All students in the Education Sciences major are required to complete a minimum of 40 fieldwork hours in an educational setting.

**Freshmen:** Preference will be given to those who rank the highest using the selection criteria as stated in the Undergraduate Admissions section of the *Catalogue*.

**Transfer students:** Preference will be given to Junior-level applicants with the highest grades overall (minimum cumulative GPA of 3.0). It is suggested that prospective transfer students work toward completing coursework to fulfill the UCI general education requirements or IGETC.



**Change of Major.** Students who wish to change their major to Education Sciences should contact the Education Student Affairs Office for information about change-of-major requirements, procedures, and policies. Information is also available at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>).

**All students must meet the University Requirements.**

**Grade Requirement.** A minimum grade average of at least C (2.0) is required (1) overall, (2) in all of the courses required for the major program, and (3) in the upper-division courses required for the major program. All courses for the major must be taken for a letter grade unless the grade option for the course is pass/no pass only.

### Overlap Restrictions

**Double Majors.** In fulfilling degree requirements for multiple majors, a maximum of two upper-division courses may overlap between two majors.

**Major and Minor Requirements.** Students may not receive both the major in Education Sciences and the minor in Education. In fulfilling requirements for a minor, a maximum of two courses may overlap between a major in Education Sciences and a minor from another department.

### Major Requirements

Students must complete 16 courses (64 units) and a 40-hour practicum as specified below:

Lower-Division Requirements (24 units):

A. Complete the following Research Methods and Data Literacy Requirement (8 units)

EDUC 10 Educational Research Design <sup>1</sup>

EDUC 15 Statistics for Education Research <sup>2</sup>

B. Complete the following Introduction to Education Science Requirement (16 units)

EDUC 25 Introduction to Education: Disciplinary Perspectives

EDUC 30 21st Century Literacies

EDUC 40 Theories of Development and Learning Applied to Education

EDUC 50 Origins, Purposes, and Central Issues in K-12 Education

Upper-Division Requirements (20 units):

C. Select one Human Development course (4 units):

EDUC 107 Child Development in Education

EDUC 108 Adolescent Development and Education

D. Select one Learning course (4 units):

EDUC 146 Education, Learning, and Culture

EDUC 173 Cognition and Learning in Educational Settings

E. Select one Social Structures and Stratification course (4 units):

EDUC 124 Multicultural Education in K-12 Schools

EDUC 147 Poverty, Education, and Social Change

F. Select one Policymaking in Education course (4 units):

EDUC 142 American History and Education Policy: An Intimate Relationship

EDUC 140 Courts, Classrooms, and Controversies in Education Policy

G. Select one Schools as Organizations course (4 units):

EDUC 144 The American Charter School

EDUC 150 Changing the High School Experience

H. Five additional elective Education courses (20 units). At least 12 units must be upper-division (numbered 100-199). <sup>3</sup>

The additional electives do not include the following professional education courses: EDUC 109, EDUC 143AW, EDUC 143BW, EDUC 148, EDUC 158. A maximum of 8 units for any repeatable Education course (e.g., EDUC 198, EDUC 199) may be used to satisfy this elective requirement.

I. Practicum Requirement (40 hours total):

A minimum of 40 hours of field experience or research in an education setting, satisfied in the following manner:

Complete 40 hours of field experience or research completed in conjunction with one or more approved UCI courses that include a practicum. Consult the Education Student Affairs Office or School of Education website for Undergraduate Academic Programs for a current list of approved practicum courses.

<sup>1</sup> The following course is an approved alternative for EDUC 10: SOCECOL 10

<sup>2</sup> The following statistics courses are approved alternatives for EDUC 15: SOCECOL 13, STATS 7, ANTHRO 10B, POL SCI 10B, PSYCH 10B, SOC SCI 10B, or SOCIOL 10B.



<b>Freshman</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
EDUC 50	EDUC 25	EDUC 40
Lower Division Writing	Lower Division Writing	General Education/Elective
General Education/Elective	General Education/Elective	General Education/Elective
	General Education/Elective	General Education/Elective
<b>Sophomore</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
EDUC 10	EDUC 15	EDUC 30
General Education/Elective	General Education/Elective	General Education/Elective
General Education/Elective	General Education/Elective	General Education/Elective
General Education/Elective	General Education/Elective	General Education/Elective
<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
Education UD Learning Course	Education UD Development Course	Education UD Policy Course
Education Elective	Education UD Elective	General Education/Elective
General Education/Elective	General Education/Elective	General Education/Elective
General Education/Elective	General Education/Elective	General Education/Elective
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
Education UD Social Structure Course	Education UD Schools as Orgs Course	Education UD Elective
Education UD Elective	Education Elective	General Education/Elective
General Education/Elective	General Education/Elective	General Education/Elective
General Education/Elective		

NOTE: This is only a sample plan. Course offerings may be moved due to unforeseen circumstances. It is strongly recommended that students meet with an academic advisor to create an academic plan tailored to meet their specific areas of interest.

## Education, Minor

The minor in Education is designed to facilitate exploration of a broad range of issues in the field of education. Graduates with the Education minor may be employed in schools, government, private industry, and non-profit organizations. Many graduates will pursue advanced training leading to teaching careers or administrative leadership.

### Requirements for the Minor in Education

The minor requires completion of a minimum of seven courses (four core courses and three electives) totaling 28 units. At least four courses must be upper-division. Students must also complete a minimum of 40 hours of verifiable field experience or research in an educational setting. No more than two non-Education courses (up to 8 units) from the student's major area of study may be used to satisfy the minor requirements. A maximum of 8 units may be used to satisfy minor requirements with any repeatable course.

A. Select four core courses (16 units) from the following:

EDUC 10	Educational Research Design <sup>1</sup>
EDUC 15	Statistics for Education Research
EDUC 30	21st Century Literacies <sup>1</sup>
EDUC 40	Theories of Development and Learning Applied to Education <sup>1</sup>
EDUC 50	Origins, Purposes, and Central Issues in K-12 Education
EDUC 107	Child Development in Education
EDUC 108	Adolescent Development and Education
EDUC 124	Multicultural Education in K-12 Schools
EDUC 160	Foundations of Out-of-School Learning
EDUC 173	Cognition and Learning in Educational Settings
EDUC 175	Foundations of Education
EDUC 176	Psychology of Learning, Abilities, and Intelligence

B. Select three elective courses (12 units) from the following:

1. Education courses numbered 1–199. A course selected to satisfy the minor core requirement cannot also be used to satisfy the elective requirement. A maximum of 4 elective units may be taken as research or independent study in EDUC 198.

C. Practicum. A minimum of 40 hours of field experience in an educational setting. Students may complete 40 hours of field experience from a list of approved practicum courses offered by the School of Education, which can include EDUC 198. Students may also petition to receive credit for practicum from other UCI courses.

<sup>1</sup> Course also satisfies university General Education requirements.

**Residence Requirement.** At least four upper-division courses must be successfully completed at UCI.

**GPA Requirement.** For certification in the minor, a student must obtain a minimum overall grade point average of at least C (2.0) in all courses required for the minor program. A maximum of 8 units of Pass/No Pass courses may be taken for the minor.

**Minor and Major.** Students may not receive both the minor in Education and the major in Education Sciences.

**Undergraduate Programs for Future Teachers Offered by Other Departments.** Undergraduates who are completing a minor in Education and who are considering a teaching career may also be interested in the following programs offered by other departments.

- The School of Physical Sciences, School of Biological Sciences, and School of Education jointly sponsor an undergraduate teacher credential program for math and science majors called CALTEACH. Learn more about CALTEACH here. (<http://calteach.uci.edu/>)
- School of Humanities: English Major with a Specialization in English for Future Teachers; History Major with a Specialization in History for Future Teachers; Spanish Major with an Emphasis in Spanish for Future Teachers
- School of Biological Sciences: Major in Biological Sciences with Concentration in Biological Sciences Education
- School of Physical Sciences: Chemistry Major with a Concentration in Chemistry Education; Math Major with a Specialization in Mathematics for Education; Physics Major with a Concentration in Physics Education.

## Education, Ph.D.

The School of Education offers a Ph.D. in Education. The program seeks applicants from varied backgrounds and experiences who have the potential to become outstanding scholars and researchers in the field of education. The program currently offers three areas: (1) Human Development in Context; (2) Educational Policy and Social Context; and (3) Teaching, Learning, and Educational Improvement. Students enrolling in the program choose among these areas based on their research interests.

Course work for the program ordinarily takes two to three years to complete and involves a number of core courses, methodology courses, elective courses, and a directed research sequence. Before advancing, students are required to have successfully completed their first-year research poster project, second year research paper, and 12 courses as specified by the area requirements. Students should advance to candidacy in the fall quarter of their fourth year. The normative time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Students are admitted to the program once per year to begin each fall quarter. Applicants must have completed a bachelor's degree with a grade point average of at least 3.0 and have prior course work or background related to the area for which they express interest. Applicants are required to submit a UCI application, transcripts, a statement of purpose, a personal statement, CV or resume, a writing sample, three letters of reference, and general GRE scores completed within the past five years. Applicants who are not citizens of countries where English is the primary or dominant language as approved by the UCI Graduate Division are also required to submit scores from either the TOEFL examination or the Academic Modules of the International English Language Testing System (IELTS).

Financial support will be offered in the form of teaching or research assistantships.

Students take a minimum of 12 4-unit courses, including five required research methods courses, five area courses, and one core course from each of the other two areas.

### Required Methods Courses

A. Complete the following:

EDUC 222	Research Epistemologies and Methodologies
EDUC 265	Applied Regression Analysis for Education and Social Research
EDUC 283A	Qualitative Research Methods in Education I
EDUC 283B	Qualitative Research Methods in Education II
EDUC 288A	Educational, Social, and Behavioral Statistics

### Additional Research Methods Courses (not required but strongly encouraged)

EDUC 210	Language, Literacy, and Discourse
EDUC 221	Longitudinal and Advanced Structural Equation Modeling
EDUC 234	Measurement and Psychometrics
EDUC 259	Community Research and Action

EDUC 266	Design-Based Implementation Research
EDUC 267	Classroom Research Methods
EDUC 279	Advanced Qualitative Methods
EDUC 280	Research Methods: Hierarchical Linear Modeling
EDUC 284	Mixed Methods in Educational Research
EDUC 287A	Quantitative Data Analysis in Education Research and Evaluation
EDUC 287B	Causal Inference: Methods for Program Evaluation and Policy Research
EDUC 288B	Structural Equation Modeling for Educ, Soc & Behavioral Analysis
EDUC 289	Use of Video in Educational Research

Other courses in statistics or research methodology offered in the Department of Statistics, the School of Social Ecology, the School of Social Sciences, or elsewhere on campus, with the permission of the instructor.

### Area Courses

The area core courses are marked with an asterisk. Students must take these courses in their own area, and one of these courses in each of the other two areas.

#### Human Development in Context (HDIC)

HDIC students are required to complete EDUC 229A, EDUC 237, EDUC 253, and four courses within the HDIC area.

EDUC 208	Reading and Writing Development
EDUC 220	Developing Adolescent Literacy
EDUC 223	Oral Language Acquisition and Education
EDUC 225	Learning, Development, and Culture
EDUC 229A	Theories and Issues in Human Development - Part I *
EDUC 229B	
EDUC 232	Mathematics Cognition and Learning
EDUC 235	Psychology of Reading Acquisition
EDUC 236	Applied Linguistics and Literacy
EDUC 238	Special Topics in Human Development in Context
EDUC 239	Cognitive Neuroscience and Human Development
EDUC 268	Out-of-School Learning and Development
EDUC 274	Studies of Professional and Staff Development
EDUC 285	Theories of Learning Cognition

#### Educational Policy and Social Context (EPSC)

EPSC students are required to complete EDUC 253, EDUC 229A, EDUC 237, one course in the Economics of Education content area, one course in the Education Policy content area, one course in the Structure and Social Context of Schools content area, and one course within the EPSC area.

EDUC 253	Foundations of Educational Policy *
Economics of Education	
ECON 249	Special Topics in Microeconomics
EDUC 264	Economic Foundations of Education and Social Policy
Education Policy	
EDUC 251	Educational Policy and Politics
EDUC 254	College Access and Persistence
EDUC 276	Early Childhood Education Policy
Structure and Social Context of Schools	
EDUC 261	Social and Cultural Foundations of Education
EDUC 252	Social Organization of Schools and Classrooms
SOCIOL 237	Educational Inequality
SOCIOL 279	Special Topics: Social Organizations and Institutions

#### Other Educational Policy and Social Context courses

EDUC 258	Special Topics in Educational Policy and Social Context
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Educational Policy and Social Context does not require its students to take more than the set of quantitative courses required, but it does strongly encourage students to take additional methods courses within or outside the School of Education:

EDUC 284	Mixed Methods in Educational Research
EDUC 287A	Quantitative Data Analysis in Education Research and Evaluation

## EDUC 287B

## Causal Inference: Methods for Program Evaluation and Policy Research

**Teaching, Learning, and Educational Improvement (TLEI)**

TLEI students are required to complete EDUC 237, EDUC 229A, EDUC 253, two courses in a single TLEI specialization, two additional TLEI courses (which can be in the same specialization or in a different TLEI specialization).

Specialization courses within TLEI:

## Digital Learning and Media

EDUC 217	Foundations of Digital Learning
EDUC 212	Literacy and Technology

## Language and Literacy

EDUC 208	Reading and Writing Development
EDUC 210	Language, Literacy, and Discourse
EDUC 211	Writing Theory and Practice
EDUC 212	Literacy and Technology
EDUC 220	Developing Adolescent Literacy
EDUC 223	Oral Language Acquisition and Education
EDUC 235	Psychology of Reading Acquisition
EDUC 236	Applied Linguistics and Literacy

## Sociocultural Perspectives on Learning and Educational Improvement

EDUC 225	Learning, Development, and Culture
EDUC 231	Interrogating Race and Education
EDUC 250	Research Practice Partnerships
EDUC 255	Immigration and the New Second Generation
EDUC 266	Design-Based Implementation Research
EDUC 289	Use of Video in Educational Research

## STEM Teaching and Learning

EDUC 217	Foundations of Digital Learning
EDUC 228	Science Education for the 21st-Century Classroom
EDUC 232	Mathematics Cognition and Learning

## Teacher Learning and Professional Development

EDUC 226	University Teaching: Concepts and Practices
EDUC 237	Foundations of Teaching and Learning *
EDUC 274	Studies of Professional and Staff Development

## Other TLEI courses

EDUC 218	Special Topics in Teaching, Learning, and Educational Improvement
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**S/U Research Courses**

Students who wish to engage in pre-dissertation or research for credit but not for a letter grade, may enroll in EDUC 295 for 2-4 units (pre-dissertation research) or EDUC 299 for 2-8 units (dissertation research). Both courses may be repeated for credit and both are graded on a Satisfactory/Unsatisfactory basis. As with other S/U courses, EDUC 295 and EDUC 299 may not be used to fulfill course of elective requirements.

**Elective Courses**

Students are expected and strongly encouraged to take courses beyond the 12 courses required that provide training essential to the student's research interests and professional development throughout their five years of doctoral study. These courses may come from their own area, from the other two areas, from other appropriate classes in the School of Education, from other departments on campus, or from other campuses within the University of California. Elective courses must be graduate-level courses taken for a letter grade. Independent study courses (e.g., EDUC 298) are also acceptable when taken for a letter grade, pending approval and syllabus is provided.

Further information regarding the Ph.D. program, courses, and application requirements is available at the School of Education website (<http://www.education.uci.edu/>).

## Elementary and Secondary Education, M.A.T.

The School of Education offers a 14-month Master of Arts program in Elementary and Secondary Education. The M.A.T. with Single Subject Credential prepares candidates to teach mathematics, social science, English language arts, sciences, art, or world languages at the middle or high school level. The M.A.T. with Multiple Subject Credential prepares students to teach all grade levels and content areas within the elementary school curriculum. The

M.A.T. program provides a rich theoretical and practical framework with a focus on *Learning to Learn from Teaching*, or continuously studying the impact of one's teaching on student learning.

Selection is based on the graduate admission requirements of the UCI Graduate Division, which include the strength of the undergraduate academic record, statement of purpose, and letters of recommendation.

**Submit an application** through the Graduate Division (<http://www.grad.uci.edu/admissions/>).

**Evidence of Academic Achievement—Transcripts from all post-secondary institutions.** Completion of a baccalaureate degree from an accredited institution and a minimum grade point average of 3.0 will support admission to the program.

**Written Recommendations.** Three letters of recommendation, including at least one from an academic source, from individuals who are familiar with the applicant's (1) ability to pursue graduate study, (2) capacity to work with children, and/or (3) demonstrated fitness for the professional environment of teaching.

### Prior to the Start of the Program

- Pass the California Basic Educational Skills Test;
- Pass the required California Subject Matter Tests or complete an approved subject-matter preparation program in the content area;
- Hold a current Certificate of Clearance or Substitute Teaching Permit from the State of California;
- Hold a current TB test with negative results.

### Program of Study

#### Multiple Subject Credential

##### Summer One – First Session

EDUC 374	Learning and Child Development
EDUC 241	Children's Sense Making in Science
EDUC 230	The History and Culture of Schooling in the United States

##### Summer One – Second Session

EDUC 202	Outcomes of Schooling/Student Assessment
EDUC 364	Instructional Design and Education Technology for the Elementary Classroom
EDUC 323A	Curriculum Methods in Elementary Science
EDUC 347	Culture, Diversity, and Educational Equity

##### Fall Quarter

EDUC 301	Directed Elementary Field Experiences in Diverse Schools
EDUC 320	Teaching Physical and Health Education in Elementary School
EDUC 322A	Curriculum and Methods for Elementary School Mathematics I
EDUC 323B	Curriculum Methods in Elementary Science
EDUC 326	Curriculum and Methods for Elementary School Reading
EDUC 362	Curriculum and Methods for Elementary Language Arts and English Language Development

##### Winter Quarter

EDUC 304	Student Teaching in the Elementary Schools
EDUC 306	Supervised Teaching in Bilingual Education, Elementary
EDUC 348A	Educational Equity and the Exceptional Learner I
EDUC 322B	Curriculum and Methods for Elementary School Mathematics II
EDUC 325	Teaching the Visual and Performing Arts in Elementary School
EDUC 246	Teaching Investigations: Identifying Dilemmas of Practice

##### Spring Quarter

EDUC 304	Student Teaching in the Elementary Schools
EDUC 306	Supervised Teaching in Bilingual Education, Elementary

EDUC 359	Curriculum and Methods for Elementary Social Science and Information Literacy
EDUC 348B	Educational Equity and the Exceptional Learner II
EDUC 247	Teaching Investigations: Exploring Dilemmas of Practice

**Summer Two**

EDUC 248	Understanding Teacher Agency
EDUC 243	The Policy Environment of Teaching

**Single Subject Credential****Summer One - First Session**

EDUC 245	Learning Inside and Outside of School
EDUC 361	The Adolescent Learner
EDUC 230	The History and Culture of Schooling in the United States

**Summer One - Second Session**

EDUC 243	The Policy Environment of Teaching
EDUC 202	Outcomes of Schooling/Student Assessment
EDUC 358	Media and Information Literacy in the Secondary Classroom

**Fall Quarter**

EDUC 302	Directed Secondary Field Experiences
EDUC 305	Learning to Learn from Teaching in Secondary Schools
EDUC 336	Methods of Teaching Languages other than English in Secondary Schools
EDUC 337	Methods of Teaching Social Science in the Secondary School
EDUC 338	Methods of Teaching English in the Secondary School
EDUC 339	Methods of Teaching Visual Arts in Secondary Schools
EDUC 340	Methods of Teaching Mathematics in Secondary School
EDUC 341	Teaching Science in Secondary School
EDUC 346	Reading and Writing in Middle School and High School Classrooms
EDUC 347	Culture, Diversity, and Educational Equity
EDUC 348A	Educational Equity and the Exceptional Learner I

**Winter Quarter**

EDUC 307	Student Teaching in Intermediate/Secondary School
EDUC 342A	Applied Instructional Strategies in Secondary Schools
EDUC 349	Theories and Methods of English Language Development Applied to Secondary Students
EDUC 246	Teaching Investigations: Identifying Dilemmas of Practice

**Spring Quarter**

EDUC 307	Student Teaching in Intermediate/Secondary School
EDUC 342B	Applied Instructional Strategies in Secondary Schools
EDUC 247	Teaching Investigations: Exploring Dilemmas of Practice
EDUC 348B	Educational Equity and the Exceptional Learner II

**Summer Two**

EDUC 248	Understanding Teacher Agency
EDUC 206	Design of Learning Environments for Teachers in Secondary School Subjects

A comprehensive examination is completed by M.A.T. candidates during the second summer. The examination is an action research project embedded in EDUC 248 Understanding Teacher Agency.

A grade of B or better is required in all courses and in student teaching for successful completion of the program.

Student teaching for Multiple Subject candidates (grades K–6) is defined as a full day, four days per week during the first quarter of student teaching and a full day, five days per week during the second quarter of student teaching. Assignments will include two grade levels within the K–6 range in elementary schools.

Student teaching for Single Subject candidates (grades 7–12) in the post-baccalaureate program is defined as a full day, five days per week for one public school semester in an appropriate classroom setting in a middle or high school.

Readiness for student teaching shall be determined by, but not be limited to, academic work, professional conduct, and potential for success in teaching. Failure to be advanced to student teaching will be considered good cause for removal and/or a leave of absence from the program.

### **Applying for a California Credential**

In addition to fulfilling all of the above requirements:

- Show evidence a college-level course, or pass an approved examination on the U.S. Constitution;
- Obtain a CPR certificate in Adult, Child, and Infant resuscitation training.
- Pass the Teaching Performance Assessment

**Adding Teaching Authorizations.** After acquiring a basic credential, it is possible to add further teaching authorizations. Consult an academic counselor in the School of Education Student Affairs office (<http://advise.education.uci.edu/contact-us.html>) for details.

# School of Humanities

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## **Tyrus Miller, Dean**

143 Humanities Instructional Building  
Undergraduate Counseling: 949-824-5132  
Graduate Counseling: 949-824-4303  
[www.humanities.uci.edu](http://www.humanities.uci.edu) (<http://www.humanities.uci.edu/>)

The UCI School of Humanities is where future leaders, communicators, scholars, CEOs, storytellers, creatives, directors, writers, and entrepreneurs come to get their start.

The School is internationally recognized for its outstanding programs in the main areas of humanistic inquiry: history; languages; philosophy; and literature, film, and the arts. With a faculty whose distinctions include three Pulitzer Prizes and numerous other national and international awards, the School offers 22 majors and 39 minors that include those in traditional disciplines, languages other than English, and interdisciplinary areas of study.

The core educational mission of the humanities is imparting to students tools of analysis that will allow them to understand, describe, and explain the world around them in a critical context. A liberal arts education in the humanities prepares students to examine a variety of written and visual forms and to communicate effectively. All Humanities students are introduced to writing, philosophy, history, visual culture, literature, and a language other than English. Students in Humanities majors are given the opportunity to conduct an intensive conversation with the traditions, both past and present; and as a result, develop the ability to understand and make sense of other people and their cultures. Humanistic inquiry equips students to enter the world as globally thinking citizens.

Because language is the humanist's essential tool and the traditional medium of historical record, philosophical deliberation, and literary creation and criticism, the School of Humanities places special emphasis on language and training in composition. The School offers programs in more than a dozen languages other than English. The serious study of language other than English is crucial to fostering critical thinking, objective self-reflection, and international awareness. The distinguished programs in creative writing, literary journalism, and the Program in Academic English are housed in Humanities. Humanities Core integrates the multi-disciplinary study of the humanities along with lower-division writing for majors who enter as freshmen.

Interdisciplinary study is an essential feature of the Humanities Honors Program as well as of many of the School's undergraduate degree programs. Examples of undergraduate programs located in Humanities that cut across disciplinary boundaries are the majors in Global Cultures, Global Middle East Studies, and Religious Studies, and the interdisciplinary minors in Archaeology, Latin American Studies, and Medical Humanities.

Students majoring in the humanities are particularly well-prepared for careers in all fields that rely on analysis, judgment, argument, and communication. Humanities students have moved into business, medicine, the law, education, politics, public policy, academia, new media and journalism. Employers in all sectors increasingly request college graduates who can communicate effectively across cultures, think critically, and have the ability to learn and adapt on the job. Employers can provide a specific form of technical training, but the School of Humanities provides the thinking and writing skills, as well as the social and emotional intelligence that allow graduates to excel in a wide range of professions.

## **Humanities Undergraduate Study**

### **Yong Chen, Associate Dean for Curriculum and Student Services**

143 Humanities Instructional Building  
949-824-5132  
<http://www.humanities.uci.edu/undergrad/>

The Office of Undergraduate Study provides academic counseling to students pursuing majors within the School of Humanities, as well as students interested in changing to, or adding a double major in School of Humanities disciplines. Students should consult an academic counselor with questions about University policies and regulations, degree requirements, course content, options for majors and minors, study abroad, honors opportunities, or when facing academic difficulties.

## **Humanities Office of Graduate Study**

### **Yong Chen, Associate Dean for Curriculum and Student Services**

157 Humanities Instructional Building  
949-824-5557

The School of Humanities offers graduate degrees in a wide range of disciplines, as well as in interdisciplinary programs. The School's graduate programs are generally aimed at those pursuing a Ph.D., with the Master's degree awarded along the way. Exceptions are the standalone M.A. programs offered in the Department of English, the Department of European Languages and Literatures, and the Department of History. For current UCI undergraduate students, the School offers three 4+1 M.A. programs (B.A. and M.A. in five years) in Art History, Asian American Studies, and European Thought and Culture. In addition, the Department of English administers the M.F.A. Program in Writing (Fiction/Poetry).



The School of Humanities houses six graduate emphases that may be pursued in conjunction with study toward the doctorate: Asian American Studies, Critical Theory, Feminist Studies, Latin American Studies, Medical Humanities, and Visual Studies.

Graduate students participate in the affairs of the School of Humanities by serving as representatives on various departmental, schoolwide, and campuswide committees.

## Honors at Graduation

Campus criteria for honors at graduation are described in the section Honors Recognition. In addition to campus criteria, the School of Humanities uses cumulative GPA as the criterion for the awarding of Honors at Graduation. The official designation of Honors on the diploma and transcript will be based upon the candidate's cumulative GPA and total units completed at the end of the final quarter.

## Humanities Honors Program

### Nancy McLoughlin, Director

143 Humanities Instructional Building

949-824-5132; [www.humanities.uci.edu/undergrad/opportunities/honors.php](http://www.humanities.uci.edu/undergrad/opportunities/honors.php) (<http://www.humanities.uci.edu/undergrad/opportunities/honors.php>)

The Honors Program within the School of Humanities is a two-year, upper-division program designed to challenge exceptional students from all majors by providing special opportunities for intellectual growth in an interdisciplinary setting. Honors students benefit from small seminars, individual faculty attention, peer support, and the chance to pursue independent research. They think deeply about the meaning and value of humanistic inquiry and thus actively shape its future while honing their skills as thinkers, writers, and citizens of the world.

Humanities Honors students complete a two-part course of study. In their junior year, students take three quarters of an interdisciplinary Proseminar (HUMAN H120) organized around a single topic or problem, such as the borders of human life, crime and punishment, state and civil society, or vision, visions, visibility. The sequence is designed to compare and contrast modes of analysis and critical thinking in several disciplines in the Humanities, such as history, literary studies, and philosophy. In a small seminar setting, students are encouraged to become reflective about their own chosen disciplines.

In their senior year, students take a sequence of courses beginning in the fall with a Senior Honors Seminar (HUMAN H140), and continuing in the winter and spring with the Senior Honors Thesis (HUMAN H141) and the Senior Honors Colloquium (HUMAN H142W), in which they complete an independent research project under the direction of a faculty member on a topic chosen by the student. A prize is awarded for the year's outstanding thesis.

In both sequences, the Honors students benefit from their close association with exceptional scholars and the challenge and support of their intellectual peers.

Students interested in learning how the Humanities Honors Program will fit into their regular courses of study are encouraged to contact the Humanities Undergraduate Study Director; telephone 949-824-5132.

## Campuswide Honors Collegium

The Campuswide Honors Collegium is available to selected high-achieving students from all academic majors from their freshman through senior years. For more information contact the Campuswide Honors Collegium, 1200 Student Services II; 949-824-5461; [honors@uci.edu](mailto:honors@uci.edu); or visit the Campuswide Honors Collegium website (<http://honors.uci.edu/>).

## Humanities Out There (H.O.T.) Program

Humanities Center, Humanities Gateway 1st Floor  
949-824-1662

Humanities Out There is a community-based education collaboration between UCI's School of Humanities and local cultural institutions. In addition to working three hours a week in a museum-based setting where they provide afterschool learning assistance and instruction to local K-8 students from surrounding area schools, undergraduate students attend weekly seminars to learn about diverse theories and methodologies relating to teaching and learning. The H.O.T. Practicum is a wonderful opportunity to learn about community-based cultural programming and develop practical skills for future tutors, teachers, and other educators.

Requirements for undergraduates include attending weekly on-campus seminars and interning three hours each week at the Bowers Kidseum. All UCI students are eligible to enroll for 2 Units, P/NP in HUMAN 195.

## Dr. Samuel M. Jordan Center for Persian Studies and Culture

### Touraj Daryaei, Director

1118 Humanities Gateway

949-824-3638

<http://www.humanities.uci.edu/persianstudies/>

[sjalalip@uci.edu](mailto:sjalalip@uci.edu) (%20sjcps@uci.edu)

The Samuel Jordan Center for Persian Studies and Culture is devoted to the study of Iran and the Persianate world. Drawing on the strengths of the entire campus, the Center focuses on interdisciplinary research projects that bridge the arts, humanities, engineering, medicine, and the sciences. The Center sponsors events such as lectures, performances, and film screenings that draw a campus and community audience throughout the year.

Courses, including language, literature, history, art history, music, and culture at the undergraduate and graduate levels, are the backbone of the Center's academic and pedagogical mission. These academic courses are offered by affiliated faculty and administered by different units. The Humanities Language Learning Program offers courses on Persian language. Courses in ancient, medieval, and modern Persian history are administered by the Department of History. Courses on modern Persian literature and the literature of Iranian diaspora are offered through the Department of Comparative Literature. And courses on Persian music are housed within the Department of Music. A list of courses and information on the Persian Studies minor is available on the minor's website (<http://www.humanities.uci.edu/persianstudiesminor/>).

## Humanities Peer Mentor Program

The Humanities Peer Mentor Program is designed to address some of the academic, cultural, and social needs of freshmen in the School of Humanities. While all new Humanities freshmen will benefit from participation in the program, it is particularly useful for new first generation college students. It has a goal of developing leadership skills in both the mentors and the proteges/mentees. The program features two-tiered mentoring, with successful upper-division students mentoring small groups of new students, and the student mentors in turn working with faculty and staff. Another focus of the program is to encourage the student mentors to go on to graduate school.

Participants attend workshops on topics such as communication styles, study skills, procrastination and time management, and studying abroad, as well as take part in a variety of more social events. They also produce weekly journals in which they express their ideas and raise issues for their mentors. Call 949-824-5132 for additional information.

## Language Other than English Placement and Progression

The following policies apply to all UCI students taking language other than English courses.

**Language Other Than English Progression.** Within the beginning and intermediate language instructional sequences (1A-B-C and 2A-B-C, and for Latin and Greek, 1A-B-C and 100) students must earn a grade of at least C (or Pass) in order to advance to the next level of instruction, unless an exception is permitted by the appropriate course director and the Associate Dean of Humanities for Curriculum and Student Services. A student may not go back and take a lower-level course for credit once a more advanced level has been completed with a passing grade. Nor may a student be enrolled in more than one level of the same language at the same time (for example, a student may not enroll in language 2B and 2C concurrently).

**Language Other Than English Placement.** Placement tests are required for the following languages: Arabic, Armenian, Chinese, Hebrew, Japanese, Korean, Persian, Russian, Spanish, and Vietnamese. Contact the UCI Academic Testing Center for information; telephone 949-824-6207; email: [testcenter@uci.edu](mailto:testcenter@uci.edu) ([testoff@uci.edu](mailto:testoff@uci.edu)); or visit the Testing Center website (<http://www.testingcenter.uci.edu/>). Placement tests are recommended but not required for French and German language courses. The purpose of placement testing is to ensure success in UCI language courses.

For languages other than English which are not listed above (and for French and German if the placement test is not taken), students entering UCI with previous high school language training only are placed as follows: in general, one year of high school work is equated with one quarter of UCI work. Thus, students with one, two, three, or four years of high school language other than English will normally enroll in 1B-, 1C-, 2A-, or 2B-level language courses, respectively. Students who opt to "go back" one quarter will earn credit (i.e., a student with three years of high school language other than English may opt to take 1C instead of 2A). If it has been five or more years since the last high school course, the student may begin at 1A for credit. Exceptions must have the approval of the appropriate course director and the Associate Dean of Humanities for Curriculum and Student Services.

Students will not receive credit for repeating at UCI language other than English courses for which they received transfer credit from another institution, even if they are placed by testing into the equivalent of a previously taken course.

**Language Other Than English Advanced Placement Credit.** Students cannot earn units or grade points at UCI in courses from which they have been exempted on the basis of Advanced Placement credit. However, since Advanced Placement awards a maximum of 8 units for scores of 4 and 5, students may elect to take 2C or the equivalent for credit.

**Native Speakers of Languages Other Than English.** A native speaker of a language other than English is defined by the University as someone who attended the equivalent of secondary school in another country where the language of instruction was other than English. Students with prior background in a language other than English should consult the UCI Academic Testing Center to see if a placement test is available to demonstrate competence in that language. If an appropriate means of evaluating competence in a non-English language of instruction does not exist, satisfactory completion, with a C average or better, or equivalent, of one year of formal schooling at the 10th-grade level or higher in an institution where the language of instruction is not English will meet the School of Humanities Language Other Than English requirement equal to second-year language. Appropriate documentation and translation, when necessary, must be presented to substantiate that the course work was completed. For some majors offered by the School of Humanities, students may be exempted from taking third-year language study in that language. In this case, the student must *substitute* appropriate upper-division courses in the major to replace the number of exempted courses. For example, if a native speaker of Spanish is exempted from SPANISH 3 and/or SPANISH 3H, that student must replace the course with an upper-division Spanish course offered by the Department of Spanish and Portuguese.

**Repeating Deficient Foreign Language Other Than English Grades.** First- and second-year language other than English courses are sequential and each is prerequisite to the next. This is also true for third-year Chinese and Japanese courses. Students wishing to repeat a deficient grade in one of

these courses must repeat it *prior* to continuing on to the next level of the language. A student may not go back and retake a lower-level course for credit once a more advanced level has been completed with a passing grade.

## Study Abroad Center

The Study Abroad Center assists students in taking advantage of the many worldwide opportunities that exist for study, work, internship, volunteering, and research. School of Humanities majors and minors can benefit from a broader perspective of their fields by studying for one year at a university in such countries as China, France, Germany, Italy, Japan, Russia, Spain, or the United Kingdom. Visit the Study Abroad Program website (<http://www.studyabroad.uci.edu/>) or an academic counselor for additional information.

- Critical Theory, Graduate Emphasis
- Department of African American Studies
- Department of Art History
- Department of Asian American Studies
- Department of Classics
- Department of Comparative Literature
- Department of East Asian Studies
- Department of English
- Department of European Languages and Studies
- Department of Film and Media Studies
- Department of Gender and Sexuality Studies
- Department of History
- Department of Philosophy
- Department of Spanish and Portuguese
- Graduate Program in Visual Studies
- Humanities Language Learning Program
- Program in Academic English
- Special Programs
- Undergraduate Program in Global Cultures
- Undergraduate Program in Religious Studies

## Requirements for the Bachelor's Degree

**All students must meet the** University Requirements.

### School Requirements

1. Satisfactory completion of HUMAN 1A-HUMAN 1AS-HUMAN 1B-HUMAN 1BS-HUMAN 1C-HUMAN 1CS taken for letter grades in the freshman year.  
Transfer students in all majors in the School of Humanities may substitute for the Humanities Core appropriate course work as described on the School of Humanities website (<http://www.humanities.uci.edu/undergrad/academics/core.php>). No overlap is permitted between the Humanities Core substitution and a student's departmental/major requirements.
2. College-level course work equivalent to UCI's sixth quarter of study (2C level, or for Latin or Greek, one 103 and one 104, or two 103s or 104s) in a language other than English or equivalent competence. The final course must be taken for a letter grade and passed with a grade of C or better.  
NOTE: Please refer to the course listings in the *Catalogue* (<http://catalogue.uci.edu/allcourses/>) for information regarding required prerequisites for the 2C level language courses, or Latin or Greek 103 or 104.

Unless otherwise specified, courses taken to satisfy major, minor, and school requirements must be a minimum of 4 units each. Unless otherwise specified, no more than one independent or directed group study course may be petitioned toward major or minor requirements. Unless otherwise specified, all courses taken to satisfy major and school requirements must be taken for a letter grade.

Quarterly consultation with a faculty advisor is recommended.

**Maximum Overlap Between Major Requirements:** In fulfilling degree requirements for multiple majors, a maximum of two courses may overlap between any two majors.

**Maximum Overlap Between Major and Minor Requirements:** In fulfilling minor requirements, a maximum of two courses may overlap between a major and a minor. No course overlap is permitted between minors.

**Normal Progress in the Major:** School of Humanities majors are expected to take at least one course required for their major program each quarter as well as make progress toward the completion of the School's language other than English requirement.

**School Residence Requirement:** At least five upper-division courses required for each major must be completed successfully at UCI. Completion of a minor program is optional; however, for certification in a minor, at least four upper-division courses required for the minor must be completed successfully at UCI. See individual major and minor requirements for specific courses and how participation in the Education Abroad Program (EAP) can affect the residence requirement. Exceptions are considered on a case-by-case basis and decided in consultation between the appropriate department or faculty member and the Associate Dean of Humanities for Curriculum and Student Affairs.

**Internship Policy.** In most cases, Humanities students are not allowed to earn credit for off-campus internships. However, if a department or program determines that the internship is academically appropriate and promotes the student's academic goals, the student may take the internship as Independent Study and unit credit will be given. The sponsoring department or program and the instructor will in all cases require a substantial academic product, such as a paper, growing out of the internship.

A student who wishes to seek approval for an off-campus internship and earn course credit must file an Independent Study form with the department/program of the sponsoring faculty. A student who wishes to apply approved credit toward degree requirements, other than elective units, must also petition for approval from the Humanities Undergraduate Study Office, prior to beginning the internship.

UCI approved internship courses are applied to major requirements as specified by individual major requirements.

**Change of Major.** Students who wish to change their major to one offered by the School of Humanities should contact the Humanities Undergraduate Counseling Office for information about change-of-major requirements, procedures, and policies. Information is also available at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>).

- African American Studies, B.A.
- African American Studies, Minor
- Ancient Iran and the Premodern Persianate World, Graduate Specialization
- Archaeology, Minor
- Armenian Studies, Minor
- Art History, B.A.
- Art History, M.A. (4+1)
- Art History, Minor
- Asian American Studies, B.A.
- Asian American Studies, Graduate Emphasis
- Asian American Studies, M.A. (4+1)
- Asian American Studies, Minor
- Asian Studies, Minor
- Chinese Language and Literature, Minor
- Chinese Studies, B.A.
- Chinese Studies, Minor
- Classical Civilization, Minor
- Classics, B.A.
- Classics, M.A.
- Classics, Ph.D.
- Comparative Literature, B.A.
- Comparative Literature, M.A.
- Comparative Literature, Minor
- Comparative Literature, Ph.D.
- Creative Writing, Minor
- Critical Theory, Graduate Emphasis
- Culture and Theory, Ph.D.
- East Asian Cultures, B.A.
- East Asian Studies, Ph.D.
- English, B.A.
- English, M.F.A.
- English, Minor
- English, Ph.D.
- European Studies, B.A.
- European Studies, Minor
- European Thought and Culture, M.A. (4+1)

- Feminist Studies, Graduate Emphasis
- Film and Media Studies, B.A.
- Film and Media Studies, Minor
- French, B.A.
- French, Minor
- Gender and Sexuality Studies, B.A.
- Gender and Sexuality Studies, Minor
- German Studies, B.A.
- German Studies, Minor
- German, Ph.D.
- Global Cultures, B.A.
- Global Cultures, Minor
- Global Middle East Studies, B.A.
- Global Middle East Studies, Minor
- Greek, Minor
- History, B.A.
- History, M.A.
- History, Minor
- History, Ph.D.
- Humanities and Law, Minor
- Italian Studies, Minor
- Japanese Language and Literature, B.A.
- Japanese Language and Literature, Minor
- Japanese Studies, Minor
- Jewish Studies, Minor
- Korean Literature and Culture, B.A.
- Korean Literature and Culture, Minor
- Latin American Studies, Graduate Emphasis
- Latin American Studies, Minor
- Latin, Minor
- Literary Journalism, B.A.
- Literary Journalism, Minor
- Master of English
- Medical Humanities, Graduate Emphasis
- Medical Humanities, Minor
- Persian Studies, Minor
- Philosophy, B.A.
- Philosophy, Minor
- Philosophy, Ph.D. (School of Humanities)
- Queer Studies, Minor
- Religious Studies, B.A.
- Religious Studies, Minor
- Russian Studies, Minor
- Spanish, B.A.
- Spanish, M.A.
- Spanish, Minor
- Spanish, Ph.D.
- Spanish/English Bilingual Education, Minor
- Visual Studies, Graduate Emphasis
- Visual Studies, Ph.D.

## Academic English Courses

### **AC ENG 20A. Academic Writing. 5 Units.**

Grammar, sentence structure, paragraph and essay organization of formal written English.

Prerequisite: Placement into AC ENG 20A.

Grading Option: Pass/no pass only.

### **AC ENG 20B. Academic Writing. 5 Units.**

Grammar, sentence structure, paragraph and essay organization of formal written English.

Prerequisite: AC ENG 20A. Placement into AC ENG 20B is also accepted.

Grading Option: Pass/no pass only.

### **AC ENG 20C. Essentials of Academic Writing. 5 Units.**

Grammar, sentence structure, paragraph and essay organization of formal written English.

Prerequisite: AC ENG 20B. Placement into AC ENG 20C is also accepted.

Grading Option: Pass/no pass only.

### **AC ENG 20D. Academic Writing. 5 Units.**

Grammar, sentence structure, paragraph and essay organization of formal written English.

Prerequisite: AC ENG 20C

Grading Option: Pass/no pass only.

### **AC ENG 22A. Academic English Reading and Vocabulary. 2 Units.**

Intensive reading exercises with occasional practice in extensive reading, focusing on comprehension, development of vocabulary, syntax, rhetorical features, reading strategies, and study skills.

Prerequisite: Placement into AC ENG 22A is required.

### **AC ENG 22B. ESL Reading and Vocabulary. 2 Units.**

Extensive reading and discussion with emphasis on journal articles, textbook chapters, notetaking, and the interpretation of charts, diagrams, tables, and figures.

Grading Option: Pass/no pass only.

### **AC ENG 23A. ESL Pronunciation I. 2 Units.**

Designed for international graduate students. Provides an emphasis on pronunciation. Development of listening and speaking skills in five fundamental areas: pronunciation, intonation, word stress, listening comprehension, and informal campus communication. Presentations of personal experiences and reports on graphs.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

### **AC ENG 23B. ESL Conversation II. 2 Units.**

Designed for international graduate students. Provides an emphasis on conversational fluency. Further development of listening and speaking skills: review of English sounds, sentence stress, and rhythm. Oral reports, debates, and reports on graphs and surveys.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**AC ENG 23C. ESL Advanced Communication III. 2 Units.**

Designed for international graduate students with advanced communication skills. Further development of listening and speaking skills: review of minimal pairs, consonant blends, intonation, stress and rhythm. Oral presentations emphasized utilizing graphs, syllabi, academic terms, and video presentations on academic work.

Prerequisite: AC ENG 23A or AC ENG 23B

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**AC ENG 24. ESL International TA Workshop. 2 Units.**

Designed for advanced-level international students preparing to be teaching assistants. Provides extensive practice in oral and written communication skills associated with teaching introductory-level college courses and participating in academic presentations and discussions. Review and analysis of language problems.

Prerequisite: AC ENG 23A or AC ENG 23B or AC ENG 23C

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**AC ENG 28. Grammar. 2-4 Units.**

A full review of English grammar covering the following areas: grammar terms, verb tenses, verb forms, conditionals, passive and word forms, punctuation, sentence structure. The concepts are applied in targeted sentence and paragraph writing practice.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**AC ENG 29. Special Topics in ESL. 2 Units.**

Directed and individualized work in English as a second language not covered in the AC ENG 20, 21, 22 sequence.

Grading Option: Pass/no pass only.

Repeatability: Unlimited as topics vary.

**AC ENG 139W. Advanced Academic Writing Across the Curriculum. 4 Units.**

Designed for transfer students who speak English as a second language. Focuses on developing academic reading and writing skills including essay content, organization, vocabulary, and grammar. Academic content also covered.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Restricted to students whose first language is not English.

(Ib)

## African American Studies Courses

**AFAM 40A. African American Studies I. 4 Units.**

Discusses main contours of African American experience from the forced importation of Africans into the Americas in the late fifteenth century to the development of social movements in post-emancipation societies of the late nineteenth and twentieth centuries.

((III or IV) and VII ).

**AFAM 40B. African American Studies II. 4 Units.**

Introduction to the history of modern racial thinking in Western society and its relationship to the material contexts of racial oppression, with emphasis on its development in British colonies and U.S.

((III or IV) and VII ).

**AFAM 40C. African American Studies III. 4 Units.**

Introduction to theories of racial blackness in the modern world, with emphasis on developments in British colonies and U.S. Traces emergence of blackness as term of collective identity, social organization, and political mobilization.

((III or IV) and VII ).



**AFAM 50. Introductory Topics in African American Studies. 4 Units.**

Introduction to a broad range of topics in African American studies, exploring history, literature, art, culture, politics, and contemporary social issues. Topical organization of courses addresses issues that have been of importance historically and are reshaping the African diaspora today.

Repeatability: Unlimited as topics vary.

**AFAM 111A. Modern African American Art. 4 Units.**

Investigates the history of modern African American art; emphasis on the politics of representation. Examines art in a variety of media from material culture and textiles to painting and photography. Issues of migration, nationalism, gender, sexuality, and hybridity are discussed.

Same as AHIS 164A.

**AFAM 111B. Contemporary African American Art. 4 Units.**

Investigates the history of contemporary African American art; emphasis on the politics of representation. Explores art in a variety of media: painting, sculpture, photography, installation, and new media. Cultural politics, appropriation, identity, gender, sexuality, hybridity and civil rights issues discussed.

Same as AHIS 164B.

**AFAM 112A. Early African American Literature. 4 Units.**

Examines the earliest forms of black literary practices, including the jeremiad, the slave narrative, the pamphlet, poetry, the short story, and how these literary forms are related to the historical experiences of enslavement and emancipation.

Repeatability: Unlimited as topics vary.

**AFAM 112B. African American Literature 1900-Present. 4 Units.**

Examines individual literary forms and/or authors, as well as movements such as the Harlem Renaissance and the Black Arts Movement. Explores how black literary practices represent the conditions of modern subjectivities and environments.

Repeatability: Unlimited as topics vary.

**AFAM 113. African American Cinema and Media. 4 Units.**

Explores the diversity of Black creative production and the historical, social, and economic forces that shaped their emergence. May include Black film, hip-hop culture, fine art, photography, and others.

Repeatability: Unlimited as topics vary.

**AFAM 114. International Cultures. 4 Units.**

Explores the various cultures of the African diaspora and their impacts on a global scale. Examines a diverse range of media, including music (reggae, hip-hop), literature, film, and others and the links between culture and social movements throughout the diaspora.

Repeatability: Unlimited as topics vary.

**AFAM 115. Race and Visual Representation. 4 Units.**

Examines film, documentary, fine art, photography, and other visual media to explore the multiple ways in which ideas about race are projected and woven through the visual landscape and the impacts this has on perpetuating social inequalities.

Repeatability: Unlimited as topics vary.

**AFAM 117. Asian American and African American Relations. 4 Units.**

Addresses relationships of Asian American and African American communities in the United States. Topics include race, class, gender, labor, economic systems, political mobilization, community, civil rights, activism, cultural expression.

Same as HIST 152B, ASAM 167.

**AFAM 118. Topics in African American Humanities. 4 Units.**

Provides students with an opportunity to pursue advanced work in African American studies from one or more humanities approaches (literature, film and media studies, art history, and others).

Repeatability: Unlimited as topics vary.

**AFAM 125. African American Women in Art. 4 Units.**

Examines depictions of and by African American women in art and popular culture through a variety of media including textiles, painting, sculpture, photography, and installation. Focuses on African American women's experiences, perspectives, and strategies for contemporary representation.

Same as AHIS 164D.



**AFAM 128. Topics in Gender/Sexuality. 4 Units.**

Expressions of genders and sexualities across the spectrum of African American experience and creativity.

Repeatability: Unlimited as topics vary.

**AFAM 134A. Caribbean History: Colonization to Emancipation. 4 Units.**

Exploration of the history of the archipelago from pre-Columbian times to the end of slavery; examining the impact of European colonization, decimation of the indigenous populations, African slavery, resistance, and emancipation; the unity and diversity of experience in region.

Same as HIST 164A.

**AFAM 134B. Caribbean History: Emancipation to Independence. 4 Units.**

Post-emancipation and anti-colonial struggles ending with political independence for most of the region. Examines social, political, economic, cultural dimensions of post-emancipation period, including large-scale migration to Central America, the U.S., and Britain; the region's global cultural and political contribution.

Same as HIST 164B.

**AFAM 137. History of the African Diaspora. 4 Units.**

Examines the causes and consequences of the multiple diasporas of African peoples since the sixteenth century in the Atlantic world, especially the Americas and Europe.

Same as HIST 134E.

**AFAM 138. Topics in African American History. 4 Units.**

Studies in selected areas of African American history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as HIST 150.

**AFAM 143. Topics in African American Music. 4 Units.**

Examines African American musical forms and traditions, such as blues, jazz, and reggae, in performance and/or critical and theoretical contexts.

Repeatability: Unlimited as topics vary.

**AFAM 144. Topics in Expressive Forms. 4 Units.**

Examines various forms of aesthetic expression in the African diaspora, including dance, music, and the plastic arts, as well as artistic visions of black cyberspace, digital activism, film, video, and aesthetic conceptions of the future.

Repeatability: Unlimited as topics vary.

**AFAM 145. African Americans and Photography. 4 Units.**

Explores depictions of and by African Americans through photography. Examines the history of photography in relationship to African American culture through a variety of media from early daguerreotype processes to digital imagery.

Same as AHIS 164E.

**AFAM 151. Comparative Minority Politics. 4 Units.**

Examines the political experiences of Blacks, Latinos, and Asian Americans in the United States from roughly 1950 to the present. Focuses on how each group has pursued political empowerment via both conventional political channels and social movements.

Same as ASAM 132, CHLT 147, PLSC 124C.

**AFAM 152. African American Politics. 4 Units.**

Examines politics of African Americans in order to gain a broader perspective of the American political process. Major developments in African American politics (including the civil rights movement, Black presidential bids), continuing problem of racism, responsiveness of key governing institutions.

Same as PLSC 124E.

**AFAM 153. African American Psychology. 4 Units.**

Historical overview of the development of black psychology and the African American frame of reference. Topics include personality development, psychological assessment, issues in education, black mental health, and the role of the African American psychologist in the community.

Same as PSYC 174E.

**AFAM 154. African American Social Formations. 4 Units.**

Topics which promote critical investigation into the historical, political, and social formations associated with the Black Diaspora.

Repeatability: Unlimited as topics vary.

**AFAM 155. Intercultural Studies. 4 Units.**

Studies relationships between various cultural formations within the Black Diaspora and the exchange, amalgamations, and tensions between Black Diasporic formations and non-Black formations. Examines expressions of racialization as representation, adaption, and resistance.

Repeatability: Unlimited as topics vary.

**AFAM 156. African Societies and Politics. 4 Units.**

Examines the violent incorporation of Africa within European modernity. Places the discourse of Pan-Africanism, African Nationalisms, Negritude, African Marxism, and/or African Socialism in juxtaposition to the forces of capitalism, colonialism, and imperialism that restructure African history.

Repeatability: Unlimited as topics vary.

**AFAM 157. Critical Race Theory. 4 Units.**

Introduction to Critical Race Theory and key American cases on racial inequality. Using this literature, examines the possibilities and pitfalls of legal claims of race, gender, and sexuality discrimination in the age of colorblindness.

Same as CLS C178.

Restriction: Upper-division students only.

**AFAM 158. Topics in African American Social Sciences. 4 Units.**

Provides students with an opportunity to pursue advanced work in African American studies from one or more social science approaches (psychology, sociology, anthropology, economics, and others).

Repeatability: Unlimited as topics vary.

**AFAM 159. Prisons and Public Education. 4 Units.**

Looks at the connections between schools and prisons in the United States. Students learn about ideas that push beyond common trope of the "school to prison pipeline."

Same as ANTH 138.

**AFAM 162W. The Black Protest Tradition. 4 Units.**

History and discourses of the black protest tradition. Traces emergence of black protest against racial slavery and white supremacy from the early colonial period to present and the complex elaboration of identity politics within black communities in the twentieth century.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only.

**(Ib)**

**AFAM 163. Seminar in African American Studies. 4 Units.**

Explores theoretical and methodological issues in Black Studies via concentrated work on a specific ensemble of questions. Emphasis is on generating student responses to the material covered through oral and written reports.

Repeatability: Unlimited as topics vary.

**AFAM 198. Directed Group Study. 1-4 Units.**

Special topics through directed reading. Paper required.

Repeatability: May be taken for credit for 24 units.

**AFAM 199. Independent Study. 1-4 Units.**

Investigation of special topics through directed reading. Paper required.

Repeatability: May be repeated for credit unlimited times.

**AFAM 399. University Teaching. 4 Units.**

Limited to teaching assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Arabic Courses

**ARABIC 1A. Fundamentals of Arabic. 5 Units.**

Designed for students with little or no exposure to Arabic. Using real world texts, provides a firm foundation in the orthography, grammar, syntax, and vocabulary of Modern Standard Arabic. Introduces students to Arab world cultures.

Prerequisite: Placement into ARABIC 1A.

Overlaps with ARABIC S1AB.

Restriction: ARABIC 1A and ARABIC S1AB may not be taken for full credit.

**ARABIC 1B. Fundamentals of Arabic. 5 Units.**

Designed for students with little or no exposure to Arabic. Using real world texts, provides a firm foundation in the orthography, grammar, syntax, and vocabulary of Modern Standard Arabic. Introduces students to Arab world cultures.

Prerequisite: ARABIC 1A. ARABIC 1A with a grade of C or better. Placement into ARABIC 1B is also accepted.

Overlaps with ARABIC S1AB, ARABIC S1BC.

Restriction: ARABIC 1B and ARABIC S1AB and ARABIC S1BC may not be taken for full credit.

**ARABIC 1C. Fundamentals of Arabic. 5 Units.**

Designed for students with little or no exposure to Arabic. Using real world texts, provides a firm foundation in the orthography, grammar, syntax, and vocabulary of Modern Standard Arabic. Introduces students to Arab world cultures.

Prerequisite: ARABIC 1B or ARABIC S1AB. ARABIC 1B with a grade of C or better. ARABIC S1AB with a grade of C or better. Placement is also accepted.

Overlaps with ARABIC S1BC.

### (VI)

**ARABIC 2A. Intermediate Arabic Language and Culture. 4 Units.**

Designed for students to advance their Arabic language skills to intermediate level. Students will develop their understanding of grammar and syntax to a more sophisticated level. Facilitates intermediate-level reading, writing, and speaking skills. Fosters college-level cultural literacy.

Prerequisite: ARABIC 1C or ARABIC S1BC. ARABIC 1C with a grade of C or better. ARABIC S1BC with a grade of C or better. Placement into ARABIC 2A is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

### (VIII)

**ARABIC 2B. Intermediate Arabic Language and Culture. 4 Units.**

Designed for students to advance their Arabic language skills to intermediate level. Students will develop their understanding of grammar and syntax to a more sophisticated level. Facilitates intermediate-level reading, writing, and speaking skills. Fosters college-level cultural literacy.

Prerequisite: ARABIC 2A. ARABIC 2A with a grade of C or better. Placement into ARABIC 2B is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

### (VIII)

**ARABIC 2C. Intermediate Arabic Language and Culture. 4 Units.**

Designed for students to advance their Arabic language skills to intermediate level. Students will develop their understanding of grammar and syntax to a more sophisticated level. Facilitates intermediate-level reading, writing, and speaking skills. Fosters college-level cultural literacy.

Prerequisite: ARABIC 2B. ARABIC 2B with a grade of C or better. Placement into ARABIC 2C is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)**

**ARABIC 10A. Arabic Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. ARABIC 10A is for language mentors.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**ARABIC 10B. Arabic Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. ARABIC 10B is for language mentees.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**ARABIC 51. Introduction to the Koran. 4 Units.**

An introduction to understanding the Koran and its significance to Muslim life, culture, and history. An overview of scholarly traditions related to the Koran, and its critics. Close readings of the Koran in English translation.

**(IV, VIII)**

**ARABIC 199. Independent Study. 4 Units.**

Research paper required.

Repeatability: May be repeated for credit unlimited times.

## Armenian Courses

**ARMN 1A. Elementary Armenian. 5 Units.**

Written and conversational Armenian for students with no knowledge of the language. Students learn the Armenian alphabet, read and comprehend simple texts, and carry basic conversation. Emphasis on reading and comprehension, grammar rules, and basic composition.

Prerequisite: Placement into ARMN 1A.

**ARMN 1B. Elementary Armenian. 5 Units.**

Continues development of the fundamentals of Armenian, including comprehension, reading of simple texts, basic conversation, and writing with a fair degree of grammatical correctness. Students learn basic reading, writing, and sentence structure through lectures, games, and assignments.

Prerequisite: ARMN 1A. ARMN 1A with a grade of C or better. Placement into ARMN 1B is also accepted.

**ARMN 1C. Elementary Armenian. 5 Units.**

Focus on building grammatical knowledge of the Armenian language and developing skills in reading, writing, listening, and speaking. Includes a strong emphasis on expanding vocabulary and developing oral proficiency in higher/formal registers.

Prerequisite: ARMN 1B. ARMN 1B with a grade of C or better. Placement into ARMN 1C is also accepted.

**(VI)**

**ARMN 2A. Intermediate Armenian. 4 Units.**

Designed to develop students' ability to communicate further orally and in writing in Armenian (Western or Eastern) by consolidating knowledge of grammar, increasing vocabulary, and developing reading, comprehension, and writing.

Prerequisite: ARMN 1C. ARMN 1C with a grade of C or better. Placement into ARMN 2A is also accepted.

**(VIII)**

**ARMN 2B. Intermediate Armenian. 4 Units.**

Designed to develop students' ability to communicate further orally and in writing in Armenian (Western or Eastern) by consolidating knowledge of grammar, increasing vocabulary, and developing reading, comprehension, and writing.

Prerequisite: ARMN 2A. ARMN 2A with a grade of C or better. Placement into ARMN 2B is also accepted.

(VIII)

**ARMN 2C. Intermediate Armenian. 4 Units.**

Designed to develop students' ability to communicate further orally and in writing in Armenian (Western or Eastern) by consolidating knowledge of grammar, increasing vocabulary, and developing reading, comprehension, and writing.

Prerequisite: ARMN 2B. ARMN 2B with a grade of C or better. Placement into ARMN 2C is also accepted.

(VIII)

## Art History Courses

**ART HIS 40A. Ancient Greek and Roman Art, and Architecture. 4 Units.**

An overview of Greek and Roman art, and related ancient visual cultures. Considers how and why the peoples of antiquity created art and architecture, as well as the significance of these works within their social, religious, and historical contexts.

(IV and VIII ).

**ART HIS 40B. Arts of Europe: Medieval and Renaissance. 4 Units.**

Focuses on the art of the Mediterranean area and Europe between ca. A.D. 350 and 1600. By means of movements and artists, examines the cultural identities of the Christian, Islamic, and Early Modern worlds.

(IV, VIII)

**ART HIS 40C. Early Modern and Modern Art in Europe and America. 4 Units.**

The visual arts from the seventeenth to the twenty-first centuries. Explores the purposes and meaning of painting, sculpture, and architecture in relation to artists, viewers, and historical events.

(IV, VIII)

**ART HIS 42A. History of Asian Art: Arts of India. 4 Units.**

Emphasizing Hindu, Buddhist, and Islamic art of greater India (Pakistan, Bangladesh, Sri Lanka) from proto-historic to modern times. Themes include art as a source of history, commercial and religious pan-Asian connections, nationalism, and modern versus historical identities.

(IV, VIII)

**ART HIS 42B. History of Asian Art: Arts of China. 4 Units.**

An introduction to the arts and visual culture of China from Neolithic to modern times. Themes includes the representation of power, death and the afterlife, popular culture and elite arts, landscape and women's painting, and concludes with contemporary China.

(IV, VIII)

**ART HIS 42C. History of Asian Art: Arts of Japan. 4 Units.**

Examines compelling images and objects of spirit and power created in Japan over many centuries. Themes include Buddhist icons, narrative illustration, popular prints, architecture, manga, and the avant-garde. Japanese interactions with Korean, Chinese, and European culture are emphasized.

(IV, VIII)

**ART HIS 42D. History of Asian Art: Arts of Islam. 4 Units.**

Examines past and present Islamic art, spanning 1,500 years and extending from the Americas through Indonesia. Themes include Islam as a globalizing force, the definition of 'Islamic,' and the competing roles of religion and politics in making art.

(IV, VIII)

**ART HIS 42E. Art and Archaeology of Ancient Persia, Egypt, and Mesopotamia. 4 Units.**

An introduction to the art and archaeology of ancient Egypt, Mesopotamia, Anatolia, Persia, and the wider Iranian world from the Neolithic to the coming of Islam. Considers wider impact on the ancient and early medieval worlds and their present legacy.

(IV and VIII ).

**ART HIS 44. Image Collision: A Multicultural Approach to Images and Their Users. 4 Units.**

Comparisons between present-day visual culture and pre-modern art to re-evaluate the ways in which one understands the contemporary histories of underrepresented groups in the United States.

(IV and VII ).

**ART HIS 55. Disneyland. 5 Units.**

From Dole Whips to roller coasters, the focus is on the innovations in industrial automation and manufacturing that made Disneyland's attractions possible. Discusses fandom, guest experiences, operating procedures, technical and design patents, and how rides work.

(II and IV ).

**ART HIS 100. Studies in Ancient Art . 4 Units.**

Topics in Egyptian, Prehistoric, and Etruscan art of the Mediterranean area treated with specific reference to relevant cultural and historical settings. Specialized courses in Greek and Roman art are also taught.

Repeatability: Unlimited as topics vary.

**ART HIS 103. Studies in Greek Art. 4 Units.**

Topics in Greek art, architecture, and topography from the Prehistoric period through the end of the fourth century B.C.E.

Repeatability: Unlimited as topics vary.

**ART HIS 107. Studies in Roman Art. 4 Units.**

Topics in Hellenistic and Roman art and architecture; stresses historical and political background.

Repeatability: Unlimited as topics vary.

**ART HIS 110. Studies in Medieval Art. 4 Units.**

Specialized topics in Medieval art and architecture in Europe, the Mediterranean area, and the Near East between the fourth and fifteenth centuries. Examples: the Art of the Migration Period, Medieval City.

Repeatability: Unlimited as topics vary.

**ART HIS 111B. Byzantine Art: 650-1450. 4 Units.**

Studies in the development of the art and architecture of the Byzantine Empire between ca. 650 and 1450.

**ART HIS 112. Studies in Early Christian and Byzantine Art. 4 Units.**

Selected topics on the development of the art and architecture of the Later Roman and Byzantine Empires between ca. 300 and 1453. Examples: Early Christian architecture, Byzantine painting.

Repeatability: Unlimited as topics vary.

**ART HIS 114. Studies in Western Medieval Art. 4 Units.**

Selected topics on the development of art and architecture in Western Europe between ca. 700 and 1400. Examples: Romanesque painting, Gothic architecture.

Repeatability: Unlimited as topics vary.

**ART HIS 120. Studies in Renaissance and Baroque Art. 4 Units.**

Selected topics on the art and architecture of Europe between the fifteenth and eighteenth centuries. Examples: Renaissance and Baroque prints, Bruegel to Rubens.

Repeatability: Unlimited as topics vary.

**ART HIS 121. Studies in Southern Renaissance Art. 4 Units.**

Selected topics determined by individual faculty members exploring historical developments and individual artists of the fifteenth and sixteenth centuries in Italy and Spain. Examples: Renaissance Venice, Age of Michelangelo.

Repeatability: Unlimited as topics vary.

**ART HIS 123. Studies in Northern Renaissance Art. 4 Units.**

Selected topics determined by individual faculty members exploring historical developments and individual artists of the fifteenth and sixteenth centuries in Northern Europe. Examples: Late Medieval art, painting from Van Eyck to Bosch.

Repeatability: Unlimited as topics vary.

**ART HIS 125. Studies in Southern Baroque Art. 4 Units.**

Selected topics determined by individual faculty members exploring historical developments and individual artists of the seventeenth and eighteenth centuries in Italy and Spain. Example: Rome in the seventeenth century.

Repeatability: Unlimited as topics vary.

**ART HIS 128. Studies in Northern Baroque Art. 4 Units.**

Selected topics determined by individual faculty members exploring historical developments and individual artists of the seventeenth and eighteenth centuries in Northern Europe. Example: the Age of Rembrandt.

Repeatability: Unlimited as topics vary.

**ART HIS 134C. Modern European Art: From Impressionism to the Fauves. 4 Units.**

History of European painting and urban transformation from 1851 to 1907, when Paris stood strong as the unquestioned cultural capital of the nineteenth century.

**ART HIS 134D. Modern European Art: From Cubism to Surrealism. 4 Units.**

History of European painting, sculpture, and design from 1907 to 1940, when Paris and painting lost their dominance as other cultural centers and other media claimed renewed importance.

**ART HIS 134E. Topics in Modern European Art. 4 Units.**

Selected topics within the period 1643 to 1940.

Repeatability: Unlimited as topics vary.

**ART HIS 140A. History of Contemporary Art. 4 Units.**

Selected topics exploring historical developments of contemporary art from 1945 to the present. Examples: American Art 1945-1989, European Art 1945-1989, Art After 1989. Works of art are studied as cultural, social, and political practices.

Repeatability: Unlimited as topics vary.

**ART HIS 140B. Topics in Contemporary Art. 4 Units.**

Selected topics exploring artistic movements, artists, and/or issues in contemporary art from 1945 to the present. Examples include Junk Art, Countercultures, Art and Politics Now. Works of art are studied as cultural, social, and political practices.

Repeatability: Unlimited as topics vary.

**ART HIS 145A. Studies in Modern Architecture. 4 Units.**

Architecture and related design practices from the late eighteenth century through 1945 are studied in relation to social, aesthetic, technological, and political questions.

Repeatability: Unlimited as topics vary.

**ART HIS 145B. Studies in Architecture after 1945. 4 Units.**

Architecture and related design practices from 1945 through present are studied in relation to social, aesthetic, technological, and political questions.

Repeatability: Unlimited as topics vary.

**ART HIS 145C. Topics in the History of Modern and Contemporary Architecture. 4 Units.**

Varying topics from the late eighteenth century to the present. Architecture and related design practices are studied in relation to social, aesthetic, technological, and political questions.

Repeatability: Unlimited as topics vary.

**ART HIS 150. Studies in Asian Art. 4 Units.**

Topics include visual studies in China, Japan, Korea and India.

Repeatability: Unlimited as topics vary.

**ART HIS 151B. Later Imperial China. 4 Units.**

Investigates the uses, subjects, styles, and social contexts of art made in the later Imperial dynasties, whether court art, religious art, women's painting, scholar painting, or art for the market.

**ART HIS 151C. Modern China. 4 Units.**

Examines the evolution and media of Chinese art and visual culture in the context of modern China's sweeping historical, social, and political changes.

**ART HIS 155A. Ancient India. 4 Units.**

Examines the visual and religious history of the region defined as 'India' today, but necessarily encompassing modern Bangladesh and Pakistan. Culminates with the supposed Golden Age of the Gupta empire and its far-reaching legacies.

Same as HISTORY 170A, REL STD 122.

Concurrent with ART HIS 255A.

**ART HIS 155B. Medieval India. 4 Units.**

Begins with the Gupta period's aesthetic legacies in South Asia's architecture, sculpture, and painting. Explores the dispersal of Islam throughout South Asia, including the Muslim communities of southern India.

Same as HISTORY 170B, REL STD 123.

Concurrent with ART HIS 255B.

**ART HIS 155C. Modern India. 4 Units.**

Examines the imperial patronage of the Mughal emperors, covering their territorial holdings extending from Afghanistan through western Bangladesh. Continues with the 'aftermath' of the Mughal empire and the rise of British commercialism and colonialism.

**ART HIS 155D. Topics in the Art and Architecture of India. 4 Units.**

Studies in selected areas of Art and Architecture of India. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**ART HIS 156. Art and Globalization, Modern. 4 Units.**

Study of modern art as a cause and expression of increasing contacts between cultures. Focusing on regions in Asia and the Americas, adoption of European oil painting, indigenous art movements, and national capital architecture are explored.

**ART HIS 162C. Contemporary Japan. 4 Units.**

Study of various media of Japanese art from the time of war defeat in 1945 until the present. Topics include artists' responses to the nuclear bomb, the aesthetics of the 'economic miracle,' avant-garde groups, manga, and innovations in architecture.

**ART HIS 163. Asian American Art, Contemporary. 4 Units.**

Study of the Asian American experience in contemporary art and visual culture. Art by Asian Americans of diverse backgrounds as well as the history of visualization of Asian identities in American art/visual culture.

**ART HIS 164A. Modern African American Art. 4 Units.**

Investigates the history of modern African American art; emphasis on the politics of representation. Examines art in a variety of media from material culture and textiles to painting and photography. Issues of migration, nationalism, gender, sexuality, and hybridity are discussed.

Same as AFAM 111A.

**ART HIS 164B. Contemporary African American Art. 4 Units.**

Investigates the history of contemporary African American art; emphasis on the politics of representation. Explores art in a variety of media: painting, sculpture, photography, installation, and new media. Cultural politics, appropriation, identity, gender, sexuality, hybridity and civil rights issues discussed.

Same as AFAM 111B.

**ART HIS 164D. African American Women in Art. 4 Units.**

Examines depictions of and by African American women in art and popular culture through a variety of media including textiles, painting, sculpture, photography, and installation. Focuses on African American women's experiences, perspectives, and strategies for contemporary representation.

Same as AFAM 125.

**ART HIS 164E. African Americans and Photography. 4 Units.**

Explores depictions of and by African Americans through photography. Examines the history of photography in relationship to African American culture through a variety of media from early daguerreotype processes to digital imagery.

Same as AFAM 145.

**ART HIS 165A. Early American Art. 4 Units.**

An examination of American visual culture from 1620 to 1860 from the era of European exploration and colonization of the New World to the beginning of the Civil War.



**ART HIS 165B. Nineteenth Century American Art. 4 Units.**

An exploration of American visual culture from 1860 to 1900, including paintings, sculpture, and photographs produced during the Civil War and during the decades of prosperity that followed.

**ART HIS 165C. Modern American Art. 4 Units.**

Focusing on the period from 1900 until 1965, this course considers the emergence and institutionalization of modern art in the United States.

**ART HIS 165D. Topics in American Art. 4 Units.**

Varying topics within the period 1620 to 1970. Works of art are studied in their cultural, social, and political contexts.

Repeatability: Unlimited as topics vary.

**ART HIS 180. Topics in the Criticism of Art. 4 Units.**

Selected topics discussed on the theoretical and/or practical dimensions of art historical criticism.

Repeatability: Unlimited as topics vary.

**ART HIS 181. Topics in Museum Studies. 4 Units.**

Addresses the historical and contemporary function of the museum as an instructional device. The function of exhibitions in the public sphere, and the roles of curators, educators, and the public are analyzed.

Repeatability: Unlimited as topics vary.

**ART HIS 183B. 20th Century Photographic History. 4 Units.**

Varying topics within the history of photography in the 20th century. Photographic practice studied in relation to art history, cultural history, and social history.

Repeatability: Unlimited as topics vary.

**ART HIS 183C. Selected Topics in Photographic History. 4 Units.**

Varying topics within the history of photography from the early 19th century to the present. Photographic practice studied in relation to art history, cultural history, and social history. Examples include documentary; pictorialism and art photography; photomontage, photographic books.

Repeatability: Unlimited as topics vary.

**ART HIS 185. Topics in Visual Studies. 4 Units.**

Interdisciplinary topics on the cultural analysis of visual artifacts and practices.

Repeatability: Unlimited as topics vary.

**ART HIS 190W. Art History Methods. 4 Units.**

Theory and practice of art history, with an emphasis on formal and social models of analyzing and writing about art.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Art History Majors only.

(Ib)

**ART HIS 196. Ethics, Law, and Art. 4 Units.**

Addresses a broad range of ethical and legal issues pertaining to art, ownership, looting and theft, museum policies, and cultural heritage.

Concurrent with ART HIS 296.

**ART HIS 198. Advanced Seminar: Topics in Art History. 4 Units.**

Discussion and report-oriented seminar with emphasis on reading, writing, and thinking about problems in art history. Examples: Gothic Cathedral, Portraiture East and West.

Prerequisite: Recommended: ART HIS 190W.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. Art History Majors have first consideration for enrollment.

Concurrent with ART HIS 298.

**ART HIS 199. Independent Study in Art History. 1-4 Units.**

Supervised, but independent reading or research on art historical topics.

Repeatability: May be taken for credit 4 times.

Restriction: Art History Majors only.

**ART HIS 255A. Ancient India. 4 Units.**

Examines the visual and religious history of the region defined as 'India' today, but necessarily encompassing modern Bangladesh and Pakistan. Culminates with the supposed Golden Age of the Gupta empire and its far-reaching legacies.

Same as IRAN 255A.

Restriction: Graduate students only.

Concurrent with ART HIS 155A.

**ART HIS 255B. Medieval India. 4 Units.**

Begins with the Gupta period's aesthetic legacies in South Asia's architecture, sculpture, and painting. Explores the dispersal of Islam throughout South Asia, including the Muslim communities of southern India.

Same as IRAN 255B.

Restriction: Graduate students only.

Concurrent with ART HIS 155B.

**ART HIS 296. Ethics, Law, and Art. 4 Units.**

Addresses a broad range of ethical and legal issues pertaining to art, ownership, looting and theft, museum policies, and cultural heritage.

Prerequisite: Background in Art History or Legal Studies.

Same as IRAN 296.

Concurrent with ART HIS 196.

**ART HIS 298. Master's Seminar: Topics in Art History. 4 Units.**

Studies in selected areas of Art History. Examples include Gothic Cathedral, Portraiture East and West.

Repeatability: Unlimited as topics vary.

Concurrent with ART HIS 198.

**ART HIS 299. Master's Thesis Research. 4 Units.**

Research and writing of the Master's thesis.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ART HIS 399. University Teaching. 4 Units.**

Limited to teaching assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Asian American Studies Courses

### **ASIANAM 50. Asian American Histories. 4 Units.**

Examines and compares diverse experiences of major Asian American groups since the mid-nineteenth century. Topics include origins of emigration; the formation and transformation of community; gender and family life; changing roles of Asian Americans in American society. Formerly ASIANAM 60A.

Same as HISTORY 15C, SOC SCI 78A.

((III or IV) and VII ).

### **ASIANAM 51. The U.S. and Asia. 4 Units.**

Explores the historical and contemporary transnational linkages between the U.S. and regions in Asia and their resultant flows of people, goods, and ideas. Attention given to the role of militarism and processes of globalization, and the histories of cultural contact/conflict.

((III or IV) and VIII ).

### **ASIANAM 52. Asian American Communities. 4 Units.**

Examines the renewal of Asian immigration following World War II. Explores contemporary Asian American populations and communities in the U.S., and the impact of contemporary Asian immigration on the U.S. political economy and social order.

Same as SOC SCI 78B.

(III, VII)

### **ASIANAM 53. Asian Americans and Race . 4 Units.**

Analyzes the Asian American experience in comparative perspective, which includes comparisons of different ethnic and racial groups, and across gender and class. Possible topics include labor, economy, politics, migration, nation, popular culture, gender, family, sexuality, and multiraciality.

Same as SOC SCI 78C.

(III, VII)

### **ASIANAM 54. Asian American Stories. 4 Units.**

Examines stories from Asian American communities through literary texts and other media. Selected themes may include the following: dislocation/relocation, finding/inventing a usable past, poetics/politics in language, identities/ethnicities.

(IV, VII)

### **ASIANAM 55. Asian Americans and the Media. 4 Units.**

Investigates popular representations of and cultural productions by Asian Pacific Americans and Asians in the Americas from the late-nineteenth century to the present. Cultural media may include political cartoons, film/television, popular music, visual art, blogs/Web sites, and performance.

(IV, VII)

### **ASIANAM 100W. Research Methodologies for Asian American Studies. 4 Units.**

Explores various research methodologies for Asian American Studies combining theoretical knowledge with field research. Goals: conduct field research about immigrants and refugees from Asia. Topics vary: migration and labor, assimilation and cultural preservation, cultural expressions in the diaspora.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

### **ASIANAM 110. Asian American Writers. 4 Units.**

Literary analysis of Asian American writers' representations of issues of identity, class, history among others. Variety of literary forms—novel, poem, drama, essay—included in a study of a variety of Asian American ethnic groups.

Repeatability: Unlimited as topics vary.

### **ASIANAM 111. Asian American History. 4 Units.**

Introduction to important themes in the history of people of Asian ancestry in the United States from the nineteenth century to the present.

Repeatability: Unlimited as topics vary.

### **ASIANAM 112. Asian American Art History. 4 Units.**

Investigation of Asian American experience expressed by art and visual culture throughout the twentieth century. Art by Asian Americans of diverse backgrounds as well as the history of cultural visualization of Asian identities in American art/visual culture.

Repeatability: Unlimited as topics vary.

**ASIANAM 114. Asian American Film and Video. 4 Units.**

Topics include histories of Asian American film and video, including documentaries, experimental, short subjects, feature-length independent film, and other forms of cinematic expression. Explores issues of identity (national, racial, gendered, among others).

Repeatability: Unlimited as topics vary.

**ASIANAM 116. Asian Americans and Popular Culture. 4 Units.**

Focuses on Asian Americans' relationship to popular culture as both producers and consumers. Topics include consumer cultures and subcultures, cyberspace and public space, popular music, indie comics and other print media.

Repeatability: Unlimited as topics vary.

**ASIANAM 130. Undocumented Immigrant Experiences. 4 Units.**

Examines the experiences of undocumented immigrants and the policies that structure their educational, economic, social, and political participation.

Same as CHC/LAT 164A, CRM/LAW C187, SOCIOL 177C.

(III and VII ).

**ASIANAM 132. Comparative Minority Politics. 4 Units.**

Examines the political experiences of Blacks, Latinos, and Asian Americans in the United States from roughly 1950 to the present. Focuses on how each group has pursued political empowerment via both conventional political channels and social movements.

Same as AFAM 151, CHC/LAT 147, POL SCI 124C.

**ASIANAM 137. Asian American Labor. 4 Units.**

Explores history of Asian Americans and work from the nineteenth century to the present. Areas of study include migration, colonialism, family, social organization, and work culture.

Same as HISTORY 152A.

**ASIANAM 138. Race and Urban Space. 4 Units.**

Examines how ethnic and racial processes shape and structure interactions in urban settings, such as schools, housing, employment, and public spaces, with attention to the international impact of globalization and postcolonial forces.

**ASIANAM 142. Islam in America. 4 Units.**

Offers a critical academic study of Islam in America, focusing on the core tenets of belief, the diversity of practices, and historical transformations that have taken place since the arrival of Muslims in the United States.

Same as ANTHRO 125Z.

**ASIANAM 143. Religious Traditions of Asian Americans. 4 Units.**

Studies the religious traditions of Asian Americans, focusing on the transplantation of religious institutions, establishment of sacred spaces, celebration of religious holidays, socialization of children, as well as birth, marriage, gender relations, death, family.

Same as SOCIOL 136.

**ASIANAM 144. The Politics of Protest. 4 Units.**

Examines the Civil Rights, Black Power, and women's movements in relationship to the Asian American movement. Uses social movement theories to illuminate the cases, and the cases to critique and revise the theories.

Same as POL SCI 124A.

(VII)

**ASIANAM 150. Special Topics in Asian American Studies. 4 Units.**

Analyzes a variety of themes in Asian American Studies—identity, history, culture—from various interdisciplinary perspectives in humanities, arts, social sciences.

Repeatability: Unlimited as topics vary.

**ASIANAM 151C. Korean American Studies. 4 Units.**

Explores the factors that have distinctly shaped the Korean American experience, including patterns of racial domination, the profile of immigrant flow, immigrant roles in the urban political economy, politics in Korea, and the role of the church.

Same as SOC SCI 178C.

**ASIANAM 151D. Vietnamese American Studies. 4 Units.**

Studies the resettlement of Vietnamese in the United States following their exodus from Southeast Asia. Topics include the Vietnam War, the 1975 evacuation, boat and land refugees, the shaping of Vietnamese communities, and Vietnamese American literature.

Same as SOC SCI 178D.

**ASIANAM 151E. Japanese American Studies. 4 Units.**

Studies the settlement of Japanese in Hawaii and the continental United States since the late 19th century. Topics include sugar plantations, development of rural Japanese America, World War II internment, post-War community development, and persistence of Japanese American identity.

Same as SOC SCI 178E.

**ASIANAM 151F. South Asian American Studies. 4 Units.**

Examines and compares the experiences of South Asian immigrants in the U.S. over time. Looks at the economic, political, and social positions of the immigrants, with special emphasis on religious changes and the changes in the second and later generations.

Same as SOC SCI 178F.

Restriction: Asian American Studies Majors have first consideration for enrollment. Social Policy/Public Service Majors have first consideration for enrollment.

**ASIANAM 151H. Southeast Asian American Studies. 4 Units.**

Analyzes experiences of refugees and immigrants from Southeast Asia, which may include those from Cambodia, Laos, Vietnam, and the Philippines. Examines political and economic factors for their exodus and how they reconstruct their identities, histories, and communities.

Same as SOC SCI 178H.

**ASIANAM 151J. Chinese American Studies. 4 Units.**

Analyzes the experiences of Chinese in the United States. Immigration, Chinese exclusion, racial and gender identity. Historical overview and contemporary issues covered.

Same as SOC SCI 178J.

**ASIANAM 151K. Filipina/Filipino American Studies. 4 Units.**

Explores the experience of Filipina/Filipino Americans from the era of Spanish colonization of the Philippines to present-day community formations in the United States, with special emphasis on the 20th century. Topics include colonialism, nation, migration, gender, and culture.

Same as SOC SCI 178K.

**ASIANAM 162. Asian American Women. 4 Units.**

Examines the representations and experiences of Asian American women from diverse perspectives. Explores the commonalities and differences among various groups of Asian American women, with particular focus on history, culture, values, and family roles.

Same as SOC SCI 177B.

**ASIANAM 164. Topics in Intersectionality. 4 Units.**

Topics include intersectional analysis of various themes related to ethnicity, gender, sexuality, and race within Asian American communities.

Repeatability: Unlimited as topics vary.

**ASIANAM 166. Race and Citizenship. 4 Units.**

Explores historical and contemporary patterns of racialization in relation to citizenship. Topics may include racial categorization, immigration, and comparative racialization.

**ASIANAM 167. Asian American and African American Relations. 4 Units.**

Addresses relationships of Asian American and African American communities in the United States. Topics include race, class, gender, labor, economic systems, political mobilization, community, civil rights, activism, cultural expression.

Same as AFAM 117, HISTORY 152B.

**ASIANAM 168. Politics of Animal Rights. 4 Units.**

Examines animal rights/welfare movement's efforts to transform moral, practical, and legal standing of nonhuman animals in contemporary U.S. Explores intersection of racism, sexism, and speciesism informed by theories of race and ethnicity, including Asian American Studies.

Same as POL SCI 126F.

Restriction: Political Science Majors have first consideration for enrollment. Asian American Studies Majors have first consideration for enrollment.

**ASIANAM 199. Independent Study. 1-4 Units.**

Directed reading and research in consultation with a faculty member. Substantial written work required.

Repeatability: May be repeated for credit unlimited times.

**ASIANAM 200A. Theory and Methods in Asian American Studies. 4 Units.**

Introduction to the intersection of the social sciences, humanities, and other fields that constitute the theory and methodology of Asian American Studies. Focuses on the interventions and contestations within Asian American Studies that have transformed the discipline in recent years.

Restriction: Graduate students only.

**ASIANAM 200B. Contemporary Issues in Asian American Studies. 4 Units.**

Examines the interrelations between history, theory, and race in the aftermath of the twentieth-century decolonial movements, offering an account of race through postcolonial and postnationalist approaches in comparative contexts. Considers the interventions made by transnational feminist and racialized queer critiques.

Restriction: Graduate students only.

**ASIANAM 200C. Leadership and Social Change in Asian American Communities. 4 Units.**

Introduces students to models of community-engaged learning and leadership that are central to the field of Asian American studies. Designed to expose students to histories and models of organizing in Asian American communities and forms of community-based research.

Restriction: Graduate students only.

**ASIANAM 200D. Introduction to Asian American Studies Research. 4 Units.**

Introduces students to research topics and methods within the field of Asian American studies. Aims to expose students to core and affiliated faculty to help them identify possible advisors for master's research projects or members of doctoral committees.

Restriction: Graduate students only.

**ASIANAM 201. Graduate Topics in Asian American Studies. 4 Units.**

Seminars on various topics in Asian American Studies.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ASIANAM 250. Advanced Topics in Asian American Studies. 4 Units.**

Seminar covering various areas of research within Asian American Studies as an interdisciplinary field. Recommended for advanced graduate students.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ASIANAM 290. Directed Research. 4-12 Units.**

Directed graduate study/research in Asian American Studies.

Repeatability: May be taken for credit for 24 units.

Restriction: Graduate students only.

**ASIANAM 291. Directed Reading. 4 Units.**

Readings focused on specialized topics in consultation with, and with the consent of, a faculty member.

Repeatability: May be taken for credit for 12 units.

Restriction: Graduate students only.

**ASIANAM 399. University Teaching. 4 Units.**

Limited to teaching assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Emphasis in Asian American Studies graduate students only.

## Chinese Courses

### **CHINESE 1A. Fundamental Mandarin Chinese. 5 Units.**

Natural approach emphasizing four fundamental skills: listening, speaking, reading and writing. Specifically designed for students with no previous experience in any dialect of Chinese. Conducted in Mandarin Chinese using the Pinyin system of Romanization, traditional and simplified Chinese characters.

Prerequisite: Placement into CHINESE 1A is also accepted.

Overlaps with CHINESE S1AB, CHINESE 1MA, CHINESE 1DA.

Restriction: CHINESE 1A and CHINESE 1DA and CHINESE 1MA and CHINESE S1AB may not be taken for full credit.

### **CHINESE 1B. Fundamental Mandarin Chinese. 5 Units.**

Natural approach emphasizing four fundamental skills: listening, speaking, reading and writing. Specifically designed for students with no previous experience in any dialect of Chinese. Conducted in Mandarin Chinese using the Pinyin system of Romanization, traditional and simplified Chinese characters.

Prerequisite: CHINESE 1A. CHINESE 1A with a grade of C or better. Placement into CHINESE 1B is also accepted.

Overlaps with CHINESE S1AB, CHINESE S1BC, CHINESE 1MB, CHINESE 1DB.

Restriction: CHINESE 1B and CHINESE 1DB and CHINESE 1MB and CHINESE S1AB and CHINESE S1BC may not be taken for full credit.

### **CHINESE 1C. Fundamental Mandarin Chinese. 5 Units.**

Natural approach emphasizing four fundamental skills: listening, speaking, reading and writing. Specifically designed for students with no previous experience in any dialect of Chinese. Conducted in Mandarin Chinese using the Pinyin system of Romanization, traditional and simplified Chinese characters.

Prerequisite: CHINESE 1B or CHINESE S1AB. CHINESE 1B with a grade of C or better. CHINESE S1AB with a grade of C or better. Placement into CHINESE 1C is also accepted.

Overlaps with CHINESE 1DC, CHINESE 1MC, CHINESE S1BC.

Restriction: CHINESE 1C and CHINESE 1DC and CHINESE 1MC and CHINESE S1BC may not be taken for full credit.

## **(VI)**

### **CHINESE 1MA. Fundamentals of Mandarin Chinese - Mandarin Background Track. 5 Units.**

Natural approach emphasizing four fundamental skills: listening, speaking, reading and writing. Specifically designed for students with previous background in Mandarin Chinese. Conducted in Mandarin Chinese using the Pinyin system of Romanization, traditional and simplified Chinese characters.

Prerequisite: Placement into CHINESE 1MA.

Overlaps with CHINESE 1DA, CHINESE 1A, CHINESE S1AB.

Restriction: CHINESE 1MA and CHINESE 1DA and CHINESE 1A and CHINESE S1AB may not be taken for full credit.

### **CHINESE 1MB. Fundamentals of Mandarin Chinese - Mandarin Background Track. 5 Units.**

Natural approach emphasizing four fundamental skills: listening, speaking, reading and writing. Specifically designed for students with previous background in Mandarin Chinese. Conducted in Mandarin Chinese using the Pinyin system of Romanization, traditional and simplified Chinese characters.

Prerequisite: CHINESE 1MA. CHINESE 1MA with a grade of C or better. Placement into CHINESE 1MB is also accepted.

Overlaps with CHINESE 1B, CHINESE 1DB, CHINESE S1AB, CHINESE S1BC.

Restriction: CHINESE 1MB and CHINESE 1DB and CHINESE 1B and CHINESE S1AB and CHINESE S1BC may not be taken for full credit.

**CHINESE 1MC. Fundamentals of Mandarin Chinese - Mandarin Background Track. 5 Units.**

Natural approach emphasizing four fundamental skills: listening, speaking, reading and writing. Specifically designed for students with previous background in Mandarin Chinese. Conducted in Mandarin Chinese using the Pinyin system of Romanization, traditional and simplified Chinese characters.

Prerequisite: CHINESE 1MB. CHINESE 1MB with a grade of C or better. Placement into CHINESE 1MC is also accepted.

Overlaps with CHINESE 1C, CHINESE 1DC, CHINESE S1BC.

Restriction: CHINESE 1MC and CHINESE 1DC and CHINESE 1C and CHINESE S1BC may not be taken for full credit.

**(VI)**

**CHINESE S1AB. Fundamentals of Mandarin Chinese. 7.5 Units.**

First half of first-year Mandarin Chinese in an intensive setting using natural approach with emphasis on listening, speaking, reading, and writing.

Prerequisite: Placement into CHINESE 1A or CHINESE 1B or CHINESE 1MA or CHINESE 1MB.

Overlaps with CHINESE 1A, CHINESE 1B, CHINESE 1MA, CHINESE 1MB.

**CHINESE S1BC. Fundamentals of Mandarin Chinese. 7.5 Units.**

Second half of first-year Mandarin Chinese in an intensive setting using natural approach with emphasis on listening, speaking, reading, and writing.

Prerequisite: CHINESE S1AB or CHINESE 1B or CHINESE 1DB or CHINESE 1MB. CHINESE S1AB with a grade of C or better. CHINESE 1B with a grade of C or better. CHINESE 1DB with a grade of C or better. CHINESE 1MB with a grade of C or better. Placement into CHINESE 1C or CHINESE 1DC or CHINESE 1MC is also accepted.

Overlaps with CHINESE 1C, CHINESE 1B, CHINESE 1DB, CHINESE 1DC, CHINESE 1MB, CHINESE 1MC.

Restriction: CHINESE S1BC, CHINESE 1B, CHINESE 1C, CHINESE 1DB or CHINESE 1DC, CHINESE 1MB or CHINESE 1MC and may not be taken for full credit.

**(VI)**

**CHINESE 2A. Intermediate Mandarin Chinese. 5 Units.**

Both authentic and pedagogically-prepared materials are used to further develop students' ability to communicate in culturally, socially, and linguistically appropriate manners. Taught in Chinese using Pinyin romanization system and both traditional and simplified forms of Chinese.

Prerequisite: CHINESE 1C or CHINESE S1BC or CHINESE 1MC. CHINESE 1C with a grade of C or better. CHINESE S1BC with a grade of C or better. CHINESE 1MC with a grade of C or better. Placement into CHINESE 2A is also accepted.

Overlaps with CHINESE 2DA, CHINESE 2MA.

**(VIII)**

**CHINESE 2B. Intermediate Mandarin Chinese. 5 Units.**

Both authentic and pedagogically-prepared materials are used to further develop students' ability to communicate in culturally, socially, and linguistically appropriate manners. Taught in Chinese using Pinyin romanization system and both traditional and simplified forms of Chinese.

Prerequisite: CHINESE 2A. CHINESE 2A with a grade of C or better. Placement into CHINESE 2B is also accepted.

Overlaps with CHINESE 2DB, CHINESE 2MB.

Restriction: CHINESE 2B and CHINESE 2DB and CHINESE 2MB may not be taken for full credit.

**(VIII)**

**CHINESE 2C. Intermediate Mandarin Chinese. 5 Units.**

Both authentic and pedagogically-prepared materials are used to further develop students' ability to communicate in culturally, socially, and linguistically appropriate manners. Taught in Chinese using Pinyin romanization system and both traditional and simplified forms of Chinese.

Prerequisite: CHINESE 2B. CHINESE 2B with a grade of C or better. Placement into CHINESE 2C is also accepted.

Overlaps with CHINESE 2DC, CHINESE 2MC.

Restriction: CHINESE 2C and CHINESE 2DC and CHINESE 2MC may not be taken for full credit.

**(VIII)**



**CHINESE 2MA. Intermediate Mandarin Chinese - Mandarin Background Track. 5 Units.**

Authentic and pedagogically prepared materials are used to further develop communication in culturally, socially, and linguistically appropriate manners for students with initial experience in Mandarin Chinese. Conducted in Mandarin using the Pinyin Romanization system, traditional and simplified Chinese characters.

Prerequisite: CHINESE 1MC or CHINESE S1BC. CHINESE 1MC with a grade of C or better. CHINESE S1BC with a grade of C or better. Placement into CHINESE 2MA is also accepted.

Overlaps with CHINESE 2A, CHINESE 2DA.

Restriction: CHINESE 2MA and CHINESE 2DA and CHINESE 2A may not be taken for full credit.

**(VIII)****CHINESE 2MB. Intermediate Mandarin Chinese - Mandarin Background Track . 5 Units.**

Authentic and pedagogically prepared materials are used to further develop communication in culturally, socially, and linguistically appropriate manners for students with initial experience in Mandarin Chinese. Conducted in Mandarin using the Pinyin Romanization system, traditional and simplified Chinese characters.

Prerequisite: CHINESE 2MA. CHINESE 2MA with a grade of C or better. Placement into CHINESE 2MB is also accepted.

Overlaps with CHINESE 2B, CHINESE 2DB.

Restriction: CHINESE 2MB and CHINESE 2DB and CHINESE 2B may not be taken for full credit.

**(VIII)****CHINESE 2MC. Intermediate Mandarin Chinese - Mandarin Background Track . 5 Units.**

Authentic and pedagogically prepared materials are used to further develop communication in culturally, socially, and linguistically appropriate manners for students with initial experience in Mandarin Chinese. Conducted in Mandarin using the Pinyin Romanization system, traditional and simplified Chinese characters.

Prerequisite: CHINESE 2MB. CHINESE 2MB with a grade of C or better. Placement into CHINESE 2MC is also accepted.

Overlaps with CHINESE 2C, CHINESE 2DC.

Restriction: CHINESE 2MC and CHINESE 2DC and CHINESE 2C may not be taken for full credit.

**(VIII)****CHINESE 3A. Advanced Mandarin Chinese. 4 Units.**

A continuation of CHINESE 2A-CHINESE 2B-CHINESE 2C emphasizing conceptualization, self-expression and academic skills in Chinese. Authentic texts from modern Chinese prose and newspapers are used. Taught in Mandarin Chinese using both traditional and simplified forms of Chinese characters.

Prerequisite: CHINESE 2C or CHINESE 2DC or CHINESE 2MC. CHINESE 2C with a grade of C or better. CHINESE 2DC with a grade of C or better. CHINESE 2MC with a grade of C or better. Placement into CHINESE 3A is also accepted.

**(VIII)****CHINESE 3B. Advanced Mandarin Chinese. 4 Units.**

A continuation of CHINESE 2A-CHINESE 2B-CHINESE 2C emphasizing conceptualization, self-expression, and academic skills in Chinese. Authentic texts from modern Chinese prose and newspapers are used. Taught in Mandarin Chinese using both traditional and simplified forms of Chinese characters.

Prerequisite: CHINESE 3A. CHINESE 3A with a grade of C or better

**(VIII)****CHINESE 3C. Advanced Mandarin Chinese. 4 Units.**

A continuation of CHINESE 2A-CHINESE 2B-CHINESE 2C emphasizing conceptualization, self-expression, and academic skills in Chinese. Authentic texts from modern Chinese prose and newspapers are used. Taught in Mandarin Chinese using both traditional and simplified forms of Chinese characters.

Prerequisite: CHINESE 3B. CHINESE 3B with a grade of C or better

**(VIII)**

**CHINESE 10. Peer Tutoring Program . 1 Workload Unit.**

Tutoring Program in which advanced Chinese students provide assistance to students at a lower level. One hour of tutoring per week.

Grading Option: Workload Credit P/NP Only.

Repeatability: May be taken for credit 4 times.

**CHINESE 40. Topics in Professional Chinese. 4 Units.**

Designed for students with native or near native fluency in Chinese. Develops students' language learning to professional levels with cultural and contextual knowledge and with formal communication and presentation skills.

Prerequisite: CHINESE 3C. CHINESE 3C with a grade of C or better. Native speakers also accepted.

Repeatability: May be taken for credit 3 times as topics vary.

**(VIII)**

**CHINESE 100A. Classical Chinese. 4 Units.**

Introduction to classical Chinese grammar and vocabulary with emphasis on reading basic texts.

Prerequisite: CHINESE 3C or JAPANESE 3C or KOREAN 3C

**CHINESE 100B. Classical Chinese. 4 Units.**

Introduction to classical Chinese grammar and vocabulary with emphasis on reading basic texts.

Prerequisite: CHINESE 3C or JAPANESE 3C or KOREAN 3C

**CHINESE 100C. Classical Chinese. 4 Units.**

Introduction to classical Chinese grammar and vocabulary with emphasis on reading basic texts.

Prerequisite: CHINESE 3C or JAPANESE 3C or KOREAN 3C

**CHINESE 101A. Fourth-Year Mandarin Chinese. 4 Units.**

Continued emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation through intensive study and analysis of specific literary texts.

Prerequisite: CHINESE 3C

**CHINESE 101B. Fourth-Year Mandarin Chinese. 4 Units.**

Continued emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation through intensive study and analysis of specific literary texts.

Prerequisite: CHINESE 3C

**CHINESE 101C. Fourth-Year Mandarin Chinese. 4 Units.**

Continued emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation through intensive study and analysis of specific literary texts.

Prerequisite: CHINESE 3C

**CHINESE 115. Topics in Chinese Literature: Advanced Texts. 4 Units.**

Designed for students with near-fluency in reading Chinese. Readings may include both literary and philosophical work by important writers, but the emphasis is on literary texts and writings that interpret those texts.

Prerequisite: Consent of instructor required to enroll.

Repeatability: Unlimited as topics vary.

**CHINESE 199. Independent Study. 1-4 Units.**

Investigation of special topics through directed reading in Chinese. Paper required.

Repeatability: May be taken for credit for 12 units.

**CHINESE 201. Readings in Traditional Chinese Narrative and Prose. 4 Units.**

Close reading of selected premodern prose texts such as historical narratives, novels, short stories, and essays.

Prerequisite: CHINESE 101C

Repeatability: Unlimited as topics vary.

**CHINESE 202. Readings in Traditional Chinese Poetry. 4 Units.**

Close readings of selected premodern poetic texts.

Prerequisite: CHINESE 100C

Repeatability: Unlimited as topics vary.

**CHINESE 203. Readings in Modern Chinese Literature. 4 Units.**

Close readings of selected modern literary texts.

Prerequisite: CHINESE 101C

Repeatability: Unlimited as topics vary.

**CHINESE 204. Readings in Chinese Literary and Cultural Theory. 4 Units.**

Close readings of selected texts in premodern criticism and theory.

Prerequisite: CHINESE 100C

Repeatability: Unlimited as topics vary.

**CHINESE 211A. Studies in Traditional Chinese Narrative and Prose. 4 Units.**

Two-quarter seminar in traditional Chinese narrative and prose, with topics varying from year to year.

Prerequisite: CHINESE 100C

Repeatability: Unlimited as topics vary.

**CHINESE 211B. Studies in Traditional Chinese Narrative and Prose. 4 Units.**

Two-quarter seminar in traditional Chinese narrative and prose, with topics varying from year to year.

Prerequisite: CHINESE 211A

Repeatability: Unlimited as topics vary.

**CHINESE 212A. Studies in Traditional Chinese Poetry. 4 Units.**

Two-quarter seminar in traditional Chinese poetry, with topics varying from year to year.

Prerequisite: CHINESE 100C

Repeatability: Unlimited as topics vary.

**CHINESE 212B. Studies in Traditional Chinese Poetry. 4 Units.**

Two-quarter seminar in traditional Chinese poetry, with topics varying from year to year.

Prerequisite: CHINESE 212A

Repeatability: Unlimited as topics vary.

**CHINESE 213A. Studies in Modern Chinese Literature. 4 Units.**

Two-quarter seminar in modern Chinese literature, with topics varying from year to year. Research paper required.

Prerequisite: CHINESE 100C

Repeatability: Unlimited as topics vary.

**CHINESE 213B. Studies in Modern Chinese Literature. 4 Units.**

Two-quarter seminar in modern Chinese literature, with topics varying from year to year. Research paper required.

Prerequisite: CHINESE 213A

Repeatability: Unlimited as topics vary.

**CHINESE 214. Studies in Chinese Literature and Cultural Theory. 4 Units.**

Seminar in Chinese literature and cultural theory, with topics varying from year to year. Research paper required.

Prerequisite: CHINESE 100C or CHINESE 101C

Repeatability: Unlimited as topics vary.

**CHINESE 230. Topics in Chinese Literature and Culture. 4 Units.**

Seminar in Chinese literature and culture, with topics varying from year to year. Research paper required.

Prerequisite: CHINESE 100C or CHINESE 101A

Repeatability: Unlimited as topics vary.

**CHINESE 290. Independent Study. 4 Units.**

Directed research on topic determined in consultation with faculty member. A term paper or project is required.

Repeatability: May be repeated for credit unlimited times.

**CHINESE 299. Dissertation Research. 4-12 Units.**

Dissertation research with Chinese faculty.

Prerequisite: Advancement to Ph.D. candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## **Classics Courses**

**CLASSIC 10. Scientific and Specialized Terminology. 4 Units.**

A study of English terms derived from Greek and Latin and important to contemporary medicine, science, and other professions, with emphasis on development of word-building skills. No prior knowledge of Greek or Latin required.

**CLASSIC 36A. The Formation of Ancient Greek Society: Early Greece. 4 Units.**

A survey of ancient Greek civilization from its origins in the Bronze Age to the mid-Archaic period. Examines political and social history, as well as literature, art, religion, and archaeological remains.

Same as HISTORY 36A.

(IV)

**CLASSIC 36B. The Formation of Ancient Greek Society: Late Archaic and Classical Greece. 4 Units.**

A survey of ancient Greek civilization from the Late Archaic period to the Classical period. Focuses on major institutions and cultural phenomena as seen through the study of ancient Greek literature, history, archaeology, and religion.

Same as HISTORY 36B.

(IV)

**CLASSIC 36C. The Formation of Ancient Greek Society: Fourth-Century and Hellenistic Greece. 4 Units.**

A survey of ancient Greek civilization from the fourth century BCE through to the Hellenistic period. Focuses on major institutions and cultural phenomena as seen through the study of ancient Greek literature, history, archaeology, and religion.

Same as HISTORY 36C.

(IV)

**CLASSIC 37A. The Formation of Ancient Roman Society: Origins to Roman Republic. 4 Units.**

A survey of the development of Roman civilization from its eighth century BCE beginnings to the civil wars of the first century BCE. Examines political and social history, as well as literature, art, architecture, and religion.

Same as HISTORY 37A.

(IV)

**CLASSIC 37B. The Formation of Ancient Roman Society: Roman Empire. 4 Units.**

A survey of Roman civilization from Augustus's consolidation of power following the civil wars of the first century BCE to the crisis of the third century CE. Includes social history, literature, art, architecture, and religion.

Same as HISTORY 37B.

(IV)

**CLASSIC 37C. The Formation of Ancient Roman Society: The Fall of Rome. 4 Units.**

A survey of Roman civilization from the crisis of the third century CE to the so-called "fall of Rome" in 476 CE. Examines political and social history, as well as literature, art, architecture, and religion.

Same as HISTORY 37C.

(IV)

**CLASSIC 45A. Classical Mythology: The Gods. 4 Units.**

An overview of the main myths of the gods of the ancient Greeks and Romans and their influence in contemporary and later literature and art. Includes readings from both ancient and modern sources.

(IV)

**CLASSIC 45B. Classical Mythology: The Heroes. 4 Units.**

An overview of the main myths of the heroes of the ancient Greeks and Romans and their influence in contemporary and later literature and art. Includes readings from both ancient and modern sources.

(IV)

**CLASSIC 45C. Classical Mythology: Ancient and Modern Perspectives of Classical Mythology. 4 Units.**

Detailed examination of key Greek and Roman myths, their interpretations, and the influence they have exerted on literature, art, and popular culture in subsequent periods.

(IV)

**CLASSIC 99. Special Studies in Classics. 1-4 Units.**

Lower-division level independent research with Classics faculty.

Repeatability: May be repeated for credit unlimited times.

**CLASSIC 140. Classics and History: The Ancient World. 4 Units.**

Selected topics in society and culture of the Graeco-Roman world. Readings in translation.

Repeatability: Unlimited as topics vary.

**CLASSIC 150. Classical Mythology. 4 Units.**

Selected myths and legends as used in Classical literature, and their modern interpretations.

**CLASSIC 160. Topics in Classical Literature in English Translation. 4 Units.**

Studies in selected areas of Classical literature. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**CLASSIC 160W. Topics in Classical Literature in English Translation. 4 Units.**

Studies in selected areas of Classical literature. Topics addressed vary each quarter.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

(Ib)

**CLASSIC 166. Topics in Classical Reception. 4 Units.**

Studies in selected areas of Classical reception. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**CLASSIC 170. Topics in Classical Civilization. 4 Units.**

Studies in selected areas of Classical civilization. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**CLASSIC 176. International Studies and the Classics. 4 Units.**

Develops a broader understanding of the formation of different cultures and countries of Classical times and their impact on the modern world.

Repeatability: Unlimited as topics vary.

**CLASSIC 192A. Senior Capstone. 2 Units.**

Under the guidance of a faculty mentor, majors design and execute a senior project. This project may be a research paper, dramatic production, school curriculum, etc. All projects must be approved by the faculty mentor.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Grading Option: In Progress (Letter Grade with P/NP).

**CLASSIC 192B. Senior Capstone. 4 Units.**

Under the guidance of a faculty mentor, majors design and execute a senior project. This project may be a research paper, dramatic production, school curriculum, etc. All projects must be approved by the faculty mentor.

Prerequisite: CLASSIC 192A. Satisfactory completion of the Lower-Division Writing requirement.

**CLASSIC 198. Directed Group Study. 4 Units.**

Special topics in Classical studies through directed reading and research.

Repeatability: May be repeated for credit unlimited times.

**CLASSIC 199. Independent Study in Classics. 1-4 Units.**

Independent research with Classics faculty.

Repeatability: May be repeated for credit unlimited times.

**CLASSIC 280. Independent Study. 4-12 Units.**

Supervised independent research. Subject varies.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CLASSIC 290. Research in Classics. 4-12 Units.**

Research under Classics faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CLASSIC 299. Dissertation Research. 4-12 Units.**

Dissertation research with Classics faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CLASSIC 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Comparative Literature Courses

### **COM LIT 3. Just Reading: Developing the Reading Experience . 4 Units.**

Develops the reading experience apart from writing. Develops tools for sustained attention in reading practice across a wide range of genres and media from across the globe. Students learn to appreciate elements of reading experience such as attention and perplexity.

(IV and VIII ).

### **COM LIT 8. Travels in Comparative Literature. 4 Units.**

Readings in English and in English translation on such topics as love, war, cities, travel writing, politics, fantasy and science fiction, violence.

Repeatability: Unlimited as topics vary.

(IV)

### **COM LIT 9. Introduction to Multiculturalism. 4 Units.**

Various themes and forms of literary and cultural production within a multicultural framework, including African American, Asian American, Chicano/Latino, and Native American literatures and cultures.

Repeatability: Unlimited as topics vary.

(IV, VII)

### **COM LIT 10. Topics in World Literature. 4 Units.**

Introduction to texts from across the globe and from different historical periods. Readings in English and English translation.

Repeatability: Unlimited as topics vary.

(IV and VIII ).

### **COM LIT 60A. World Literature. 4 Units.**

An introduction to the comparative study of literatures and cultures in a global context. Studies literary texts and other media across the borders of various cultures, historical periods, and traditions. All texts are read in English translation.

(IV and VIII ).

### **COM LIT 60B. Reading with Theory. 4 Units.**

Introduction to theory and methods of literary and cultural criticism in a global context. Students read theoretical approaches to literature, culture, and ideas. Marx and Freud, e.g., may be studied alongside readings in narrative poetry, film, song lyrics, novel.

(IV, VIII)

### **COM LIT 60C. Cultural Studies. 4 Units.**

Introduces students to a variety of cultural practices (literature, blogs, films, radio, comics) from across the globe. Focuses on the ways that context, genre, and medium (e.g., written, visual, oral) affect how these practices are produced, circulated, and received.

(IV, VIII)

### **COM LIT 100A. Nations, Regions, and Beyond. 4 Units.**

Intensive study of national and regional cultural and literary traditions from across the globe, among them the literary and cultural production of the Middle East, Africa, Europe, the Americas, and Asia.

Repeatability: Unlimited as topics vary.

### **COM LIT 101W. An Introduction to Translation Studies. 4 Units.**

Focuses on theories of translation and on how these theories help students understand the role of translation in the world. Students develop a critical vocabulary for discussing translation in multiple linguistic traditions and complete a final translation project.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

### **COM LIT 102. Comparative Studies in Literature and Theory. 4 Units.**

In-depth discussion of special topics.

Repeatability: Unlimited as topics vary.

**COM LIT 102W. Comparative Studies in Literature and Theory. 4 Units.**

In-depth discussion of special topics.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**(Ib)**

**COM LIT 105. Topics in Comparative Multiculturalism. 4 Units.**

Treats the literatures and cultures of one or more minority groups in California and the United States, including African Americans, Asian Americans, Chicano/Latinos, and Native Americans, and their relations to other national literatures.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Repeatability: May be repeated for credit unlimited times.

**COM LIT 107. Colonialisms and Postcolonialisms. 4 Units.**

Explores topics such as colonialism and race, decolonization, pre- and postcoloniality, globalization, and the cultural dynamics of colonization and subjectivity.

Repeatability: Unlimited as topics vary.

**COM LIT 108. Diasporic Literatures and Cultures. 4 Units.**

Literatures, cultures, and histories of diasporic groups, e.g., literature of the Persian diaspora; cinema of the African diaspora.

Repeatability: Unlimited as topics vary.

**COM LIT 120. Philosophy, Culture, and Literature. 4 Units.**

Discusses contemporary and historical philosophical questions and figures--for example, existentialism or debates about artificial intelligence--in interaction with culture and literature.

Repeatability: Unlimited as topics vary.

**COM LIT 121. Narrative, Pattern, and Text. 4 Units.**

Explores textual patterns, structures, and effects. May include topics such as novel, hypertext, genre, reader responses, intertextuality.

Repeatability: Unlimited as topics vary.

**COM LIT 122. Rhetorical Approaches to Literature. 4 Units.**

Studies the art and politics of rhetoric and persuasion in connection with cultural works from various times and places, for example, classical political speeches, Internet journalism.

Repeatability: Unlimited as topics vary.

**COM LIT 123. Literatures in Dialogue. 4 Units.**

Studies how texts interact across time and space in a global context. Uses concepts of influence, imitation, and parody, to ask, for example, how the Homeric epics can help us understand Caribbean novels and U.S. movies such as *Troy*.

Repeatability: Unlimited as topics vary.

**COM LIT 130. Gender, Sexuality, Race, Class. 4 Units.**

Discusses the roles of differences such as race, class, gender, and sexuality in society, culture, and literature across the globe, covering topics such as theoretical and literary representations of queer sexuality, gender performance, critical race theory.

Repeatability: Unlimited as topics vary.

**COM LIT 131. Psychoanalysis and Culture. 4 Units.**

Discusses major psychoanalytic writings of Freud and others in connection with questions of culture.

Repeatability: Unlimited as topics vary.

**COM LIT 132. Discourse, Ideologies, and Politics. 4 Units.**

Compares ideologies and systems, e.g., nationalism and fundamentalism, as they affect literature and culture in a global context.

Repeatability: Unlimited as topics vary.



**COM LIT 140. Critical Cultural Studies. 4 Units.**

Introduces a variety of ways of understanding cultural phenomena in relation to different power structures. These cultural phenomena may include comics, film, literature, sports, music, festivals, telling stories, or eating out.

Repeatability: Unlimited as topics vary.

**COM LIT 141. Topics in Popular Culture . 4 Units.**

Critical analyses of popular culture such as comics, oral narratives, films, TV, and music in an international framework.

Repeatability: Unlimited as topics vary.

**COM LIT 142. The Metropolis and Other Cultural Geographies. 4 Units.**

Examines the relationship between space and culture; cultural production in the city, suburb, and/or countryside; spaces in texts and artifacts (film, literature, comics, photographs) in a global context.

Repeatability: Unlimited as topics vary.

**COM LIT 143. Literature, Arts, and Media. 4 Units.**

Explores literature and other arts and media in a global context. May include film and electronic media, fine arts, oral cultures, architecture, in an international framework.

Repeatability: Unlimited as topics vary.

**COM LIT 144. Literature, History, and Society. 4 Units.**

Explores the relationship between literary texts and their historical and social contexts in an international framework. Courses may address, for example, literary and cultural expressions in social revolutions or the way literary texts talk back to medicine, religion, and anthropology.

Repeatability: Unlimited as topics vary.

**COM LIT 150. Literature in Translation. 4 Units.**

The study of literary works in one or more genres in English translation. May be a comparative study of works from several different original languages or a concentration on works from a single cultural/linguistic tradition.

Repeatability: Unlimited as topics vary.

**COM LIT 160. World Cinema . 4 Units.**

Comparative analysis of contemporary film in languages other than English.

Repeatability: May be taken for credit 2 times as topics vary.

**COM LIT 190W. Advanced Seminar in Comparative Literature and Theory. 4 Units.**

Capstone seminar for the Comparative Literature major. Deepens understanding of the field through investigation of a special topic and a substantial research and writing project.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: School of Humanities students only.

**(Ib)****COM LIT 199. Independent Study in Comparative Literature. 1-4 Units.**

To be taken only when the materials to be studied lie outside the normal run of departmental offerings.

Repeatability: May be repeated for credit unlimited times.

**COM LIT 200A. History of Comparative Literature and Introduction to Methods and Theories of CL. 4 Units.**

Seminar designed to introduce graduate students in Comparative Literature to the discipline of Comparative Literature. Issues and theories of comparative literary and cultural study are covered. Strongly recommended for first and second year students before the M.A. exam and review.

Restriction: Graduate students only.

**COM LIT 200B. Theories of Translation. 4 Units.**

The reproduction, translation, and transfer of literary and cultural, ideological and political, and symbolic codes and texts have long been the object of study in Comparative Literature. Addresses the diverse ways in which expressive systems interact and intersect.

Repeatability: Unlimited as topics vary.

**COM LIT 200C. Theories of Globalization, Inter-Nationalism, and Postcolonialism. 4 Units.**

Addresses both theories and the complex history of literary and cultural expression in a national, trans-, inter-, and post-national, global frame. Topics may include: globalism and nationhood, theories of citizenship and political subjecthood, postcolonial literature and theory.

Repeatability: Unlimited as topics vary.

**COM LIT 210. Comparative Studies . 4 Units.**

Studies in selected areas of Comparative Literature. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**COM LIT 220. Translation Workshop. 2-4 Units.**

Trains students in the methodologies and practice of translation. Students focus on the translating process in a series of case studies and individual projects.

Repeatability: May be taken for credit for 8 units.

**COM LIT 280A. Professionalization Seminar. 2 Units.**

The first of two required professionalization seminars in Comparative Literature. Intended for second and third year students and covers preparation for the M.A. and Ph.D. exams, conference presentations, teaching and classroom management, and publishing journals.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**COM LIT 280B. Professionalization Seminar. 2 Units.**

The second of two required professionalization seminars in Comparative Literature. Intended for fourth and fifth year students and covers course design, applying for grants, dissertation prospectus and support, and the job application process.

Prerequisite: COM LIT 280A. COM LIT 280A with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**COM LIT 290. Reading and Conference. 4-12 Units.**

Studies in selected areas. Topics addressed vary each quarter.

Repeatability: May be repeated for credit unlimited times.

**COM LIT 291. Guided Reading Course. 4 Units.**

Studies in selected areas. Topics addressed vary each quarter.

Repeatability: May be repeated for credit unlimited times.

**COM LIT 292. Teaching Practicum . 2 Units.**

Graduate students develop their pedagogical practices by accompanying a professor teaching a UCI undergraduate class. Meets individually with the professor to discuss relevant pedagogical practices, syllabus design, lecturing, assessment, classroom management, etc. Actively participates in one teaching component.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**COM LIT 299. Dissertation Research. 4-12 Units.**

A units-only course for students in the dissertation phase.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**COM LIT 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**Criticism/English Courses****CRITISM 200A. Political Economy: Methods and Critique. 4 Units.**

Introduction to canonical texts in Marxism coupled with an examination of the questions of race, gender, ethnicity, and sexuality that distend the calculus of the canon's assumptive logic. May be taken after CLT&THY 200B.

Same as CLT&THY 200A.

Restriction: Graduate students only.

**CRITISM 220B. Studies in Literary Theory and Its History. 4 Units.**

Introduction to criticism and aesthetics for beginning graduate students. Readings from continental, English, and American theorists.

Same as HUMAN 220B.

Restriction: Graduate students only.

**CRITISM 240. Advanced Theory Seminar. 4 Units.**

Studies in selected areas of Criticism Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**Culture and Theory Courses****CLT&THY 200A. Political Economy: Methods and Critique. 4 Units.**

Introduction to canonical texts in Marxism coupled with an examination of the questions of race, gender, ethnicity, and sexuality that distend the calculus of the canon's assumptive logic. May be taken after CLT&THY 200B.

Same as CRITISM 200A.

Restriction: Graduate students only.

**CLT&THY 200B. Libidinal Economy: Methods and Critique. 4 Units.**

Introduction to canonical texts in psychoanalysis coupled with an examination of the questions of race, gender, ethnicity, and sexuality that distend the calculus of the canon's assumptive logic. May be taken before CLT&THY 200A.

Restriction: Graduate students only.

**CLT&THY 200C. Theory from Below. 4 Units.**

Introduction to systems of thought understudied or undervalued in academic canons--for instance, systems constituted in communities' practices or theories that do not seek permanence or generality.

Prerequisite: CLT&THY 200A and CLT&THY 200B

Restriction: Graduate students only.

**CLT&THY 241. Ethics, Erotics, and Will: Gendered Black Politics, Sexualized Racisms, and the Humanities. 4 Units.**

Introduces doctoral students to an interdisciplinary conversation about black queer sexuality and black heteropatriarchy. Uses disciplinary formations as a tool for understanding knowledge formations about the shifting relations that constitute sexuality, gender, and racial blackness.

Restriction: Graduate students only.

**CLT&THY 242. Afro-Pessimism and the Status of the Subject. 4 Units.**

Afro-Pessimism theorizes the Black as a being against which all other beings become legible as human subjects. Focuses on either the subject of psychoanalysis or the subject of capital accumulation in their explorations of the antagonism between Blackness.

Restriction: Graduate students only.

**CLT&THY 280. Independent Study. 4 Units.**

Limited to students who have not yet received the M.A. degree.

Repeatability: May be repeated for credit unlimited times.

**CLT&THY 289. Topics in Culture and Theory. 4 Units.**

Seminars on various topics in Culture and Theory.

Repeatability: Unlimited as topics vary.

**CLT&THY 298. Directed Reading. 4-12 Units.**

Directed readings on a specific topic agreed upon by students and their instructors. Limited to students who have completed their M.A. degree and are preparing for their qualifying exam.

Prerequisite: Completion of the M.A. degree.

Repeatability: May be repeated for credit unlimited times.

**CLT&THY 299. Dissertation Research. 4-12 Units.**

Dissertation research in Culture and Theory.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## **East Asian Studies Courses**

**EAS 15C. Introductory Topics in Chinese Literature. 4 Units.**

Introduces students to major themes in Chinese literature and culture through the close reading, discussion, and analysis of selected texts in English translation.

Repeatability: Unlimited as topics vary.

Restriction: Korean Literature and Culture Majors only. Chinese Studies Majors only. Japanese Language Literature Majors only. East Asian Cultures Majors only.

**EAS 15J. Introductory Topics in Japanese Literature. 4 Units.**

Introduces students to major themes in Japanese literature and culture through the close reading, discussion, and analysis of selected texts in English translation.

Repeatability: Unlimited as topics vary.

Restriction: Korean Literature and Culture Majors only. Chinese Studies Majors only. Japanese Language Literature Majors only. East Asian Cultures Majors only.

**EAS 15K. Introductory Topics in Korean Literature. 4 Units.**

Introduces students to major themes in Korean literature and culture through the close reading, discussion, and analysis of selected texts in English translation.

Repeatability: Unlimited as topics vary.

Restriction: Korean Literature and Culture Majors only. Chinese Studies Majors only. Japanese Language Literature Majors only. East Asian Cultures Majors only.

**EAS 20. Topics in Asian Religions . 4 Units.**

An introduction to Asian religions (Hinduism, Buddhism, Confucianism, Taoism, Shamanism) including both elite doctrinal aspects and forms of more popular religiosity.

Repeatability: May be taken for credit 3 times as topics vary.

**(IV and VIII ).**

**EAS 40. Topics in East Asian Popular Culture. 4 Units.**

Selected topics in the popular cultural traditions of East Asia designed to introduce students both to problems in situating culture in a specific time and place and to contemporary theories of popular culture and their application to East Asian contexts.

Repeatability: Unlimited as topics vary.

(IV and VIII ).

**EAS 55. Introduction to East Asian Cultures . 4 Units.**

Interdisciplinary courses organized each year around a broad theme designed to introduce students to the cultures of East Asia. Topical organization of courses addresses issues that have been of importance historically and are reshaping East Asia today.

Repeatability: May be taken for credit 3 times as topics vary.

(IV and VIII ).

**EAS H84. Traveling East/West. 4 Units.**

Traveling East/West presents a wide range of travel writings by Chinese, Indian, and Euro-American authors in which they contemplate the complexities of cross-cultural encounters and how knowledge about others and knowledge of ourselves are closely intertwined.

Same as HUM H84.

Restriction: Campuswide Honors Collegium students only.

(IV)

**EAS 110. Topics in Chinese Literature and Society. 4 Units.**

Studies in Chinese texts in their social and cultural context(s). Conducted in English.

Repeatability: May be taken for credit 3 times as topics vary.

**EAS 116. Topics in East Asian Religions. 4 Units.**

Selected topics in the religions of East Asia, e.g., Buddhism, Daoism, Shintô, Christianity, popular religions.

Repeatability: May be taken for credit 3 times as topics vary.

**EAS 117. Topics in East Asian Philosophy. 4 Units.**

Selected topics in the philosophies of East Asia, e.g., Yoga, Buddhism, Vedanta, Confucianism, Taoism, and Shinto.

Repeatability: Unlimited as topics vary.

**EAS 120. Topics in Japanese Literature and Society. 4 Units.**

Studies in Japanese texts in their social and cultural context(s). Conducted in English.

Repeatability: May be taken for credit 3 times as topics vary.

**EAS 123. Structure of Japanese. 4 Units.**

An overview of the linguistic features of modern Japanese. Provides students with a systematic introduction to the nature and characteristics of the language.

Same as LSCI 165B.

**EAS 126. Topics in East Asian Linguistics. 4 Units.**

In-depth examination of selected topics in the linguistics of East Asian languages, including Chinese, Japanese, Korean, and Vietnamese.

Repeatability: May be taken for credit 3 times as topics vary.

**EAS 130. Topics in Korean Society and Culture. 4 Units.**

Studies of the social and cultural forces that affect the lives of the Koreans, including those in the United States. Considers traditional values and contemporary issues within a historical framework.

Repeatability: May be taken for credit 3 times as topics vary.

**EAS 140. Topics in Korean Literature and Society. 4 Units.**

Studies in Korean texts in their social and cultural context(s). Conducted in English.

Repeatability: May be taken for credit 3 times as topics vary.

**EAS 150. Topics in East Asian Literature in Translation. 4 Units.**

East Asian literary works in translation. Taught in English.

Repeatability: Unlimited as topics vary.

**EAS 155. Topics in Cultural Studies in East Asia. 4 Units.**

Interdisciplinary and theoretical introduction to issues in cultural studies that are pertinent to the study of East Asia. All readings in English.

Repeatability: Unlimited as topics vary.

**EAS 160. Topics in East Asian Cinema. 4 Units.**

Study of East Asian cinema from historical, theoretical, and comparative perspectives. Taught in English.

Repeatability: Unlimited as topics vary.

**EAS 170. Topics in Gender in East Asia . 4 Units.**

Explores the construction of gender in East Asian cultures and literatures. Pays close attention to the specificity of historical, cultural, and literary contexts of East Asia as it investigates various theoretical and critical perspectives on gender and sexuality.

Repeatability: Unlimited as topics vary.

**EAS 190. Junior-Senior Colloquium. 4 Units.**

Specialized courses dealing with primary sources; required reports and papers. Each colloquium reflects the instructor's intellectual interest and is conducted as a discussion group. Limited to 15 students.

Repeatability: May be taken for credit 3 times as topics vary.

Restriction: Upper-division students only. Korean Literature and Culture Majors only. Chinese Studies Majors only. Japanese Language Literature Majors only. East Asian Cultures Majors only.

**EAS 192W. Junior-Senior Seminar. 4 Units.**

Analysis of a literary or cultural topic or problem through research and writing of two short and one long research paper for a minimum of 4,000 total words. Seminar follows EAS 190; related to the colloquium's subject.

Prerequisite: EAS 190. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 3 times as topics vary.

**(Ib)**

**EAS 199. Independent Study. 1-4 Units.**

Investigation of special topics through directed reading in translation. Paper required.

Repeatability: May be taken for credit for 12 units.

**EAS 216. Topics in East Asian Religions . 4 Units.**

Selected topics in the religions of East Asia, e.g., Buddhism, Daoism, Shintô, Islam, shamanism.

Repeatability: May be taken for credit 3 times as topics vary.

**EAS 220. Topics in East Asian Cultural Studies. 4 Units.**

Seminar, with topics varying from year to year. Research paper required.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EAS 225. Topics in East Asian Applied Linguistics. 4 Units.**

In-depth examination of selected topics in applied linguistics, with a particular emphasis on language acquisition and language pedagogy.

Repeatability: May be taken for credit 3 times as topics vary.

Concurrent with EALL 125.

**EAS 260. Topics in East Asian Cinema. 4 Units.**

An examination of the possibilities of East Asian cinematic narrative. Possible topics: cinematic history; cinema in popular culture; comparisons with literary texts; major auteurs. Emphasis on technical as well as on thematic aspects. Includes readings in film theory.

Prerequisite: EAS 160

Repeatability: Unlimited as topics vary.

**EAS 290. Independent Study. 2-4 Units.**

Directed research on topic determined in consultation with faculty member. A term paper or project is required.

Repeatability: May be repeated for credit unlimited times.

**EAS 299. Dissertation Research. 4-12 Units.**

Dissertation research for students who are advanced to doctoral candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**EAS 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## English Courses

**ENGLISH 8. Multicultural American Literature. 4 Units.**

Writings from at least two historically underrepresented groups in California and the United States with particular attention to historical conditions of literary production. Considers in-depth how literary works relate to racial constructions, economic conditions, and/or social movements.

(IV and VII ).

**ENGLISH 9. Shakespeare. 4 Units.**

Plays by William Shakespeare are used to explore the playwright's poetic gifts, theatrical imagination, and inquiry into human relationships and the human condition.

(IV)

**ENGLISH 10. Topics in English and American Literature. 4 Units.**

Explores the diversity of human expression manifested in selected works of literature. By engaging with substantial literary texts, students will think critically about how meaning is created and how experience is interpreted in literary language.

Repeatability: May be taken for credit 3 times as topics vary.

(IV)

**ENGLISH 10B. Topics in English and American Literature. 4 Units.**

Linked with Writing 39B. Explores the diversity of human expression manifested in selected works of literature. By engaging with substantial literary texts, students think critically about how meaning is created and how experience is interpreted in literary language.

Corequisite: WRITING 39B

Repeatability: May be taken for credit 3 times as topics vary.

Overlaps with ENGLISH 10.

(IV)

**ENGLISH 11. Society, Law, and Literature. 4 Units.**

Examines how works of literature represent and influence the relation between law and society. The primary readings will be works of literature, but selections of works of law, politics, and sociology may also be assigned.

(III or IV ).

**ENGLISH 11C. Society, Law, and Literature. 4 Units.**

Linked with Writing 39C. Explores how works of literature represent and influence the relation between law and society. The primary readings are works of literature, but selections of works of law, politics, and sociology may also be assigned.

Corequisite: WRITING 39C

Overlaps with ENGLISH 11.

(III or IV ).

**ENGLISH 12. Young Adult Fiction . 4 Units.**

Young adult fiction studied in historical context, including the publishing industry and mass marketing, as well as education and literacy. Primary readings will focus on young adult fiction, but works of history, advertising, and film will also be included.

(IV)

**ENGLISH 15. Introductory Seminar in English: Topics in Literary Studies. 4 Units.**

Discussion-based seminar on a faculty-chosen topic that introduces majors and those considering a major in English to interpretive methodologies and critical frameworks that characterize the field of English studies.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: English Majors have first consideration for enrollment.

**ENGLISH 16. The Craft of Poetry. 4 Units.**

Reading of selected texts to explore the ways in which these modes formulate experience. Students write several short analytic papers. Requires creative writing.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(IV)

**ENGLISH 17. The Craft of Fiction. 4 Units.**

Reading of selected texts to explore the ways in which these modes formulate experience. Students write several short analytic papers. Requires creative writing.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(IV)

**ENGLISH H80. Sanctuary: Medieval and Modern. 4 Units.**

Principles and significance of the practice of legal sanctuary in medieval English history, literature, and religion. Development of modern use of churches and other safe spaces in the American Civil Rights movement, immigrant sanctuary movements, and international asylum.

Restriction: Campuswide Honors Collegium students only.

(III or IV ).

**ENGLISH H81. What is a Person?. 4 Units.**

Contemporary debates about personhood in law, culture, and society. Beginning with the emergence of ideas of personhood in philosophy and theology, and culminating in the study of highly contested cases: slavery, abortion law, animal rights, corporate personhood, and artificial intelligence.

Restriction: Campuswide Honors Collegium students only.

(III)

**ENGLISH 100. Introduction to Literary Theory. 4 Units.**

Using Plato and Aristotle as points of departure, addresses a range of perspectives and problems in literary theory. To be taken by English majors in the junior year.

Prerequisite: Three courses selected from ENGLISH 8, ENGLISH 9, ENGLISH 10, ENGLISH 11, ENGLISH 12, ENGLISH 15, ENGLISH 16, ENGLISH 17, LIT JRN 20, LIT JRN 21.



**ENGLISH 101W. Undergraduate Seminar in Critical Writing: Topics in Literary History. 4 Units.**

Each instructor identifies a topic within literary history; special attention is given to mastering the conventions of academic argument and expression. To be taken as early as possible in the junior year.

Prerequisite: Three courses selected from ENGLISH 8, ENGLISH 9, ENGLISH 10, ENGLISH 11, ENGLISH 12, ENGLISH 15, ENGLISH 16, ENGLISH 17; or LIT JRN 20 and LIT JRN 21 and one course selected from the above list. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. English Majors have first consideration for enrollment.

**(Ib)****ENGLISH 102A. Topics in Medieval and Renaissance Literature. 4 Units.**

Studies of works representative of Medieval and Renaissance literature in English, with attention to literary history, treating at a minimum more than one author and more than one genre.

Prerequisite: Three courses selected from ENGLISH 8, ENGLISH 9, ENGLISH 10, ENGLISH 11, ENGLISH 12, ENGLISH 15, ENGLISH 16, ENGLISH 17. Or LIT JRN 20 and LIT JRN 21 and one course selected from the above list.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. English Majors have first consideration for enrollment.

**ENGLISH 102B. Topics in Restoration and 18th-Century Literature . 4 Units.**

Studies of works representative of Restoration and 18th-century literature in English, with attention to literary history, treating at a minimum more than one author and more than one genre.

Prerequisite: Three courses selected from ENGLISH 8, ENGLISH 9, ENGLISH 10, ENGLISH 11, ENGLISH 12, ENGLISH 15, ENGLISH 16, ENGLISH 17. Or LIT JRN 20 and LIT JRN 21 and one course selected from the above list.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. English Majors have first consideration for enrollment.

**ENGLISH 102C. Topics in Romantic and 19th-Century Literature. 4 Units.**

Studies of works representative of Romantic and 19th-century literature in English, with attention to literary history, treating at a minimum more than one author and more than one genre.

Prerequisite: Three courses selected from ENGLISH 8, ENGLISH 9, ENGLISH 10, ENGLISH 11, ENGLISH 12, ENGLISH 15, ENGLISH 16, ENGLISH 17. Or LIT JRN 20 and LIT JRN 21 and one course selected from the above list.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. English Majors have first consideration for enrollment.

**ENGLISH 102D. Topics in 20th-Century Literature. 4 Units.**

Studies of works representative of 20th-century literature in English, with attention to literary history, treating at a minimum more than one author and more than one genre.

Prerequisite: Three courses selected from ENGLISH 8, ENGLISH 9, ENGLISH 10, ENGLISH 11, ENGLISH 12, ENGLISH 15, ENGLISH 16, ENGLISH 17. Or LIT JRN 20 and LIT JRN 21 and one course selected from the above list.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. English Majors have first consideration for enrollment.

**ENGLISH 103. Topics in Literature, Theory, and Criticism. 4 Units.**

A series of lectures on and discussions of announced topics in literary criticism, theory, history, genres, modes, major authors.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Recommended: Upper-division students only.

**ENGLISH 105. Multicultural Topics in Literatures in English. 4 Units.**

Focuses on ethnic or minority literatures, or treats issues related to race and cultural identity.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Recommended: Upper-division students only.

**ENGLISH 106. Advanced Seminar: Topics in English Literature . 4 Units.**

Capstone course. Provides intensive work on a topic within the area of literatures in English with particular attention to the theoretical, critical, or conceptual issues it raises, with the goal of producing a substantive research paper.

Prerequisite: (ENGLISH 101W or WRITING 101W) and (ENGLISH 100 and 102A) or (ENGLISH 100 and 102B) or (ENGLISH 100 and 102C) or (ENGLISH 100 and 102D) or (ENGLISH 102A and 102B) or (ENGLISH 102A and 102C) or (ENGLISH 102A and 102D) or (ENGLISH 102B and 102C) or (ENGLISH 102C and 102D) or (ENGLISH 103 and 102A) or (ENGLISH 103 and 102B) or (ENGLISH 103 and 102C) or (ENGLISH 103 and 102D) or (ENGLISH 105 and 102A) or (ENGLISH 105 and 102B) or (ENGLISH 105 and 102C) or (ENGLISH 105 and 102D) or (ENGLISH 100 and 103) or (ENGLISH 103 and 105) or (ENGLISH 100 and 105).

Repeatability: Unlimited as topics vary.

Restriction: Seniors only. English Majors have first consideration for enrollment.

**ENGLISH 150. Topics in Literature for Nonmajors . 4 Units.**

Major texts in English, American, and Comparative Literature explored for basic humanistic issues and themes, on announced topics. Primarily for upper-division students, but not requiring previous training in literature.

Repeatability: Unlimited as topics vary.

Restriction: Recommended: Upper-division students only.

**ENGLISH 160. Topics in English Language Film and TV. 4 Units.**

Focuses on the analysis of film and/or television traditions in the English-speaking world, from a historical, theoretical, or comparative perspective.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Upper-division students only.

**ENGLISH 198. Special Topics. 4 Units.**

Directed group study of selected topics as arranged by instructor.

Repeatability: May be repeated for credit unlimited times.

**ENGLISH 199. Independent Study. 1-4 Units.**

To be taken only when the materials to be studied lie outside the normal run of departmental offerings, and when the student will have no formal chance to pursue the subject. Research paper required.

Repeatability: May be repeated for credit unlimited times.

**ENGLISH 210. Studies in Literary History. 4 Units.**

Studies in selected areas of literary history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**ENGLISH 225. Studies in Literary Genres. 4 Units.**

Studies in selected areas of literary genres. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**ENGLISH 230. Studies in Major Writers. 4 Units.**

Studies in selected areas of major writers. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**ENGLISH 255. Graduate Workshop in Academic Publishing. 4 Units.**

Reading and critique of student-authored essays with the goal of producing a publishable essay. Instructor leads discussion, meets with students individually, and provides an introduction to appropriate venues for publication and the process of submission, peer review, and revision.

Grading Option: Satisfactory/unsatisfactory only.

**ENGLISH 290. Reading and Conference. 4-12 Units.**

Studies in selected areas. Topics addressed vary each quarter.

Repeatability: May be repeated for credit unlimited times.

**ENGLISH 291. Guided Reading Course. 4 Units.**

Studies in selected areas. Topics addressed vary each quarter.

**ENGLISH 299. Dissertation Research. 4-12 Units.**

A units-only course for students in the dissertation phase.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**ENGLISH 398. Rhetoric/Teaching of Composition. 4 Units.**

Readings, lectures, and internship designed to prepare graduate students to teach composition. Formal instruction in rhetoric and practical work in teaching methods and grading.

**ENGLISH 399. University Teaching. 4 Units.**

A units-only course for students appointed as teaching assistants or associates.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## European Languages and Studies Courses

**EURO ST 9. Topics in Europe in the Middle Ages. 4 Units.**

Explores the literature, history, and thought of the European Middle Ages. Topics may include understandings of self and community, aristocratic power and courtly life, colonialism, crusading, religious beliefs and persecution, monasticism and reform, university culture, epic literature, and Arthurian romance.

Repeatability: Unlimited as topics vary.

(IV and VIII ).

**EURO ST 10. Topics in Historical Foundations (1500-1800). 4 Units.**

Offers an overview of the European experience from its social, political, and cultural foundations to modern European issues and institutions in a globalized world. Topics include social, political, and cultural history up to the French Revolution.

Repeatability: Unlimited as topics vary.

Overlaps with EURO ST S10.

((III or IV) and VIII ).

**EURO ST S10. Historical Foundations: Europe and the Foundations of the Modern World. 4 Units.**

Encompasses a variety of perspectives in the social sciences and the humanities involving crucial developments coming out of Europe from roughly 1500 to 1800, (the Protestant Reformation through the French Revolution), that helped shape the modern (western) world.

Overlaps with EURO ST 10.

((III or IV) and VIII ).

**EURO ST 11. Issues and Institutions in Modern Europe (1789-1945). 4 Units.**

Offers an overview of modern European societies in social, political, and cultural terms. Topics include shifting geopolitical borders, social movements, and various forms of cultural expression (film, art, literature) as they intersect with and shape issues and events after 1800.

Repeatability: Unlimited as topics vary.

((III or IV) and VIII ).

**EURO ST S11. Europe's Futures: 1755-Present. 4 Units.**

Introduces students to competing approaches from humanities and social sciences to conceptualizing the future in politics, art, and literature. From the enlightenment to today, investigates the cultural and political context of moments when new ideas emerged to secure Europe's futures.

Overlaps with EURO ST 11.

((III or IV) and VIII ).

**EURO ST 12. What is the Origin of Language?. 4 Units.**

Teaches symbol-based logic and universal grammar in human language as tools to investigate the origin of language. Does language originate with reason? Is language inherently universal or diverse? Does it begin as something literal or figurative.

((III or IV) and Vb ).

**EURO ST 13. Topics in Contemporary Europe (1945 – Today). 4 Units.**

Offers a perspective on contemporary politics and social and cultural life of today's Europe. Introduces students to literature, film, and social theory crises of the contemporary world as they emanated from World War II, such as nationalism and populism.

Repeatability: Unlimited as topics vary.

(IV and VIII ).

**EURO ST 101A. European Studies Core I - Early Europe (Pre-1789). 4 Units.**

Introduction to multidisciplinary approaches to important themes in European society, culture, art, literature, and politics; encourages students to explore intersections among disciplines. Possible themes: Concept of Europe in Renaissance, Self and Other: Europe and Islam, Hybrid Cultures in Medieval Europe.

Repeatability: Unlimited as topics vary.

**EURO ST 101B. European Studies Core II: Modern Europe (Post-1789). 4 Units.**

Multidisciplinary approaches to important themes in modern European society, culture, art, literature, and politics, encouraging students to see points of intersection among disciplines. Possible themes: Subjects, Citizens, and Representation; Europe in the World; European Revolutions in Art and Society.

Repeatability: Unlimited as topics vary.

**EURO ST 102. Topics in Early European History and Culture: Pre-1789. 4 Units.**

Addresses historical and cultural events, issues, and texts (art, literature, music, political theory) from the pre-1789 period in more than one European country.

Repeatability: Unlimited as topics vary.

**EURO ST 103. Topics in Modern European History and Culture: Post-1789. 4 Units.**

Addresses historical and cultural events, issues, and texts (art, literature, music, political theory) from 1789 to present in more than one European country.

Repeatability: Unlimited as topics vary.

**EURO ST 190W. Senior Seminar in European Studies. 4 Units.**

Capstone research seminar. Students engage in rigorous, in-depth, interdisciplinary exploration of specific topics, periods, or themes, investigating and analyzing the intersection of material and discursive culture in different historical periods and geographical locations.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: School of Humanities students only.

(Ib)

**EURO ST 199. Independent Study. 1-4 Units.**

Directed reading and research in consultation with a faculty advisor. Substantial written work required.

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**EURO ST 200A. Core Seminar I: Foundations of European Thought and Culture. 4 Units.**

Provides a historical, geographical, and methodological overview of foundational texts and issues in European thought and culture. Covering several historical periods between the Middle Ages and the present, students will see how ideas and institutions change over time.

**EURO ST 200B. Core Seminar II: Theorizing Periods and Movements in European Thought and Culture. 4 Units.**

Periods and movements still form basic units for organizing European thought and theory, even as such categories are problematized. This course will allow for greater focus on a specific time period or constellation of issues around a period or movement.

**EURO ST 200C. Core Seminar III: European Thought and Culture Beyond Europe. 4 Units.**

Studies the intersection and afterlives of European thought and culture with and in non-European contexts, the way European thought and culture has been translated and transformed, taken up and challenged, in colonial, postcolonial, and other global situations.

**EURO ST 201. Topics in European Studies. 4 Units.**

Seminars on various topics related to European Studies.

Repeatability: Unlimited as topics vary.

**EURO ST 299. Independent Research. 4 Units.**

For students to do independent research with advisors on their master's thesis or master's examination reading lists.

Restriction: Graduate students only. School of Humanities students only.

## Film and Media Studies Courses

**FLM&MDA H80. Honors Seminar: Race Sport Media. 4 Units.**

Honors seminar examining the intersection of race, sports, and media in everyday U.S. popular culture (film, TV, advertising, gaming, social media) and political culture. Materials fee.

Restriction: Campuswide Honors Collegium students only.

(IV and VII ).

**FLM&MDA 85A. Introduction to Film and Visual Analysis. 4 Units.**

Introduces the language and techniques of visual and film analysis. Teaches students to analyze the moving image; emphasize framing, camera movement, and sound; and conveys how editing produces meaning, reproduces historical ideologies, fosters or disrupts narrative, and cues spectators.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

(IV)

**FLM&MDA 85B. Broadcast Media History and Analysis. 4 Units.**

History of broadcast media from the radio era to the present day, including social, political, institutional, and audience analysis as well as methods of visual and aural analysis of these media.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

(IV)

**FLM&MDA 85C. New Media and Digital Technologies. 4 Units.**

The study of digital media, computer-mediated communication, and Internet cultures, from historical and theoretical perspectives.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

(IV)

**FLM&MDA 101A. History of Film I: The Silent Era. 4 Units.**

The aesthetic, industrial, and socio-historical developments of cinema in the U.S. and internationally from its invention to the adoption of synchronous sound. Includes early exhibition, developments in narrative and editing, the formation of the studio system, and avant-garde film movements. Materials fee.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 101B. History of Film II: The Studio Era. 4 Units.**

The aesthetic, industrial, and socio-historical developments of cinema in the U.S. and internationally from the 1930s through the 1960s. Includes the Hollywood studio system, propaganda films, Italian neorealism, post-war Japanese cinema, and the French New Wave. Materials fee.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 101C. History of Film III: The Contemporary Era. 4 Units.**

The aesthetic, industrial, and socio-historical developments of cinema in the U.S. and internationally from the late 1960s to the present. Includes New Hollywood and independent U.S. films, ethnic cinemas, postcolonial cinemas, East-Asian new waves, and digital filmmaking. Materials fee.

Prerequisite: FLM&MDA 85A and FLM&MDA 101B. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 110. Film and Media Theory. 4 Units.**

Survey of major directions in film and media theory. Various theories of mass culture, realism, auteurism, semiotics, feminism, cultural studies, and theories of other media, with an emphasis on developing the student's ability to analyze and articulate a theoretical argument. Materials fee.

Prerequisite: FLM&MDA 85A and FLM&MDA 85B and FLM&MDA 85C and (FLM&MDA 101A or FLM&MDA 101B or FLM&MDA 101C). Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 111. Film and Media Theory and Practice. 4 Units.**

Seminar focusing on issues in film and media production and editing. Reading and exercises to understand aspects of film and media production (montage, sound, film movement, directing, and mise en scène), and how ideology works in tandem with style.

Prerequisite: FLM&MDA 85A and FLM&MDA 85B and FLM&MDA 85C and FLM&MDA 120A and (FLM&MDA 101A or FLM&MDA 101B or FLM&MDA 101C). Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 112. Genre Study . 4 Units.**

Critical approaches to the serial productions we call 'genre' films such as westerns, weepies, musicals, horror films, and others; televisual genres, such as sitcoms, drama, comedy, news, docudrama, police; Internet categories, such as chat-rooms, listservs, Web pages.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 113. Narrative/Image . 4 Units.**

What relations do sound, image, and story assume in film, television, video, and Internet narratives? In what ways do these media interact with and borrow from each other and traditional story-telling media? How have the new media explored non-narrative strategies.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 114. Film, Media, and the Arts. 4 Units.**

A synthetic entity, film draws on both established and popular arts. Looks at visual media's exchanges with 'high' and 'low' culture, exploring its relation to areas such as photography, music, painting, and architecture.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 115. Authorship . 4 Units.**

Theoretical and analytical discussions of visual media authorship, focusing on case studies of directors, producers, scriptwriters, and film, video, and digital artists.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 117A. Introduction to Screenwriting. 4 Units.**

Introduction to the technique and format of the screenplay, with a particular focus on its three act structural elements: coverage, treatment, and 60 beat outline. Materials fee.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 117B. Intermediate Screenwriting. 4 Units.**

Exercises in the development of screenplays, with emphasis on formal and structural considerations of character development. Students work with the hero structure and other character development methodologies, such as method acting. Materials fee.

Prerequisite: FLM&MDA 117A. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 117C. Screenwriting Workshop. 4 Units.**

Continuation and intensification of work initiated in 117B. Students complete a full-length screenplay. Concentrates on both practical and technical concerns, addressing pragmatic and aesthetic questions in intensive small-group discussions. Materials fee.

Prerequisite: FLM&MDA 117B. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 118A. Writing Television I. 4 Units.**

Introduction to the technique and format of the television screenplay. Focuses on character, storytelling, structure, and scene development; culminating in a one-hour drama series treatment and first act of the pilot.

Prerequisite: FLM&MDA 85B. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 118B. Writing Television II. 4 Units.**

Intermediate-level screenwriting class exploring the one-hour television drama format. Students write and workshop an original pilot, continuing work started in 118A, and finish a complete draft of the pilot script.

Prerequisite: FLM&MDA 118A. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 120A. Basic Production. 4 Units.**

Introduction to the basic apparatus of video/film production. The elementary essentials of production, including the use of camera and lenses, lighting, editing, and sound. Materials fee.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 120B. Intermediate Production. 4 Units.**

Students work on individual and group projects, utilizing skills and insights introduced in Film and Media Studies 120A. Materials fee.

Prerequisite: FLM&MDA 120A. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 120C. Production Workshop. 4 Units.**

As film and video are collaborative media, students form production groups and ultimately produce final 10-15-minute film/video projects. Materials fee.

Prerequisite: FLM&MDA 120B. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 130. Multicultural Topics in the Media. 4 Units.**

Investigation of media representations of gender, race, and sexuality in the United States. Topics include media images of and by one or more minority groups in the United States, including African Americans, Asian Americans, Chicano/Latinos, Native Americans, gays, and lesbians.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 139W. Writing on Film and Media. 4 Units.**

Writing on cinema, television, and/or digital culture, emphasizing identification of reliable sources, close readings, addressing academic, professional, and/or popular audiences. Requires at least 4,000 words of assigned composition.

Prerequisite: FLM&MDA 85A or FLM&MDA 85B or FLM&MDA 85C. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Film and Media Studies Majors only.

(Ib)

**FLM&MDA 143. Critical Theory of Television. 4 Units.**

Introduction to critical, theoretical, and scholarly understandings and analyses of television, which offer in-depth analyses of television programming, audience reception practices, and industry strategies of address.

Prerequisite: FLM&MDA 85B. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 144. Studies in New Media. 4 Units.**

Advanced analysis of the technologies, texts, theories, and cultures of computers, video games, networks, or platforms.

Prerequisite: FLM&MDA 85C. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 145. Popular Culture and Media. 4 Units.**

Considers the forms, ideologies, consumption, and marketing of popular entertainment and technologies. May focus on cultural studies methods, transnational approaches, and synergy between media.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 146. Sound Studies. 4 Units.**

Focuses on the production, theories, and meanings of sound recordings, music, and/or audio technologies. Topics may include the cultures of popular music and audio devices, music television, and theories of film sound.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 150. Audiences and Reception. 4 Units.**

Explores the dynamics of address, interpretation, and appropriation between film and media texts and their viewers. Topics may include reception studies, fandom, audience-defined modes of production, demographics, spectatorial pleasure, and historical approaches to audiences.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 151. Documentary and Experimental Film and Media. 4 Units.**

Examines nonfiction and/or experimental cinemas and media, such as documentary, the historical avant-garde, video art, and activist media. Students consider the specific aesthetics and ideologies of forms distinct from narrative feature films.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 160. National/Regional Cinemas and Media. 4 Units.**

National schools, period styles, or cultural movements beyond U.S. cinema, as defined by national borders or by geographic regions, such as Latin America. May be approached from a comparative perspective.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 161. Global/Transnational Cinemas and Media. 4 Units.**

Analyzes the multinational production, circulation, and reception of film and media texts beyond singular national borders or specific geographic regions. Topics may include transnational co-productions, exports, and diasporic reception.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 162. US Cinema . 4 Units.**

Explores the modes of production and distribution, aesthetics, and contexts that have shaped cinema in the United States. Topics may include classical Hollywood, American independent cinema, or periods such as 1970s cinema.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.



**FLM&MDA 185. Television and New Media. 4 Units.**

Advanced seminar focusing on special topics in television and new media. Past examples have included courses on media marketing and brand identity; television and sound; game theory; and other issues related to popular culture, broadcast media, and new media technologies.

Prerequisite: FLM&MDA 85B or FLM&MDA 85C. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 190. Special Topics in Film and Modern Media. 4 Units.**

Special issues concerned with film and media history, theory, and criticism.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 191. Special Topics in Critical Practice. 4 Units.**

Integrates critical analysis, historical, and theoretical methods with creative projects to illuminate film and media production and industries. May include courses in adaptation, writing television, media activism, writing the short film, performance studies, and movie title sequences.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 192. Special Topics in Advanced Film Production. 4 Units.**

Focuses on special topics in production. Culminates in final 6-10-minute group film projects. Topics include producing, acting, and/or directing in short films, experimental films, documentaries, television, and other media.

Prerequisite: FLM&MDA 120A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 193. Special Topics in Advanced Screenwriting. 4 Units.**

Focuses on special topics in screenwriting. Topics include adaptation, alternative screenwriting, writing the first feature, act two construction, and rewriting.

Prerequisite: FLM&MDA 117A or FLM&MDA 118A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 197. Professional Internship. 2-4 Units.**

Professional internship in the film, broadcast, and/or digital media industries designed to provide students with closely supervised professional experience to enhance their understanding of media from industrial, historical, and critical perspectives. Journal and final report required.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

Restriction: Upper-division students only.

**FLM&MDA 198. Creative Project. 2-4 Units.**

Creative project in screenwriting, filmmaking, videomaking, or Web or internet design intended to provide advanced production and creative writing training beyond the Film and Media Studies 117A-B-C or 120A-B-C series. Final project required.

Prerequisite: (FLM&MDA 85A and FLM&MDA 117A and FLM&MDA 117B and FLM&MDA 117C) or (FLM&MDA 120A and FLM&MDA 120B and FLM&MDA 120C). Satisfactory completion of the Lower-Division Writing requirement. Recommended: FLM&MDA 101A.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Upper-division students only.

**FLM&MDA 199. Directed Research. 4 Units.**

Directed reading and research under supervision of a faculty member in topic areas not covered by regular course offerings. Final research paper required.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only.

**FLM&MDA 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## French Courses

**FRENCH 1A. Fundamentals of French. 5 Units.**

First quarter of first-year French in a hybrid format. Students are taught to conceptualize in French as they learn to understand, read, write, and speak. Classes are conducted entirely in French.

Overlaps with FRENCH S1AB, FRENCH 1AB, FRENCH 1ABSP.

**FRENCH 1AB. Intensive Fundamentals of French. 7.5 Units.**

Intensive first half of first-year French. Students are taught to conceptualize in French as they learn to read, write, and speak. Students develop an awareness of and sensibility to French and Francophone life and culture through reading, viewing, and discussion.

Overlaps with FRENCH 1A, FRENCH 1B, FRENCH S1AB.

**FRENCH 1ABSP. Accelerated Fundamentals of French for Spanish Speakers. 5 Units.**

Accelerated first half of first-year French for Hispanophone students. Teaches conceptualizing in French while learning to read, write, and speak using knowledge of Spanish. Develops awareness of and sensibility to French and Francophone life and culture through reading, viewing, discussing.

Prerequisite: Two years of high school Spanish, one semester of college Spanish, or heritage speaker of Spanish.

Overlaps with FRENCH 1A, FRENCH 1AB, FRENCH S1AB, FRENCH 1B.

**FRENCH 1B. Fundamentals of French. 5 Units.**

First quarter of first-year French in a hybrid format. Students are taught to conceptualize in French as they learn to understand, read, write, and speak. Classes are conducted entirely in French.

Prerequisite: FRENCH 1A. FRENCH 1A with a grade of C or better

Overlaps with FRENCH S1AB, FRENCH S1BC, FRENCH 1AB, FRENCH 1BC, FRENCH 1ABSP, FRENCH 1BCSP.

**FRENCH 1BC. Intensive Fundamentals of French. 7.5 Units.**

Intensive second half of first-year French. Students are taught to conceptualize in French as they learn to read, write, and speak. Students develop an awareness of and sensibility to French and Francophone life and culture through reading, viewing, and discussion.

Prerequisite: FRENCH 1AB or FRENCH 1B or FRENCH S1AB. FRENCH 1AB with a grade of C or better. FRENCH 1B with a grade of C or better. FRENCH S1AB with a grade of C or better. Placement into FRENCH 1BC is also accepted.

Overlaps with FRENCH 1B, FRENCH 1C, FRENCH S1BC.

### (VI)

**FRENCH 1BCSP. Accelerated Fundamentals of French for Spanish Speakers. 5 Units.**

Accelerated second half of first-year French for Hispanophone students. Teaches conceptualizing in French while learning to read, write, and speak using knowledge of Spanish. Develops awareness of and sensibility to French and Francophone life and culture through reading, viewing, discussing.

Prerequisite: FRENCH 1ABSP or FRENCH 1AB or FRENCH S1AB or FRENCH 1B. FRENCH 1ABSP with a grade of C or better. FRENCH 1AB with a grade of C or better. FRENCH S1AB with a grade of C or better. FRENCH 1B with a grade of C or better. Two years of high school Spanish, one semester of college Spanish, or heritage speaker of Spanish.

Overlaps with FRENCH 1B, FRENCH 1BC, FRENCH S1BC, FRENCH 1C.

### (VI)

**FRENCH 1C. Fundamentals of French. 5 Units.**

First quarter of first-year French in a hybrid format. Students are taught to conceptualize in French as they learn to understand, read, write, and speak. Classes are conducted entirely in French.

Prerequisite: FRENCH 1B. FRENCH 1B with a grade of C or better

Overlaps with FRENCH S1BC, FRENCH 1BC, FRENCH 1BCSP.

**(VI)****FRENCH S1AB. Intensive Fundamentals of French. 7.5 Units.**

First half of first-year French in an intensified form and hybrid format. Students are taught to conceptualize in French as they learn to understand, read, write, and speak. Classes are conducted entirely in French.

Overlaps with FRENCH 1A, FRENCH 1B, FRENCH 1AB, FRENCH 1ABSP.

**FRENCH S1BC. Intensive Fundamentals of French. 7.5 Units.**

Second half of first-year French in an intensified form and hybrid format. Students are taught to conceptualize in French as they learn to understand, read, write, and speak. Classes are conducted entirely in French.

Prerequisite: FRENCH S1AB or FRENCH 1B or FRENCH 1AB or FRENCH 1ABSP. FRENCH S1AB with a grade of C or better. FRENCH 1B with a grade of C or better. FRENCH 1AB with a grade of C or better. FRENCH 1ABSP with a grade of C or better

Overlaps with FRENCH 1B, FRENCH 1C, FRENCH 1BC, FRENCH 1BCSP.

**(VI)****FRENCH 2A. Intermediate French. 4 Units.**

Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in French.

Prerequisite: FRENCH 1C or FRENCH 1BC or FRENCH S1BC or FRENCH 1BCSP. FRENCH 1C with a grade of C or better. FRENCH 1BC with a grade of C or better. FRENCH S1BC with a grade of C or better. FRENCH 1BCSP with a grade of C or better. Placement into FRENCH 2A is also accepted.

Overlaps with FRENCH S2AB.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)****FRENCH 2AB. Intensive Intermediate French . 6 Units.**

Intensive first half of second-year French. Texts and films of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in French.

Prerequisite: FRENCH 1C or FRENCH 1BC or FRENCH S1BC. FRENCH 1C with a grade of C or better. FRENCH 1BC with a grade of C or better. FRENCH S1BC with a grade of C or better. Prior high school or college French is recommended. Placement into French 2AB is also accepted.

Overlaps with FRENCH 2A, FRENCH 2B, FRENCH S2AB.

**(VIII)****FRENCH 2B. Intermediate French. 4 Units.**

Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in French.

Prerequisite: FRENCH 2A. FRENCH 2A with a grade of C or better

Overlaps with FRENCH S2AB, FRENCH S2BC.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment. FRENCH 2B and FRENCH S2AB and FRENCH S2BC may not be taken for full credit.

**(VIII)**

**FRENCH 2BC. Intensive Intermediate French . 6 Units.**

Intensive second half of second-year French. Texts and films of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in French.

Prerequisite: FRENCH S2AB or FRENCH 2AB. FRENCH S2AB with a grade of C or better. FRENCH 2AB with a grade of C or better. Prior high school or college French is recommended. Placement into French 2BC is also accepted.

Overlaps with FRENCH S2BC, FRENCH 2B, FRENCH 2C.

**(VIII)**

**FRENCH 2C. Intermediate French. 4 Units.**

Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in French.

Prerequisite: FRENCH 2B or FRENCH S2AB. FRENCH 2B with a grade of C or better. FRENCH S2AB with a grade of C or better

Overlaps with FRENCH S2BC.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment. FRENCH 2C and FRENCH S2BC may not be taken for full credit.

**(VIII)**

**FRENCH S2AB. Intermediate French. 6 Units.**

First half of second-year French in an intensified form. Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in French. Prior high school or college French recommended.

Prerequisite: FRENCH 1C or FRENCH 1BC or FRENCH S1BC. FRENCH 1C with a grade of C or better. FRENCH 1BC with a grade of C or better. FRENCH S1BC with a grade of C or better. Placement into FRENCH S2AB is also accepted.

Overlaps with FRENCH 2A, FRENCH 2B.

Restriction: FRENCH S2AB and FRENCH 2A and FRENCH 2B may not be taken for full credit.

**(VIII)**

**FRENCH S2BC. Intermediate French. 6 Units.**

Second half of second-year French in an intensified form. Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in French. Prior high school or college French recommended.

Prerequisite: FRENCH S2AB or FRENCH 2B. FRENCH S2AB with a grade of C or better. FRENCH 2B with a grade of C or better

Overlaps with FRENCH 2C, FRENCH 2B.

Restriction: FRENCH S2BC and FRENCH 2B and FRENCH 2C may not be taken for full credit.

**(VIII)**

**FRENCH 10. French Peer Tutoring. 1 Unit.**

Tutoring Program in which advanced French students provide assistance to students at a lower level. One hour of tutoring per week.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**FRENCH 50. Topics in French Culture and the Modern World. 4 Units.**

Introductory course for non-majors. Focuses on France's role in the modern world and its cultural connections to Asia, the Middle East, Africa, Europe, and the Americas. Taught in English.

Repeatability: May be taken for credit 3 times as topics vary.

**(IV and VIII ).**

**FRENCH 97. Fundamentals of French (with Emphasis on Reading). 4 Units.**

Designed primarily for students interested in acquiring a solid reading knowledge of French, and to facilitate the understanding and translating of French texts dealing with a variety of disciplines.

Restriction: No French Majors.

**FRENCH 101A. Introduction to 19th-Century French Literature. 4 Units.**

Fiction, nonfiction, drama, and poetry of the 19th century studied in relationship to a specific literary or historical problem.

Prerequisite: FRENCH 2C or FRENCH S2BC

**FRENCH 101B. Introduction to 18th-Century French Literature. 4 Units.**

Literature and philosophy of the 18th century studied in relationship to a specific literary or historical problem.

Prerequisite: FRENCH 2C or FRENCH S2BC

**FRENCH 101C. Introduction to 20th-Century French Literature. 4 Units.**

Literatures of the French-speaking world studied in relationship to a specific literary or historical problem.

Prerequisite: FRENCH 2C or FRENCH S2BC

**FRENCH 102A. Grammar and Composition. 4 Units.**

Review of grammar taught in FRENCH 2A-B-C. Students gain facility in writing French and increase reading comprehension. Short texts and films are introduced to generate substantive discussion, and multiple short writing exercises are assigned to solidify skills. Formerly FRENCH 60.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better

**FRENCH 102B. Topics in Issues in French and Francophone Culture. 4 Units.**

Investigation of an issue of cultural significance in the francophone world through historical documents, literary works, and newspaper articles. Supplemented with films and/or other elements of popular culture. Multiple short writing assignments to solidify writing skills. Formerly FRENCH 61.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 102C. Translation. 4 Units.**

Introduction to the theory and practice of translation from French to English and English to French. Many opportunities provided to improve skills in writing and comprehension. Formerly FRENCH 62.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better

**FRENCH 102D. Topics in the Work World in French. 4 Units.**

A view into the world of work in French. Areas of study include international relations; French administration; and tensions between management and workers. Attention given to vocabulary and grammar of professional interactions in French. Formerly FRENCH 63.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 102E. Advanced French Language and Style. 4 Units.**

Intended for advanced students who wish to improve their expressive capabilities in French. Review of more nuanced grammar points. Emphasis placed on rhetoric, syntax, and precision. Advanced readings increase comprehension. Formerly FRENCH 64.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better

**FRENCH 116. Topics in 16th-Century French Literature. 4 Units.**

Examines the diverse literature of the Renaissance and the Age of Exploration.

Repeatability: Unlimited as topics vary.

**FRENCH 117. Topics in 17th-Century French Literature. 4 Units.**

Examines the age of drama and other vibrant forms in French literature of the period.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC or FRENCH 60. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better. FRENCH 60 with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 118. Topics in 18th-Century French Literature. 4 Units.**

Examines the literature and philosophy of the Enlightenment, the Ancient Régime, Classicism, and/or Revolution.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC or FRENCH 60. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better. FRENCH 60 with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 119. Topics in 19th-Century French Literature. 4 Units.**

Focuses on the literature of an era that experienced many modernist transformations.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC or FRENCH 60. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better. FRENCH 60 with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 120. Topics in 20th-Century French and Francophone Literature. 4 Units.**

A study of modern and contemporary literature and culture.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC or FRENCH 60. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better. FRENCH 60 with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 125. Topics in African Literature of French Expression. 4 Units.**

Introduction to the principal African and Caribbean works written in French. Offers opportunity to study literature and culture in French in a non-European context. Lectures and papers in French.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC or FRENCH 60. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better. FRENCH 60 with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 127. Topics in Francophone Literature and Culture. 4 Units.**

Literature and cultures of the francophone world.

Repeatability: Unlimited as topics vary.

**FRENCH 139W. Literature and Society. 4 Units.**

In English. Readings of masterpieces of French literature in their social, political, and historical contexts. Requires at least 4,000 words of assigned composition based on French works. Several essays required.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. French Majors have first consideration for enrollment.

**(Ib)**

**FRENCH 140. Topics in French Literary Genre. 4 Units.**

Examines the development and transformation of a single genre, such as the poem or the novel.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC or FRENCH 60. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better. FRENCH 60 with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 150. Topics in French Literature and Culture. 4 Units.**

Study of a theme, movement, or problem crucial to understanding French Literature and Culture.

Repeatability: Unlimited as topics vary.

**FRENCH 160. French Cinema. 4 Units.**

Study of a period, movement, or theme in French or Francophone cinema.

Repeatability: May be taken for credit 2 times as topics vary.

**FRENCH 170. Topics in History and Literature. 4 Units.**

Examines the dialogue between historical events and literary texts.

Repeatability: Unlimited as topics vary.

**FRENCH 171. Politics and Literature. 4 Units.**

Examines the role played by politics and ethics in French literature, film, and culture.

Repeatability: Unlimited as topics vary.

**FRENCH 180. Topics in Theory and Criticism. 4 Units.**

Advanced study of theoretical and critical texts.

Repeatability: Unlimited as topics vary.

**FRENCH 185. Junior/Senior Seminar in French Literature and Culture. 4 Units.**

Required intensive writing course for French majors to explore in depth selected topic in French literature and culture. Students complete major independent research project on topic studied, making use of literary and critical materials in their capstone essay. In French.

Prerequisite: FRENCH 100A and FRENCH 100B and FRENCH 101A and FRENCH 101B and FRENCH 101C. One course from FRENCH 101A, FRENCH 101B, or FRENCH 101C may be taken as a corequisite.

**FRENCH 199. Special Studies in French. 1-4 Units.**

A project proposal is prepared by the student and approved by the faculty member who directs the project. Procedure must be completed by the end of the first week of classes.

Repeatability: Unlimited as topics vary.

Restriction: Repeatability: once for M.A. candidates; twice for Ph.D. candidates.

**FRENCH 216. Studies in Renaissance Literature. 4 Units.**

Advanced study of a topic in the Renaissance period.

Repeatability: Unlimited as topics vary.

**FRENCH 217. Studies in Seventeenth-Century Literature. 4 Units.**

Advanced study of a topic in the 17th century.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**FRENCH 218. Studies in Eighteenth-Century Literature. 4 Units.**

Advanced study of a topic in the 18th century.

Repeatability: Unlimited as topics vary.

**FRENCH 219. Studies in Nineteenth-Century Literature. 4 Units.**

Advanced study of a topic in the 19th century.

Repeatability: Unlimited as topics vary.

**FRENCH 220. Studies in Twentieth-Century Literature. 4 Units.**

Advanced study of a topic in the 20th and 21st century.

Repeatability: May be taken for credit 9 times as topics vary.

Restriction: Graduate students only.

**FRENCH 225. Francophone Literature and Culture. 4 Units.**

Studies in different francophone literatures and cultures (of Canada, the Caribbean, West and North Africa, and Southeast Asia).

Repeatability: Unlimited as topics vary.

**FRENCH 231. Studies in Fiction . 4 Units.**

Examines the art of fiction.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**FRENCH 232. Studies in Nonfictional Prose. 4 Units.**

Examines non-fictional genres such as the essay and the memoir.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**FRENCH 233. Studies in Poetry and Poetics. 4 Units.**

Examines the genre of poetry and theories of poetry.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**FRENCH 240. Studies on a Major Writer. 4 Units.**

Focused study of one author.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**FRENCH 250. Studies in Theory and Criticism. 4 Units.**

Advanced study of a topic in theory and/or criticism.

Repeatability: Unlimited as topics vary.

**FRENCH 254. History and Literature. 4 Units.**

Advanced study of literary works in their historical context.

Repeatability: Unlimited as topics vary.

**FRENCH 272. Cultural Studies . 4 Units.**

Examines the theoretical paradigm of cultural studies.

Repeatability: Unlimited as topics vary.

**FRENCH 290. Research in French Language and Literature. 4 Units.**

A project proposal is prepared by the student and approved by the faculty member who directs the project. Procedure must be completed by the end of the first week of classes. Limit: Once for M.A. candidates; twice for Ph.D. candidates.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only. French Majors only.

**FRENCH 299. Dissertation Research. 4-12 Units.**

For graduate students writing a dissertation with a faculty member in French.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Humanities students only.

**FRENCH 399. University Teaching. 4 Units.**

For graduate students completing a course on foreign language pedagogy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Humanities students only.



## Gender and Sexuality Studies Courses

### **GEN&SEX 20. Introduction to Queer Studies. 4 Units.**

Study of sexuality from the perspective of lesbian, gay, queer, transgender scholarship spanning humanities, social sciences, and arts.

(IV and VII ).

### **GEN&SEX 50A. Gender and Feminism in Everyday Life. 4 Units.**

What is gender? Why does studying it matter? Explores how feminism has understood not only gender as a category of social analysis, but how gender structures personal identities, family, citizenship, work and leisure, social policy, sexuality, and language.

(IV, VII)

### **GEN&SEX 50B. Gender and Power. 4 Units.**

From workplace to home to schools to prisons, how are societal institutions and politics “gendered”? Examines power and inequalities around gender, race, class, and sexuality in national and transnational contexts.

(IV, VII)

### **GEN&SEX 50C. Gender and Popular Culture. 4 Units.**

An investigation of gender, race, and sexuality in film, TV, video, music, and advertising, with attention to the ways that popular culture shapes understandings of technology, national identities, leisure and work, historical memory, international communication, and multicultural representation.

(IV, VII)

### **GEN&SEX 60A. Gender and Science. 4 Units.**

Examines science from a variety of feminist viewpoints in order to explore how science influences everyday life. Special attention is given to the ways science shapes our understanding of gender, race, and sexuality.

(III)

### **GEN&SEX 60B. Gender and Law. 4 Units.**

Introduction to the relationship between gender, race, sexuality, and the law. Critical thinking about how law defines citizenship, political representation, and democracy, focusing on the history of legal reform undertaken in the name of women as a social group.

(III)

### **GEN&SEX 60C. Gender and Religion. 4 Units.**

Introduces the topic of religion in a feminist context by performing cross-cultural exploration of gender, authority, and faith in various traditions. Study includes (but is not limited to) writings of contemporary Jewish, Christian, and Muslim feminists.

Same as REL STD 61.

(III and VIII ).

### **GEN&SEX 100A. Feminism and Social Change. 4 Units.**

Explores feminist modes of knowledge production in relation to histories and activist practices of various social movements. Examines the kinds of information, research, ideas, theories, and concepts that underlie feminist cultural analysis and social movement organizing.

### **GEN&SEX 100B. Feminist Theory. 4 Units.**

Introduction to historical traditions in theory and various conceptual frameworks informing scholarship in gender studies, sexuality studies, and women's studies as a field of critical inquiry.

### **GEN&SEX 100C. Feminist Cultural Studies. 4 Units.**

Investigation of the theories and methods that inform the feminist study of culture. Focuses on the interpretation of the visual arts and literature created by, and predominately for, women.

### **GEN&SEX 100D. Queer Knowledges. 4 Units.**

Explores the emergence of historical elaboration of non-normative sexual identities, practices, and communities; focuses on medical, legal, literary, aesthetic, scientific, and religious notions about homosexuality and appropriations and subversions of these notions by queer people.

### **GEN&SEX 110A. Gender, State, and Nation. 4 Units.**

Examination of gender and sexuality in relation to the production of identities created through participation in state and nation. Examines complexity of relationship between feminism and nationalism, feminism and the state.

**GEN&SEX 110B. Money, Sex, and Power. 4 Units.**

Examination of gender and sexuality in relation to the emergence of the modern world, modernity, and capitalism; commodification, circulation, and transnational exchanges relating to race, gender, class, sexuality, religion, and nationality.

**GEN&SEX 110D. The Politics of Health and Medicine. 4 Units.**

Focuses on cultural and political-economic analysis and representations of disease both within the U.S. and globally.

**GEN&SEX 120A. Histories of Sexuality. 4 Units.**

Examines the historical production of non-normative sexual and gender identities, bodies, practices, and communities. Explores how past formations inform and shape the present and future.

**GEN&SEX 120B. Image Problems. 4 Units.**

Examination of scholarly approaches to gender stereotypes and politics of representation as they present possibilities for critical analysis and produce problems and limitations; how powerful ideas of gender intersect with other forms of social differentiation such as race and class.

**GEN&SEX 120C. Practices of Embodiment. 4 Units.**

Explores how science, medicine, and law have shaped the understanding of differentiated bodies; examines shifting norms and ideals about producing, shaping, adorning, and dressing gendered bodies across diverse historical, cultural, social, economic, and spatial contexts.

**GEN&SEX 139. Topics in Gender Studies. 4 Units.**

Various topics in gender studies. Encompasses issues of gender, culture, race and class, including issues of sexualities and social justice.

Repeatability: Unlimited as topics vary.

**GEN&SEX 155. Topics in Gender and Sexuality Studies. 4 Units.**

Designed to provide students with an opportunity to conduct advanced work in Gender and Sexuality Studies.

Repeatability: Unlimited as topics vary.

**GEN&SEX 157. Topics in Queer Studies. 4 Units.**

Explores issues in queer studies from one or more of the following perspectives: theoretical, historical, legal, economic, political, sociological, and representation in the arts.

Repeatability: Unlimited as topics vary.

**GEN&SEX 165F. Gender and Technology. 4 Units.**

Using a variety of disciplinary methods, examines how various technological processes and products produce culturally complex meanings associated with gender and technology.

**GEN&SEX 167A. Militarism and Gender. 4 Units.**

Examination of feminist approaches to militarism, war, and political violence; drawing on representations of women as both victims of and participants in military violence; effects of militarism on formations of gender; effects of military industrial complex on nationalism and identity.

Same as INTL ST 153F.

**GEN&SEX 170. Topics in Gender, Feminism, Literature, and Language. 4 Units.**

Topics cover issues in language and literature which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 171. Topics in Gender, Feminism, and History. 4 Units.**

Topics cover issues in history which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 171A. Sex and Conquest in Latin America. 4 Units.**

Competing ideas of masculinity and femininity, sexual violence, sexual identities, and gendered hierarchies informed how the Spanish engaged in military and religious domination of Mexican and Andean communities, as well as the forms of native resistance throughout colonial Latin America.

Same as ANTHRO 140, CHC/LAT 150A, HISTORY 160.

**GEN&SEX 174. Topics in Gender, Feminism, and the Arts. 4 Units.**

Topics cover issues in the arts which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 175. Topics in Gender, Feminism, and the Media. 4 Units.**

Topics cover issues in the media which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 180. Topics in Gender, Feminism, and Anthropology. 4 Units.**

Topics cover issues in Anthropology which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 181. Topics in Gender, Feminism, and Cognitive Psychology. 4 Units.**

Topics cover issues in cognitive psychology which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 182. Topics in Gender, Feminism and Economics. 4 Units.**

Topics cover issues in economics which relate to women and gender or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 183. Topics in Gender, Feminism, and Sociology. 4 Units.**

Topics cover issues in sociology which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 184. Topics in Gender, Feminism, and Political Science. 4 Units.**

Topics cover issues in political science which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 185. Topics in Gender, Feminism, and Social Sciences. 4 Units.**

Topics cover issues in social sciences which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 187. Topics in Gender, Feminism, and Social Ecology. 4 Units.**

Topics cover issues in social ecology which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 188. Topics in Gender, Feminism, and Science. 4 Units.**

Topics cover issues in science which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 189. Topics in Gender, Feminism, and Interdisciplinary Studies. 4 Units.**

Topics cover issues in interdisciplinary studies which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 190. Topics in Sexualities Studies. 4 Units.**

Topics cover issues in the humanities, social sciences, sciences, and arts that relate to critical inquiry of sexualities.

Repeatability: Unlimited as topics vary.

**GEN&SEX 197. Senior Seminar in Gender and Sexuality Studies. 4 Units.**

Students read advanced scholarship in Gender and Sexuality Studies and complete a major seminar paper.

Prerequisite: Satisfactory completion of the Upper-Division Writing requirement.

Restriction: Gender and Sexuality Studies Majors only.

**GEN&SEX 199. Independent Study . 1-4 Units.**

Directed reading and research in consultation with a faculty member. Substantial written work required. Includes independent study, involving 3-12 hours a week.

Repeatability: May be repeated for credit unlimited times.

**GEN&SEX 200A. Feminist Knowledge and Social Change. 4 Units.**

Provides a broad and introductory overview of Women's Studies and feminist knowledge, including key concepts, theoretical frameworks, disciplinary approaches and methods, and critical debates that have shaped the field.

Repeatability: May be taken for credit 2 times.

**GEN&SEX 200B. Problems in Feminist Research. 4 Units.**

Colloquium on analytic approaches to interdisciplinary feminist research in Women's Studies and exploration of how feminist knowledges are produced in different academic disciplines.

Repeatability: May be taken for credit 2 times.

**GEN&SEX 201. Special Topics in Feminist Studies. 4 Units.**

Seminars on various topics in feminist studies.

Repeatability: Unlimited as topics vary.

**GEN&SEX 210A. Topics in Graduate Feminist Theory. 4 Units.**

In-depth introduction to various theoretical frameworks that have and continue to inform scholarship in Women's Studies including (but not limited to) identity, representation, and political economy.

Repeatability: Unlimited as topics vary.

**GEN&SEX 290. Directed Research. 2-12 Units.**

Directed graduate study/research in Gender and Sexuality Studies.

Repeatability: May be taken for credit for 24 units.

Restriction: Graduate students only.

**GEN&SEX 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

## German Courses

**GERMAN 1A. Fundamentals of German. 5 Units.**

Emphasizes the development of meaningful communicative skills in German for the purposes of interaction with German speakers and beginning study of German. With a learner-centered approach, the courses help students develop speaking, listening, reading, writing, and cultural skills and knowledge.

Overlaps with GERMAN S1AB, GERMAN 1AB.

**GERMAN 1AB. Intensive German Fundamentals . 7.5 Units.**

First half of first-year German in a time-intensive form. Development of meaningful communicative skills for the purposes of interaction with German speakers and beginning study of German. Learner-centered approach develops speaking, listening, reading, writing, and cultural skills and knowledge. Materials fee.

Prerequisite: Placement into GERMAN 1AB.

Overlaps with GERMAN S1AB, GERMAN 1A, GERMAN 1B.

Restriction: GERMAN 1AB and GERMAN 1A and GERMAN 1B and GERMAN S1AB may not be taken for full credit.

**GERMAN 1B. Fundamentals of German. 5 Units.**

Emphasizes the development of meaningful communicative skills in German for the purposes of interaction with German speakers and beginning study of German. With a learner-centered approach, students develop speaking, listening, reading, writing, and cultural skills and knowledge.

Prerequisite: GERMAN 1A. GERMAN 1A with a grade of C or better. Placement into GERMAN 1B is also accepted.

Overlaps with GERMAN S1AB, GERMAN S1BC, GERMAN 1AB, GERMAN 1BC.

**GERMAN 1BC. Intensive German Fundamentals. 7.5 Units.**

Second half of first-year German in a time-intensive form. Development of meaningful communicative skills for the purposes of interaction with German speakers and beginning study of German. Learner-centered approach develops speaking, listening, reading, writing, and cultural skills and knowledge. Materials fee.

Prerequisite: GERMAN 1AB or GERMAN 1B or GERMAN S1AB. GERMAN 1AB with a grade of C or better. GERMAN 1B with a grade of C or better. GERMAN S1AB with a grade of C or better. Placement into GERMAN 1BC is also accepted.

Overlaps with GERMAN 1B, GERMAN 1C, GERMAN S1BC.

Restriction: GERMAN 1BC and GERMAN 1B and GERMAN 1C and GERMAN S1AB may not be taken for full credit.

**(VI)****GERMAN 1C. Fundamentals of German. 5 Units.**

Emphasizes the development of meaningful communicative skills in German for the purposes of interaction with German speakers and beginning study of German. With a learner-centered approach, students develop speaking, listening, reading, writing, and cultural skills and knowledge.

Prerequisite: GERMAN 1B. GERMAN 1B with a grade of C or better. Placement into GERMAN 1C is also accepted.

Overlaps with GERMAN 1BC, GERMAN S1BC.

**(VI)****GERMAN S1AB. Fundamentals of German. 7.5 Units.**

First half of first-year German in a time-intensive form. Development of meaningful communicative skills for the purposes of interaction with German speakers and beginning study of German. Learner-centered approach develops speaking, listening, reading, writing, and cultural skills and knowledge.

Overlaps with GERMAN 1A, GERMAN 1B, GERMAN 1AB.

Restriction: GERMAN S1AB and GERMAN 1A and GERMAN 1B and GERMAN 1AB may not be taken for full credit.

**GERMAN S1BC. Fundamentals of German. 7.5 Units.**

Second half of first-year German in a time-intensive form. Development of meaningful communicative skills for the purposes of interaction with German speakers and beginning study of German. Learner-centered approach develops speaking, listening, reading, writing, and cultural skills and knowledge.

Prerequisite: GERMAN 1AB or GERMAN 1B or GERMAN S1AB. GERMAN 1AB with a grade of C or better. GERMAN 1B with a grade of C or better. GERMAN S1AB with a grade of C or better. Placement into GERMAN S1BC is also accepted.

Overlaps with GERMAN 1B, GERMAN 1C, GERMAN 1BC.

Restriction: GERMAN 1BC and GERMAN S1BC and GERMAN 1B and GERMAN 1C may not be taken for full credit.

**(VI)****GERMAN 2A. Intermediate German. 4 Units.**

Emphasizes communicative skills for the purposes of interaction with German speakers and intermediate study of German. With a learner-centered approach, helps students develop reading, writing, speaking, listening, grammatical, and cultural skills and knowledge. First-year grammar is reviewed and expanded.

Prerequisite: GERMAN 1BC or GERMAN 1C or GERMAN S1BC. GERMAN 1BC with a grade of C or better. GERMAN 1C with a grade of C or better. GERMAN S1BC with a grade of C or better. Placement into GERMAN 2A is also accepted.

Overlaps with GERMAN S2AB.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)**

**GERMAN 2B. Intermediate German. 4 Units.**

Emphasizes communicative skills for the purposes of interaction with German speakers and intermediate study of German. With a learner-centered approach, helps students develop reading, writing, speaking, listening, grammatical, and cultural skills and knowledge. First-year grammar is reviewed and expanded.

Prerequisite: GERMAN 2A. GERMAN 2A with a grade of C or better. Placement into GERMAN 2B is also accepted.

Overlaps with GERMAN S2AB, GERMAN S2BC.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)**

**GERMAN 2C. Intermediate German. 4 Units.**

Emphasizes communicative skills for the purposes of interaction with German speakers and intermediate study of German. With a learner-centered approach, helps students develop reading, writing, speaking, listening, grammatical, and cultural skills and knowledge. First-year grammar is reviewed and expanded.

Prerequisite: GERMAN 2B. GERMAN 2B with a grade of C or better. Placement into GERMAN 2C is also accepted.

Overlaps with GERMAN S2BC.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)**

**GERMAN S2AB. Intermediate German. 6 Units.**

First half of second-year German in a time-intensive form. Emphasizes communicative skills for the purposes of interaction with German speakers and intermediate study of German. Learner-centered approach develops reading, writing, speaking, listening, grammatical, and cultural skills and knowledge.

Prerequisite: GERMAN 1C or GERMAN S1BC

Overlaps with GERMAN 2A, GERMAN 2B.

Restriction: GERMAN S2AB and GERMAN 2A and GERMAN 2B may not be taken for full credit.

**(VIII)**

**GERMAN S2BC. Intermediate German. 6 Units.**

Second half of second-year German in a time-intensive form. Emphasizes communicative skills for the purposes of interaction with German speakers and intermediate study of German. Learner-centered approach develops reading, writing, speaking, listening, grammatical, and cultural skills and knowledge.

Prerequisite: GERMAN 2B or GERMAN S2AB. GERMAN 2B with a grade of C or better. GERMAN S2AB with a grade of C or better

Overlaps with GERMAN 2B, GERMAN 2C.

Restriction: GERMAN S2BC and GERMAN 2B and GERMAN 2C may not be taken for full credit.

**(VIII)**

**GERMAN 53. Advanced Conversation. 2 Units.**

Includes reading of political and cultural material. Conducted in German.

Prerequisite or corequisite: GERMAN 2C

Repeatability: May be repeated for credit unlimited times.

**GERMAN 97. Fundamentals of German (with Emphasis on Reading). 4 Units.**

Primarily for students interested in acquiring a solid reading knowledge of German. Facilitates comprehension and translation of texts in various disciplines. Does not serve as prerequisite for any higher-level German courses or fulfill any undergraduate foreign language requirement.

Repeatability: May be taken for credit 3 times.

Restriction: No German Studies Majors.

**GERMAN 101. Topics in Introduction to German Literature and Culture. 4 Units.**

Sample interpretations of texts in their cultural and historical contexts. Introduction to critical language in German.

Prerequisite or corequisite: GERMAN 2C. GERMAN 2C with a grade of C or better

Repeatability: Unlimited as topics vary.

**GERMAN 102. Topics in German Culture and Society. 4 Units.**

Interdisciplinary introduction to German culture from the perspective of its aesthetic, social, and political aspects. Methodological problems arising from an analysis of culture in its historical context.

Prerequisite or corequisite: GERMAN 2C. GERMAN 2C with a grade of C or better

Repeatability: Unlimited as topics vary.

**GERMAN 103. Topics in German Film. 4 Units.**

Introduction to the history and interpretation of German film within its cultural and social contexts. Enhances German grammar knowledge and vocabulary and develops sophisticated speaking, writing, and reading skills.

Prerequisite or corequisite: GERMAN 2C. GERMAN 2C with a grade of C or better

Repeatability: Unlimited as topics vary.

**GERMAN 104. Topics in German Linguistics. 4 Units.**

Introduces German or other Germanic-language linguistic, sociolinguistic, or ethnography-of-communication topics. Taught in German.

Prerequisite or corequisite: GERMAN 2C. GERMAN 2C with a grade of C or better

Repeatability: Unlimited as topics vary.

**GERMAN 105. German for Professions . 4 Units.**

Explores the structure of German business practices, including in scientific fields and engineering, while developing verbal and written skills important for professional life in Germany. Taught in German.

Prerequisite or corequisite: GERMAN 2C. GERMAN 2C with a grade of C or better

**GERMAN 115. Topics in Advanced German for Business and Economics. 4 Units.**

Explores the structure of the German economy and business practices while developing advanced verbal and written skills important for professional life in Germany. Taught in German.

Prerequisite or corequisite: GERMAN 101 or GERMAN 102 or GERMAN 103 or GERMAN 104 or GERMAN 105

Repeatability: Unlimited as topics vary.

**GERMAN 118. Topics in Studies in the Age of Goethe. 4 Units.**

Individual authors such as Lessing, Goethe, Schiller, Kleist, and Hölderlin, or the drama of the 'angry young men' of the German 1770s.

Prerequisite or corequisite: GERMAN 101 or GERMAN 102 or GERMAN 103 or GERMAN 104 or GERMAN 105

Repeatability: Unlimited as topics vary.

**GERMAN 119. Topics in 19th Century German Literature and Culture. 4 Units.**

Individual authors such as Büchner, Grillparzer, Keller, and Nietzsche, or broader social-literary phenomena.

Prerequisite or corequisite: GERMAN 101 or GERMAN 102 or GERMAN 103 or GERMAN 104 or GERMAN 105

Repeatability: Unlimited as topics vary.

**GERMAN 120. Topics in 20th Century German Literature and Culture. 4 Units.**

Individual authors such as Thomas Mann, Brecht, and Kafka, or topics addressing questions of genre and/or social-literary problems.

Prerequisite or corequisite: GERMAN 101 or GERMAN 102 or GERMAN 103 or GERMAN 104 or GERMAN 105

Repeatability: Unlimited as topics vary.

**GERMAN 130. Topics in German Literature and Culture. 4 Units.**

Literary and cultural topics not fully contained within the periods listed above, such as 'German Comedy' and 'Turn-of-the-Century Vienna.'

Prerequisite or corequisite: GERMAN 101 or GERMAN 102 or GERMAN 103 or GERMAN 104 or GERMAN 105

Repeatability: Unlimited as topics vary.

**GERMAN 140. Topics in Literary Theory and Criticism. 4 Units.**

In English. Theoretical dimensions of literary criticism and the German philosophical tradition. Topics have included Marxism, Freudian thought, German Idealist aesthetics, Historicism, twentieth-century hermeneutics, Frankfurt School, and Rezeptionsästhetik.

Repeatability: Unlimited as topics vary.

**GERMAN 140W. Topics in Literary Theory and Criticism. 4 Units.**

In English. Theoretical dimensions of literary criticism and the German philosophical tradition. Topics have included Marxism, Freudian thought, German Idealist aesthetics, Historicism, twentieth-century hermeneutics, Frankfurt School, and Rezeptionsästhetik.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only.

**(Ib)**

**GERMAN 150. German Literature and Culture in Translation. 4 Units.**

In English. Major works in Germanic literature and culture in context.

Repeatability: Unlimited as topics vary.

**GERMAN 150W. German Literature and Culture in Translation. 4 Units.**

In English. Major works in Germanic literature and culture in context.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only.

**(Ib)**

**GERMAN 160. German Cinema.**

Historical, theoretical, and comparative perspectives on German cinema.

Repeatability: Unlimited as topics vary.

**GERMAN 160W. German Cinema. 4 Units.**

Historical, theoretical, and comparative perspectives on German cinema.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only.

**(Ib)**

**GERMAN 170. Topics in German Linguistics. 4 Units.**

Explores linguistic, sociolinguistic, or ethnography-of-communication topics of German or other Germanic languages (Swedish, Icelandic, Yiddish, and others). Taught in English.

Repeatability: Unlimited as topics vary.



**GERMAN 170W. Topics in German Linguistics. 4 Units.**

Explores linguistic, sociolinguistic, or ethnography-of-communication topics of German or other Germanic languages (Swedish, Icelandic, Yiddish, and others). Taught in English.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only.

**(Ib)****GERMAN 197. German Internship . 4 Units.**

In this internship course, students will engage in professional practice (e.g., Engineering, Business Administration, government) in a German setting and thereby increase their knowledge of German language and culture in a setting beyond the academic classroom.

Prerequisite: GERMAN 2C

Grading Option: Pass/no pass only.

**GERMAN 199. Independent Study. 1-4 Units.**

Independent research with German faculty.

Repeatability: May be repeated for credit unlimited times.

**GERMAN 200. Literary Criticism . 4 Units.**

Topics in literary criticism.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**GERMAN 210. Literary Theory . 4 Units.**

Topics in literary theory.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**GERMAN 220. Selected Topics in German Linguistics . 4 Units.**

Topics in German linguistics.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**GERMAN 230. Literary and Cultural History. 4 Units.**

Topics in literary and cultural history.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**GERMAN 290. Independent Study. 4 Units.**

Counted toward course requirements for the M.A. or Ph.D. A term paper or project is required.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Humanities students only.

**GERMAN 298. Independent Directed Reading. 4-12 Units.**

For students preparing for doctoral examination.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**GERMAN 299. Dissertation Research. 4-12 Units.**

For students who have been admitted to doctoral candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Humanities students only.

**GERMAN 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Global Cultures Courses

**GLBLCLT 103A. Global Cultures I . 4 Units.**

Introduction to the processes by which economies, cultural practices, national entities, groups, individuals, and personal identities have undergone globalization. General background and methodological tools for understanding problems and processes of globalization.

Repeatability: Unlimited as topics vary.

**GLBLCLT 103B. Global Cultures II . 4 Units.**

Introduction to the processes by which economies, cultural practices, national entities, groups, individuals, and personal identities have undergone globalization. Explores how globalization has manifested itself in specific topics, periods, or societies.

Repeatability: Unlimited as topics vary.

**GLBLCLT 105. Language Origins: Evolution, Genetics, and the Brain. 4 Units.**

Examines how human language(s) may have originated. Studies pertinent techniques (reconstruction) and addresses related questions, including is our language faculty inborn (i.e., genetically encoded)? Can brain imaging and population genetics research help to unlock this mystery of human evolution?.

Same as ANTHRO 152A, LSCI 175, HISTORY 135G.

**GLBLCLT 191. Senior Seminar:Topics in Global Cultures. 4 Units.**

Students explore a topic(s) concerning processes and/or problems of globalization from an interdisciplinary perspective and build on their critical and analytical skills when investigating cultural and other phenomena that cut across national borders. Research assignments, class presentations, final seminar paper.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only.

**GLBLCLT 199. Independent Study. 1-4 Units.**

Directed reading and research in consultation with a faculty advisor. Substantial written work required.

Repeatability: May be repeated for credit unlimited times.

## Global Middle East Studies Courses

**GLBL ME 60A. Humanities and Arts: Problems and Methods for Global Middle East Studies. 4 Units.**

Introduces students to the broad set of humanities and arts approaches to studying the Middle East as a global zone of cultural, political, and economic interaction.

(IV and VIII ).

**GLBL ME 60B. Social Sciences: Problems and Methods for Global Middle East Studies. 4 Units.**

Introduces students to the broad set of social sciences approaches to studying the Middle East as a global zone of cultural, political, and economic interaction.

(III and VIII ).

**GLBL ME 60C. Social Ecology and Sciences: Problems and Methods for Global Middle East Studies. 4 Units.**

Introduces students to the broad set of approaches to studying the Middle East as a global zone of cultural, political, and economic interaction, focusing on the disciplines related to Social Ecology.

(III and VIII ).

**GLBL ME 100W. Research and Writing for Global Middle East Studies. 4 Units.**

Research and writing course for Global Middle East Studies majors. The primary focus is to refine the skills necessary for students to engage in independent research and writing in Global Middle East Studies.

Prerequisite or corequisite: GLBL ME 60A or GLBL ME 60B or GLBL ME 60C. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Global Middle East Studies Majors have first consideration for enrollment.

(Ib)

## Greek Courses

**GREEK 1A. Fundamentals of Greek. 5 Units.**

Elements of Classical Greek grammar, syntax, and vocabulary.

Overlaps with GREEK S1AB.

Restriction: GREEK 1A and GREEK S1AB may not be taken for full credit.

**GREEK 1B. Fundamentals of Greek. 5 Units.**

Elements of Classical Greek grammar, syntax, and vocabulary.

Prerequisite: GREEK 1A. GREEK 1A with a grade of C or better

Overlaps with GREEK S1AB, GREEK S1BC.

Restriction: GREEK 1B and GREEK S1AB and GREEK S1BC may not be taken for full credit.

**GREEK 1C. Fundamentals of Greek. 5 Units.**

Introduction to reading texts.

Prerequisite: GREEK 1B. GREEK 1B with a grade of C or better

Overlaps with GREEK S1BC.

Restriction: GREEK 1C and GREEK S1BC may not be taken for full credit.

(VI)

**GREEK 99. Special Studies in Greek. 1-4 Units.**

Lower-division level independent research with Greek faculty.

Repeatability: May be repeated for credit unlimited times.

**GREEK 100. Topics in Attic Greek. 4 Units.**

Selected readings in Attic Greek prose and poetry. Authors may include Xenophon, Lysias, Antiphon, Euripides, and others. Selections from prose and poetry will be read each quarter. Grammar and syntax review included.

Prerequisite: GREEK 1C. GREEK 1C with a grade of C or better. Placement into GREEK 100 is also accepted.

Repeatability: Unlimited as topics vary.

**GREEK 103. Seminar in Greek Prose. 4 Units.**

Specialized and focused study of a particular Greek prose author or topic.

Prerequisite: GREEK 100

Repeatability: Unlimited as topics vary.

**GREEK 104. Seminar in Greek Poetry. 4 Units.**

Specialized and focused study of a particular topic or author of Greek poetry.

Prerequisite: GREEK 100

Repeatability: Unlimited as topics vary.

**GREEK 198. Directed Group Study. 4 Units.**

Special topics in Greek culture and civilization through directed reading and research.

Repeatability: May be repeated for credit unlimited times.

**GREEK 199. Independent Studies in Greek. 1-4 Units.**

Independent research with Greek faculty.

Repeatability: May be repeated for credit unlimited times.

## Hebrew Courses

**HEBREW 1A. Fundamentals of Hebrew. 5 Units.**

Designed for students with little or no exposure to Hebrew. May focus on Biblical Hebrew and/or modern Hebrew. Students learn the writing system and basics of grammar via latest pedagogical materials. Topics in Jewish culture are also included.

Prerequisite: Placement into HEBREW 1A is also accepted.

**HEBREW 1C. Fundamentals of Hebrew. 5 Units.**

Designed for students with little or no exposure to Hebrew. May focus on Biblical Hebrew and/or modern Hebrew. Students learn the writing system and basics of grammar via latest pedagogical materials. Topics in Jewish culture are also included.

Prerequisite: HEBREW 1B. HEBREW 1B with a grade of C or better. Placement into HEBREW 1C is also accepted.

**(VI)**

**HEBREW 10A. Hebrew Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. HEBREW 10A is for language mentors.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**HEBREW 10B. Hebrew Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. HEBREW 10B is for language mentors.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**HEBREW 50. Jewish and Israeli Culture. 4 Units.**

Examination of subjects relevant to the culture of Israel and Judaism in their historical and modern day contexts through the study of film, literature, religious texts, artistic representations, etc.

**(IV, VIII)**

**HEBREW 199. Independent Study. 4 Units.**

Research paper required.

Repeatability: May be repeated for credit unlimited times.

## Humanities Courses

### **HUMAN 1A. Humanities Core Lecture. 4 Units.**

Through a range of cultural traditions and an interdisciplinary approach to works of literature, history, philosophy, and contemporary media, students are introduced to the humanities.

Restriction: Lower-division students only.

#### **(IV)**

### **HUMAN 1AES. Humanities Core Writing: Entry Level Writing. 4 Units. 2 Workload Units.**

A small writing course for Entry Level Writing students exploring the ideas presented in the companion lecture course and illustrated in the literary, historical, philosophical, and media works assigned.

Corequisite: HUMAN 1A

Grading Option: Workload Credit Letter Grade with P/NP.

Overlaps with HUMAN 1AS, HUMAN H1AS.

Restriction: Lower-division students only.

### **HUMAN 1AS. Humanities Core Writing. 4 Units.**

A small writing course in which students explore the ideas presented in the companion lecture course and illustrated in the literary, historical, philosophical, and media works assigned.

Corequisite: HUMAN 1A

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

Overlaps with HUMAN 1AES, HUMAN H1AS.

Restriction: Lower-division students only.

#### **(Ia)**

### **HUMAN 1B. Humanities Core Lecture. 4 Units.**

Through a range of cultural traditions and an interdisciplinary approach to works of literature, history, philosophy, and contemporary media, students are introduced to the humanities.

Restriction: Lower-division students only.

#### **(IV)**

### **HUMAN 1BES. Humanities Core Writing: Entry Level Writing. 4 Units. 2 Workload Units.**

A small writing course for Entry Level Writing students exploring the ideas presented in the companion lecture course and illustrated in the literary, historical, philosophical, and media works assigned.

Corequisite: HUMAN 1B

Prerequisite: HUMAN 1AES. HUMAN 1AES with a grade of C- or better

Grading Option: Workload Credit Letter Grade with P/NP.

Overlaps with HUMAN 1BS, HUMAN H1BS.

Restriction: Lower-division students only.

#### **(Ia)**

**HUMAN 1BS. Humanities Core Writing. 4 Units.**

A small writing course in which students explore the ideas presented in the companion lecture course and illustrated in the literary, historical, philosophical, and media works assigned.

Corequisite: HUMAN 1B

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

Overlaps with HUMAN H1BS, HUMAN 1BES.

Restriction: Lower-division students only.

**(Ia)**

**HUMAN 1C. Humanities Core Lecture. 4 Units.**

Through a range of cultural traditions and an interdisciplinary approach to works of literature, history, philosophy, and contemporary media, students are introduced to the humanities.

Prerequisite: HUMAN 1A or HUMAN 1B

Restriction: Lower-division students only.

**(IV and VII and VIII ).**

**HUMAN 1CS. Humanities Core Writing. 4 Units.**

A small writing course in which students explore the ideas presented in the companion lecture course and illustrated in the literary, historical, philosophical, and media works assigned.

Corequisite: HUMAN 1C

Prerequisite: HUMAN 1AS or HUMAN H1AS or HUMAN 1AES or HUMAN 1BS or HUMAN H1BS or HUMAN 1BES. HUMAN 1AS with a grade of C or better. HUMAN H1AS with a grade of C or better. HUMAN 1AES with a grade of C or better. HUMAN 1BS with a grade of C or better. HUMAN H1BS with a grade of C or better. HUMAN 1BES with a grade of C or better

Overlaps with HUMAN H1CS, HUMAN 1CES.

Restriction: Lower-division students only.

**(Ia)**

**HUMAN B1A. Humanities Core Biological Sciences Lecture. 4 Units.**

Through a range of cultural traditions and an interdisciplinary approach to works of literature, history, philosophy, and contemporary media, students are introduced to the humanities.

Overlaps with HUMAN 1A.

Restriction: Lower-division students only. Biological Sciences Majors only.

**(IV)**

**HUMAN H1AS. Humanities Core Writing: Honors. 4 Units.**

For Campuswide Honors students exploring the ideas presented in the companion lecture course and illustrated in the literary, historical, philosophical, and media works assigned.

Corequisite: HUMAN 1A

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

Overlaps with HUMAN 1AS, HUMAN 1AES.

Restriction: Campuswide Honors Collegium students only. Lower-division students only.

**(Ia)**

**HUMAN H1BS. Humanities Core Writing: Honors. 4 Units.**

For Campuswide Honors students exploring the ideas presented in the companion lecture course and illustrated in the literary, historical, philosophical, and media works assigned.

Corequisite: HUMAN 1B

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

Overlaps with HUMAN 1BS, HUMAN 1BES.

Restriction: Campuswide Honors Collegium students only. Lower-division students only.

**(Ia)**

**HUMAN H1CS. Humanities Core Writing: Honors. 4 Units.**

For Campuswide Honors students exploring the ideas presented in the companion lecture course and illustrated in the literary, historical, philosophical, and media works assigned.

Corequisite: HUMAN 1C

Prerequisite: HUMAN 1AS or HUMAN H1AS or HUMAN 1AES or HUMAN 1BS or HUMAN H1BS or HUMAN 1BES with a grade of C or better.

Overlaps with HUMAN 1CS, HUMAN 1CES.

Restriction: Lower-division students only. Campuswide Honors Program students only.

**(Ia)**

**HUMAN 10. Masterpieces of Literature. 4 Units.**

Students closely read major works of world literature that are significant (1) in their own right, (2) for a specific literary tradition, and (3) because of their reception in other cultural contexts. Literature written in English and English translation.

Repeatability: Unlimited as topics vary.

**(IV and VIII ).**

**HUMAN 52. Foundations of Bilingual Education and Bilingualism. 4 Units.**

Provides a comprehensive overview of current issues in bilingual education and bilingualism. Topics include dimensions of bilingualism, the effects of bilingualism on children's linguistic and cognitive development, bilingual education programs, literacy, special needs, and assessment.

Same as EDUC 52, LSCI 51B.

**HUMAN H80. Exploring Memory. 4 Units.**

Questions about human memory are central to a wide range of disciplines. Students will explore how historians, sociologists, social psychologists, legal experts, and neuroscientists understand human memory and apply their findings to understand and shape their own societies.

Restriction: Campuswide Honors Collegium students only.

**(IV)**

**HUMAN H81. The Vietnam War . 4 Units.**

Examines the origins, evolution, opposition against, conclusion, and legacy of the United States in the Vietnam War.

Restriction: Campuswide Honors Collegium students only.

**(GE III or IV ).**

**HUMAN H83. How Nations Remember. 4 Units.**

Just like people, nations select and organize what and how they want to remember. Compares how specific historical events (such as slavery and the Holocaust) are memorialized in various countries and represented in public art works, museums, literature, and film.

Restriction: Campuswide Honors Collegium students only.

**(III)**

**HUMAN H84. Traveling East/West. 4 Units.**

Traveling East/West presents a wide range of travel writings by Chinese, Indian, and Euro-American authors in which they contemplate the complexities of cross-cultural encounters and how knowledge about others and knowledge of ourselves are closely intertwined.

Same as EAS H84.

Restriction: Campuswide Honors Collegium students only.

**(IV)**

**HUMAN H120. Honors Proseminar . 4 Units.**

Interdisciplinary Honors courses organized each year around a single topic problem designed to compare and contrast modes of analysis in history, literary studies, and philosophy.

Repeatability: May be taken for credit 3 times as topics vary.

Restriction: Humanities Honors students only.

**HUMAN H140. Senior Honors Seminar. 4 Units.**

Directed by Humanities Honors Thesis Advisor and required of students in Humanities Honors program and Humanities majors in Campuswide Honors Program. Designed to facilitate exchange of ideas and research strategies among students and begin process of writing senior honors thesis.

Restriction: Humanities Honors students only. Seniors only.

**HUMAN H141. Senior Honors Thesis. 4 Units.**

Directed independent research required of participants in the Humanities Honors Program and Humanities majors in the Campuswide Honors Program.

Prerequisite: HUMAN H140

Restriction: Campuswide Honors Collegium students only. Humanities Honors students only.

**HUMAN H142W. Senior Honors Colloquium. 4 Units.**

Completion, presentation, and discussion of Senior Honors Theses.

Prerequisite: HUMAN H141

Restriction: Campuswide Honors Collegium students only. Humanities Honors students only.

**(Ib)**

**HUMAN H145. Arts of Contemporary Communication. 4 Units.**

A workshop seminar exploring the theory and practice of visual design, data visualization, and oral presentation. Designed to get students to think about, and hone their skills in, effective presentation of information in multiple media.

Restriction: Campuswide Honors Collegium students only. Humanities Honors Program students can enroll as space allows.

**HUMAN 175. Topics in Humanities and Science . 4 Units.**

Interdisciplinary topics exploring the relationship between the humanities and the physical and biological sciences.

Repeatability: May be taken for credit 3 times as topics vary.

**HUMAN 195. Humanities Out There (H.O.T.) Practicum. 0 - 2 Units.**

H.O.T. sponsors tutoring opportunities in local schools and after-school sites for UCI students. Requirements include weekly one-hour training sessions at UCI; at least eight off-site tutoring sessions; and short writing assignments.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 8 units.

**HUMAN 198. Directed Group Study. 1-4 Units.**

Directed group study on special topics.

Grading Option: Pass/no pass only.

Repeatability: Unlimited as topics vary.



**HUMAN 199. Directed Research. 1-4 Units.**

Directed research for senior Humanities students.

Repeatability: Unlimited as topics vary.

Restriction: Seniors only.

**HUMAN 220B. Studies in Literary Theory and Its History. 4 Units.**

Introduction to criticism and aesthetics for beginning graduate students. Readings from continental, English, and American theorists.

Same as CRITISM 220B.

Restriction: Graduate students only.

**HUMAN 260A. Critical Theory Workshop.**

A year-long Critical Theory Workshop, conducted by a team of instructors, conceived as a reading group, and developed with the input of all participants, where significant texts are discussed and analyzed in class.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**HUMAN 260B. Critical Theory Workshop.**

A year-long Critical Theory Workshop, conducted by a team of instructors, conceived as a reading group, and developed with the input of all participants, where significant texts are discussed and analyzed in class.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**HUMAN 260C. Critical Theory Workshop. 4 Units.**

A year-long Critical Theory Workshop, conducted by a team of instructors, conceived as a reading group, and developed with the input of all participants, where significant texts are discussed and analyzed in class.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**HUMAN 261. Race and Justice Studies Writing Seminar . 4 Units.**

A required writing-intensive seminar conducted by an instructor affiliated with the Race and Justice Studies emphasis. Students with manuscripts on relevant topics will read and critique peer manuscripts, and revise manuscripts toward completion of articles, dissertation chapters, and other publications.

Prerequisite: CRM/LAW C260C

Same as CRM/LAW C261, SOC SCI 253K.

Restriction: Graduate students only.

**HUMAN 265A. Issues In Latin American Studies I.**

Students discuss significant texts on Latin America from a range of disciplines in the humanities, social sciences, and the arts. This course will meet 3-4 times per quarter throughout the academic year.

Grading Option: Satisfactory/unsatisfactory only.

**HUMAN 265B. Issues In Latin American Studies II.**

Students discuss significant texts on Latin America from a range of disciplines in the humanities, social sciences, and the arts. This course will meet 3-4 times per quarter throughout the academic year.

Prerequisite: HUMAN 265A

Grading Option: Satisfactory/unsatisfactory only.

**HUMAN 265C. Issues In Latin American Studies III . 4 Units.**

Students discuss significant texts on Latin America from a range of disciplines in the humanities, social sciences, and the arts. This course will meet 3-4 times per quarter throughout the academic year.

Prerequisite: HUMAN 265B

Grading Option: Satisfactory/unsatisfactory only.

**HUMAN 270. Advanced Critical Theory. 4 Units.**

Seminars on various topics in critical theory.

Prerequisite: Students should have taken introductory courses before enrolling in these seminars.

Repeatability: Unlimited as topics vary.

**HUMAN 298. Humanities Out There (H.O.T.) Practicum. 4 Units.**

Individual study with H.O.T. faculty supervisor.

Repeatability: May be repeated for credit unlimited times.

**HUMAN 398A. Foreign Language Teaching: Approaches and Methods. 2 Units.**

Introduces approaches and methods of foreign language learning and teaching, and the theoretical models of second-language acquisition and teaching. Focus areas include lesson planning, teaching vocabulary, grammar, speaking, reading, writing, listening, culture, task-based teaching, uses of digital media.

Restriction: Graduate students only.

**HUMAN 398B. Foreign Language Teaching: Approaches and Methods. 2 Units.**

Introduces approaches and methods of foreign language learning and teaching, and the theoretical models of second-language acquisition and teaching. Focus areas include lesson planning, teaching vocabulary, grammar, speaking, reading, writing, listening, culture, task-based teaching, uses of digital media.

Restriction: Graduate students only.

**HUMAN 399. University Teaching. 4 Units.**

Limited to Teaching Associates in Humanities Core course.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## **Iranian Studies Courses**

**IRAN 231A. History of Zoroastrianism. 4 Units.**

Reviews major trends in the history of Zoroastrianism.

Restriction: Graduate students only.

Concurrent with HIST 131A.

**IRAN 231B. Ancient Persia. 4 Units.**

Survey of the history of Persia in antiquity.

Restriction: Graduate students only.

Concurrent with HIST 131B.

**IRAN 231C. Medieval Persia. 4 Units.**

A survey of Persian history in the context of Late Antique and Medieval Islamic history.

Restriction: Graduate students only.

Concurrent with HIST 131C.

**IRAN 255A. Ancient India. 4 Units.**

Examines the visual and religious history of the region defined as 'India' today, but necessarily encompassing modern Bangladesh and Pakistan. Culminates with the supposed Golden Age of the Gupta empire and its far-reaching legacies.

Same as AHIS 255A.

Restriction: Graduate students only.

Concurrent with AHIS 155A.

**IRAN 255B. Medieval India. 4 Units.**

Begins with the Gupta period's aesthetic legacies in South Asia's architecture, sculpture, and painting. Explores the dispersal of Islam throughout South Asia, including the Muslim communities of southern India.

Same as AHIS 255B.

Restriction: Graduate students only.

Concurrent with AHIS 155B.

**IRAN 280. Studies in Old Iranian. 4 Units.**

Studies in grammars and texts of Old Persian and Avestan.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IRAN 281. Studies in Middle Iranian. 4 Units.**

Studies in grammars and texts of Middle Iranian languages (e.g., Middle Persian, Parthian, Sogdian, Bactrian).

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IRAN 282. Studies in Classical Persian. 4 Units.**

Studies in the premodern literatures and historical texts of medieval and early modern Persian.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IRAN 290. Special Topics in Premodern Iranian Studies. 4 Units.**

Studies in selected areas of premodern Iranian Studies. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**IRAN 292. Seminar in Premodern Iranian Studies. 4 Units.**

Seminar in selected areas of premodern Iranian Studies. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**IRAN 293. Directed Readings in Premodern Iranian Studies. 4 Units.**

Directed reading on a specific topic agreed upon by student and instructor.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IRAN 294. Curatorial Methods. 4 Units.**

Development of curatorial methodologies with an instructor in conjunction with curatorial internship or practicum.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IRAN 295. Special Methods. 4 Units.**

Reading course focused on the development of particular research skills (e.g. archaeological field methods, numismatics, digital humanities) often in conjunction with a practicum.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IRAN 296. Ethics, Law, and Art. 4 Units.**

Addresses a broad range of ethical and legal issues pertaining to art, ownership, looting and theft, museum policies, and cultural heritage.

Prerequisite: Background in Art History or Legal Studies.

Same as AHIS 296.

Concurrent with AHIS 196.

## Italian Courses

**ITALIAN 1A. Fundamentals of Italian. 5 Units.**

First quarter of first-year Italian in a hybrid format. Students are taught to conceptualize in Italian as they learn to understand, read, write, and speak. Classes are conducted entirely in Italian.

Overlaps with ITALIAN S1AB, ITALIAN 1AB.

**ITALIAN 1AB. Intensive Italian Fundamentals. 7.5 Units.**

First half of first-year Italian in a time-intensive form. Development of meaningful communicative skills for the purposes of interaction with Italian speakers and beginning study of Italian. Learner-centered approach develops speaking, listening, reading, writing, and cultural skills and knowledge.

Overlaps with ITALIAN 1A, ITALIAN 1B, ITALIAN S1AB.

Restriction: ITALIAN 1AB and ITALIAN 1A and ITALIAN 1B and ITALIAN S1AB may not be taken for full credit.

**ITALIAN 1B. Fundamentals of Italian. 5 Units.**

Second quarter of first-year Italian in a hybrid format. Students are taught to conceptualize in Italian as they learn to understand, read, write, and speak. Classes are conducted entirely in Italian.

Prerequisite: ITALIAN 1A. ITALIAN 1A with a grade of C or better. Placement into ITALIAN 1B is also accepted.

Overlaps with ITALIAN S1AB, ITALIAN S1BC, ITALIAN 1AB, ITALIAN 1BC.

**ITALIAN 1BC. Intensive Italian Fundamentals. 7.5 Units.**

Second half of first-year Italian in a time-intensive form. Development of meaningful communicative skills for the purposes of interaction with Italian speakers and beginning study of Italian. Learner-centered approach develops speaking, listening, reading, writing, and cultural skills and knowledge.

Prerequisite: ITALIAN 1AB or ITALIAN S1AB or ITALIAN 1B. ITALIAN 1AB with a grade of C or better. ITALIAN S1AB with a grade of C or better. ITALIAN 1B with a grade of C or better. Placement into ITALIAN 1BC is also accepted.

Overlaps with ITALIAN 1B, ITALIAN 1C, ITALIAN S1BC.

Restriction: ITALIAN 1AB and ITALIAN 1A and ITALIAN 1B and ITALIAN S1AB may not be taken for full credit.

**(VI)**

**ITALIAN 1C. Fundamentals of Italian. 5 Units.**

Third quarter of first-year Italian in a hybrid format. Students are taught to conceptualize in Italian as they learn to understand, read, write, and speak. Classes are conducted entirely in Italian.

Prerequisite: ITALIAN 1B or ITALIAN 1AB or ITALIAN S1AB. ITALIAN 1B with a grade of C or better. ITALIAN 1AB with a grade of C or better. ITALIAN S1AB with a grade of C or better. Placement into ITALIAN 1C is also accepted.

Overlaps with ITALIAN S1BC, ITALIAN 1BC.

**(VI)**

**ITALIAN S1AB. Italian Fundamentals. 7.5 Units.**

First-year Italian in an intensified form. Students are taught to conceptualize in Italian as they learn to understand, read, write, and speak. Classes are conducted entirely in Italian and meet daily three hours for five weeks each session.

Overlaps with ITALIAN 1A, ITALIAN 1B, ITALIAN 1AB.

Restriction: ITALIAN S1AB and ITALIAN 1A and ITALIAN 1B and ITALIAN 1AB may not be taken for full credit.

**ITALIAN S1BC. Italian Fundamentals. 7.5 Units.**

First-year Italian in an intensified form. Students are taught to conceptualize in Italian as they learn to understand, read, write, and speak. Classes are conducted entirely in Italian and meet daily three hours for five weeks each session.

Prerequisite: ITALIAN S1AB or ITALIAN 1B or ITALIAN 1AB. ITALIAN S1AB with a grade of C or better. ITALIAN 1B with a grade of C or better. ITALIAN 1AB with a grade of C or better

Overlaps with ITALIAN 1B, ITALIAN 1C, ITALIAN 1BC.

Restriction: ITALIAN S1BC and ITALIAN 1B and ITALIAN 1C and ITALIAN 1BC may not be taken for full credit.

**(VI)****ITALIAN 2A. Intermediate Italian. 4 Units.**

Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in Italian.

Prerequisite: ITALIAN 1C or ITALIAN 1BC or ITALIAN S1BC. ITALIAN 1C with a grade of C or better. ITALIAN 1BC with a grade of C or better. ITALIAN S1BC with a grade of C or better. Placement into ITALIAN 2A is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)****ITALIAN 2B. Intermediate Italian. 4 Units.**

Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in Italian.

Prerequisite: ITALIAN 2A. ITALIAN 2A with a grade of C or better. Placement into ITALIAN 2B is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)****ITALIAN 2C. Intermediate Italian. 4 Units.**

Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in Italian.

Prerequisite: ITALIAN 2B. ITALIAN 2B with a grade of C or better. Placement into 2C is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)****ITALIAN 50. Topics in Italian Culture. 4 Units.**

Examines Italian culture at home and from abroad, in cinema, literature, and popular culture.

Repeatability: Unlimited as topics vary.

**(IV and VIII ).****ITALIAN 99. Special Studies in Italian. 4 Units.**

Both student and instructor arrive at the theme of the course and the critical approach to be followed in consultation. Intended to offer courses in Italian otherwise unavailable.

Repeatability: May be repeated for credit unlimited times.

**ITALIAN 150. Topics in Italian Literature and Culture. 4 Units.**

Major themes, periods, and/or movements in Italian literature and culture. Taught in English.

Repeatability: Unlimited as topics vary.

**ITALIAN 199. Tutorial in Italian Literature and Culture. 4 Units.**

The student must submit a written description of the proposed course to the instructor and the Chair prior to the beginning of the course.

Repeatability: Unlimited as topics vary.

## **Japanese Courses**

**JAPANESE 1A. Fundamental Japanese. 5 Units.**

Students develop listening, speaking, reading, and writing abilities in Japanese for meaningful communication. Content deals with daily life, society, and culture in Japan. Approximately 180 kanji (Chinese characters) are introduced in addition to the hiragana and katakana orthography.

Prerequisite: Placement into JAPANESE 1A is accepted.

Overlaps with JAPANESE S1AB.

Restriction: JAPANESE 1A and JAPANESE S1AB may not be taken for full credit.

**JAPANESE 1B. Fundamental Japanese. 5 Units.**

Students develop listening, speaking, reading, and writing abilities in Japanese for meaningful communication. Content deals with daily life, society, and culture in Japan. Approximately 180 kanji (Chinese characters) are introduced in addition to the hiragana and katakana orthography.

Prerequisite: JAPANESE 1A or JAPANESE S1AB. JAPANESE 1A with a grade of C or better. JAPANESE S1AB with a grade of C or better. Placement into JAPANESE 1B is also accepted.

Overlaps with JAPANESE S1AB, JAPANESE S1BC.

Restriction: JAPANESE 1B and JAPANESE S1AB and JAPANESE S1BC may not be taken for full credit.

**JAPANESE 1C. Fundamental Japanese. 5 Units.**

Students develop listening, speaking, reading, and writing abilities in Japanese for meaningful communication. Content deals with daily life, society, and culture in Japan. Approximately 180 kanji (Chinese characters) are introduced in addition to the hiragana and katakana orthography.

Prerequisite: JAPANESE 1B or JAPANESE S1AB. JAPANESE 1B with a grade of C or better. JAPANESE S1AB with a grade of C or better. Placement into JAPANESE 1C is also accepted.

Overlaps with JAPANESE S1BC.

Restriction: JAPANESE 1C and JAPANESE S1BC may not be taken for full credit.

## **(VI)**

**JAPANESE S1AB. Fundamentals of Japanese. 7.5 Units.**

First half of first-year Japanese in an intensified form.

Prerequisite: Placement into JAPANESE 1A.

Overlaps with JAPANESE 1A, JAPANESE 1B.

Restriction: JAPANESE S1AB and JAPANESE 1A and JAPANESE 1B may not be taken for full credit.

**JAPANESE S1BC. Fundamentals of Japanese. 7.5 Units.**

Second half of first-year Japanese in an intensified form.

Prerequisite: JAPANESE S1AB or JAPANESE 1B. JAPANESE S1AB with a grade of C or better. JAPANESE 1B with a grade of C or better. Placement into JAPANESE 1C is also accepted.

Overlaps with JAPANESE 1C, JAPANESE 1B.

Restriction: JAPANESE S1BC and JAPANESE 1B and JAPANESE 1C may not be taken for full credit.

## **(VI)**

**JAPANESE 2A. Intermediate Japanese. 5 Units.**

Japanese listening, speaking, reading, and writing abilities developed for meaningful communication. Content deals with daily life, society, and culture, including social issues in Japan. Approximately 180 kanji (Chinese characters) are introduced in addition to the 180 characters learned in 1A-B-C.

Prerequisite: JAPANESE 1C or JAPANESE S1BC. JAPANESE 1C with a grade of C or better. JAPANESE S1BC with a grade of C or better. Placement into JAPANESE 2A is also accepted.

Overlaps with JAPANESE S2AB.

Restriction: JAPANESE 2A and JAPANESE S2AB may not be taken for full credit.

(VIII)

**JAPANESE 2B. Intermediate Japanese. 5 Units.**

Japanese listening, speaking, reading, and writing abilities developed for meaningful communication. Content deals with daily life, society, and culture, including social issues in Japan. Approximately 180 kanji (Chinese characters) are introduced in addition to the 180 characters learned in 1A-B-C.

Prerequisite: JAPANESE 2A. JAPANESE 2A with a grade of C or better. Placement into JAPANESE 2B is also accepted.

Overlaps with JAPANESE S2AB.

Restriction: JAPANESE 2B and JAPANESE S2AB and JAPANESE S2BC may not be taken for full credit.

(VIII)

**JAPANESE 2C. Intermediate Japanese. 5 Units.**

Japanese listening, speaking, reading, and writing abilities developed for meaningful communication. Content deals with daily life, society, and culture, including social issues in Japan. Approximately 180 kanji (Chinese characters) are introduced in addition to the 180 characters learned in 1A-B-C.

Prerequisite: JAPANESE 2B or JAPANESE S2AB. JAPANESE 2B with a grade of C or better. JAPANESE S2AB with a grade of C or better. Placement into JAPANESE 2C is also accepted.

Overlaps with JAPANESE S2BC.

Restriction: JAPANESE 2C and JAPANESE S2BC may not be taken for full credit.

(VIII)

**JAPANESE S2AB. Intermediate Japanese. 7.5 Units.**

First half of second-year Japanese in an intensified form.

Prerequisite: JAPANESE 1C or JAPANESE S1BC. JAPANESE 1C with a grade of C or better. JAPANESE S1BC with a grade of C or better. Placement into JAPANESE 2A is also accepted.

Overlaps with JAPANESE 2A, JAPANESE 2B.

Restriction: JAPANESE S2AB and JAPANESE 2A and JAPANESE 2B may not be taken for full credit.

(VIII)

**JAPANESE S2BC. Intermediate Japanese. 7.5 Units.**

Second half of second-year Japanese in an intensified form.

Prerequisite: JAPANESE S2AB or JAPANESE 2B. JAPANESE S2AB with a grade of C or better. JAPANESE 2B with a grade of C or better. Placement into JAPANESE 2C is also accepted.

Overlaps with JAPANESE 2C, JAPANESE 2B.

Restriction: JAPANESE S2BC and JAPANESE 2B and JAPANESE 2C may not be taken for full credit.

(VIII)

**JAPANESE 3A. Advanced Japanese. 4 Units.**

Students are taught to conceptualize in Japanese as they learn to understand, read, write, and speak. Authentic Japanese texts are used. Approximately 360 kanji (Chinese characters) in addition to the 270 characters learned in 1A-B-C and 2A-B-C are introduced.

Prerequisite: JAPANESE 2C or JAPANESE S2BC or placement into JAPANESE 3A. JAPANESE 2C with a grade of C or better. JAPANESE S2BC with a grade of C or better.

(VIII)

**JAPANESE 3B. Advanced Japanese. 4 Units.**

Students are taught to conceptualize in Japanese as they learn to understand, read, write, and speak. Authentic Japanese texts are used. Approximately 360 kanji (Chinese characters) in addition to the 270 characters learned in 1A-B-C and 2A-B-C are introduced.

Prerequisite: JAPANESE 3A. JAPANESE 3A with a grade of C or better. Placement into JAPANESE 3B is also accepted.

(VIII)

**JAPANESE 3C. Advanced Japanese. 4 Units.**

Students are taught to conceptualize in Japanese as they learn to understand, read, write, and speak. Authentic Japanese texts are used. Approximately 360 kanji (Chinese characters) in addition to the 270 characters learned in first and second year are introduced.

Prerequisite: JAPANESE 3B. JAPANESE 3B with a grade of C or better. Placement into JAPANESE 3C is also accepted.

Restriction: Japanese Language Literature Majors have first consideration for enrollment.

(VIII)

**JAPANESE 100A. Classical Japanese. 4 Units.**

Introduction to classical Japanese grammar and vocabulary with emphasis on reading and analysis of basic texts.

Prerequisite: JAPANESE 3C. JAPANESE 3C with a grade of C or better

**JAPANESE 100B. Classical Japanese. 4 Units.**

Introduction to classical Japanese grammar and vocabulary with emphasis on reading and analysis of basic texts.

Prerequisite: JAPANESE 100A. JAPANESE 100A with a grade of C or better

**JAPANESE 101A. Fourth Year Japanese. 4 Units.**

Continued emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation through intensive study and analysis of a variety of texts.

Prerequisite: JAPANESE 3C

**JAPANESE 101B. Fourth Year Japanese. 4 Units.**

Continued emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation through intensive study and analysis of a variety of texts.

Prerequisite: JAPANESE 3C

**JAPANESE 115. Japanese Literature: Advanced Texts. 4 Units.**

Designed for students with near-fluency in reading Japanese. Texts include both fiction and nonfiction by important writers, and may be supplemented and contextualized where needed by literary criticism and cultural-studies texts in English.

Prerequisite: JAPANESE 101A or JAPANESE 101B or JAPANESE 101C

Repeatability: Unlimited as topics vary.

**JAPANESE 180. Topics in Japanese Literature. 4 Units.**

Special topics through directed reading in Japanese. Paper required.

Prerequisite: JAPANESE 3C. JAPANESE 3C with a grade of C or better

Repeatability: May be taken for credit 3 times as topics vary.

**JAPANESE 199. Independent Study. 1-4 Units.**

Investigation of special topics through directed reading in Japanese. Paper required.

Repeatability: May be taken for credit for 12 units.



**JAPANESE 201. Readings in Traditional Japanese Prose. 4 Units.**

Close reading of selected premodern prose texts, including tales, journals, travel journals, essays.

Prerequisite: JAPANESE 100B

Repeatability: Unlimited as topics vary.

**JAPANESE 202. Readings in Traditional Japanese Poetry or Drama. 4 Units.**

Close reading of selected premodern poetic or dramatic texts.

Prerequisite: JAPANESE 100B

Repeatability: Unlimited as topics vary.

**JAPANESE 203. Readings in Modern Japanese Literature. 4 Units.**

Texts include both fiction and nonfiction by important writers, and may be supplemented where needed by literary criticism and cultural-studies texts in English.

Prerequisite: JAPANESE 101C

Repeatability: Unlimited as topics vary.

**JAPANESE 204. Readings in Traditional Japanese Literary and Cultural Theory . 4 Units.**

Close reading of selected texts involving literary criticism and/or aesthetics.

Prerequisite: JAPANESE 100B

Repeatability: Unlimited as topics vary.

**JAPANESE 205. Readings in Japanese Religion. 4 Units.**

Close readings of selected Japanese religious texts.

Prerequisite: JAPANESE 101C

Repeatability: Unlimited as topics vary.

**JAPANESE 211A. Studies in Traditional Japanese Prose. 4 Units.**

Studies in selected areas of traditional Japanese prose. Topics addressed vary each quarter. Research paper required.

Prerequisite: JAPANESE 100B

Repeatability: Unlimited as topics vary.

**JAPANESE 211B. Studies in Traditional Japanese Prose. 4 Units.**

Studies in selected areas of traditional Japanese prose. Topics addressed vary each quarter. Research paper required.

Prerequisite: JAPANESE 100B and JAPANESE 211A

Repeatability: Unlimited as topics vary.

**JAPANESE 212A. Studies in Traditional Japanese Poetry or Drama. 4 Units.**

Studies in selected areas of traditional Japanese poetry or drama. Topics addressed vary each quarter. Research paper required.

Prerequisite: JAPANESE 100B

Repeatability: Unlimited as topics vary.

**JAPANESE 212B. Studies in Traditional Japanese Poetry or Drama. 4 Units.**

Studies in selected areas of traditional Japanese poetry or drama. Topics addressed vary each quarter. Research paper required.

Prerequisite: JAPANESE 212A

Repeatability: Unlimited as topics vary.

**JAPANESE 213A. Studies in Modern Japanese Literature. 4 Units.**

A two-quarter, in-depth look at a major author and/or issue in modern Japanese literature. Seminar format. The first quarter is devoted to reading of the requisite texts; the second quarter, to the writing of a research paper.

Prerequisite: JAPANESE 203

Repeatability: Unlimited as topics vary.

**JAPANESE 213B. Studies in Modern Japanese Literature. 4 Units.**

A two-quarter, in-depth look at a major author and/or issue in modern Japanese literature. Seminar format. The first quarter is devoted to reading of the requisite texts; the second quarter, to the writing of a research paper.

Prerequisite: JAPANESE 203 and JAPANESE 213A

Repeatability: May be repeated for credit unlimited times.

**JAPANESE 214. Studies in Japanese Literary and Cultural Theory. 4 Units.**

Studies in selected areas of Japanese literary and cultural theory. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**JAPANESE 215. Studies in Japanese Religion. 4 Units.**

Studies in selected areas of Japanese religion. Topics addressed vary each quarter. Research paper required.

Prerequisite: JAPANESE 101C

Repeatability: Unlimited as topics vary.

**JAPANESE 230. Topics in Japanese Literature and Culture. 4 Units.**

A topical study that addresses important issues in Japanese literature and culture. May focus on a specific writer or writers, or on a specific issue or set of related issues.

Prerequisite: JAPANESE 203

Repeatability: Unlimited as topics vary.

**JAPANESE 290. Independent Study. 4 Units.**

Directed research on topic determined in consultation with faculty member. A term paper or project is required.

Repeatability: May be repeated for credit unlimited times.

**JAPANESE 299. Dissertation Research. 4-12 Units.**

For Students who have been admitted to doctoral candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## **Korean Courses**

**KOREAN 1A. Fundamental Korean. 5 Units.**

Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing for students with no previous background in Korean. Conducted in both English and Korean.

Prerequisite: Placement into KOREAN 1A.

Overlaps with KOREAN 1KA, KOREAN S1AB.

Restriction: KOREAN 1A and KOREAN 1KA and KOREAN S1AB may not be taken for full credit.

**KOREAN 1B. Fundamental Korean. 5 Units.**

Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing for students with no previous background in Korean. Conducted in both English and Korean.

Prerequisite: KOREAN 1A. KOREAN 1A with a grade of C or better. Placement into KOREAN 1B is also accepted.

Overlaps with KOREAN S1BC, KOREAN 1KB, KOREAN S1AB.

Restriction: KOREAN 1B and KOREAN 1KB and KOREAN S1AB and KOREAN S1BC may not be taken for full credit.

**KOREAN 1C. Fundamental Korean. 5 Units.**

Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing for students with no previous background in Korean. Conducted in both English and Korean.

Prerequisite: KOREAN 1B or KOREAN S1AB. KOREAN 1B with a grade of C or better. KOREAN S1AB with a grade of C or better. Placement into KOREAN 1C is also accepted.

Overlaps with KOREAN 1KC, KOREAN S1BC.

Restriction: KOREAN 1C and KOREAN 1KC and KOREAN S1BC may not be taken for full credit.

**(VI)****KOREAN 1KA. Fundamental Korean for Students with a Previous Background in Korean. 5 Units.**

Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing for students with a previous background in Korean. Conducted in both English and Korean.

Prerequisite: Placement into KOREAN 1KA.

Overlaps with KOREAN 1A, KOREAN S1AB.

Restriction: KOREAN 1KA and KOREAN 1A and KOREAN S1AB may not be taken for full credit.

**KOREAN 1KB. Fundamental Korean for Students with a Previous Background in Korean . 5 Units.**

Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing for students with a previous background in Korean. Conducted in both English and Korean.

Prerequisite: KOREAN 1KA. KOREAN 1KA with a grade of C or better. Placement into KOREAN 1KB is also accepted.

Overlaps with KOREAN 1B, KOREAN S1AB, KOREAN S1BC.

Restriction: KOREAN 1KB and KOREAN 1B and KOREAN S1AB and KOREAN S1BC may not be taken for full credit.

**KOREAN 1KC. Fundamental Korean for Students with a Previous Background in Korean. 5 Units.**

Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing for students with a previous background in Korean. Conducted in both English and Korean.

Prerequisite: KOREAN 1KB. KOREAN 1KB with a grade of C or better. Placement into KOREAN 1KC is also accepted.

Overlaps with KOREAN 1C, KOREAN S1BC.

Restriction: KOREAN 1KC and KOREAN 1C and KOREAN S1BC may not be taken for full credit.

**(VI)****KOREAN S1AB. Fundamentals of Korean. 7.5 Units.**

First half of first-year Korean in an intensified form.

Prerequisite: Placement into KOREAN 1A or KOREAN 1KA or KOREAN 1B or KOREAN 1KB.

Overlaps with KOREAN 1A, KOREAN 1B, KOREAN 1KA, KOREAN 1KB.

Restriction: KOREAN S1AB and KOREAN 1A and KOREAN 1KA and KOREAN 1B and KOREAN 1KB may not be taken for full credit.

**KOREAN S1BC. Fundamentals of Korean. 7.5 Units.**

Second half of first-year Korean in an intensified form.

Prerequisite: KOREAN S1AB or KOREAN 1B or KOREAN 1KB. KOREAN S1AB with a grade of C or better. KOREAN 1B with a grade of C or better. KOREAN 1KB with a grade of C or better. Placement into KOREAN 1C or KOREAN 1KC is also accepted.

Overlaps with KOREAN 1C, KOREAN 1KB, KOREAN 1KC, KOREAN 1B.

Restriction: KOREAN S1BC and KOREAN 1B and KOREAN 1KB and KOREAN 1C and KOREAN 1KC may not be taken for full credit.

**(VI)**

**KOREAN 2A. Intermediate Korean. 5 Units.**

Designed to develop writing and reading skills as well as communicative skills in authentic situations for students without previous initial background in Korean. Students also introduced to aspects of Korean culture as related to lesson topics and basic Chinese characters.

Prerequisite: KOREAN 1C or KOREAN S1BC. KOREAN 1C with a grade of C or better. KOREAN S1BC with a grade of C or better. Placement into KOREAN 2A is also accepted.

Overlaps with KOREAN 2KA.

**(VIII)**

**KOREAN 2B. Intermediate Korean. 5 Units.**

Designed to develop writing and reading skills as well as communicative skills in authentic situations for students without previous initial background in Korean. Students also introduced to aspects of Korean culture as related to lesson topics and basic Chinese characters.

Prerequisite: KOREAN 2A. KOREAN 2A with a grade of C or better. Placement into KOREAN 2B is also accepted.

Overlaps with KOREAN 2KB.

**(VIII)**

**KOREAN 2C. Intermediate Korean. 5 Units.**

Designed to develop writing and reading skills as well as communicative skills in authentic situations for students without previous initial background in Korean. Students also introduced to aspects of Korean culture as related to lesson topics and basic Chinese characters.

Prerequisite: KOREAN 2B. KOREAN 2B with a grade of C or better. Placement into KOREAN 2C is also accepted.

Overlaps with KOREAN 2KC.

**(VIII)**

**KOREAN 2KA. Intermediate Korean for Students with a Previous Background in Korean . 5 Units.**

Designed to develop writing and reading skills as well as communicative skills in authentic situations for students with previous background in Korean. Students also introduced to aspects of Korean culture as related to lesson topics and basic Chinese characters.

Prerequisite: KOREAN 1KC or KOREAN S1BC. KOREAN 1KC with a grade of C or better. KOREAN S1BC with a grade of C or better. Placement into KOREAN 2KA is also accepted.

Overlaps with KOREAN 2A.

**(VIII)**

**KOREAN 2KB. Intermediate Korean for Students with a Previous Background in Korean . 5 Units.**

Designed to develop writing and reading skills as well as communicative skills in authentic situations for students with previous background in Korean. Students also introduced to aspects of Korean culture as related to lesson topics and basic Chinese characters.

Prerequisite: KOREAN 2KA. KOREAN 2KA with a grade of C or better. Placement into KOREAN 2KB is also accepted.

Overlaps with KOREAN 2B.

**(VIII)**

**KOREAN 2KC. Intermediate Korean for Students with a Previous Background in Korean. 5 Units.**

Designed to develop writing and reading skills as well as communicative skills in authentic situations for students with previous background in Korean. Students also introduced to aspects of Korean culture as related to lesson topics and basic Chinese characters.

Prerequisite: KOREAN 2KB. KOREAN 2KB with a grade of C or better. Placement into KOREAN 2KC is also accepted.

Overlaps with KOREAN 2C.

(VIII)

**KOREAN 3A. Advanced Korean. 4 Units.**

Focuses on developing advanced reading/writing and translation skills with additional instruction in Chinese characters.

Prerequisite: KOREAN 2C or KOREAN 2KC or KOREAN S2BC. KOREAN 2C with a grade of C or better. KOREAN 2KC with a grade of C or better. KOREAN S2BC with a grade of C or better. Placement into KOREAN 3A is also accepted.

(VIII)

**KOREAN 3B. Advanced Korean. 4 Units.**

Focuses on developing advanced reading, writing, and translation skills.

Prerequisite: KOREAN 3A or KOREAN 2C or KOREAN 2KC or KOREAN S2BC. KOREAN 3A with a grade of C or better. KOREAN 2C with a grade of C or better. KOREAN 2KC with a grade of C or better. KOREAN S2BC with a grade of C or better. Placement into KOREAN 3B is also accepted.

(VIII)

**KOREAN 3C. Advanced Korean. 4 Units.**

Focuses on developing advanced reading, writing, and translation skills.

Prerequisite: KOREAN 2C or KOREAN 2KC or KOREAN S2BC or KOREAN 3A or KOREAN 3B. KOREAN 2C with a grade of C or better. KOREAN 2KC with a grade of C or better. KOREAN S2BC with a grade of C or better. KOREAN 3A with a grade of C or better. KOREAN 3B with a grade of C or better. Placement into KOREAN 3C is also accepted.

(VIII)

**KOREAN 101A. Fourth-Year Korean. 4 Units.**

Continued emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation through intensive study and analysis of a variety of modern texts.

Prerequisite: KOREAN 3A or KOREAN 3B or KOREAN 3C. KOREAN 3A with a grade of C or better. KOREAN 3B with a grade of C or better. KOREAN 3C with a grade of C or better.

**KOREAN 115. Korean Literature: Advanced Texts. 4 Units.**

Designed for students with near-fluency in reading Korean. Readings include modern Korean literary works (poetry, prose, and drama) by important writers. Emphasis is on the interpretation of the texts and writings that interpret those texts in the original language.

Prerequisite: KOREAN 101A or KOREAN 101B or KOREAN 101C

Repeatability: Unlimited as topics vary.

**KOREAN 199. Independent Study. 1-4 Units.**

Investigation of special topics through directed reading in Korean. Paper required.

Repeatability: May be taken for credit for 12 units.

## Latin Courses

**LATIN 1A. Fundamentals of Latin. 5 Units.**

Elements of Latin grammar, syntax, and vocabulary.

Overlaps with LATIN S1AB.

Restriction: LATIN 1A and LATIN S1AB may not be taken for full credit.

**LATIN 1B. Fundamentals of Latin. 5 Units.**

Elements of Latin grammar, syntax, and vocabulary.

Prerequisite: LATIN 1A. LATIN 1A with a grade of C or better

Overlaps with LATIN S1AB, LATIN S1BC.

Restriction: LATIN 1B and LATIN S1AB and LATIN S1BC may not be taken for full credit.

**LATIN 1C. Fundamentals of Latin. 5 Units.**

Introduction to reading texts, including study of the poetry of Catullus and selected readings.

Prerequisite: LATIN 1B. LATIN 1B with a grade of C or better

Overlaps with LATIN S1BC.

Restriction: LATIN 1C and LATIN S1BC may not be taken for full credit.

**(VI)**

**LATIN 99. Special Studies in Latin. 1-4 Units.**

Lower-division level independent research with Latin faculty.

Repeatability: May be repeated for credit unlimited times.

**LATIN 100. Topics in Classical Latin. 4 Units.**

Selected readings in Classical Latin prose and poetry. Authors may include Cicero, Caesar, Ovid, Catullus, and others. Selections from prose and poetry will be read each quarter. Grammar and syntax review included.

Prerequisite: LATIN 1C. LATIN 1C with a grade of C or better. Placement into Latin 100 is also accepted.

Repeatability: Unlimited as topics vary.

**LATIN 103. Seminar in Latin Prose. 4 Units.**

Specialized and focused study of a particular Latin prose author or topic.

Prerequisite: LATIN 100

Repeatability: Unlimited as topics vary.

**LATIN 104. Seminar in Latin Poetry. 4 Units.**

Specialized and focused study of a particular topic or author in Latin poetry.

Prerequisite: LATIN 100

Repeatability: Unlimited as topics vary.

**LATIN 198. Directed Group Study. 1-4 Units.**

Special topics in Roman culture and civilization through directed reading and research.

Repeatability: May be repeated for credit unlimited times.

**LATIN 199. Independent Studies in Latin. 1-4 Units.**

Independent research with Latin faculty.

Repeatability: May be repeated for credit unlimited times.

## **Literary Journalism Courses**

**LIT JRN 20. Introduction to Literary Journalism. 4 Units.**

Reading of selected texts to explore the ways in which literary journalism and related nonfiction modes formulate experience. Students complete a range of writing projects.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Literary Journalism Majors have first consideration for enrollment.

**(IV)**

**LIT JRN 21. Reporting for Literary Journalism. 4 Units.**

Instruction and hands-on training in how to interview, report, research, and collect the types of information needed to write literary journalism.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Literary Journalism Majors have first consideration for enrollment.

**LIT JRN 100. Advanced Reporting. 4 Units.**

Practical engagement with advanced reporting techniques of Literary Journalism, emphasizing the importance of thorough and effective research in the production of high-quality journalistic writing. Prepares students to make good decisions about where and how to publish their writing.

Prerequisite: LIT JRN 21

**LIT JRN 101A. Studies in the History, Theory, and Ethics of Literary Journalism. 4 Units.**

Lectures and discussion on topics that explore the historical and theoretical dimensions of literary journalism, with particular emphasis on the evolution of ethics in the field.

Prerequisite: LIT JRN 21 and LIT JRN 20 and (ENGLISH 28A or ENGLISH 28B or ENGLISH 28C or ENGLISH 28D or ENGLISH 28E or COM LIT 60A or COM LIT 60B or COM LIT 60C or ENGLISH 8 or ENGLISH 10 or ENGLISH 11 or ENGLISH 12 or ENGLISH 15 or ENGLISH 16 or ENGLISH 17)

**LIT JRN 101BW. Literary Journalism Core Writing Workshop. 4 Units.**

Writing workshops in announced specialized genres that students will both study and practice. Examples include 'The Memoir,' 'Review Writing,' 'The Editorial,' 'Writing Biography,' 'The Profile,' and 'Political Writing.'

Prerequisite: LIT JRN 101A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 3 times as topics vary.

Restriction: Upper-division students only. Students may enroll in one LITJ 101BW course per quarter.

(Ib)

**LIT JRN 103. Lectures on Topics in Literary Journalism. 4 Units.**

A series of lectures on, and discussions of, announced topics in literary journalism and the literature of fact. Examples include 'Travel Literary Journalism'; 'Literature of True Crime'; 'Narratives in the Digital Age'; 'Journalism on the Edge'.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Recommended: Upper-division students only.

**LIT JRN 197. Community Reporting . 4 Units.**

Directed group study in which students work with an instructor to report and write about community news in a newsroom-style format. Students will partner with local publications to pitch, market, and publish their stories.

Prerequisite: Satisfactory completion of lower-division writing requirement.

Repeatability: May be repeated for credit unlimited times.

**LIT JRN 198. Special Topics. 4 Units.**

Directed group study of selected topics.

Repeatability: Unlimited as topics vary.

**LIT JRN 199. Reading and Conference. 1-4 Units.**

To be taken only when the materials to be studied lie outside the normal run of departmental offerings.

Repeatability: May be repeated for credit unlimited times.

**Medical Humanities Initiative Courses****MED HUM 1. Health, Wellness, and Conception of the Body. 4 Units.**

Asks what is health and who gets to have it? What is considered a "healthy" or "sick" body? We analyze historical and contemporary experiences of illness, medicine, and caregiving, including how patients represent their bodies and healing.

(GE III or IV ).

**MED HUM 3. Art and Medicine . 4 Units.**

Analyzes the relationship between medicine and the visual arts from the late medieval to modern periods, covering topics such as anatomy, optical medical technologies, gender and race in medicine, and popular representations of disease and doctors.

(GE II or IV ).

**MED HUM 195. Capstone Seminar: The Clinical Moral Laboratory. 4 Units.**

Interdisciplinary exploration of the clinical encounter, and the importance of meaning making in these “moral laboratories.” Students enter the clinical space as participant observers, and reflect on how the clinical site informs and challenges reading practices.

Prerequisite: MED HUM 1 or MED HUM 3 or GEN&SEX 60A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only.

**MED HUM 200. Critical Perspectives in Medical Humanities. 4 Units.**

Analyzes social and cultural understandings of the body, health, illness, medicine, and disease. Themes include critical histories of the body; non-compliant subjects interacting with medicine; racial-sexual hierarchies of health; and theories and expressions of pain and suffering.

Restriction: Graduate students only.

## Persian Courses

**PERSIAN 1A. Fundamentals in Persian. 5 Units.**

Designed for students with little or no exposure to Persian. Students learn the modern writing system and grammar of Persian. Facilitates basic reading, writing, and speaking skills and fosters college-level literacy in Persian culture.

Prerequisite: Placement into PERSIAN 1A.

Overlaps with PERSIAN S1AB.

Restriction: PERSIAN 1A and PERSIAN S1AB may not be taken for full credit.

**PERSIAN 1B. Fundamentals in Persian. 5 Units.**

Designed for students with little or no exposure to Persian. Students learn the modern writing system and grammar of Persian. Facilitates basic reading, writing, and speaking skills and fosters college-level literacy in Persian culture.

Prerequisite: PERSIAN 1A. PERSIAN 1A with a grade of C or better. Placement into PERSIAN 1B is also accepted.

Overlaps with PERSIAN S1AB, PERSIAN S1BC.

Restriction: PERSIAN 1B and PERSIAN S1AB and PERSIAN S1BC may not be taken for full credit.

**PERSIAN 1C. Fundamentals in Persian. 5 Units.**

Designed for students with little or no exposure to Persian. Students learn the modern writing system and grammar of Persian. Facilitates basic reading, writing, and speaking skills and fosters college-level literacy in Persian culture.

Prerequisite: PERSIAN 1B or PERSIAN S1AB. PERSIAN 1B with a grade of C or better. PERSIAN S1AB with a grade of C or better. Placement into PERSIAN 1C is also accepted.

Overlaps with PERSIAN S1BC.

Restriction: PERSIAN 1C and PERSIAN S1BC may not be taken for full credit.

(VI)

**PERSIAN 2A. Intermediate Persian. 4 Units.**

Designed for students to advance their Persian language skills from introductory to intermediate level. Student will advance their understanding of grammar and syntax. Facilitates intermediate-level reading, writing, and speaking skills. Fosters college-level cultural literacy.

Prerequisite: PERSIAN 1C or PERSIAN S1BC. PERSIAN 1C with a grade of C or better. PERSIAN S1BC with a grade of C or better. Placement into PERSIAN 2A is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(VIII)



**PERSIAN 2B. Intermediate Persian. 4 Units.**

Designed for students to advance their Persian language skills from introductory to intermediate level. Students will advance their understanding of grammar and syntax. Facilitates intermediate-level reading, writing, and speaking skills. Fosters college-level cultural literacy.

Prerequisite: PERSIAN 2A. PERSIAN 2A with a grade of C or better. Placement into PERSIAN 2B is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(VIII)

**PERSIAN 2C. Intermediate Persian. 4 Units.**

Designed for students to advance their Persian language skills from introductory to intermediate level. Students will advance their understanding of grammar and syntax. Facilitates intermediate-level reading, writing, and speaking skills. Fosters college-level cultural literacy.

Prerequisite: PERSIAN 2B. PERSIAN 2B with a grade of C or better. Placement into PERSIAN 2C is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(VIII)

**PERSIAN 10A. Persian Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. PERSIAN 10A is for language mentors.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**PERSIAN 10B. Persian Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. PERSIAN 10B is for language mentees.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**PERSIAN 50. Persian Culture. 4 Units.**

Study of varied topics in Persian culture, area studies, and society, both in the present and in historical perspective. Topics are not normally repeated for a two-year period.

Repeatability: Unlimited as topics vary.

(IV, VIII)

**PERSIAN 150. Topics in Advanced Persian Culture. 4 Units.**

In-depth examination of major works in premodern and modern Persian literature and/or the arts, with specific emphasis upon historical and cultural context and relevant societal issues and trends. Course is conducted in English.

Repeatability: May be taken for credit for 4 units as topics vary.

**PERSIAN 165A. Modern Iran: Cinema and the City. 4 Units.**

Exploring modern Iran through film, literature, photography, travel writing, and philosophy and social science texts that introduce students to important concepts in post-colonial studies, social thought, war culture, religion, and media as experienced through the paradigm of a non-Western modernity.

Same as ANTHRO 165A.

**PERSIAN 199. Independent Study. 4 Units.**

Independent research with Persian faculty.

Repeatability: May be repeated for credit unlimited times.

## Philosophy Courses

**PHILOS 1. Introduction to Philosophy. 4 Units.**

A selection of philosophical problems, concepts, and methods, e.g., free will, cause and substance, personal identity, the nature of philosophy itself. Materials fee.

(IV)

**PHILOS 2. Puzzles and Paradoxes. 4 Units.**

Introduction to the formal tools needed to comprehend and evaluate philosophical arguments and theoretical reasoning in general.

(IV and VB ).

**PHILOS 3. Technology and Society. 4 Units.**

A study of the nature of technology, its relation to human values, the philosophical assumptions in its development, and the philosophical implications of technology.

(II)

**PHILOS 4. Introduction to Ethics. 4 Units.**

Selected topics from the history of ethics, e.g., the nature of the good life and the moral justification of conduct.

(IV)

**PHILOS 5. Contemporary Moral Problems. 4 Units.**

Selected moral issues of current interest, e.g., abortion, sexual morality, euthanasia, capital punishment, reverse discrimination, civil disobedience, or violence.

(IV)

**PHILOS 7. Introduction to Existentialism. 4 Units.**

An analysis of themes in phenomenology and existentialism and their philosophical origins, e.g., consciousness, self and other, freedom and individuality.

(IV)

**PHILOS 10. History of Ancient Philosophy. 4 Units.**

Examination of the central philosophical themes developed by the pre-Socratics, Socrates, Plato, Aristotle, the Stoics, the Epicureans, and the Skeptics.

(IV)

**PHILOS 11. History of Medieval Philosophy. 4 Units.**

A study of some of the major theological and philosophical texts from the Medieval period.

Prerequisite: Recommended: PHILOS 10.

(IV)

**PHILOS 12. History of Modern Philosophy. 4 Units.**

A study of major developments in western philosophy from Descartes to Kant with readings from Descartes, Leibniz, Locke, Berkeley, Hume, and Kant.

Prerequisite: Recommended: PHILOS 10 or PHILOS 11.

(IV)

**PHILOS 13. History of Contemporary Philosophy. 4 Units.**

A study of recent philosophical developments in Anglo-American and Continental philosophy with readings from such figures as Russell, Moore, Wittgenstein, Quine, Heidegger, and Sartre.

Prerequisite: Recommended: PHILOS 12.

(IV)

**PHILOS 21. Philosophy and Religion. 4 Units.**

Examines the intersection of religion and philosophy from a standpoint that does not presuppose previous academic study of either. Both Western and Eastern traditions and perspectives may be explored.

Repeatability: Unlimited as topics vary.

Same as REL STD 21.

(IV)

**PHILOS 22. Introduction to Law and Society. 4 Units.**

What constitutes a legal system? What does it mean for a society to have a system as a part of the social fabric. Examines the social status of law and its use as a tool for fashioning society.

(III)

**PHILOS 29. Critical Reasoning. 4 Units.**

Introduction to analysis and reasoning. The concepts of argument, premise, and conclusion, validity and invalidity, consistency and inconsistency. Identifying and assessing premises and inferences. Deductive versus inductive reasoning, and introduction to the probability calculus. Evaluating definitions. Informal fallacies.

Same as LPS 29.

(II and Vb ).

**PHILOS 30. Introduction to Symbolic Logic. 4 Units.**

An introduction to the symbolism and methods of the logic of statements, including evaluation of arguments by truth tables, the techniques of natural deduction, and semantic tableaux.

Same as LPS 30, LSCI 43.

(Vb)

**PHILOS 31. Introduction to Inductive Logic. 4 Units.**

Philosophical questions concerning the foundations of scientific inference, e.g., the traditional problem of induction, the Goodman paradox, the concept of cause, Mill's method of inductive reasoning, probability calculus, different interpretations of probability, and their interaction in inductive reasoning.

Same as LPS 31.

(II, Va)

**PHILOS 40. Special Topics in Philosophy. 4 Units.**

Lectures on selected topics at the lower-division level.

Repeatability: Unlimited as topics vary.

**PHILOS 91. The Philosophy of Sex. 4 Units.**

Discusses the origins of biological sex, dynamics of sexual selection, sex differences in humans, and the construction of gender in human societies. Seeks to understand the role social values play in the creation of science.

Same as LPS 91.

Overlaps with LPS H91.

(III)

**PHILOS 100W. Writing Philosophy. 4 Units.**

Discussion of those aspects of writing of special importance in philosophy, e.g., philosophical terminology, techniques for evaluating arguments, philosophical definitions and theories. At least 4,000 words of assigned composition based on philosophical readings.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as LPS 100W.

Restriction: Upper-division students only.

(Ib)

**PHILOS 101. Introduction to Metaphysics. 4 Units.**

A study of one or more of the problems of 'first philosophy,' e.g., substance, free will, causation, abstract entities, identity.

**PHILOS 102. Introduction to the Theory of Knowledge. 4 Units.**

A study of one or more of the basic issues in epistemology, e.g., the role of perception in the acquisition of knowledge, the nature of evidence, the distinction between belief and knowledge, and the nature of truth and certainty.

Same as LPS 102.

**PHILOS 102W. Introduction to the Theory of Knowledge. 4 Units.**

A study of one or more of the basic issues in epistemology, e.g., the role of perception in the acquisition of knowledge, the nature of evidence, the distinction between belief and knowledge, and the nature of truth and certainty.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Overlaps with PHILOS 102, LPS 102.

**(Ib)**

**PHILOS 103. Introduction to Moral Philosophy. 4 Units.**

A study of one or more of the problems of contemporary moral philosophy, e.g., the nature of justice, liberalism versus conservatism, happiness and its relation to virtue and right conduct, the objectivity of moral standards.

**PHILOS 104. Introduction to Logic. 4 Units.**

Introduction to sentence logic, including truth tables and natural deduction; and to predicate logic, including semantics and natural deduction.

Same as LPS 104, LSCI 142.

**PHILOS 105A. Elementary Set Theory. 4 Units.**

An introduction to the basic working vocabulary of mathematical reasoning. Topics include sets, Boolean operations, ordered n-tuples, relations, functions, ordinal and cardinal numbers.

Same as LPS 105A, LSCI 145A.

**PHILOS 105B. Metalogic. 4 Units.**

Introduction to formal syntax (proof theory) and semantics (model theory) for first-order logic, including the deduction, completeness, compactness, and Löwenheim-Skolem theorems.

Prerequisite: PHILOS 105A

Same as LPS 105B, LSCI 145B.

Overlaps with MATH 150.

**PHILOS 105C. Undecidability and Incompleteness. 4 Units.**

Introduction to the formal theory of effective processes, including recursive functions, Turing machines, Church's thesis, and proofs of Gödel's incompleteness theorem for arithmetic, and Church's undecidability theorem for first-order logic.

Prerequisite: PHILOS 105B

Same as LPS 105C, LSCI 145C.

Overlaps with MATH 152.

Concurrent with LPS 205C.

**PHILOS 106. Topics in Logic . 4 Units.**

Selected topics in mathematical or philosophical logic.

Prerequisite: PHILOS 105B or LPS 105B

Repeatability: Unlimited as topics vary.

Same as LPS 106.

**PHILOS 108. Topics in Induction, Probability, and Decision Theory. 4 Units.**

Selected topics in induction, probability, and decision theory.

Repeatability: Unlimited as topics vary.

Same as LPS 108.

**PHILOS 110. Topics in Ancient Philosophy. 4 Units.**

Selected topics from the writings of Plato and Aristotle, e.g., Aristotle's criticisms of Plato's metaphysics, ethics, or politics.

Repeatability: May be taken for credit 2 times as topics vary.

**PHILOS 111. Topics in Medieval Philosophy. 4 Units.**

Studies of some of the major issues of concern to Medieval philosophers, e.g., universals, the nature and existence of God, faith, and reason.

Repeatability: May be taken for credit 2 times as topics vary.

**PHILOS 113. Topics in Modern Philosophy. 4 Units.**

Focuses on the works of central philosophical figures of modern Philosophy (e.g., Descartes, Leibniz, Hobbes, Locke, Hume, Kant) or on the treatment of one or more central philosophical problems by a number of these figures.

Repeatability: Unlimited as topics vary.

Same as LPS 113.

**PHILOS 114. Topics in Nineteenth-Century Philosophy. 4 Units.**

Studies of some of the major figures after Kant (e.g., Hegel, Nietzsche, Marx, Kierkegaard), especially in German idealism and social thought.

Repeatability: Unlimited as topics vary.

**PHILOS 115. Topics in History of Analytic Philosophy. 4 Units.**

Review of central theories or figures in the history of analytic philosophy. Emphasis on writings of Frege, Russell, Schlick, Carnap, and Quine. Topics include the nature of meaning and truth, the synthetic/analytic distinction, and scientific knowledge.

Repeatability: Unlimited as topics vary.

Same as LPS 115.

**PHILOS 116. Topics in Continental Philosophy. 4 Units.**

Studies of some of the major figures (e.g., Husserl), movements (e.g., phenomenology, existentialism) in early twentieth-century continental European thought.

Repeatability: Unlimited as topics vary.

**PHILOS 117. Topics in Asian Philosophy. 4 Units.**

Selected topics in the philosophies of Asia, e.g. Jainism, Buddhism, Yoga, Vedanta, Confucianism, Taoism, and Shinto.

Repeatability: Unlimited as topics vary.

**PHILOS 120. Topics in Metaphysics. 4 Units.**

Examines central philosophical questions concerning our own fundamental nature and that of the world around us (e.g., causation and necessity, determination, free will, personal identity, the mind-body problem).

Repeatability: Unlimited as topics vary.

Same as LPS 120.

**PHILOS 121. Topics in the Theory of Knowledge . 4 Units.**

One or more topics in the theory of knowledge, e.g., the nature of rational justification, of perceptual knowledge, of a priori knowledge.

Repeatability: Unlimited as topics vary.

Same as LPS 121.

**PHILOS 121A. Medical Epistemology. 4 Units.**

Analysis of epistemological issues concerning medical research and health care. Topics may include medical evidence, transmission of medical knowledge, medical expertise, the epistemology of medical disagreement, classification of illnesses, well-being, philosophy of pain, and medical decision making.

**PHILOS 122. Topics in Philosophy of Mind. 4 Units.**

Selected topics involving the concept of mind, e.g., the relation between mind and body, the self, personal identity, consciousness, the unconscious.

Repeatability: Unlimited as topics vary.

**PHILOS 123. Topics in Philosophy of Religion. 4 Units.**

Critical examination of concepts involved in the theological literature, e.g., the nature and existence of God, miracles, the problem of evil, divine command theories in ethics.

Repeatability: Unlimited as topics vary.

**PHILOS 130. Topics in Moral Philosophy. 4 Units.**

Selected topics in ethics.

Repeatability: Unlimited as topics vary.

**PHILOS 131A. Applied Ethics. 4 Units.**

Topics may include capital punishment, world hunger, obligations to future generations, environmental ethics, animal rights, economic justice, sexual morality, affirmative action, racism and sexism, or legalization of drugs.

**PHILOS 131C. Medical Ethics. 4 Units.**

Analysis of moral issues concerning health care. Topics may include just allocation of scarce medical resources, the doctor/patient relationship, genetic engineering, surrogate motherhood, abortion, euthanasia, or social policy concerning AIDS.

**PHILOS 132. Topics in Political and Social Philosophy. 4 Units.**

Selected topics in social and political philosophy, e.g., the functions of government, the justification of political authority, the nature of democracy, the varieties of liberty, and social justice. Readings from classical and contemporary sources.

Repeatability: Unlimited as topics vary.

**PHILOS 133. Topics in Philosophy of Law. 4 Units.**

Selected topics concerning legal systems and the concept of law, e.g., the nature and purpose of law, the nature of authority, the relationship between law and morality, law and political-economic systems.

Repeatability: Unlimited as topics vary.

**PHILOS 140. Topics in Philosophy of Science. 4 Units.**

Selected topics in contemporary philosophy of science, e.g., the status of theoretical entities, the confirmation of theories, the nature of scientific explanation.

Repeatability: Unlimited as topics vary.

Same as LPS 140.

**PHILOS 141A. Topics in Philosophy of Physics. 4 Units.**

Selected topics in the philosophy of physics, e.g., the interpretation of quantum mechanics, the nature of spacetime, the problem of quantum field theories.

Repeatability: Unlimited as topics vary.

Same as LPS 141A.

**PHILOS 141B. Geometry and Spacetime. 4 Units.**

An examination of the foundations of the special theory of relativity, with emphasis on the geometry of Minkowski spacetime, and its relation to both Euclidean and non-Euclidean (hyperbolic) plane geometries.

Prerequisite: MATH 2D and (MATH 3A or MATH 6G)

Same as LPS 141B.

**PHILOS 141C. Philosophy of Quantum Mechanics. 4 Units.**

An examination of the standard von Neumann-Dirac formulation of quantum mechanics. The quantum measurement problem is discussed along with several proposed solutions, including GRW, many-worlds, man-minds, and Bohm's theory.

Same as LPS 141C.

**PHILOS 141D. Probability and Determinism. 4 Units.**

An examination of a cluster of interrelated issues concerning probability, determinism, logic, and the foundations of quantum mechanics.

Prerequisite: MATH 2D and (MATH 3A or MATH 6G)

Same as LPS 141D.

**PHILOS 142W. Writing/Philosophy of Biology. 4 Units.**

Philosophy of biology, e.g., scientific method in biology, the structure of evolutionary theory, teleology, ethics, and evolution. Course work includes one 4,000-word and four 1,000-word papers.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as LPS 142W, BIO SCI E142W.

Restriction: Juniors only.

**(Ib)****PHILOS 143. Topics in Philosophy of Psychology. 4 Units.**

Selected topics in the philosophy of psychology, e.g., the nature of psychological explanation, reductionism, issues in cognitive, behavioral, and neuroscience.

Repeatability: Unlimited as topics vary.

Same as LPS 143, PSYCH 123P.

Restriction: Psychology Majors have first consideration for enrollment. Philosophy Majors have first consideration for enrollment.

**PHILOS 144. Topics in Philosophy of Social Science. 4 Units.**

Selected topics in the philosophy of the social sciences, e.g., Is their goal to understand behavior or to predict and control it?; Are they normative and the natural sciences not?; Do they incorporate philosophical doctrines about language and mind?.

Repeatability: May be taken for credit for 4 units as topics vary.

Same as LPS 144.

**PHILOS 145. Topics in Philosophy of Language. 4 Units.**

Selected topics in the philosophy of language, e.g., the nature of meaning, mechanisms of reference, speech acts.

Repeatability: Unlimited as topics vary.

Same as LPS 145, LSCI 141.

**PHILOS 146. Topics in Philosophy of Logic. 4 Units.**

Selected topics in the philosophy of logic, e.g., the nature of logical truth and our knowledge of it, the status of propositions, definite descriptions, and existential presuppositions.

Repeatability: Unlimited as topics vary.

Same as LPS 146.

**PHILOS 147. Topics in Philosophy of Mathematics. 4 Units.**

Selected historical and contemporary topics in the philosophy of mathematics, e.g., mathematical truth and ontology, mathematical knowledge, the nature and role of proof, the workings of mathematics in application.

Repeatability: Unlimited as topics vary.

Same as LPS 147.

**PHILOS 150. Phenomenology . 4 Units.**

A study of the foundations of phenomenology in Husserl and its background in Bolzano, Frege, Brentano, Meinong, Kant, and Descartes.

**PHILOS 151. Existentialism. 4 Units.**

A study of such central existentialist thinkers as Heidegger and Sartre.

Prerequisite: Recommended: PHILOS 7 or PHILOS 150.

**PHILOS 162. Social Ontology. 4 Units.**

Examines how things in one's social environment exist. Such things are compared and contrasted to others in what might be regarded as the given, natural environment. Topics discussed include natural kinds; artifacts; essentialism; constructivism; intentionality; agency.

**PHILOS 163. Social Epistemology. 4 Units.**

Social epistemology is specifically concerned with questions concerning knowledge and justification that arise in a social context. Topics discussed include testimony, experts, disagreement, group knowledge, feminist epistemology, legal epistemology, and epistemology of education.

**PHILOS 164. Well-Being. 4 Units.**

Examines what it is that makes a life good (or bad) for the person who lives it. Topics include hedonism, desire-satisfaction theories of well-being (as well as other such theories), the notion of harm, the possibility of posthumous harm.

**PHILOS 165. Philosophy of Action. 4 Units.**

Philosophy of action is specifically concerned with questions concerning the nature of acting, and related phenomena such as intending, willing, trying, and trusting. It deals both with individual and group action and their moral and epistemological underpinnings.

**PHILOS 190. Special Topics in Philosophy. 4 Units.**

Lectures on selected topics to be given by regular faculty and visiting faculty.

Repeatability: Unlimited as topics vary.

**PHILOS 199. Directed Special Studies. 2-4 Units.**

Independent study on a research topic supervised by a faculty member.

Repeatability: May be repeated for credit unlimited times.

**PHILOS 199H. Honors Directed Special Studies. 2 Units.**

Independent study on a research topic supervised by a faculty member, with the objective of preparing the Department of Philosophy honors paper.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**PHILOS 200. Special Topics in Philosophy. 4 Units.**

Seminars on selected topics to be given by regular faculty and visiting faculty.

Repeatability: Unlimited as topics vary.

**PHILOS 201. First-Year Seminar. 4 Units.**

An examination of some standard works in the history of philosophy, value theory, metaphysics, or epistemology; required of all first-year Philosophy graduate students in the School of Humanities.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only. Philosophy Majors only. Logic and Philosophy of Sci Majors only.

**PHILOS 205A. Set Theory. 4 Units.**

The basic working vocabulary of mathematical reasoning. Topics include: sets, Boolean operations, ordered n-tuples, relations, functions, ordinal and cardinal numbers.

Same as LPS 205A.

**PHILOS 205B. Metalogic. 4 Units.**

Formal syntax (proof theory) and semantics (model theory) for first-order logic, including the deduction, completeness, compactness, and Loewenheim-Skolem theorems.

Prerequisite: PHILOS 205A or LPS 205A

Same as LPS 205B.

**PHILOS 205C. Undecidability and Incompleteness. 4 Units.**

Formal theory of effective processes, including recursive function, Turing machines, Church's thesis, proofs of Goedel's incompleteness theorem for arithmetics, and Church's undecidability for first-order logic.

Prerequisite: PHILOS 205B or LPS 205B

Same as LPS 205C.

Restriction: Graduate students only.

Concurrent with LPS 105C.



**PHILOS 206. Topics in Logic . 4 Units.**

Studies in selected areas of logic. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 206.

**PHILOS 210. Topics in Ancient Philosophy. 4 Units.**

Studies in selected areas of ancient philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 211. Topics in Medieval Philosophy. 4 Units.**

Studies in selected areas of medieval philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 212. Topics in Renaissance Philosophy. 4 Units.**

Studies in selected areas of renaissance philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 213. Topics in Modern Philosophy. 4 Units.**

Studies in selected areas of modern philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 213.

**PHILOS 214. Topics in Nineteenth-Century Philosophy. 4 Units.**

Studies in selected areas of nineteenth-century philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 215. Topics in Analytic Philosophy. 4 Units.**

Studies in selected areas of analytic philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 215.

**PHILOS 216. Topics in Continental Philosophy. 4 Units.**

Studies in selected areas of continental philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 218. Topics in Contemporary Philosophy. 4 Units.**

Studies in selected areas of contemporary philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 220. Topics in Metaphysics. 4 Units.**

Studies in selected areas of metaphysics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 220.

**PHILOS 221. Topics in Epistemology. 4 Units.**

Studies in selected areas of epistemology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 221.

**PHILOS 221A. Medical Epistemology. 4 Units.**

Analysis of epistemological issues concerning medical research and healthcare. Topics may include medical evidence, transmission of medical knowledge in the doctor-patient interaction, medical expertise, epistemology of medical disagreement, classification of illness, well-being, philosophy of pain, or medical decision making.

Same as LPS 221A.

Restriction: Graduate students only.

**PHILOS 222. Topics in Mind and Action. 4 Units.**

Studies in selected areas of mind and action. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 230. Topics in Ethics . 4 Units.**

Studies in selected areas of ethics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 232. Topics in Political and Social Philosophy. 4 Units.**

Studies in selected areas of political and social philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 232.

**PHILOS 234. Topics in Aesthetics . 4 Units.**

Studies in selected areas of aesthetics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 240. Topics in Philosophy of Science. 4 Units.**

Studies in selected areas of philosophy of science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 240.

**PHILOS 241. Topics in Philosophy of Physics. 4 Units.**

Studies in selected areas of philosophy of physics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 241.

**PHILOS 242. Topics in Philosophy of Biology. 4 Units.**

Studies in selected areas of philosophy of biology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 242.

**PHILOS 243. Topics in Philosophy of Psychology. 4 Units.**

Selected topics in the philosophy of psychology, e.g., the nature of psychological explanation, reductionism, issues in cognitive, behavioral, and neuroscience.

Repeatability: Unlimited as topics vary.

Same as LPS 243, PSYCH 231P.

**PHILOS 244. Topics in Philosophy of Social Science. 4 Units.**

Studies in selected areas of philosophy and social science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 244.

**PHILOS 245. Topics in Philosophy of Language. 4 Units.**

Studies in selected areas of philosophy of language. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 245.

**PHILOS 246. Topics in Philosophy of Logic. 4 Units.**

Studies in selected areas of philosophy of logic. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 246.

**PHILOS 247. Topics in Philosophy of Mathematics. 4 Units.**

Studies in selected areas of philosophy of mathematics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 247.

**PHILOS 250. Topics in Existentialism and Phenomenology. 4 Units.**

Studies in selected areas of existentialism and phenomenology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 298. Independent Study. 4-12 Units.**

Independent research with Philosophy faculty.

Repeatability: May be repeated for credit unlimited times.

**PHILOS 299. Directed Research. 4-12 Units.**

Directed research with Philosophy faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHILOS 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Portuguese Courses

**PORTUG 121. Topics in Luso-Brazilian Literature. 4 Units.**

In English. Contextualized study of a major author, current, or genre in Brazilian, Portuguese, and/or Lusophone African literature. Examples: Gender, Race, and Sexualities in Postcolonial Lusophone Literatures; Women and Writing in Brazil and Portugal; The Short Story.

Repeatability: Unlimited as topics vary.

**PORTUG 243. Studies in Luso-Brazilian Literature and Culture. 4 Units.**

Critical analysis of selected literary works from Portugal and/or Brazil. Contextualizes the works within their historical and literary specificity, and discusses pertinent theoretical issues raised by them. Taught in Portuguese.

Prerequisite: Reading knowledge of Portuguese.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

## Religious Studies Courses

### **REL STD 5A. World Religions I. 4 Units.**

An introduction to the history, doctrine, culture, and writing of Judaism, Christianity, and Islam.

Same as HISTORY 16A.

**(IV and VIII ).**

### **REL STD 5B. World Religions II. 4 Units.**

An introduction to various religious traditions in selected areas of the world—including India and South Asia, East Asia, Africa, and the Americas.

Same as HISTORY 16B.

**(IV and VIII ).**

### **REL STD 5C. Religious Dialogue. 4 Units.**

Lectures and discussion on controversial topics in religion: sexual morality; religious violence; science; treatment of women and girls; religious truth, American Constitutional matters; secularization; the future of religion, and other topics.

Same as HISTORY 16C.

**(IV, VIII)**

### **REL STD 17. An Economic Approach to Religion. 4 Units.**

Introduction to how basic economic concepts such as demand, supply, consumption, production, competition, free-riding, innovation, regulation, and rent-seeking can be applied to understand observed religious behavior.

Same as ECON 17.

**(III)**

### **REL STD 21. Philosophy and Religion. 4 Units.**

Examines the intersection of religion and philosophy from a standpoint that does not presuppose previous academic study of either. Both Western and Eastern traditions and perspectives may be explored.

Repeatability: Unlimited as topics vary.

Same as PHILOS 21.

**(IV)**

### **REL STD 61. Gender and Religion. 4 Units.**

Introduces the topic of religion in a feminist context by performing cross-cultural exploration of gender, authority, and faith in various traditions. Study includes (but is not limited to) writings of contemporary Jewish, Christian, and Muslim feminists.

Same as GEN&SEX 60C.

**(III and VIII ).**

### **REL STD 90. Aspects of Religion. 4 Units.**

A presentation of selected issues in the study of religion.

Repeatability: May be taken for credit 3 times as topics vary.

### **REL STD 91. Topics in Aspects of Asian Religions. 4 Units.**

A survey course of a specific Asian religious tradition such as Hinduism, Buddhism, Jainism, Sikhism, Daoism, Confucianism, or Shinto in its manifestation in Asia or in its transmission to the Americas.

Repeatability: May be taken for credit 3 times as topics vary.

### **REL STD 100. Topics in the Study of Religion. 4 Units.**

The intersection of religious belief and practices with selected subjects of continuing interest.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 103. Topics in the Philosophy of Religion. 4 Units.**

Critical examination of philosophical concepts in religious scripture and theology, e.g., the nature and existence of God, miracles, the problem of evil, and divine command theories in ethics. May include any religious tradition.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 106. Topics in Gender and Religion. 4 Units.**

Critical examination of how religious beliefs and practices have shaped (and been shaped by) attitudes toward gender and sexuality in modern and/or premodern society.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 110. Thinking about Religion: Theories and Methodologies. 4 Units.**

A survey and investigation of the major thinkers, theories, and methodologies in the study of religions. Designed to develop the student's ability to analyze and articulate theoretical arguments; includes a paper on relevant Religious Studies topics.

Prerequisite: (REL STD 5A or HISTORY 16A) and (REL STD 5B or HISTORY 16B) and (REL STD 5C or HISTORY 16C)

Overlaps with REL STD 110W.

Restriction: Religious Studies Majors have first consideration for enrollment.

**REL STD 110W. Thinking about Religion: Theories and Methodologies. 4 Units.**

A survey and investigation of the major thinkers, theories, and methodologies in the study of religions. Designed to develop the student's ability to analyze and articulate theoretical arguments in writing; includes a paper on relevant Religious Studies topics.

Prerequisite: (REL STD 5A or HISTORY 16A) and (REL STD 5B or HISTORY 16B) and (REL STD 5C or HISTORY 16C). Satisfactory completion of the Lower-Division Writing requirement.

Overlaps with REL STD 110.

Restriction: Religious Studies Majors have first consideration for enrollment.

**(Ib)****REL STD 115. Religion and World Politics. 4 Units.**

Examines the relationship between religion and world politics historically and today, focusing on connections with peace/war, democracy, human rights, secularism(s), and globalization. Covers major debates, scholarship, concepts, and theories through class exercises, exams, and essays.

Prerequisite: POL SCI 41A or INTL ST 11 or INTL ST 12 or REL STD 5A or REL STD 5B or REL STD 5C

Same as POL SCI 146B, INTL ST 151B.

**REL STD 120. Topics in Asian Religious Traditions. 4 Units.**

Studies involving (but not limited to) Hinduism, Buddhism, Confucianism, Jainism, Sikhism, Daoism, Shinto or Shamanism, including both elite and doctrinal aspects and forms of more popular religiosity.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 122. Ancient India. 4 Units.**

Examines the visual and religious history of the region defined as 'India' today, but necessarily encompassing modern Bangladesh and Pakistan. Culminates with the supposed Golden Age of the Gupta empire and its far-reaching legacies.

Same as HISTORY 170A, ART HIS 155A.

Concurrent with ART HIS 255A.

**REL STD 123. Medieval India. 4 Units.**

Begins with the Gupta period's aesthetic legacies in South Asia's architecture, sculpture, and painting. Explores the dispersal of Islam throughout South Asia, including the Muslim communities of southern India.

Same as HISTORY 170B, ART HIS 155B.

Concurrent with ART HIS 255B.

**REL STD 124. Topics in Modern Indian Religion. 4 Units.**

Topics in religions of the Indian subcontinent including, but not confined to, Hinduism, Jainism, Sikhism, Islam, and Buddhism from the founding of the Mughal Empire in 1526 to the creation of the several modern states of the Indian subcontinent.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 130. Jewish, Islamic, and Middle Eastern Religious Traditions. 4 Units.**

Character and evolution of Egyptian, Jewish, Zoroastrian, Muslim, and other religious communities of the region from their formative periods to the present era.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 130F. Jews and Power. 4 Units.**

Examines the relationship between the Jewish people and political power over a 3500 year period. How have Jews preserved their communal interests and personal safety? How have they defined the proper relationship of the people to political authority.

Same as HISTORY 130F, POL SCI 154J.

**REL STD 131A. History of Zoroastrianism. 4 Units.**

Reviews major trends in the history of Zoroastrianism.

Same as HISTORY 131A.

**REL STD 140. Early Western Religious Traditions. 4 Units.**

Religious perspectives of the Mediterranean and European regions from the earliest times to approximately 1500 C.E.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 141. Recent Western Religious Traditions. 4 Units.**

Studies related to Catholic, Protestant, and Orthodox Christianity as well as alternative belief systems in Europe of the early modern and modern eras.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 150. Religion in the Americas. 4 Units.**

Religious belief and social context in North and South America from the earliest human societies to the present.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 160. Diaspora Religions. 4 Units.**

Examination of what happens to belief and practice as religious communities are scattered geographically.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 170. Topics in Comparative Studies in Religion. 4 Units.**

Literary, historical, or philosophical comparison of selected religious and quasi-religious traditions, their beliefs and practices.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 199. Independent Study. 1-4 Units.**

Directed reading and research in consultation with a faculty member. Substantial written work required.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only.

**REL STD 399. University Teaching . 4 Units.**

Limited to teaching assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Russian Courses

### **RUSSIAN 1A. Fundamentals of Russian. 5 Units.**

Focuses on reading, comprehension, basic composition, and conversation skills, and gives the student an initial exposure to the Russian cultural scene.

Prerequisite: Placement into RUSSIAN 1A.

### **RUSSIAN 1B. Fundamentals of Russian. 5 Units.**

Focuses on reading, comprehension, basic composition, and conversation skills, and gives the student an initial exposure to the Russian cultural scene.

Prerequisite: RUSSIAN 1A. RUSSIAN 1A with a grade of C or better. Placement into RUSSIAN 1B is also accepted.

### **RUSSIAN 1C. Fundamentals of Russian. 5 Units.**

Focuses on reading, comprehension, basic composition, and conversation skills, and gives the student an initial exposure to the Russian cultural scene.

Prerequisite: RUSSIAN 1AB or RUSSIAN 1B. RUSSIAN 1AB with a grade of C or better. RUSSIAN 1B with a grade of C or better. Placement into RUSSIAN 1C is also accepted.

### **(VI)**

### **RUSSIAN 2A. Intermediate Russian. 4 Units.**

Students read simple passages from contemporary Russian literary texts and newspapers. Development of oral skills and exposure to Russian culture continue.

Prerequisite: RUSSIAN 1BC or RUSSIAN 1C. RUSSIAN 1BC with a grade of C or better. RUSSIAN 1C with a grade of C or better. Placement into RUSSIAN 2A is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

### **(VIII)**

### **RUSSIAN 2B. Intermediate Russian. 4 Units.**

Students read simple passages from contemporary Russian literary texts and newspapers. Development of oral skills and exposure to Russian culture continue.

Prerequisite: RUSSIAN 2A. RUSSIAN 2A with a grade of C or better. Placement into RUSSIAN 2B is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

### **(VIII)**

### **RUSSIAN 2C. Intermediate Russian. 4 Units.**

Students read simple passages from contemporary Russian literary texts and newspapers. Development of oral skills and exposure to Russian culture continue.

Prerequisite: RUSSIAN 2B. RUSSIAN 2B with a grade of C or better. Placement into RUSSIAN 2C is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

### **(VIII)**

### **RUSSIAN 50. Russian Culture . 4 Units.**

Study of varied topics in Russian culture, area studies, and society, both in the present and in historical perspective.

Repeatability: May be taken for credit 4 times as topics vary.

### **(IV, VIII)**

### **RUSSIAN 99. Special Studies Russian. 1-5 Units.**

Special studies under faculty supervision.

Repeatability: May be taken for credit 2 times.

### **RUSSIAN 150. Topics in Russian Literature. 4 Units.**

Examines major themes in Russian literature, film, and other media from the eighteenth to twenty-first centuries. Taught in English.

Repeatability: Unlimited as topics vary.

**RUSSIAN 190. Topics in Russian Language Through Film. 4 Units.**

Uses Russian films of the late 20th century to enhance students' language skills and deepen their cultural knowledge. Work involves intensive conversation, reading and listening comprehension, and the acquisition of written skills and grammatical accuracy. Conducted primarily in Russian.

Prerequisite or corequisite: RUSSIAN 2C

Repeatability: Unlimited as topics vary.

**RUSSIAN 199. Independent Study. 1-4 Units.**

Independent study under direct faculty supervision.

Repeatability: May be taken for credit 2 times.

## Spanish Courses

**SPANISH 1A. Fundamentals of Spanish. 5 Units.**

Communicative approach with emphasis on conversational skills: the students and their environment, their experiences, and their opinions about issues. Reading and writing skills also introduced.

Prerequisite: Placement into SPANISH 1A.

Overlaps with SPANISH 1AB, SPANISH S1AB.

Restriction: SPANISH 1A and SPANISH 1AB and SPANISH S1AB may not be taken for full credit.

**SPANISH 1AB. Fundamentals Intensive Spanish. 10 Units.**

An intensive, proficiency-oriented, and task-based approach, designed to develop basic oral communicative abilities in Spanish. Reading and writing skills, along with an introduction to Hispanic cultures.

Prerequisite: Placement into SPANISH 1A.

Overlaps with SPANISH 1A, SPANISH 1B, SPANISH S1AB.

Restriction: SPANISH 1AB and SPANISH 1A and SPANISH 1B and SPANISH S1AB may not be taken for full credit.

**SPANISH 1B. Fundamentals of Spanish. 5 Units.**

Communicative approach with emphasis on conversational skills: the students and their environment, their experiences, and their opinions about issues. Reading and writing skills also introduced.

Prerequisite: SPANISH 1A. SPANISH 1A with a grade of C or better. Placement into SPANISH 1B is also accepted.

Overlaps with SPANISH 1AB, SPANISH S1AB.

Restriction: SPANISH 1B and SPANISH 1AB and SPANISH S1AB may not be taken for full credit.

**SPANISH 1C. Fundamentals of Spanish. 5 Units.**

Communicative approach with emphasis on conversational skills: the students and their environment, their experiences, and their opinions about issues. Reading and writing skills also introduced.

Prerequisite: SPANISH 1AB or SPANISH 1B or SPANISH S1AB. SPANISH 1AB with a grade of C or better. SPANISH 1B with a grade of C or better. SPANISH S1AB with a grade of B or better. Placement into SPANISH 1C is also accepted.

Overlaps with SPANISH S1BC.

Restriction: SPANISH 1C and SPANISH S1BC may not be taken for full credit.

## (VI)

**SPANISH S1AB. Fundamentals of Spanish. 7.5 Units.**

First half of first-year Spanish in an intensified form. Communicative approach with emphasis on conversational skills.

Prerequisite: Placement into SPANISH 1A.

Overlaps with SPANISH 1A, SPANISH 1B, SPANISH 1AB.

Restriction: SPANISH S1AB and SPANISH 1A and SPANISH 1B and SPANISH 1AB may not be taken for full credit.



**SPANISH S1BC. Fundamentals of Spanish. 7.5 Units.**

Second half of first-year Spanish in an intensified form. Communicative approach with emphasis on conversational skills.

Prerequisite: SPANISH S1AB or SPANISH 1A or SPANISH 1B. SPANISH S1AB with a grade of C or better. SPANISH 1A with a grade of C or better. SPANISH 1B with a grade of C or better. Placement into SPANISH 1B or SPANISH 1C is also accepted.

Overlaps with SPANISH 1B, SPANISH 1C, SPANISH 1AB.

Restriction: SPANISH S1BC and SPANISH 1B and SPANISH 1C and SPANISH 1AB may not be taken for full credit.

**(VI)****SPANISH 2A. Intermediate Spanish. 4 Units.**

Conversation, reading, and composition skills are developed using texts of literary and social interest. Emphasis on grammar review.

Prerequisite: SPANISH 1C or SPANISH S1BC. SPANISH 1C with a grade of C or better. SPANISH S1BC with a grade of C or better. Placement into SPANISH 2A is also accepted.

Overlaps with SPANISH 2AB, SPANISH S2AB.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)****SPANISH 2AB. Intermediate Intensive Spanish. 8 Units.**

Intensive intermediate course designed to improve student's abilities in reading, writing, speaking, and comprehension, including a thorough introduction to Hispanic cultures. Grammatical component of the language is gradually reviewed and tested.

Prerequisite: SPANISH 1C or SPANISH S1BC. SPANISH 1C with a grade of C or better. SPANISH S1BC with a grade of C or better. Placement into SPANISH 2A is also accepted.

Overlaps with SPANISH 2A, SPANISH 2B, SPANISH S2AB.

**(VIII)****SPANISH 2B. Intermediate Spanish. 4 Units.**

Conversation, reading, and composition skills are developed using texts of literary and social interest. Emphasis on grammar review.

Prerequisite: SPANISH 2A. SPANISH 2A with a grade of C or better. Placement into SPANISH 2B is also accepted.

Overlaps with SPANISH 2AB, SPANISH S2AB.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)****SPANISH 2C. Intermediate Spanish. 4 Units.**

Conversation, reading, and composition skills are developed using texts of literary and social interest. Emphasis on grammar review.

Prerequisite: SPANISH 2AB or SPANISH 2B or SPANISH S2AB. SPANISH 2AB with a grade of C or better. SPANISH 2B with a grade of C or better. SPANISH S2AB with a grade of B or better. Placement into SPANISH 2C is also accepted.

Overlaps with SPANISH S2BC.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)****SPANISH S2AB. Intermediate Spanish. 6 Units.**

First half of second-year Spanish in an intensified form. Conversation, reading, and composition skills are developed using texts of literary and social interest. Emphasis on grammar review.

Prerequisite: SPANISH 1C or SPANISH S1BC. SPANISH 1C with a grade of C or better. SPANISH S1BC with a grade of C or better. Placement into SPANISH 2A is also accepted.

Overlaps with SPANISH 2A, SPANISH 2B, SPANISH 2AB.

**(VIII)**

**SPANISH S2BC. Intermediate Spanish. 6 Units.**

Second half of second-year Spanish in an intensified form. Conversation, reading, and composition skills are developed using texts of literary and social interest. Emphasis on grammar review.

Prerequisite: SPANISH 2B or SPANISH S2AB or SPANISH 2A. SPANISH 2B with a grade of C or better. SPANISH S2AB with a grade of C or better. SPANISH 2A with a grade of B or better. Placement into SPANISH 2B or SPANISH 2C is also accepted.

Overlaps with SPANISH 2B, SPANISH 2C, SPANISH 2AB, SPANISH 2.

Restriction: SPANISH S2BC and SPANISH 2B and SPANISH 2C and SPANISH 2AB and SPANISH 2 may not be taken for full credit.

**(VIII)**

**SPANISH 3. US Latino Communities. 4 Units.**

Focuses on intermediate to advanced grammar and composition. Emphasis is placed on key elements of grammar, which constitutes about 70 percent of the curriculum, and composition writing, which constitutes the remaining 30 percent.

Prerequisite: SPANISH 2C or SPANISH S2BC. SPANISH 2C with a grade of C or better. SPANISH S2BC with a grade of C or better. Placement into SPANISH 3 is also accepted.

Overlaps with SPANISH 3H.

**(VIII)**

**SPANISH 3H. Heritage Spanish: Latinidad. 4 Units.**

Designed for students who grew up speaking Spanish in their homes/communities, whose schooling has been primarily in English, and need additional practice writing in Spanish.

Prerequisite: Placement into SPANISH 3H.

Overlaps with SPANISH 3.

**(VII)**

**SPANISH 44. Hispanic Literatures for Nonmajors. 4 Units.**

Focuses on major Spanish and Latin American literary texts within a historical and theoretical perspective. Taught in English with literary texts read in the original language.

Prerequisite: SPANISH 2 or SPANISH 2C or SPANISH S2BC

Restriction: No Spanish Majors.

**(VIII)**

**SPANISH 50. Latin America, U.S. Latino, and Iberian Cultures. 4 Units.**

Introduction (for non-majors) to the culture of the Spanish- and Portuguese-speaking worlds (Europe, Latin America, U.S., Africa). May focus on any time period. Taught in English.

Repeatability: May be taken for credit 3 times as topics vary.

**(IV and VIII ).**

**SPANISH 60E. Mexico and Central America: A Survey . 4 Units.**

Panoramic view of Mexico and Central America examining key texts throughout history. Shows the richness of the culture, and an appraisal of various forms of representation, including images, chronicles, novels, essays, poems, and a film. Taught in English.

Overlaps with SPANISH 60S.

**(IV and VIII ).**

**SPANISH 60S. Mexico and Central America: A Survey . 4 Units.**

Panoramic view of Mexico and Central America examining key texts throughout history. Shows the richness of the culture, and an appraisal of various forms of representation, including images, chronicles, novels, essays, poems, and a film. Taught in Spanish.

Prerequisite: Placement into SPANISH 2A or higher via Spanish Placement Test B is required.

Overlaps with SPANISH 60E.

(IV and VIII ).

**SPANISH 61. The Culture of the Visual Image in Latin America . 4 Units.**

A survey of visual forms of expression which have endured through more than five centuries of pre-colonial, colonial, and independent Latin America. Forms to be treated in the class include painting, monuments, sculpture, urban planning, graffiti, comics, and photography.

(IV and VIII ).

**SPANISH 62. Latinx, Multilingualism, and Social Justice . 4 Units.**

Explores the role of multilingualism (Spanish, indigenous languages, Latino English) in Latinx social justice movements in the United States with an emphasis on California. Course is taught in English.

(VII)

**SPANISH 97. Fundamentals of Spanish (with Emphasis on Reading). 4 Units.**

Designed for students interested in acquiring a solid reading knowledge of Spanish, and to facilitate the understanding and translating of Spanish texts covering a variety of disciplines. Does not fulfill any undergraduate foreign language requirement. Taught in English.

Prerequisite: Does not serve as prerequisite for any higher-level Spanish courses.

Restriction: No Spanish Majors.

**SPANISH 101A. Introduction to Iberian Literature and Culture. 4 Units.**

Introduction to the major authors and movements of Iberian literature and culture from the Middle Ages to the present.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 101B. Introductory Studies to Latin American Literature and Culture. 4 Units.**

A historical overview of Latin American literature and culture mainly focused on canonical texts. Topics include colonialism and postcolonialism, the nation, indigenismo, gender, and literary movements. Also introduces literary analysis, research methods, and cultural critique.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 104. Writing in Spanish. 4 Units.**

Focuses on the use of writing as a medium to encourage critical thinking and the practical analysis of literary texts, as well as the study of historical and social issues in the Spanish-speaking world.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 105. Spanish Communication. 4 Units.**

Designed to help students develop Spanish oral skills by exposing them to different verbal Spanish language registers. Special emphasis placed on abilities essential to professional or academic careers. Intended for Spanish majors as an important component of their overall education.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 107. Advanced Spanish Grammar. 4 Units.**

Designed for students who have demonstrated a substantial level of proficiency in their studies of the Spanish language. Takes thorough approach to advanced grammatical problems, in order to assist students in their mastery of the elements of the Spanish language.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 110A. Topics in Peninsular Literature and Cultures. 4 Units.**

Topics in Peninsular literature and cultures.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 110B. Topics in Latin American Literature and Cultures. 4 Units.**

Topics in Latin American literature and cultures.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 110C. U.S. Latino Literature and Cultures. 4 Units.**

Focuses on aspects of literature, art, cultural production, and history of the multifaceted Latino cultures that have developed within the United States. Focuses on one group, such as Caribbean Americans, Chicanos, Central Americans, or a comparative perspective of several groups.

Same as CHC/LAT 134.

**SPANISH 113A. Spanish Phonetics. 4 Units.**

Introduction to fundamental notions of Spanish phonetics. Particular attention paid to problems of pronunciation that arise in native and non-native speakers of Spanish due to interference between Spanish and English. Phonology (the system that underlies phonetics) and Spanish dialectology included.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 113B. Introduction to Spanish Linguistics. 4 Units.**

Application of basic notions of linguistics to Spanish, Spanish phonology, morphology, syntax, and semantics. Special attention to the application of linguistics to the teaching of Spanish.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 119. Textual Analysis and Interpretation. 4 Units.**

Focus on analysis and interpretation of literary texts. Emphasis on narrative, poetry, theater/performance, and visual media. Introduces students to major currents in theoretical thought, such as cultural studies, postmodernism, and others. Oral presentations and short essays required. Taught in Spanish.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 121. Topics in Golden Age Literature and Culture. 4 Units.**

Golden Age Literature in Spain, including the Renaissance and Baroque periods. Works of poetry, narrative, and theater. Historical and cultural background.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: May be taken for credit 3 times as topics vary.

**SPANISH 122. Topics in 18th and 19th Century Spanish Literature and Culture. 4 Units.**

The main literary and ideological trends in 18th and 19th century Spain, including the enlightenment, romanticism, realism, and naturalism.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: May be taken for credit 3 times as topics vary.

**SPANISH 123. Topics in 20th and 21st Century Spanish Literature and Culture. 4 Units.**

20th century Spanish authors. Works of poetry, narrative, or theater. Historical context of the period and principles of literary theory.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: May be taken for credit 3 times as topics vary.

**SPANISH 130A. Topics in Latin American Colonial Literature and Culture. 4 Units.**

Topics in Latin American colonial literature and culture.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 130B. Topics in Latin American Literature and Culture of the 19th Century. 4 Units.**

Topics in Latin American literature and culture of the 19th century.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 130C. Topics in Latin American Literature and Culture of the 20th Century. 4 Units.**

Topics in Latin American literature and culture of the 20th century.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 140. Topics in Chicano Literature and Culture. 4 Units.**

Studies in selected areas of Chicano/Latino Studies. Topics addressed vary each quarter. Taught in English.

Repeatability: May be taken for credit 4 times as topics vary.

Same as CHC/LAT 110.

**SPANISH 150. Topics in Literature in Translation. 4 Units.**

Study of texts by modern and contemporary Peninsular, Latin American, and/or U.S. Latino writers in translation. Taught in English. Not applicable toward Spanish major or minor requirements.

Repeatability: Unlimited as topics vary.

**SPANISH 160. Topics in Luso-Hispanic Film Studies. 4 Units.**

Study of Peninsular, Latin-American, and/or U.S. Latino film. Taught in English or Spanish.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 185. Selected Topics in Peninsular Literature and Culture. 4 Units.**

Selection of representative topics in Spanish and/or Portuguese literature and culture.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 186. Selected Topics in Latin American Literature and Culture. 4 Units.**

Selection of representative topics in the history of Latin American literature and culture.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 187. Selected Topics in Spanish Linguistics. 4 Units.**

Major topics in Spanish linguistics.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 190. Colloquium. 4 Units.**

Specialized, discussion-based course dealing primarily with a research topic that reflects the instructor's current intellectual interests. Required oral presentation(s) and final research paper. Limited to 15 students.

Prerequisite: SPANISH 107 or SPANISH 113A

Restriction: Upper-division students only. Spanish Majors only.

**SPANISH 199. Independent Study. 1-4 Units.**

Research paper required.

Repeatability: May be repeated for credit unlimited times.

**SPANISH 201. History of the Spanish Language. 4 Units.**

Diachronic survey of phonological changes from Latin to Old Spanish to Modern Spanish. Focuses in Castilian including Romance languages and other peninsula dialects for comparative purposes. Morphological changes.

**SPANISH 204. Spanish in Contact. 4 Units.**

Sociohistorical and linguistic overview of Spanish in contact with Basque, Catalan, English, German, American Indian, and African languages in Spain, Latin America, and the United States. Examines theories about language contact, and linguistic changes in Spanish phonology and grammar.

**SPANISH 205. Spanish Dialectology. 4 Units.**

Phonological, morphological, and syntactic variations in Spanish as spoken in the Hispanic world, from synchronic and diachronic points of view. The study of Spanish as spoken in the United States.

Restriction: Graduate students only.

**SPANISH 214. Topics in Golden Age Literature and Culture. 4 Units.**

Topics in Golden Age literature and culture.

Repeatability: Unlimited as topics vary.

**SPANISH 218. Topics in Enlightenment and Romanticism. 4 Units.**

Topics in Enlightenment and Romanticism.

Repeatability: Unlimited as topics vary.

**SPANISH 219. Topics in Nineteenth Century. 4 Units.**

Topics in nineteenth-century Spanish literature and culture.

Repeatability: Unlimited as topics vary.

**SPANISH 220. Topics in Twentieth Century. 4 Units.**

Topics in twentieth-century Spanish literature and culture.

Repeatability: Unlimited as topics vary.

**SPANISH 221. Topics in Iberian Studies. 4 Units.**

Cross-cultural connections and interactions between different ethnicities in the Iberian Peninsula.

Repeatability: Unlimited as topics vary.

**SPANISH 231. Topics in Colonial Latin America. 4 Units.**

Topics in Colonial Latin America.

Repeatability: Unlimited as topics vary.

**SPANISH 232. Topics in Nineteenth-Century Latin America. 4 Units.**

Topics in nineteenth-century Latin America.

Repeatability: Unlimited as topics vary.

**SPANISH 233. Topics in Twentieth-Century Latin America. 4 Units.**

Topics in twentieth-century Latin America.

Repeatability: Unlimited as topics vary.

**SPANISH 234. Topics in Latin America. 4 Units.**

Topics in Latin America.

Repeatability: Unlimited as topics vary.

**SPANISH 235. Topics in Trans-Oceanic Studies. 4 Units.**

Focuses on meaningful connections between different geographical and cultural areas.

Repeatability: Unlimited as topics vary.

**SPANISH 239A. Topics in Literary Theory I. 4 Units.**

Traces the development of Western literary critical principles from Aristotle to the twentieth century through selected readings of key figures in intellectual history (Aristotle, St. Augustine, Descartes, Kant, Hegel, Marx, Nietzsche, William James, Freud).

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SPANISH 239B. Topics in Literary Theory II. 4 Units.**

Study of major critical movements of the twentieth century, from Modernism's varied trends to those of the Postmodern/Postcolonial period. Emphasis on the development of prior critical discourses as well as revisionary theories.

Prerequisite: SPANISH 239A

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SPANISH 239C. Special Topics in Theory. 4 Units.**

Focus on issues related to critical theory, theory of literature, cultural criticism and visual arts as they pertain specifically to Latin America, Spain, Portugal, and Brazil. Topics vary. Examples: Latin American cultural studies; theory, film, and media in post-war Spain.

Repeatability: Unlimited as topics vary.

**SPANISH 245. Topics in Luso-Hispanic Film. 4 Units.**

Topics in Luso-Hispanic Film.

Repeatability: Unlimited as topics vary.

**SPANISH 251. Topics in Chicano Literature and Culture. 4 Units.**

Topics in Chicano Literature and Culture.

Repeatability: Unlimited as topics vary.

**SPANISH 252. Topics in U.S. Latino Literature and Culture. 4 Units.**

Topics in U.S. Latino Literature and Culture.

Repeatability: Unlimited as topics vary.

**SPANISH 260. Seminar in Spanish . 4 Units.**

Topics in Spanish.

Repeatability: Unlimited as topics vary.

**SPANISH 270. Creative Writing Workshop in Spanish/English. 4 Units.**

Discussion of theory and practice of creative writing. Focus on critical analysis of participant's work in progress. Texts may be written in Spanish and/or English and may be written in poetry or prose format.

Repeatability: Unlimited as topics vary.

**SPANISH 290. Individual Study. 4 Units.**

Individual Study.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SPANISH 291. Directed Reading. 4 Units.**

Directed Reading in Spanish.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SPANISH 292. Teaching Practicum. 4 Units.**

Teaching Practicum.

Grading Option: Satisfactory/unsatisfactory only.

**SPANISH 299. Dissertation Research. 4-12 Units.**

Dissertation Research.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Humanities students only.

**SPANISH 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Vietnamese Courses

**VIETMSE 1A. Fundamentals of Vietnamese. 5 Units.**

Designed for students with little or no exposure to Vietnamese. Natural approach with emphasis on four fundamental skills of listening, speaking, reading, and writing. Conducted in Vietnamese.

Prerequisite: Placement into VIETMSE 1A is required.

**VIETMSE 1B. Fundamentals of Vietnamese. 5 Units.**

Designed for students with little or no exposure to Vietnamese. Natural approach with emphasis on four fundamental skills of listening, speaking, reading, and writing. Conducted in Vietnamese.

Prerequisite: VIETMSE 1A. VIETMSE 1A with a grade of C or better. Placement into VIETMSE 1B is also accepted.

**VIETMSE 1C. Fundamentals of Vietnamese. 5 Units.**

Designed for students with little or no exposure to Vietnamese. Natural approach with emphasis on four fundamental skills of listening, speaking, reading, and writing. Conducted in Vietnamese.

Prerequisite: VIETMSE 1B or VIETMSE S1AB. VIETMSE 1B with a grade of C or better. VIETMSE S1AB with a grade of C or better. Placement into VIETMSE 1C is also accepted.

**(VI)****VIETMSE 2A. Intermediate Vietnamese. 4 Units.**

Designed for students to advance their Vietnamese language skills from introductory to intermediate level. Designed to develop writing and reading skills and communicative skills in authentic situations. Students are introduced to aspects of Vietnamese culture relating to lesson topics.

Prerequisite: VIETMSE 1C and VIETMSE S1BC. VIETMSE 1C with a grade of C or better. VIETMSE S1BC with a grade of C or better. Placement into VIETMSE 2A is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)****VIETMSE 2B. Intermediate Vietnamese. 4 Units.**

Designed for students to advance their Vietnamese language skills from introductory to intermediate level. Designed to develop writing and reading skills and communicative skills in authentic situations. Students are introduced to aspects of Vietnamese culture relating to lesson topics.

Prerequisite: VIETMSE 2A. VIETMSE 2A with a grade of C or better. Placement into VIETMSE 2B is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)**



**VIETMSE 2C. Intermediate Vietnamese. 4 Units.**

Designed for students to advance their Vietnamese language skills from introductory to intermediate level. Designed to develop writing and reading skills and communicative skills in authentic situations. Students are introduced to aspects of Vietnamese culture relating to lesson topics.

Prerequisite: VIETMSE 2B. VIETMSE 2B with a grade of C or better. Placement into VIETMSE 2C is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)****VIETMSE 10A. Vietnamese Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. VIETMSE 10A is for language mentors.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**VIETMSE 10B. Vietnamese Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. VIETMSE 10B is for language mentees.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**VIETMSE 50. Vietnamese Culture . 4 Units.**

Vietnamese culture and society in modern and historical contexts through the study of literary works, film, and other media. Philosophy and religious practices may also be examined. Course is taught in English.

**(IV)****VIETMSE 150. Vietnamese Literature and Culture in Translation. 4 Units.**

Major works in Vietnamese literature and culture in context.

Repeatability: Unlimited as topics vary.

**Writing Courses****WRITING 30. The Art of Writing: Poetry. 4 Units.**

Beginners' workshop in the writing of poetry, evaluation of student manuscripts, and parallel readings.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

Repeatability: May be taken for credit 2 times.

**(Ia)****WRITING 31. The Art of Writing: Prose Fiction. 4 Units.**

Beginners' workshop in fiction writing, evaluation of student manuscripts, and parallel readings.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

Repeatability: May be taken for credit 2 times.

**(Ia)****WRITING 37. Intensive Writing. 6 Units.**

Critical reading and analysis conducted through literary, academic, journalistic, and fictional genres with additional instruction in paragraph development and sentence-level mechanics. Students analyze and apply rhetorical principles in a range of writing assignments.

Prerequisite: Students must have taken the UC Analytical Writing Placement Examination.

Grading Option: Letter Grade only.

Overlaps with WRITING 39A, WRITING 39B.

**(Ia)**

**WRITING 39A. Introduction to Writing and Rhetoric. 4 Units.**

Introduction to the principles of rhetoric through readings and writing assignments across a range of genres, including fiction, non-fiction, journalism and academic essays. Rigorous instruction in composition and style, including organization, paragraph development, and sentence-level mechanics.

Prerequisite: Placement via the UC Analytical Writing Placement Examination is required.

Grading Option: Letter Grade only.

Overlaps with WRITING 37, WRITING 39AP.

**WRITING 39AP. Introduction to Writing and Rhetoric with Lab. 6 Units.**

Introduces the principles of rhetoric through readings and writing assignments across a range of genres. Rigorous instruction in composition and style. Designed for students seeking additional English language support.

Prerequisite: Students must have taken the UC Analytical Writing Placement Examination and the Academic English Placement Test.

Grading Option: Letter Grade only.

Overlaps with WRITING 39A, WRITING 37.

**WRITING 39B. Critical Reading and Rhetoric. 4 Units.**

Critical reading and analysis conducted through literary, academic, journalistic, and fictional genres. Students analyze and apply rhetorical principles in a range of writing assignments.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

Overlaps with WRITING 37.

**(Ia)**

**WRITING 39C. Argument and Research. 4 Units.**

Intensive instruction in research methods, argumentation, and rhetorical invention. Readings selected from current nonfiction and materials located by students from the University library's holdings, to include databases across a range of disciplines.

Prerequisite: WRITING 37 or WRITING 39B or AP36 or AP37. WRITING 37 with a grade of C or better. WRITING 39B with a grade of C or better. AP36 with a minimum score of 4. AP37 with a minimum score of 4

**(Ia)**

**WRITING 90. Intermediate Poetry Writing. 4 Units.**

Intermediate workshop in the writing of poetry, evaluation of student manuscripts, and parallel readings.

Prerequisite: WRITING 30

Repeatability: May be taken for credit 2 times.

**WRITING 91. Intermediate Fiction Writing. 4 Units.**

Intermediate workshop in the writing of fiction, evaluation of student manuscripts, and parallel readings.

Prerequisite: WRITING 31

Repeatability: May be taken for credit 2 times.

**WRITING 101W. Undergraduate Seminar: Applications in Literary Theory and Criticism for Creative Writing. 4 Units.**

Readings in literature, with discussions and written rhetorical responses on their making.

Prerequisite: (WRITING 30 or WRITING 31) and (WRITING 90 or WRITING 91) and (WRITING 30 or WRITING 31 or WRITING 90 or WRITING 91 or ENGLISH 16 or ENGLISH 17). Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: English Majors only. Literary Journalism Majors only.

**(Ib)**

**WRITING 110. Short Story Writing. 4 Units.**

Three-hour workshop in short fiction; discussion of student writing and of relevant literary texts.

Repeatability: May be taken for credit 2 times.

**WRITING 111. Poetry Writing. 4 Units.**

Three-hour advanced poetry writing workshop; discussion of student writing and of relevant literary texts.

Repeatability: May be taken for credit 2 times.

**WRITING 113. Novel Writing. 4 Units.**

Three-hour advanced workshop in fiction writing; discussion of student writing and of relevant literary texts.

**WRITING 139W. Advanced Expository Writing. 4 Units.**

Study of rhetoric, disciplinary genres, and modes of knowledge production; practice in writing effective prose. Essays of varying lengths, totaling at least 4,000 words.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only.

**(Ib)****WRITING 197. Writing Internship . 2-4 Units.**

Internships focused on writing. In consultation with a faculty advisor, students create a course from response essays, research essays, and assessment project data. Internships may include editing and publication projects, supervised teaching and tutoring assignments, community literacy projects.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**WRITING 250A. Graduate Writers' Workshop (Fiction). 4 Units.**

Graduate fiction workshop open to students enrolled in the MFA program in Writing.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**WRITING 250B. Graduate Writers' Workshop (Fiction). 4 Units.**

Graduate fiction workshop open to students enrolled in the MFA program in Writing.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**WRITING 250C. Graduate Writers' Workshop (Poetry). 8 Units.**

Graduate poetry workshop open to students enrolled in the M.F.A. Programs in Writing.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**WRITING 251A. Writing in Conference (Fiction). 4 Units.**

Graduate fiction workshop open to students enrolled in the MFA program in Writing.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**WRITING 251B. Writing in Conference (Fiction). 4 Units.**

Graduate fiction workshop open to students enrolled in the MFA program in Writing.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**WRITING 251C. Writing in Conference (Poetry). 8 Units.**

Graduate poetry workshop open to students enrolled in the M.F.A. Programs in Writing.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

## Ancient Iran and the Premodern Persianate World, Graduate Specialization

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The graduate specialization in Ancient Iran and the Premodern Persianate World is University of California, Irvine's interdisciplinary platform for graduate study in premodern Iranian studies. It is designed to provide Ph.D. students with the interdisciplinary training they need to conduct advanced research in the art, archaeology, architecture, history, literatures, and religions of Iran, as well as those peoples, regions, and empires whose destinies were intertwined with Iran, or impacted by its cultures (e.g. ancient Greece and Rome, Armenia, or Islamic Western or South Asia).

UCI boasts unparalleled faculty and programmatic resources for the study of ancient Iran and the wider premodern Persianate world, including the highest concentration of endowed chairs in ancient Iranian studies of any North American institution. With especial faculty strengths in ancient Iran, the specialization's broader historical scope encompasses the Bronze Age cultures of the Iranian Plateau, Mesopotamia, and Central Asia up to the early modern empires of the Mughals, Safavids, and Ottomans (ca. 3500 BCE – ca. 1740 CE). The specialization's broad conception of premodern Iranian Studies is paralleled in, and supported by, the extensive programming of UCI's Samuel Jordan Center for Persian Studies and Culture (<https://www.humanities.uci.edu/persianstudies/>), which provides the primary focus of the specialization's graduate workshop.

Prospective students who wish to pursue a Ph.D. in Iranian Studies at UCI must first apply ([https://www.humanities.uci.edu/persianstudies/program/grad\\_admit.php](https://www.humanities.uci.edu/persianstudies/program/grad_admit.php)) and be admitted to the doctoral program through which their potential advisor accepts students, for example, the Ph.D. program in History, or the Ph.D. program in Visual Studies. Students are encouraged to contact their potential advisors and the Director of the specialization before they apply. Once they have accepted UCI's offer of admission and are enrolled, students join the interdisciplinary graduate specialization by submitting a summary of degrees earned and prior undergraduate and graduate coursework taken related to Iranian Studies, together with a brief statement of purpose that details their degree program, interest in the field, current or potential advisor, and potential dissertation research. This should be submitted via email to the Director of the specialization at the start of their first quarter at UCI.

In addition to Ph.D. students whose doctoral work focuses on premodern Iran, the specialization is open to any student currently enrolled in a Ph.D. or M.A. program at UCI whose career goals would benefit from a deeper historical perspective and whose program provides sufficient flexibility to fulfill the requirements of the specialization. Students should follow the same procedure detailed above. Lack of previous degrees or coursework does not preclude admission. Applications to the specialization are reviewed on a rolling basis, although students are encouraged to apply as soon as they decide they wish to pursue it. All students accepted into the specialization are eligible to be affiliates of the Samuel Jordan Center for Persian Studies and Culture.

The program structure of the specialization consists of four required components: coursework and workshop; languages and specialized training; examinations; and the dissertation or thesis.

### Coursework and Workshop

Students must take four courses (seminar, lecture, or independent study) that deal with the art and archaeology, history, or religions of ancient Iran and the premodern Persianate world, its legacy, or methodological or theoretical issues related to its study (e.g. field methods, historical linguistics, critical theory, art law, ethics, museology). These can also include language courses that provide the training necessary to conduct advanced research in the study of premodern Iran (e.g. Avestan, Old Persian, Bactrian, Pahlavi, Aramaic, ancient Greek, Arabic, New Persian, etc.). Topics vary courses are provided through their normal departmental designators and are approved by the program director. A selection of courses for the specialization is listed below. All approved courses are listed on the program's webpage ([https://www.humanities.uci.edu/persianstudies/program/grad\\_program.php](https://www.humanities.uci.edu/persianstudies/program/grad_program.php)).

IRAN 290	Special Topics in Premodern Iranian Studies
IRAN 292	Seminar in Premodern Iranian Studies
IRAN 280	Studies in Old Iranian
IRAN 281	Studies in Middle Iranian
IRAN 282	Studies in Classical Persian
IRAN 294	Curatorial Methods
IRAN 295	Special Methods
IRAN 293	Directed Readings in Premodern Iranian Studies
IRAN 231A	History of Zoroastrianism
IRAN 231B	Ancient Persia
IRAN 231C	Medieval Persia

When a student counts a theoretically focused seminar toward the specialization, the topic of the seminar paper is expected to involve some aspect of the premodern Iranian or Persianate world. In order to encourage interdisciplinarity, students are expected to take at least one course from a program other than their own offered under or cross-listed with the specialization's course designator. In addition, students are expected to participate in the Premodern Iranian Studies workshop, conference, and speaker series. This is a collaborative faculty-student initiative whose content and discussions are focused, in part, on the lectures, conferences, and symposia ([https://www.humanities.uci.edu/persianstudies/calendar/events\\_more.php](https://www.humanities.uci.edu/persianstudies/calendar/events_more.php)) organized by the Jordan Center that year. Faculty and students may also present papers or works in progress. All graduate students in the specialization are expected to participate when in residency.

## Languages and Specialized Training

In addition to the modern languages required by students' home program, all students must prove competence in at least one premodern language relevant for conducting research in the Iranian world. Doctoral students will be expected to gain competency in at least two premodern research languages. This can take the form of a reading exam administered by the Director of the specialization or the completion of coursework at UCI or another institution equivalent to that needed to gain intermediate competency, including summer intensives. Depending on a student's objectives and needs, languages may include any Old or Middle Iranian language (e.g. Avestan, Old Persian, Middle Persian, Bactrian, Sogdian, etc.), relevant Mesopotamian, Mediterranean or Caucasian languages (e.g. Akkadian, Aramaic, Syriac, Old Armenian, ancient Greek and Latin, etc.), and any language with a substantial corpus of texts relevant to the study of the medieval or early modern Persianate world (e.g. Classical New Persian, Arabic, Urdu, Ottoman Turkish, etc.). According to their focus, students may be advised to pursue a course or practicum in numismatics, curatorial studies, archaeological fieldwork, or related digital methods in lieu of or in addition to language study.

## Examinations

For doctoral students, the director must approve that at least one area of the qualifying examination incorporates premodern Iran or the Persianate world as a central concern. One member of the candidate's qualifying examination committee is normally core or affiliated faculty of the specialization.

Plan II M.A. students must have significant premodern Iranian Studies content in their examination. There are no requirements concerning qualifying examinations for Plan I M.A. students.

## Dissertation or Thesis

Doctoral students must complete a dissertation that engages the study of the premodern Iranian world as part of their broader project. This can either be the sole focus of the project, the most common scenario, or an important subcomponent informing earlier, later, or coeval developments (e.g. a study of ancient or medieval Iranian art and architecture informing the study of modern or contemporary visual arts or literature).

After advising and before advancement to candidacy, the program director will confirm their approval of the proposed topic through email. Ph.D. students writing an in-process M.A. thesis en route to the Ph.D. and Plan I M.A. students will similarly gain approval of their M.A. thesis topic. Alternatively, a research or seminar paper written under the guidance of one or more of the specialization faculty will be submitted to the director. There are no requirements concerning theses for Plan II M.A. students (see examinations).

## Courses

### IRAN 231A. History of Zoroastrianism. 4 Units.

Reviews major trends in the history of Zoroastrianism.

Restriction: Graduate students only.

Concurrent with HIST 131A.

**IRAN 231B. Ancient Persia. 4 Units.**

Survey of the history of Persia in antiquity.

Restriction: Graduate students only.

Concurrent with HIST 131B.

**IRAN 231C. Medieval Persia. 4 Units.**

A survey of Persian history in the context of Late Antique and Medieval Islamic history.

Restriction: Graduate students only.

Concurrent with HIST 131C.

**IRAN 255A. Ancient India. 4 Units.**

Examines the visual and religious history of the region defined as 'India' today, but necessarily encompassing modern Bangladesh and Pakistan. Culminates with the supposed Golden Age of the Gupta empire and its far-reaching legacies.

Same as AHIS 255A.

Restriction: Graduate students only.

Concurrent with AHIS 155A.

**IRAN 255B. Medieval India. 4 Units.**

Begins with the Gupta period's aesthetic legacies in South Asia's architecture, sculpture, and painting. Explores the dispersal of Islam throughout South Asia, including the Muslim communities of southern India.

Same as AHIS 255B.

Restriction: Graduate students only.

Concurrent with AHIS 155B.

**IRAN 280. Studies in Old Iranian. 4 Units.**

Studies in grammars and texts of Old Persian and Avestan.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IRAN 281. Studies in Middle Iranian. 4 Units.**

Studies in grammars and texts of Middle Iranian languages (e.g., Middle Persian, Parthian, Sogdian, Bactrian).

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IRAN 282. Studies in Classical Persian. 4 Units.**

Studies in the premodern literatures and historical texts of medieval and early modern Persian.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IRAN 290. Special Topics in Premodern Iranian Studies. 4 Units.**

Studies in selected areas of premodern Iranian Studies. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**IRAN 292. Seminar in Premodern Iranian Studies. 4 Units.**

Seminar in selected areas of premodern Iranian Studies. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**IRAN 293. Directed Readings in Premodern Iranian Studies. 4 Units.**

Directed reading on a specific topic agreed upon by student and instructor.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IRAN 294. Curatorial Methods. 4 Units.**

Development of curatorial methodologies with an instructor in conjunction with curatorial internship or practicum.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IRAN 295. Special Methods. 4 Units.**

Reading course focused on the development of particular research skills (e.g. archaeological field methods, numismatics, digital humanities) often in conjunction with a practicum.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**IRAN 296. Ethics, Law, and Art. 4 Units.**

Addresses a broad range of ethical and legal issues pertaining to art, ownership, looting and theft, museum policies, and cultural heritage.

Prerequisite: Background in Art History or Legal Studies.

Same as AHIS 296.

Concurrent with AHIS 196.

## Critical Theory, Graduate Emphasis

**James Steintrager, Director**

4100 Humanities Gateway

949-824-6117

<http://www.humanities.uci.edu/critical/>

An emphasis in Critical Theory, under the supervision of the Committee on Critical Theory, is available for doctoral students in all departments at UCI upon approval of the student's faculty advisor or associate dean in accordance with departmental policy. Ph.D. students may, with Committee approval, complete the emphasis in addition to the degree requirements of their graduate program. Although there is no change in the existing Ph.D. program requirements or procedures, if the student wishes to have a letter (signed by the Dean and by the Director of Critical Theory) testifying that the student has satisfactorily added this theoretical dimension to the graduate program, then additional requirements must be met. Critical theory at UCI is understood in the broad sense as the study of the shared assumptions, problems, and commitments of the various discourses in the humanities. The faculty regards critical theory not as an adjunct to the study of one of the traditional humanistic disciplines but as a necessary context for the study of any humanistic discipline.

Admission to the emphasis may be granted by the Critical Theory Committee in response to the student's petition. The petition normally is submitted by the middle of the second year of graduate study, after completion of one HUMAN 270 seminar, and upon the recommendation of the Workshop's instructor or a faculty representative of the student's department.

### Requirements

(1) a three-quarter Critical Theory Workshop, conducted preferably by a team of instructors, conceived as a reading group, and developed with the input of all participants, where significant texts are discussed and analyzed in class. No term papers are required, and the course is graded Satisfactory/Unsatisfactory only. Students receive credit for this course only in the spring quarter. For the first two quarters, the course is 0 units with IP grading; (2) three HUMAN 270 courses offered under the supervision of the Committee. At least three such courses will be offered each quarter; (3) participation in two mini-seminars (six–eight hours) offered by visiting scholars (and sponsored by the Committee) on the visiting scholar's ongoing research; and (4) a dissertation that reflects the students' preparation in critical theory; alternatively, a research paper written under the guidance of one or more of the Emphasis faculty and submitted to the Director.

## Culture and Theory, Ph.D.

**Sora Han, Director**

<https://www.humanities.uci.edu/cultureandtheory/>



The Ph.D. program in Culture and Theory provides a strong theoretical and critical approach to race, gender, and sexuality studies. It is the Ph.D. graduate program that is constituted by several interdisciplinary units including African American Studies and Asian American Studies, and works integrally with the Critical Theory Emphasis. Interdisciplinary in nature and buttressed by the established strengths in critical theory at UCI, the program uses a problem-oriented approach to issues of race, gender, and sexuality in diasporic, transnational, and postcolonial contexts, as they are engaged broadly in the humanities, social sciences, and arts.

The Ph.D. program in Culture and Theory is designed to take full advantage of the combined expertise of the nationally and internationally prominent faculty at UCI whose work exemplifies the best in contemporary, critical, interdisciplinary studies in the humanities, social sciences, and the arts.

Applicants must have earned a bachelor's, master's, or equivalent degree in any discipline in the humanities, arts, or social sciences.

Applicants submit unofficial transcripts, statement of purpose, personal history, three letters of recommendation, and a sample of written work. In addition, an interview may be required. Incoming students are admitted for fall quarter only.

To be admitted formally into the doctoral program, students must satisfactorily pass an evaluation at the end of their first year of study; this includes students who entered with an M.A. from another institution.

**NOTE:** Ph.D. students will receive the M.A. after the satisfactory completion of specified requirements, as a step toward the Ph.D. Those students who complete the M.A., but whose committees assess their work as not meeting the standard for the Ph.D., will receive a terminal M.A. Students who enter the program with an M.A. from another institution may receive full or partial credit for the M.A., depending on the assessment of the Executive Committee at the time the student is admitted or on the assessment of the student's faculty advisor and committee during the student's first year. Students who receive full credit for the M.A. will be exempt from writing the master's paper.

1. CLT&THY 200A, CLT&THY 200B, CLT&THY 200C. Basic to the curriculum, this three-quarter core sequence provides a solid foundation in critical and cultural theories, their philosophical genealogies and institutional histories, and interdisciplinary methodologies. The core sequence also provides the space for an intellectual coherence and cohort building for Culture and Theory graduate students who will be taking most of their other courses in supporting departments and programs.
2. Seven additional theoretical courses selected, in consultation with the student's faculty advisor, from CLT&THY 240-CLT&THY 260, sets of offerings in the core supporting interdisciplinary units, the Critical Theory Emphasis, and other course offerings by core and affiliated faculty, which may include HUMAN 260A-HUMAN 260B-HUMAN 260C and HUMAN 270. One of these courses must be focused on research methods. Typically the seven courses will revolve around a set of theoretical problems, e.g., feminist theory and practice, critical race studies, sexualities, postcolonialism, transnational circuits, globalization, theorizing the political, philosophical debates on ethics, the intersections of visibility and textuality, to name a few. The theoretical problem courses are centered on the philosophical and theoretical approaches that form the basis of much work in critical, cultural, and social theory regarding race, gender, and sexuality studies.
3. Six courses on a focused area of study selected, in consultation with the student's faculty advisor, from CLT&THY 215-CLT&THY 235, concentrations within and across a department, within the Critical Theory emphasis, or in one of the core supporting interdisciplinary units. The courses in a focused area of study address a particular field in which various forms of critical theory have been applied, as well as a focus on groups, nations, and regions: examples include globalization, racism and the welfare state, diasporas of particular kinds, human rights, anti-colonial resistance movements in particular regions, modernity, and race.
4. CLT&THY 280. In this independent study course taken during their second year, students expand and develop a seminar paper into the master's paper, with the guidance of their faculty advisor.
5. Students must TA in a Humanities or Social Sciences department or program for a minimum of three quarters. They are also required to take the teaching seminar and workshops associated with the course in which they teach.
6. Additionally, students are expected to participate regularly in the Culture and Theory Colloquium, a series of events comprised of lectures, conferences, and performances sponsored by the program and allied units, particularly in the social sciences and the arts. Each year, the Colloquium will also include academic workshops (e.g., faculty and student works-in-progress, as well as on grant writing and on framing the dissertation project) and professionalization workshops (e.g., preparation for conferences and, later, for the job market). In addition to exposure to diverse ideas and development of practical techniques, participation in the Colloquium is intended to strengthen relations among students, and between students and faculty who are otherwise stretched across several units and schools.

**Master's Paper and M.A.:** During their second year, students work with their faculty advisor to expand and develop a seminar paper into a master's paper. A master's paper expands a seminar paper to a version that is of near-publishable quality. Upon completion of the paper, the faculty advisor and two other core faculty members will participate in an assessment of student's work to date.

Ph.D. students will receive the M.A. after the satisfactory completion of the three core courses, seven theoretical problem courses, six courses on a focused area of study, and the master's paper. Those students who complete the M.A. requirements, but whose committees assess their work as not meeting the standards for the Ph.D., will receive a terminal M.A.

**Qualifying Examination:** Students work with a committee comprised of five faculty members, including one outside member, to draw up reading lists and head notes on four topics, as well as a dissertation prospectus. Three of these topics should relate to the major areas of study outlined in the 200A, B, C core course sequence, and one should relate to the student's area of disciplinary or focused study. The examination itself will be comprised



of a written and oral exam. A student shall advance to candidacy upon successful passing of the Qualifying Exam and fulfillment of the language requirement, normally by the end of the third year.

**Language Requirement:** By the time they qualify for candidacy, students must demonstrate through course work or examination the ability to do research in one ancient or modern language (other than English).

**Dissertation:** The dissertation topic should be drawn from a focused area of study, chosen in consultation with the dissertation advisor and other committee members. Students will draw up their dissertation committee, which must consist of at least three members, at least two of whom must be drawn from the core faculty in the program whose interests match the topic chosen for the thesis. Dissertations must be approved by the student's dissertation committee and submitted to the executive committee.

**Time to Degree:** The normative time for advancement to candidacy is four years. The normative time for completion of the Ph.D. is seven years, and the maximum time permitted is eight years.

## Faculty

Jonathan Alexander, Ph.D. Louisiana State University, *Associate Dean, Division of Undergraduate Education and Campus Writing Coordinator and Chancellor's Professor of English; Culture and Theory; Education; Gender and Sexuality Studies; Informatics* (writing studies, sexuality studies, queer theory, new media studies)

Bridget R. Cooks Cumbo, Ph.D. University of Rochester, *Associate Professor of African American Studies; Art History; Culture and Theory; Visual Studies* (African American art, museum studies, feminist and post-colonial theory)

Sora Han, Ph.D. University of California, Santa Cruz, *Director of the Graduate Program in Culture and Theory and Associate Professor of Criminology, Law and Society; African American Studies; Culture and Theory; School of Law* (law and popular culture, critical race theory, philosophies of punishment, feminism and psychoanalysis)

Sandra Harvey, Ph.D. University of California, Santa Cruz, *Assistant Professor of African American Studies; Culture and Theory* (black diasporas, sovereignty, indigeneity, visual art and culture, Enlightenment philosophy, feminist and queer theories)

Rodrigo Lazo, Ph.D. University of Maryland, College Park, *Associate Professor of English; Culture and Theory* (hemispheric American studies, nineteenth century, Latino studies and the Americas, Cuba, immigrant literature)

James K. Lee, Ph.D. University of California, Los Angeles, *Associate Professor of Asian American Studies; Culture and Theory; English; Religious Studies* (Asian American literature and culture, contemporary U.S. literature, race and ethnic studies, urban studies, religious studies)

Jerry Won Lee, Ph.D. University of Arizona, *Associate Professor of English; Anthropology; Asian American Studies; Comparative Literature; Culture and Theory*

Julia Hyoun Joo Lee, Ph.D. University of California, Los Angeles, *Department Chair and Associate Professor of Asian American Studies; Culture and Theory; English* (Asian American literature and culture, African American literature and culture, ethnic literature, twentieth-century American literature.)

Kevin E. Olson, Ph.D. Northwestern University, *Professor of Political Science; Culture and Theory; European Languages and Studies* (political theory, history of political thought, legal theory, philosophy of the social sciences)

Rajagopalan Radhakrishnan, Ph.D. Binghamton University, State University of New York, *Distinguished Professor of English; African American Studies; Comparative Literature; Culture and Theory* (critical theory, postcoloniality, nationalisms and diasporas, poststructuralism, postmodernism, democracy and minority discourse, cultural studies, globalization and transnationalism)

Jared Charles Sexton, Ph.D. University of California, Berkeley, *Professor of African American Studies; Culture and Theory; Film and Media Studies; Visual Studies* (race and sexuality, policing and imprisonment, contemporary U.S. cinema and political culture, multiracial coalition, critical theory)

John H. Smith, Ph.D. Princeton University, *Professor of Comparative Literature; Culture and Theory; German; Religious Studies* (18th- and 19th-century literature and intellectual history, literary theory)

Rei Terada, Ph.D. Boston University, *Professor of Comparative Literature; Culture and Theory* (theory, poststructuralism, nineteenth- and twentieth-century poetry)

Keith Topper, Ph.D. University of California, Los Angeles, *Associate Professor of Political Science; Culture and Theory* (political theory, critical theory, poststructuralism, theories of power, language and politics, theory and politics of interpretation, politics of culture, philosophy of the social sciences)

Frank B. Wilderson III, Ph.D. University of California, Berkeley, *Department Chair and Professor of African American Studies; Culture and Theory* (Afro-Pessimism, film theory, Marxism, narratology)

Tiffany Willoughby-Herard, Ph.D. University of California, Santa Barbara, *Associate Professor of African American Studies; Comparative Literature; Culture and Theory; Political Science* (South Africa, poor whites, race in foreign policy, diaspora, comparative racial politics, third world feminisms, feminist pedagogy, black political thought)

Judy Tzu-Chun Wu, Ph.D. Stanford University, *Director of Humanities Center and Chancellor's Professor of Asian American Studies; Culture and Theory* (Asian American history; comparative racialization and immigration; empire and decolonization; gender and sexuality)

## Affiliate Faculty

Catherine Benamou, Ph.D. New York University, *Associate Professor of Film and Media Studies; Culture and Theory; Visual Studies* (Hispanophone and Lusophone cinema and television, U.S. Latino media, Orson Welles and maverick cinema, transnational flows, spectatorship, cinematic memory and cultures of preservation)

Victoria Bernal, Ph.D. Northwestern University, *Professor of Anthropology; Culture and Theory; Gender and Sexuality Studies; Religious Studies* (gender, war, cyberspace, Islam, transnationalism, Africa)

Vinayak Chaturvedi, Ph.D. University of Cambridge, *Associate Professor of History; Culture and Theory; European Languages and Studies; Religious Studies* (modern South Asia, social and intellectual history)

Dorothy B. Fujita-Rony, Ph.D. Yale University, *Associate Professor of Asian American Studies; Culture and Theory; History* (U.S. history, Asian American studies)

Joseph Jonghyun Jeon, Ph.D. University of California, Berkeley, *Professor of English; Asian American Studies; Culture and Theory* (Asian-American literature, film modernism)

Victoria E. Johnson, Ph.D. University of Southern California, *Professor of Film and Media Studies; African American Studies; Culture and Theory; Visual Studies* (U.S. television, history, media industry studies, critical race theory, cultural geography, sound and music in popular media, media law and policy)

Horacio Legras, Ph.D. Duke University, *Professor of Spanish and Portuguese; Comparative Literature; Culture and Theory; European Languages and Studies* (Latin American literature and culture, Latin American film, visual arts in Latin America, psychoanalysis, and photography)

Theodore Martin, Ph.D. University of California, Berkeley, *Associate Professor of English; Culture and Theory* (Contemporary literature, genre fiction, literary history, crime, and the novel)

Annie McClanahan, Ph.D. University of California, Berkeley, *Associate Professor of English; Culture and Theory* (U.S. culture, the novel, political and economic theory)

Jessica Millward, Ph.D. University of California, Los Angeles, *Associate Professor of History; African American Studies; Culture and Theory* (U.S., slavery, African diaspora, African American gender and women)

Gabriele M. Schwab, Ph.D. University of Konstanz, *UCI Chancellor's Professor of Comparative Literature; Anthropology; Culture and Theory; English; European Languages and Studies; German* (modern literature, critical theory, psychoanalysis, comparative literature)

Damien Sojoyner, Ph.D. University of Texas at Austin, *Associate Professor of Anthropology; Culture and Theory* (prisons; public education; urban anthropology; race; African diaspora theory; public policy and law; gender; United States)

Roxanne Varzi, Ph.D. Columbia University, *Professor of Anthropology; Culture and Theory; Film and Media Studies; Religious Studies; Visual Studies* (Iran, media, war, visual anthropology, film studies, ethnographic and fiction writing)

Linda T. Vö, Ph.D. University of California, San Diego, *Professor of Asian American Studies; Culture and Theory; Sociology; Urban Planning and Public Policy* (race and ethnic relations, immigrants and refugees, gender relations, community and urban studies)

## Courses

### CLT&THY 200A. Political Economy: Methods and Critique. 4 Units.

Introduction to canonical texts in Marxism coupled with an examination of the questions of race, gender, ethnicity, and sexuality that distend the calculus of the canon's assumptive logic. May be taken after CLT&THY 200B.

Same as CRITISM 200A.

Restriction: Graduate students only.

**CLT&THY 200B. Libidinal Economy: Methods and Critique. 4 Units.**

Introduction to canonical texts in psychoanalysis coupled with an examination of the questions of race, gender, ethnicity, and sexuality that distend the calculus of the canon's assumptive logic. May be taken before CLT&THY 200A.

Restriction: Graduate students only.

**CLT&THY 200C. Theory from Below. 4 Units.**

Introduction to systems of thought understudied or undervalued in academic canons—for instance, systems constituted in communities' practices or theories that do not seek permanence or generality.

Prerequisite: CLT&THY 200A and CLT&THY 200B

Restriction: Graduate students only.

**CLT&THY 241. Ethics, Erotics, and Will: Gendered Black Politics, Sexualized Racisms, and the Humanities. 4 Units.**

Introduces doctoral students to an interdisciplinary conversation about black queer sexuality and black heteropatriarchy. Uses disciplinary formations as a tool for understanding knowledge formations about the shifting relations that constitute sexuality, gender, and racial blackness.

Restriction: Graduate students only.

**CLT&THY 242. Afro-Pessimism and the Status of the Subject. 4 Units.**

Afro-Pessimism theorizes the Black as a being against which all other beings become legible as human subjects. Focuses on either the subject of psychoanalysis or the subject of capital accumulation in their explorations of the antagonism between Blackness.

Restriction: Graduate students only.

**CLT&THY 280. Independent Study. 4 Units.**

Limited to students who have not yet received the M.A. degree.

Repeatability: May be repeated for credit unlimited times.

**CLT&THY 289. Topics in Culture and Theory. 4 Units.**

Seminars on various topics in Culture and Theory.

Repeatability: Unlimited as topics vary.

**CLT&THY 298. Directed Reading. 4-12 Units.**

Directed readings on a specific topic agreed upon by students and their instructors. Limited to students who have completed their M.A. degree and are preparing for their qualifying exam.

Prerequisite: Completion of the M.A. degree.

Repeatability: May be repeated for credit unlimited times.

**CLT&THY 299. Dissertation Research. 4-12 Units.**

Dissertation research in Culture and Theory.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Department of African American Studies

**Frank Wilderson, Department Chair**

3000 Humanities Gateway

949-824-2376

<http://www.humanities.uci.edu/afam/>

African American Studies is an interdisciplinary program which offers undergraduate students an opportunity to study those societies and cultures established by the people of the African diaspora. The Department's curriculum encourages students to investigate the African American experience from a variety of disciplinary perspectives and theoretical approaches. Among the topics explored in the course offerings are the process of colonization and the forced migration of African people, the positionality of African people in the racialized symbolic and social orders of the western hemisphere, the rhetoric produced by and about African people, and the cultural and aesthetic values associated with "blackness" and "Africanness." The Department offers a B.A. program in African American Studies and a minor.

## Career Opportunities

UCI graduates with a B.A. in African American Studies enhance their chances of success in the job market and in the highly competitive arena of graduate and professional school admissions, especially in the fields of medicine and other health professions, law, and business. Employers and admissions officers understand that many of their employees and graduates will one day work in communities with significant African American populations, and for this reason they give due consideration to applicants who have in-depth knowledge of African American culture.

- African American Studies, B.A.
- African American Studies, Minor

## Faculty

Nahum D. Chandler, Ph.D. University of Chicago, *Professor of African American Studies; Asian American Studies; Comparative Literature; English; European Languages and Studies* (modern philosophy, intellectual history, history of the human sciences)

Bridget R. Cooks Cumbo, Ph.D. University of Rochester, *Associate Professor of African American Studies; Art History; Culture and Theory; Visual Studies* (African American art, museum studies, feminist and post-colonial theory)

Sora Han, Ph.D. University of California, Santa Cruz, *Director of the Graduate Program in Culture and Theory and Associate Professor of Criminology, Law and Society; African American Studies; Culture and Theory; School of Law* (law and popular culture, critical race theory, philosophies of punishment, feminism and psychoanalysis)

Sandra Harvey, Ph.D. University of California, Santa Cruz, *Assistant Professor of African American Studies; Culture and Theory* (black diasporas, sovereignty, indigeneity, visual art and culture, Enlightenment philosophy, feminist and queer theories)

Douglas M. Haynes, Ph.D. University of California, Berkeley, *Vice Chancellor for Equity, Diversity, and Inclusion and Professor of History; African American Studies* (social and cultural history of modern Britain, social history of modern medicine)

Ulysses S. Jenkins, M.F.A. Otis Art Institute, *Professor of Art; African American Studies* (video, performance art)

Victoria E. Johnson, Ph.D. University of Southern California, *Professor of Film and Media Studies; African American Studies; Culture and Theory; Visual Studies* (U.S. television, history, media industry studies, critical race theory, cultural geography, sound and music in popular media, media law and policy)

Jessica Millward, Ph.D. University of California, Los Angeles, *Associate Professor of History; African American Studies; Culture and Theory* (U.S., slavery, African diaspora, African American gender and women)

John Murillo III, Ph.D. Brown University, *Assistant Professor of African American Studies* (Afro-pessimism, theoretical physics, radical black feminism, literary theory, 20th/21st century black literature, black speculative fiction)

Rajagopalan Radhakrishnan, Ph.D. Binghamton University, State University of New York, *Distinguished Professor of English; African American Studies; Comparative Literature; Culture and Theory* (critical theory, postcoloniality, nationalisms and diasporas, poststructuralism, postmodernism, democracy and minority discourse, cultural studies, globalization and transnationalism)

Jared Charles Sexton, Ph.D. University of California, Berkeley, *Professor of African American Studies; Culture and Theory; Film and Media Studies; Visual Studies* (race and sexuality, policing and imprisonment, contemporary U.S. cinema and political culture, multiracial coalition, critical theory)

Darryl Taylor, D.M.A. University of Michigan, *Professor of Music; African American Studies*

Frank B. Wilderson III, Ph.D. University of California, Berkeley, *Department Chair and Professor of African American Studies; Culture and Theory* (Afro-Pessimism, film theory, Marxism, narratology)

Tiffany Willoughby-Herard, Ph.D. University of California, Santa Barbara, *Associate Professor of African American Studies; Comparative Literature; Culture and Theory; Political Science* (South Africa, poor whites, race in foreign policy, diaspora, comparative racial politics, third world feminisms, feminist pedagogy, black political thought)

## Affiliate Faculty

Alex Borucki, Ph.D. Emory University, *Associate Professor of History; African American Studies* (African diaspora, early modern Atlantic world, slave trade, colonial Latin America)

Sohail Daulatzai, Ph.D. University of Southern California, *Associate Professor of Film and Media Studies; African American Studies; Visual Studies* (decolonization, empire, race, Muslim studies, Black studies)

Bambi Haggins, Ph.D. University of California, Los Angeles, *Associate Professor of Film and Media Studies; African American Studies; Visual Studies* (Black [African American] comedy in film, television, digital media and performance, television history, comedy as social and political discourse, African-American studies, American studies)

S. Ama Wray, Ph.D. University of Surrey, *Associate Professor of Dance; African American Studies* (jazz, choreography, improvisation, teaching of dance, jazz ensemble)

## Courses

### **AFAM 40A. African American Studies I. 4 Units.**

Discusses main contours of African American experience from the forced importation of Africans into the Americas in the late fifteenth century to the development of social movements in post-emancipation societies of the late nineteenth and twentieth centuries.

((III or IV) and VII ).

### **AFAM 40B. African American Studies II. 4 Units.**

Introduction to the history of modern racial thinking in Western society and its relationship to the material contexts of racial oppression, with emphasis on its development in British colonies and U.S.

((III or IV) and VII ).

### **AFAM 40C. African American Studies III. 4 Units.**

Introduction to theories of racial blackness in the modern world, with emphasis on developments in British colonies and U.S. Traces emergence of blackness as term of collective identity, social organization, and political mobilization.

((III or IV) and VII ).

### **AFAM 50. Introductory Topics in African American Studies. 4 Units.**

Introduction to a broad range of topics in African American studies, exploring history, literature, art, culture, politics, and contemporary social issues. Topical organization of courses addresses issues that have been of importance historically and are reshaping the African diaspora today.

Repeatability: Unlimited as topics vary.

### **AFAM 111A. Modern African American Art. 4 Units.**

Investigates the history of modern African American art; emphasis on the politics of representation. Examines art in a variety of media from material culture and textiles to painting and photography. Issues of migration, nationalism, gender, sexuality, and hybridity are discussed.

Same as AHIS 164A.

### **AFAM 111B. Contemporary African American Art. 4 Units.**

Investigates the history of contemporary African American art; emphasis on the politics of representation. Explores art in a variety of media: painting, sculpture, photography, installation, and new media. Cultural politics, appropriation, identity, gender, sexuality, hybridity and civil rights issues discussed.

Same as AHIS 164B.

### **AFAM 112A. Early African American Literature. 4 Units.**

Examines the earliest forms of black literary practices, including the jeremiad, the slave narrative, the pamphlet, poetry, the short story, and how these literary forms are related to the historical experiences of enslavement and emancipation.

Repeatability: Unlimited as topics vary.

### **AFAM 112B. African American Literature 1900-Present. 4 Units.**

Examines individual literary forms and/or authors, as well as movements such as the Harlem Renaissance and the Black Arts Movement. Explores how black literary practices represent the conditions of modern subjectivities and environments.

Repeatability: Unlimited as topics vary.

### **AFAM 113. African American Cinema and Media. 4 Units.**

Explores the diversity of Black creative production and the historical, social, and economic forces that shaped their emergence. May include Black film, hip-hop culture, fine art, photography, and others.

Repeatability: Unlimited as topics vary.

**AFAM 114. International Cultures. 4 Units.**

Explores the various cultures of the African diaspora and their impacts on a global scale. Examines a diverse range of media, including music (reggae, hip-hop), literature, film, and others and the links between culture and social movements throughout the diaspora.

Repeatability: Unlimited as topics vary.

**AFAM 115. Race and Visual Representation. 4 Units.**

Examines film, documentary, fine art, photography, and other visual media to explore the multiple ways in which ideas about race are projected and woven through the visual landscape and the impacts this has on perpetuating social inequalities.

Repeatability: Unlimited as topics vary.

**AFAM 117. Asian American and African American Relations. 4 Units.**

Addresses relationships of Asian American and African American communities in the United States. Topics include race, class, gender, labor, economic systems, political mobilization, community, civil rights, activism, cultural expression.

Same as HIST 152B, ASAM 167.

**AFAM 118. Topics in African American Humanities. 4 Units.**

Provides students with an opportunity to pursue advanced work in African American studies from one or more humanities approaches (literature, film and media studies, art history, and others).

Repeatability: Unlimited as topics vary.

**AFAM 125. African American Women in Art. 4 Units.**

Examines depictions of and by African American women in art and popular culture through a variety of media including textiles, painting, sculpture, photography, and installation. Focuses on African American women's experiences, perspectives, and strategies for contemporary representation.

Same as AHIS 164D.

**AFAM 128. Topics in Gender/Sexuality. 4 Units.**

Expressions of genders and sexualities across the spectrum of African American experience and creativity.

Repeatability: Unlimited as topics vary.

**AFAM 134A. Caribbean History: Colonization to Emancipation. 4 Units.**

Exploration of the history of the archipelago from pre-Columbian times to the end of slavery; examining the impact of European colonization, decimation of the indigenous populations, African slavery, resistance, and emancipation; the unity and diversity of experience in region.

Same as HIST 164A.

**AFAM 134B. Caribbean History: Emancipation to Independence. 4 Units.**

Post-emancipation and anti-colonial struggles ending with political independence for most of the region. Examines social, political, economic, cultural dimensions of post-emancipation period, including large-scale migration to Central America, the U.S., and Britain; the region's global cultural and political contribution.

Same as HIST 164B.

**AFAM 137. History of the African Diaspora. 4 Units.**

Examines the causes and consequences of the multiple diasporas of African peoples since the sixteenth century in the Atlantic world, especially the Americas and Europe.

Same as HIST 134E.

**AFAM 138. Topics in African American History. 4 Units.**

Studies in selected areas of African American history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as HIST 150.

**AFAM 143. Topics in African American Music. 4 Units.**

Examines African American musical forms and traditions, such as blues, jazz, and reggae, in performance and/or critical and theoretical contexts.

Repeatability: Unlimited as topics vary.



**AFAM 144. Topics in Expressive Forms. 4 Units.**

Examines various forms of aesthetic expression in the African diaspora, including dance, music, and the plastic arts, as well as artistic visions of black cyberspace, digital activism, film, video, and aesthetic conceptions of the future.

Repeatability: Unlimited as topics vary.

**AFAM 145. African Americans and Photography. 4 Units.**

Explores depictions of and by African Americans through photography. Examines the history of photography in relationship to African American culture through a variety of media from early daguerreotype processes to digital imagery.

Same as AHIS 164E.

**AFAM 151. Comparative Minority Politics. 4 Units.**

Examines the political experiences of Blacks, Latinos, and Asian Americans in the United States from roughly 1950 to the present. Focuses on how each group has pursued political empowerment via both conventional political channels and social movements.

Same as ASAM 132, CHLT 147, PLSC 124C.

**AFAM 152. African American Politics. 4 Units.**

Examines politics of African Americans in order to gain a broader perspective of the American political process. Major developments in African American politics (including the civil rights movement, Black presidential bids), continuing problem of racism, responsiveness of key governing institutions.

Same as PLSC 124E.

**AFAM 153. African American Psychology. 4 Units.**

Historical overview of the development of black psychology and the African American frame of reference. Topics include personality development, psychological assessment, issues in education, black mental health, and the role of the African American psychologist in the community.

Same as PSYC 174E.

**AFAM 154. African American Social Formations. 4 Units.**

Topics which promote critical investigation into the historical, political, and social formations associated with the Black Diaspora.

Repeatability: Unlimited as topics vary.

**AFAM 155. Intercultural Studies. 4 Units.**

Studies relationships between various cultural formations within the Black Diaspora and the exchange, amalgamations, and tensions between Black Diasporic formations and non-Black formations. Examines expressions of racialization as representation, adaption, and resistance.

Repeatability: Unlimited as topics vary.

**AFAM 156. African Societies and Politics. 4 Units.**

Examines the violent incorporation of Africa within European modernity. Places the discourse of Pan-Africanism, African Nationalisms, Negritude, African Marxism, and/or African Socialism in juxtaposition to the forces of capitalism, colonialism, and imperialism that restructure African history.

Repeatability: Unlimited as topics vary.

**AFAM 157. Critical Race Theory. 4 Units.**

Introduction to Critical Race Theory and key American cases on racial inequality. Using this literature, examines the possibilities and pitfalls of legal claims of race, gender, and sexuality discrimination in the age of colorblindness.

Same as CLS C178.

Restriction: Upper-division students only.

**AFAM 158. Topics in African American Social Sciences. 4 Units.**

Provides students with an opportunity to pursue advanced work in African American studies from one or more social science approaches (psychology, sociology, anthropology, economics, and others).

Repeatability: Unlimited as topics vary.

**AFAM 159. Prisons and Public Education. 4 Units.**

Looks at the connections between schools and prisons in the United States. Students learn about ideas that push beyond common trope of the "school to prison pipeline."

Same as ANTH 138.

**AFAM 162W. The Black Protest Tradition. 4 Units.**

History and discourses of the black protest tradition. Traces emergence of black protest against racial slavery and white supremacy from the early colonial period to present and the complex elaboration of identity politics within black communities in the twentieth century.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only.

**(Ib)**

**AFAM 163. Seminar in African American Studies. 4 Units.**

Explores theoretical and methodological issues in Black Studies via concentrated work on a specific ensemble of questions. Emphasis is on generating student responses to the material covered through oral and written reports.

Repeatability: Unlimited as topics vary.

**AFAM 198. Directed Group Study. 1-4 Units.**

Special topics through directed reading. Paper required.

Repeatability: May be taken for credit for 24 units.

**AFAM 199. Independent Study. 1-4 Units.**

Investigation of special topics through directed reading. Paper required.

Repeatability: May be repeated for credit unlimited times.

**AFAM 399. University Teaching. 4 Units.**

Limited to teaching assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## African American Studies, B.A.

African American Studies is an interdisciplinary program which offers undergraduate students an opportunity to study those societies and cultures established by the people of the African diaspora. The Department's curriculum encourages students to investigate the African American experience from a variety of disciplinary perspectives and theoretical approaches. Among the topics explored in the course offerings are the process of colonization and the forced migration of African people, the positionality of African people in the racialized symbolic and social orders of the western hemisphere, the rhetoric produced by and about African people, and the cultural and aesthetic values associated with "blackness" and "Africanness."

### Requirements for the B.A. in African American Studies

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

#### Requirements for the Major

A. Complete the following African American Studies introductory series:

AFAM 40A	African American Studies I
AFAM 40B	African American Studies II
AFAM 40C	African American Studies III

B. Select three courses, with one from three of the following five rubrics:

Humanities (AFAM 110–119)
Gender/Sexuality (AFAM 120–129)
History (AFAM 130–139)
Fine Arts (AFAM 140–149)
Social Sciences (AFAM 150–159)

C. Select five additional upper-division electives from AFAM 110–159, 163.

D. Complete:

AFAM 162W	The Black Protest Tradition
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**Residence Requirement for the Major:** A minimum of five upper-division courses required for the major must be completed successfully at UCI.

UCI graduates with a B.A. in African American Studies enhance their chances of success in the job market and in the highly competitive arena of graduate and professional school admissions, especially in the fields of medicine and other health professions, law, and business. Employers and admissions officers understand that many of their employees and graduates will one day work in communities with significant African American populations, and for this reason they give due consideration to applicants who have in-depth knowledge of African American culture.

## African American Studies, Minor

African American Studies is an interdisciplinary program which offers undergraduate students an opportunity to study those societies and cultures established by the people of the African diaspora. The Department's curriculum encourages students to investigate the African American experience from a variety of disciplinary perspectives and theoretical approaches. Among the topics explored in the course offerings are the process of colonization and the forced migration of African people, the positionality of African people in the racialized symbolic and social orders of the western hemisphere, the rhetoric produced by and about African people, and the cultural and aesthetic values associated with "blackness" and "Africanness."

### Requirements for the Minor in African American Studies

#### Requirements for the Minor

A. Complete the following African American Studies introductory series:

AFAM 40A	African American Studies I
AFAM 40B	African American Studies II
AFAM 40C	African American Studies III

B. Select three courses, with one from three of the following five rubrics:

Humanities (AFAM 110–119)
Gender/Sexuality (AFAM 120–129)
History (AFAM 130–139)
Fine Arts (AFAM 140–149)
Social Sciences (AFAM 150–159)

C. Select one additional upper-division elective from AFAM 110–159, 163.

**Residence Requirement for the Minor:** Four upper-division courses required for the minor must be completed successfully at UCI. Two of the four may be taken through the UC Education Abroad Program, provided course content is approved in advance by the appropriate department chair.

## Department of Art History

### Bert Winther-Tamaki, Department Chair

2000 Humanities Gateway

949-824-8596

<http://www.humanities.uci.edu/arhistory/>

The Department of Art History offers a major and minor in Art History. Art History is the study of works of art and other visual artifacts from all regions of the world and all periods of history. Consequently, the undergraduate curriculum in Art History, with its global perspective, is one of the most diverse disciplines in the humanities. Through Art History, students learn how to describe and interpret a range of objects including sculpture, painting, photography, architecture, and "new media" such as video and performance art. These skills, along with the program's intense focus on writing and verbal expression, prepare students to think critically and to express themselves clearly at a time when visual communication is becoming ever more important.

Because works of art are always created within a larger cultural context, Art History courses are a good way to understand what other places or times were like. Students may explore, for example, ancient Greece, 19th century Japan, or even the 21st century United States. Majors in Art History are encouraged to take related courses in other fields in the humanities and to pursue the study of language beyond the minimum requirements. Because of its international perspective, Art History is a particularly good major for students interested in studying abroad. There are many study centers throughout the world associated with the University's Education Abroad Program that offer widely varied selections of Art History courses.

Art History offers a unique one-year Master's Program in which all current UCI undergraduate students can build upon their undergraduate work to complete an M.A. in Art History in one additional year beyond the completion of the Bachelor's degree. The M.A. program in Art History is designed to provide students with advanced skills and broad knowledge in the discipline of art history. See the M.A. in Art History page for detailed information.

### Career Opportunities

Following their graduation, students with a B.A. in Art History have found employment in art galleries, auction houses, and museums, and they have entered graduate programs with a view to careers in university teaching, curatorial work, and art conservation. Moreover, with its strong emphasis on developing critical skills in writing, speaking, and analysis, Art History also provides an excellent preparation for many other careers. UCI graduates have

pursued professional paths ranging from medicine and law, to business and education, to information technologies and architecture. As in the case of arts administration or intellectual property law, some of these professional pursuits have depended on and continue to make use of training in the arts.

- Archaeology, Minor
- Art History, B.A.
- Art History, M.A. (4+1)
- Art History, Minor
- Graduate Program in Visual Studies

## Faculty

Roland Betancourt, Ph.D. Yale University, *Director of the Graduate Program in Visual Studies and Chancellor's Fellow and Associate Professor of Art History; Religious Studies; Visual Studies* (Byzantine and Medieval art, critical and queer theory; histories of race, gender, and sexuality)

Matthew P. Canepa, Ph.D. University of Chicago, *Elahe Omidyar Mir-Djali Presidential Chair and Professor of Art History; Religious Studies; Visual Studies* (Achaemenid, Seleucid, Parthian, and Sasanian art and archaeology; Iranian visual cultures and Afro-Eurasian exchange; critical approaches to space, place, landscape, urbanism, and memory)

Bridget R. Cooks Cumbo, Ph.D. University of Rochester, *Associate Professor of African American Studies; Art History; Culture and Theory; Visual Studies* (African American art, museum studies, feminist and post-colonial theory)

James D. Herbert, Ph.D. Yale University, *Professor of Art History; Visual Studies* (modern European art)

Lyle Massey, Ph.D. University of California, Los Angeles, *Associate Professor of Art History; Visual Studies* (Italian Renaissance and early modern European art, gender theory, science studies)

Tyrus Miller, Ph.D. Stanford University, *Dean of the School of Humanities and Professor of English; Art History; Comparative Literature; Visual Studies* (modernist and avant-garde studies in literature and visual arts; critical theory and aesthetics; modern architecture and urbanism; East-Central European studies; culture of socialism and post-socialism; Frankfurt School theory)

James P. Nisbet, Ph.D. Stanford University, *Associate Professor of Art History; Visual Studies* (modern and contemporary art)

Alka Patel, Ph.D. Harvard University, *Associate Professor of Art History; History; Religious Studies; Visual Studies* (South Asian and Islamic art and architecture, historiographies, Islamic diasporas in Cuba)

Cécile Marie Whiting, Ph.D. Stanford University, *Chancellor's Professor of Art History; Visual Studies* (American art, 20th century visual culture)

Bert Winther-Tamaki, Ph.D. New York University, *Department Chair and Professor of Art History; Asian American Studies; Visual Studies* (modern Japanese art and visual culture, Asian American art, art and globalization)

Roberta Wue, Ph.D. New York University, *Associate Professor of Art History; Visual Studies* (modern Chinese art, photography, print culture)

## Courses

### **ART HIS 40A. Ancient Greek and Roman Art, and Architecture. 4 Units.**

An overview of Greek and Roman art, and related ancient visual cultures. Considers how and why the peoples of antiquity created art and architecture, as well as the significance of these works within their social, religious, and historical contexts.

(IV and VIII ).

### **ART HIS 40B. Arts of Europe: Medieval and Renaissance. 4 Units.**

Focuses on the art of the Mediterranean area and Europe between ca. A.D. 350 and 1600. By means of movements and artists, examines the cultural identities of the Christian, Islamic, and Early Modern worlds.

(IV, VIII)

### **ART HIS 40C. Early Modern and Modern Art in Europe and America. 4 Units.**

The visual arts from the seventeenth to the twenty-first centuries. Explores the purposes and meaning of painting, sculpture, and architecture in relation to artists, viewers, and historical events.

(IV, VIII)

**ART HIS 42A. History of Asian Art: Arts of India. 4 Units.**

Emphasizing Hindu, Buddhist, and Islamic art of greater India (Pakistan, Bangladesh, Sri Lanka) from proto-historic to modern times. Themes include art as a source of history, commercial and religious pan-Asian connections, nationalism, and modern versus historical identities.

(IV, VIII)

**ART HIS 42B. History of Asian Art: Arts of China. 4 Units.**

An introduction to the arts and visual culture of China from Neolithic to modern times. Themes includes the representation of power, death and the afterlife, popular culture and elite arts, landscape and women's painting, and concludes with contemporary China.

(IV, VIII)

**ART HIS 42C. History of Asian Art: Arts of Japan. 4 Units.**

Examines compelling images and objects of spirit and power created in Japan over many centuries. Themes include Buddhist icons, narrative illustration, popular prints, architecture, manga, and the avant-garde. Japanese interactions with Korean, Chinese, and European culture are emphasized.

(IV, VIII)

**ART HIS 42D. History of Asian Art: Arts of Islam. 4 Units.**

Examines past and present Islamic art, spanning 1,500 years and extending from the Americas through Indonesia. Themes include Islam as a globalizing force, the definition of 'Islamic,' and the competing roles of religion and politics in making art.

(IV, VIII)

**ART HIS 42E. Art and Archaeology of Ancient Persia, Egypt, and Mesopotamia. 4 Units.**

An introduction to the art and archaeology of ancient Egypt, Mesopotamia, Anatolia, Persia, and the wider Iranian world from the Neolithic to the coming of Islam. Considers wider impact on the ancient and early medieval worlds and their present legacy.

(IV and VIII ).

**ART HIS 44. Image Collision: A Multicultural Approach to Images and Their Users. 4 Units.**

Comparisons between present-day visual culture and pre-modern art to re-evaluate the ways in which one understands the contemporary histories of underrepresented groups in the United States.

(IV and VII ).

**ART HIS 55. Disneyland. 5 Units.**

From Dole Whips to roller coasters, the focus is on the innovations in industrial automation and manufacturing that made Disneyland's attractions possible. Discusses fandom, guest experiences, operating procedures, technical and design patents, and how rides work.

(II and IV ).

**ART HIS 100. Studies in Ancient Art . 4 Units.**

Topics in Egyptian, Prehistoric, and Etruscan art of the Mediterranean area treated with specific reference to relevant cultural and historical settings. Specialized courses in Greek and Roman art are also taught.

Repeatability: Unlimited as topics vary.

**ART HIS 103. Studies in Greek Art. 4 Units.**

Topics in Greek art, architecture, and topography from the Prehistoric period through the end of the fourth century B.C.E.

Repeatability: Unlimited as topics vary.

**ART HIS 107. Studies in Roman Art. 4 Units.**

Topics in Hellenistic and Roman art and architecture; stresses historical and political background.

Repeatability: Unlimited as topics vary.

**ART HIS 110. Studies in Medieval Art. 4 Units.**

Specialized topics in Medieval art and architecture in Europe, the Mediterranean area, and the Near East between the fourth and fifteenth centuries. Examples: the Art of the Migration Period, Medieval City.

Repeatability: Unlimited as topics vary.

**ART HIS 111B. Byzantine Art: 650-1450. 4 Units.**

Studies in the development of the art and architecture of the Byzantine Empire between ca. 650 and 1450.

**ART HIS 112. Studies in Early Christian and Byzantine Art. 4 Units.**

Selected topics on the development of the art and architecture of the Later Roman and Byzantine Empires between ca. 300 and 1453. Examples: Early Christian architecture, Byzantine painting.

Repeatability: Unlimited as topics vary.

**ART HIS 114. Studies in Western Medieval Art. 4 Units.**

Selected topics on the development of art and architecture in Western Europe between ca. 700 and 1400. Examples: Romanesque painting, Gothic architecture.

Repeatability: Unlimited as topics vary.

**ART HIS 120. Studies in Renaissance and Baroque Art. 4 Units.**

Selected topics on the art and architecture of Europe between the fifteenth and eighteenth centuries. Examples: Renaissance and Baroque prints, Bruegel to Rubens.

Repeatability: Unlimited as topics vary.

**ART HIS 121. Studies in Southern Renaissance Art. 4 Units.**

Selected topics determined by individual faculty members exploring historical developments and individual artists of the fifteenth and sixteenth centuries in Italy and Spain. Examples: Renaissance Venice, Age of Michelangelo.

Repeatability: Unlimited as topics vary.

**ART HIS 123. Studies in Northern Renaissance Art. 4 Units.**

Selected topics determined by individual faculty members exploring historical developments and individual artists of the fifteenth and sixteenth centuries in Northern Europe. Examples: Late Medieval art, painting from Van Eyck to Bosch.

Repeatability: Unlimited as topics vary.

**ART HIS 125. Studies in Southern Baroque Art. 4 Units.**

Selected topics determined by individual faculty members exploring historical developments and individual artists of the seventeenth and eighteenth centuries in Italy and Spain. Example: Rome in the seventeenth century.

Repeatability: Unlimited as topics vary.

**ART HIS 128. Studies in Northern Baroque Art. 4 Units.**

Selected topics determined by individual faculty members exploring historical developments and individual artists of the seventeenth and eighteenth centuries in Northern Europe. Example: the Age of Rembrandt.

Repeatability: Unlimited as topics vary.

**ART HIS 134C. Modern European Art: From Impressionism to the Fauves. 4 Units.**

History of European painting and urban transformation from 1851 to 1907, when Paris stood strong as the unquestioned cultural capital of the nineteenth century.

**ART HIS 134D. Modern European Art: From Cubism to Surrealism. 4 Units.**

History of European painting, sculpture, and design from 1907 to 1940, when Paris and painting lost their dominance as other cultural centers and other media claimed renewed importance.

**ART HIS 134E. Topics in Modern European Art. 4 Units.**

Selected topics within the period 1643 to 1940.

Repeatability: Unlimited as topics vary.

**ART HIS 140A. History of Contemporary Art. 4 Units.**

Selected topics exploring historical developments of contemporary art from 1945 to the present. Examples: American Art 1945-1989, European Art 1945-1989, Art After 1989. Works of art are studied as cultural, social, and political practices.

Repeatability: Unlimited as topics vary.

**ART HIS 140B. Topics in Contemporary Art. 4 Units.**

Selected topics exploring artistic movements, artists, and/or issues in contemporary art from 1945 to the present. Examples include Junk Art, Countercultures, Art and Politics Now. Works of art are studied as cultural, social, and political practices.

Repeatability: Unlimited as topics vary.

**ART HIS 145A. Studies in Modern Architecture. 4 Units.**

Architecture and related design practices from the late eighteenth century through 1945 are studied in relation to social, aesthetic, technological, and political questions.

Repeatability: Unlimited as topics vary.

**ART HIS 145B. Studies in Architecture after 1945. 4 Units.**

Architecture and related design practices from 1945 through present are studied in relation to social, aesthetic, technological, and political questions.

Repeatability: Unlimited as topics vary.

**ART HIS 145C. Topics in the History of Modern and Contemporary Architecture. 4 Units.**

Varying topics from the late eighteenth century to the present. Architecture and related design practices are studied in relation to social, aesthetic, technological, and political questions.

Repeatability: Unlimited as topics vary.

**ART HIS 150. Studies in Asian Art. 4 Units.**

Topics include visual studies in China, Japan, Korea and India.

Repeatability: Unlimited as topics vary.

**ART HIS 151B. Later Imperial China. 4 Units.**

Investigates the uses, subjects, styles, and social contexts of art made in the later Imperial dynasties, whether court art, religious art, women's painting, scholar painting, or art for the market.

**ART HIS 151C. Modern China. 4 Units.**

Examines the evolution and media of Chinese art and visual culture in the context of modern China's sweeping historical, social, and political changes.

**ART HIS 155A. Ancient India. 4 Units.**

Examines the visual and religious history of the region defined as 'India' today, but necessarily encompassing modern Bangladesh and Pakistan. Culminates with the supposed Golden Age of the Gupta empire and its far-reaching legacies.

Same as HISTORY 170A, REL STD 122.

Concurrent with ART HIS 255A.

**ART HIS 155B. Medieval India. 4 Units.**

Begins with the Gupta period's aesthetic legacies in South Asia's architecture, sculpture, and painting. Explores the dispersal of Islam throughout South Asia, including the Muslim communities of southern India.

Same as HISTORY 170B, REL STD 123.

Concurrent with ART HIS 255B.

**ART HIS 155C. Modern India. 4 Units.**

Examines the imperial patronage of the Mughal emperors, covering their territorial holdings extending from Afghanistan through western Bangladesh. Continues with the 'aftermath' of the Mughal empire and the rise of British commercialism and colonialism.

**ART HIS 155D. Topics in the Art and Architecture of India. 4 Units.**

Studies in selected areas of Art and Architecture of India. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**ART HIS 156. Art and Globalization, Modern. 4 Units.**

Study of modern art as a cause and expression of increasing contacts between cultures. Focusing on regions in Asia and the Americas, adoption of European oil painting, indigenous art movements, and national capital architecture are explored.

**ART HIS 162C. Contemporary Japan. 4 Units.**

Study of various media of Japanese art from the time of war defeat in 1945 until the present. Topics include artists' responses to the nuclear bomb, the aesthetics of the 'economic miracle,' avant-garde groups, manga, and innovations in architecture.

**ART HIS 163. Asian American Art, Contemporary. 4 Units.**

Study of the Asian American experience in contemporary art and visual culture. Art by Asian Americans of diverse backgrounds as well as the history of visualization of Asian identities in American art/visual culture.

**ART HIS 164A. Modern African American Art. 4 Units.**

Investigates the history of modern African American art; emphasis on the politics of representation. Examines art in a variety of media from material culture and textiles to painting and photography. Issues of migration, nationalism, gender, sexuality, and hybridity are discussed.

Same as AFAM 111A.

**ART HIS 164B. Contemporary African American Art. 4 Units.**

Investigates the history of contemporary African American art; emphasis on the politics of representation. Explores art in a variety of media: painting, sculpture, photography, installation, and new media. Cultural politics, appropriation, identity, gender, sexuality, hybridity and civil rights issues discussed.

Same as AFAM 111B.

**ART HIS 164D. African American Women in Art. 4 Units.**

Examines depictions of and by African American women in art and popular culture through a variety of media including textiles, painting, sculpture, photography, and installation. Focuses on African American women's experiences, perspectives, and strategies for contemporary representation.

Same as AFAM 125.

**ART HIS 164E. African Americans and Photography. 4 Units.**

Explores depictions of and by African Americans through photography. Examines the history of photography in relationship to African American culture through a variety of media from early daguerreotype processes to digital imagery.

Same as AFAM 145.

**ART HIS 165A. Early American Art. 4 Units.**

An examination of American visual culture from 1620 to 1860 from the era of European exploration and colonization of the New World to the beginning of the Civil War.

**ART HIS 165B. Nineteenth Century American Art. 4 Units.**

An exploration of American visual culture from 1860 to 1900, including paintings, sculpture, and photographs produced during the Civil War and during the decades of prosperity that followed.

**ART HIS 165C. Modern American Art. 4 Units.**

Focusing on the period from 1900 until 1965, this course considers the emergence and institutionalization of modern art in the United States.

**ART HIS 165D. Topics in American Art. 4 Units.**

Varying topics within the period 1620 to 1970. Works of art are studied in their cultural, social, and political contexts.

Repeatability: Unlimited as topics vary.

**ART HIS 180. Topics in the Criticism of Art. 4 Units.**

Selected topics discussed on the theoretical and/or practical dimensions of art historical criticism.

Repeatability: Unlimited as topics vary.

**ART HIS 181. Topics in Museum Studies. 4 Units.**

Addresses the historical and contemporary function of the museum as an instructional device. The function of exhibitions in the public sphere, and the roles of curators, educators, and the public are analyzed.

Repeatability: Unlimited as topics vary.

**ART HIS 183B. 20th Century Photographic History. 4 Units.**

Varying topics within the history of photography in the 20th century. Photographic practice studied in relation to art history, cultural history, and social history.

Repeatability: Unlimited as topics vary.

**ART HIS 183C. Selected Topics in Photographic History. 4 Units.**

Varying topics within the history of photography from the early 19th century to the present. Photographic practice studied in relation to art history, cultural history, and social history. Examples include documentary; pictorialism and art photography; photomontage, photographic books.

Repeatability: Unlimited as topics vary.

**ART HIS 185. Topics in Visual Studies. 4 Units.**

Interdisciplinary topics on the cultural analysis of visual artifacts and practices.

Repeatability: Unlimited as topics vary.

**ART HIS 190W. Art History Methods. 4 Units.**

Theory and practice of art history, with an emphasis on formal and social models of analyzing and writing about art.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Art History Majors only.

(Ib)

**ART HIS 196. Ethics, Law, and Art. 4 Units.**

Addresses a broad range of ethical and legal issues pertaining to art, ownership, looting and theft, museum policies, and cultural heritage.

Concurrent with ART HIS 296.

**ART HIS 198. Advanced Seminar: Topics in Art History. 4 Units.**

Discussion and report-oriented seminar with emphasis on reading, writing, and thinking about problems in art history. Examples: Gothic Cathedral, Portraiture East and West.

Prerequisite: Recommended: ART HIS 190W.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. Art History Majors have first consideration for enrollment.

Concurrent with ART HIS 298.

**ART HIS 199. Independent Study in Art History. 1-4 Units.**

Supervised, but independent reading or research on art historical topics.

Repeatability: May be taken for credit 4 times.

Restriction: Art History Majors only.

**ART HIS 255A. Ancient India. 4 Units.**

Examines the visual and religious history of the region defined as 'India' today, but necessarily encompassing modern Bangladesh and Pakistan. Culminates with the supposed Golden Age of the Gupta empire and its far-reaching legacies.

Same as IRAN 255A.

Restriction: Graduate students only.

Concurrent with ART HIS 155A.

**ART HIS 255B. Medieval India. 4 Units.**

Begins with the Gupta period's aesthetic legacies in South Asia's architecture, sculpture, and painting. Explores the dispersal of Islam throughout South Asia, including the Muslim communities of southern India.

Same as IRAN 255B.

Restriction: Graduate students only.

Concurrent with ART HIS 155B.

**ART HIS 296. Ethics, Law, and Art. 4 Units.**

Addresses a broad range of ethical and legal issues pertaining to art, ownership, looting and theft, museum policies, and cultural heritage.

Prerequisite: Background in Art History or Legal Studies.

Same as IRAN 296.

Concurrent with ART HIS 196.

**ART HIS 298. Master's Seminar: Topics in Art History. 4 Units.**

Studies in selected areas of Art History. Examples include Gothic Cathedral, Portraiture East and West.

Repeatability: Unlimited as topics vary.

Concurrent with ART HIS 198.



**ART HIS 299. Master's Thesis Research. 4 Units.**

Research and writing of the Master's thesis.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ART HIS 399. University Teaching. 4 Units.**

Limited to teaching assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Archaeology, Minor

The interdisciplinary minor in Archaeology offers rigorous academic study of the archaeological record and its interpretation from cultures of great antiquity through the modern period. The curriculum engages students with methodological training in archaeological recovery and analysis, as well as the theoretical underpinnings of how we know what we know about past societies through the material traces of human activity.

Students also grapple with the ways in which archaeology is experienced and shaped through the heritage industry, popular culture, museums, as well as political, social, and cultural movements. As they prepare for careers or graduate study, Archaeology minors are encouraged to explore these problems while gaining foundational knowledge in the archaeology of a wide variety of cultures throughout the Old and New worlds, including ancient Anatolia, Mesopotamia, and Iran, the ancient and medieval Mediterranean, the Islamic world, South Asia, Pre-Columbian North and South America, as well as archaeology in and of the contemporary world.

Upon completion of the minor, students are equipped to think critically about the archaeological record and as educators, museum professionals, researchers, lawyers, as well as policy makers and employees of cultural institutions and heritage sites in various roles across multiple government agencies (forestry, BLM, state parks, etc.) who manage our shared cultural resources. The minor's curricular structure consists of an introduction to archaeology (category A), one or more geographically- or historically-focused surveys to gain foundational knowledge in the archaeology of a specific region, time period, or culture (category B), and upper-division lectures or seminars that explore specific archaeological problems in greater depth (category C). To ensure interdisciplinarity, students are allowed to take no more than five courses from any single academic unit.

### Requirements for the Minor in Archaeology

Completion of seven courses (28 units) as specified below. At least four courses must be upper-division.

**A. Complete:**

ANTHRO 2C	Introduction to Archaeology
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**B. Select one of the following:**

ART HIS 40A	Ancient Greek and Roman Art, and Architecture
ART HIS 42A	History of Asian Art: Arts of India
ART HIS 42D	History of Asian Art: Arts of Islam
ART HIS 42E	Art and Archaeology of Ancient Persia, Egypt, and Mesopotamia
ANTHRO 141A	Ancient Civilization of Mexico and the Southwest

**C. Select five additional elective courses chosen from Areas B or C <sup>1,2</sup>**

ANTHRO 148	I Dig UCI
ANTHRO 149	Special Topics in Archaeology <sup>3</sup>
ANTHRO 169	Special Topics in Area Studies <sup>3</sup>
ART HIS 100	Studies in Ancient Art
ART HIS 103	Studies in Greek Art
ART HIS 107	Studies in Roman Art
ART HIS 111B	Byzantine Art: 650-1450
ART HIS 155A	Ancient India
ART HIS 181	Topics in Museum Studies <sup>3</sup>
ART HIS 196	Ethics, Law, and Art
ART HIS 198	Advanced Seminar: Topics in Art History <sup>3</sup>



### Residence Requirement for the Minor

Four upper-division courses required for the minor must be completed successfully at UCI. Two of the four may be taken through the UC Education Abroad Program provided course content is approved in advance by the Humanities Undergraduate Study Office.

- <sup>1</sup> No more than three of the five electives can be taken from a single department.
- <sup>2</sup> With the approval of the director of the minor, other relevant courses may satisfy the requirements for the minor. Possibilities include a course with archaeological content not already listed, credit earned from the completion of an accredited field school, or courses imparting training relevant to digital archaeology, geology, remote sensing, CAD, GIS, etc. (e.g. from COMPSI, EARTHSS, EECS, ENGRCEE, I&C SCI, IN4MATX, etc.). In such cases, students must fulfill any prerequisites required by the program offering the course.
- <sup>3</sup> Course must be on an approved topic. A list of approved topics can be viewed on the Archaeology Minor webpage on the Department of Art History website (<https://www.humanities.uci.edu/archaeology/>).

## Art History, B.A.

Art History is the study of works of art and other visual artifacts from all regions of the world and all periods of history. Consequently, the undergraduate curriculum in Art History, with its global perspective, is one of the most diverse disciplines in the humanities. Through Art History, students learn how to describe and interpret a range of objects including sculpture, painting, photography, architecture, and “new media” such as video and performance art. These skills, along with the program’s intense focus on writing and verbal expression, prepare students to think critically and to express themselves clearly at a time when visual communication is becoming ever more important.

Because works of art are always created within a larger cultural context, Art History courses are a good way to understand what other places or times were like. Students may explore, for example, ancient Greece, 19th century Japan, or even the 21st century United States. Majors in Art History are encouraged to take related courses in other fields in the humanities and to pursue the study of language beyond the minimum requirements. Because of its international perspective, Art History is a particularly good major for students interested in studying abroad. There are many study centers throughout the world associated with the University’s Education Abroad Program that offer widely varied selections of Art History courses.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Departmental Requirements for the Major

A. Select three of the following:

ART HIS 40A	Ancient Greek and Roman Art, and Architecture
ART HIS 40B	Arts of Europe: Medieval and Renaissance
ART HIS 40C	Early Modern and Modern Art in Europe and America
ART HIS 42A	History of Asian Art: Arts of India
ART HIS 42B	History of Asian Art: Arts of China
ART HIS 42C	History of Asian Art: Arts of Japan
ART HIS 42D	History of Asian Art: Arts of Islam
ART HIS 42E	Art and Archaeology of Ancient Persia, Egypt, and Mesopotamia
ART HIS 44	Image Collision: A Multicultural Approach to Images and Their Users
ART HIS 55	Disneyland

B. Select eight upper-division Art History courses, with at least one course in each of the following geographical regions: <sup>1</sup>

Americas: Art History 140, 156, 163–167

Europe: Art History 100–140

Asia: Art History 150–163

and at least one course in each of the following five historical periods: <sup>1</sup>

Ancient:

Art History 100–107

ART HIS 155A Ancient India

Medieval:

ART HIS 110 Studies in Medieval Art

ART HIS 111B Byzantine Art: 650-1450

ART HIS 112 Studies in Early Christian and Byzantine Art

ART HIS 114 Studies in Western Medieval Art

ART HIS 155B Medieval India

Early Modern:

## Art History 120–128

ART HIS 151B	Later Imperial China
ART HIS 165A	Early American Art
Modern:	
ART HIS 134C	Modern European Art: From Impressionism to the Fauves
ART HIS 134D	Modern European Art: From Cubism to Surrealism
ART HIS 134E	Topics in Modern European Art
ART HIS 145A	Studies in Modern Architecture
ART HIS 151C	Modern China
ART HIS 155C	Modern India
ART HIS 156	Art and Globalization, Modern
ART HIS 162B	
ART HIS 164A	Modern African American Art
ART HIS 164E	African Americans and Photography
ART HIS 165B	Nineteenth Century American Art
ART HIS 165C	Modern American Art
ART HIS 183B	20th Century Photographic History
ART HIS 183C	Selected Topics in Photographic History
Contemporary:	
ART HIS 140A	History of Contemporary Art
ART HIS 140B	Topics in Contemporary Art
ART HIS 145B	Studies in Architecture after 1945
ART HIS 162C	Contemporary Japan
ART HIS 163	Asian American Art, Contemporary
ART HIS 164B	Contemporary African American Art
ART HIS 164D	African American Women in Art
ART HIS 183B	20th Century Photographic History
ART HIS 183C	Selected Topics in Photographic History
C. Complete:	
ART HIS 190W	Art History Methods
D. Select one of the following options:	
1. Two quarters of:	
ART HIS 198	Advanced Seminar: Topics in Art History
2. or one quarter of:	
ART HIS 196	Ethics, Law, and Art
and	
ART HIS 198	Advanced Seminar: Topics in Art History

<sup>1</sup> NOTE: A course may apply as both one Geographical Region *and* one Historical Period, but no course may be used to satisfy more than one Geographical Region or more than one Historical Period.

Students should enroll in ART HIS 190W (for upper-division writing) as early as possible in their junior year, after successfully completing UCI's lower-division writing requirement. It is strongly recommended that students complete ART HIS 190W before taking ART HIS 198.

**Residence Requirement for the Major:** Five upper-division courses required for the major must be completed successfully at UCI.

Following their graduation, students with a B.A. in Art History have found employment in art galleries, auction houses, and museums, and they have entered graduate programs with a view to careers in university teaching, curatorial work, and art conservation. Moreover, with its strong emphasis on developing critical skills in writing, speaking, and analysis, Art History also provides an excellent preparation for many other careers. UCI graduates have pursued professional paths ranging from medicine and law, to business and education, to information technologies and architecture. As in the case of arts administration or intellectual property law, some of these professional pursuits have depended on and continue to make use of training in the arts.

## Art History, M.A. (4+1)

The 4+1 program allows students to earn a bachelor's degree while simultaneously completing courses that can be applied toward a master's degree in Art History. This unique structure permits students to complete coursework for their master's degree during the undergraduate term and one additional year. This is a 4+1 M.A. Program for UCI undergraduates majoring in Art History or other majors.

The M.A. program in Art History is designed to provide students with advanced skills and broad knowledge in the discipline of art history. The faculty is particularly well equipped to guide students with special interests in American, Asian, and European art history.

Students can begin coursework during the last year of the B.A. and are required to take a total of nine courses, equivalent to 36 units, toward the M.A. Nine courses are required for the degree:

A. Complete:

ART HIS 298	Master's Seminar: Topics in Art History (two quarters)
VIS STD 290A	Art History: Theories and Methods
VIS STD 295	Graduate Seminar in Visual Studies (three quarters, with Art History faculty only)
ART HIS 299	Master's Thesis Research (two quarters)
One additional elective graduate seminar	

The Master's Thesis is an approximately 20-page work of independent research supervised by a member of the faculty. Students wishing to participate in the program should apply in their final undergraduate year, which would allow them to begin course work toward the M.A. in their last undergraduate year.

For more information, please visit: <http://www.humanities.uci.edu/arhistory/graduate/51.php>

## Art History, Minor

Art History is the study of works of art and other visual artifacts from all regions of the world and all periods of history. Consequently, the undergraduate curriculum in Art History, with its global perspective, is one of the most diverse disciplines in the humanities. Through Art History, students learn how to describe and interpret a range of objects including sculpture, painting, photography, architecture, and "new media" such as video and performance art. These skills, along with the program's intense focus on writing and verbal expression, prepare students to think critically and to express themselves clearly at a time when visual communication is becoming ever more important.

### Requirements for the Minor in Art History

#### Departmental Requirements

A. Select three of the following:

ART HIS 40A	Ancient Greek and Roman Art, and Architecture
ART HIS 40B	Arts of Europe: Medieval and Renaissance
ART HIS 40C	Early Modern and Modern Art in Europe and America
ART HIS 42A	History of Asian Art: Arts of India
ART HIS 42B	History of Asian Art: Arts of China
ART HIS 42C	History of Asian Art: Arts of Japan
ART HIS 42D	History of Asian Art: Arts of Islam
ART HIS 42E	Art and Archaeology of Ancient Persia, Egypt, and Mesopotamia
ART HIS 44	Image Collision: A Multicultural Approach to Images and Their Users
ART HIS 55	Disneyland

B. Select four upper-division Art History courses from 100–198, excluding ART HIS 190W.

**Residence Requirement for the Minor:** Four upper-division courses required for the minor must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the department chair.

## Department of Asian American Studies

**Julia H. Lee, Chair**

3000 Humanities Gateway

949-824-2376

<http://www.humanities.uci.edu/aas/>

The Department of Asian American Studies examines the historical and contemporary experiences of Asians in the United States and in a global context. The curriculum seeks to provide an analysis of the cultural, political, and economical organization of Asian American communities. Students are invited to participate and partake in broadening their understanding of multicultural perspectives within U.S. society. The Department offers a B.A. program in Asian American Studies, a 4+1 B.A./M.A. program, a minor, and a graduate emphasis.

The Department also contributes to the Culture and Theory Ph.D. program, which uses the strengths of interdisciplinary programs and departments, particularly African American Studies, Chicano/Latino Studies, Asian American Studies, Critical Theory, and Gender and Sexuality Studies. This degree uses a problem-oriented rather than a disciplinary approach to issues of race, gender, and sexuality in relation to diasporas, transnational, and postcolonial contexts, all of which are broadly based in the humanities, social sciences, and arts.

## Scholarship Opportunities

The Ching-Suei Su Endowed Memorial Scholarship is awarded annually to sophomores or juniors who are majoring in Asian American Studies, East Asian Languages and Literatures, or Linguistics (with an emphasis on an East Asian language) and who demonstrate academic excellence and campus or community service.

- Asian American Studies, B.A.
- Asian American Studies, Graduate Emphasis
- Asian American Studies, M.A. (4+1)
- Asian American Studies, Minor

## Faculty

Dorothy B. Fujita-Rony, Ph.D. Yale University, *Associate Professor of Asian American Studies; Culture and Theory; History* (U.S. history, Asian American studies)

Claire J. Kim, Ph.D. Yale University, *Professor of Asian American Studies; Political Science*

James K. Lee, Ph.D. University of California, Los Angeles, *Associate Professor of Asian American Studies; Culture and Theory; English; Religious Studies* (Asian American literature and culture, contemporary U.S. literature, race and ethnic studies, urban studies, religious studies)

Julia Hyoun Joo Lee, Ph.D. University of California, Los Angeles, *Department Chair and Associate Professor of Asian American Studies; Culture and Theory; English* (Asian American literature and culture, African American literature and culture, ethnic literature, twentieth-century American literature.)

Isabela Seong Leong Quintana, Ph.D. University of Michigan, *Assistant Professor of Asian American Studies* (comparative and relational ethnic studies; Asian American history; Chicano/Latinx history; race and gender; borderlands, diasporas, and empire)

Linda T. Võ, Ph.D. University of California, San Diego, *Professor of Asian American Studies; Culture and Theory; Sociology; Urban Planning and Public Policy* (race and ethnic relations, immigrants and refugees, gender relations, community and urban studies)

Judy Tzu-Chun Wu, Ph.D. Stanford University, *Director of Humanities Center and Chancellor's Professor of Asian American Studies; Culture and Theory* (Asian American history; comparative racialization and immigration; empire and decolonization; gender and sexuality)

## Affiliate Faculty

Kei Akagi, B.A. International Christian University, *Professor of Music; Asian American Studies*

Anita Casavantes Bradford, Ph.D. University of California, San Diego, *Associate Professor of Chicano/Latino Studies; Asian American Studies; History* (20th century U.S., U.S. in the world, Cuba and the Caribbean; history of childhood; history of immigration, race and ethnicity; transnational and comparative Latina/o history; religion, politics and social movements)

Nahum D. Chandler, Ph.D. University of Chicago, *Professor of African American Studies; Asian American Studies; Comparative Literature; English; European Languages and Studies* (modern philosophy, intellectual history, history of the human sciences)

Yong Chen, Ph.D. Cornell University, *Associate Dean of Curriculum and Student Services and Professor of History; Asian American Studies; Religious Studies* (Asian American history and immigration, food and culture, U.S./China economic and cultural interactions)

Gilberto Q. Conchas, Ph.D. University of Michigan, *Professor of Education; Asian American Studies; Sociology* (urban education, sociology of education, comparative race and ethnicity)

Laura Enriquez, Ph.D. University of California, Los Angeles, *Assistant Professor of Chicano/Latino Studies; Asian American Studies; Sociology* (undocumented 1.5 generation young adults, immigration, citizenship, Latino families)

Christopher Fan, Ph.D. University of California, Berkeley, *Assistant Professor of English; Asian American Studies* (transnational Asia American, 20th, and 21st century literature, speculative fiction, political economy)

Ann Hironaka, Ph.D. Stanford University, *Professor of Sociology; Asian American Studies* (political sociology, war and peace, environmental sociology, ethnic and racial conflict)

Suellen Hopfer, Ph.D. Pennsylvania State University, *Assistant Professor of Program in Public Health; Asian American Studies*

Joseph Jonghyun Jeon, Ph.D. University of California, Berkeley, *Professor of English; Asian American Studies; Culture and Theory* (Asian-American literature, film modernism)

Eleana Kim, Ph.D. New York University, *Associate Professor of Anthropology; Asian American Studies* (kinship, transnationalism, environment, Korea)

Kyung Hyun Kim, Ph.D. University of Southern California, *Professor of Korean Culture; Asian American Studies; Film and Media Studies; Visual Studies* (East Asian cinema, modern Korea, critical theory)

Young-Suk Kim, Ed.D. Harvard University, *Professor of Education; Asian American Studies*

Jerry Won Lee, Ph.D. University of Arizona, *Associate Professor of English; Anthropology; Asian American Studies; Comparative Literature; Culture and Theory*

Stephen Lee, J.D. University of California, Berkeley, *Professor of School of Law; Asian American Studies*

Daphne Pi-Wei Lei, Ph.D. Tufts University, *Head of Doctoral Studies and Professor of Drama; Asian American Studies* (Asian theatre, Asian American theatre, intercultural theatre, gender theory, performance theory)

Simon Leung, B.A. University of California, Los Angeles, *Professor of Art; Asian American Studies* (new genres, critical theory, contemporary art history, performance)

Sylvia Nam, Ph.D. University of California, Berkeley, *Assistant Professor of Anthropology; Biological Chemistry; Urban Planning and Public Policy* (urban studies, property, transnational expertise, Southeast Asia)

L. Song Richardson, J.D. Yale Law School, *Dean of the School of Law and Professor of School of Law; Asian American Studies*

Annie E. Ro, Ph.D. University of California, Los Angeles, *Assistant Professor of Program in Public Health; Asian American Studies*

Tara Rodman, Ph.D. Northwestern University, *Assistant Professor of Drama; Asian American Studies* (modernist performance, Japanese theatre and dance, transnationalism, racial formation, global Asias)

Bert Winther-Tamaki, Ph.D. New York University, *Department Chair and Professor of Art History; Asian American Studies; Visual Studies* (modern Japanese art and visual culture, Asian American art, art and globalization)

Karna Wong, Ph.D. University of California, Los Angeles, ; *Asian American Studies*

Bruce N. Yonemoto, M.F.A. Otis Art Institute, *Professor of Art; Asian American Studies* (video, experimental media, film theory)

## Courses

### **ASIANAM 50. Asian American Histories. 4 Units.**

Examines and compares diverse experiences of major Asian American groups since the mid-nineteenth century. Topics include origins of emigration; the formation and transformation of community; gender and family life; changing roles of Asian Americans in American society. Formerly ASIANAM 60A.

Same as HISTORY 15C, SOC SCI 78A.

((III or IV) and VII ).

### **ASIANAM 51. The U.S. and Asia. 4 Units.**

Explores the historical and contemporary transnational linkages between the U.S. and regions in Asia and their resultant flows of people, goods, and ideas. Attention given to the role of militarism and processes of globalization, and the histories of cultural contact/conflict.

((III or IV) and VIII ).

### **ASIANAM 52. Asian American Communities. 4 Units.**

Examines the renewal of Asian immigration following World War II. Explores contemporary Asian American populations and communities in the U.S., and the impact of contemporary Asian immigration on the U.S. political economy and social order.

Same as SOC SCI 78B.

(III, VII)

**ASIANAM 53. Asian Americans and Race . 4 Units.**

Analyzes the Asian American experience in comparative perspective, which includes comparisons of different ethnic and racial groups, and across gender and class. Possible topics include labor, economy, politics, migration, nation, popular culture, gender, family, sexuality, and multiraciality.

Same as SOC SCI 78C.

(III, VII)

**ASIANAM 54. Asian American Stories. 4 Units.**

Examines stories from Asian American communities through literary texts and other media. Selected themes may include the following: dislocation/relocation, finding/inventing a usable past, poetics/politics in language, identities/ethnicities.

(IV, VII)

**ASIANAM 55. Asian Americans and the Media. 4 Units.**

Investigates popular representations of and cultural productions by Asian Pacific Americans and Asians in the Americas from the late-nineteenth century to the present. Cultural media may include political cartoons, film/television, popular music, visual art, blogs/Web sites, and performance.

(IV, VII)

**ASIANAM 100W. Research Methodologies for Asian American Studies. 4 Units.**

Explores various research methodologies for Asian American Studies combining theoretical knowledge with field research. Goals: conduct field research about immigrants and refugees from Asia. Topics vary: migration and labor, assimilation and cultural preservation, cultural expressions in the diaspora.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**ASIANAM 110. Asian American Writers. 4 Units.**

Literary analysis of Asian American writers' representations of issues of identity, class, history among others. Variety of literary forms—novel, poem, drama, essay—included in a study of a variety of Asian American ethnic groups.

Repeatability: Unlimited as topics vary.

**ASIANAM 111. Asian American History. 4 Units.**

Introduction to important themes in the history of people of Asian ancestry in the United States from the nineteenth century to the present.

Repeatability: Unlimited as topics vary.

**ASIANAM 112. Asian American Art History. 4 Units.**

Investigation of Asian American experience expressed by art and visual culture throughout the twentieth century. Art by Asian Americans of diverse backgrounds as well as the history of cultural visualization of Asian identities in American art/visual culture.

Repeatability: Unlimited as topics vary.

**ASIANAM 114. Asian American Film and Video. 4 Units.**

Topics include histories of Asian American film and video, including documentaries, experimental, short subjects, feature-length independent film, and other forms of cinematic expression. Explores issues of identity (national, racial, gendered, among others).

Repeatability: Unlimited as topics vary.

**ASIANAM 116. Asian Americans and Popular Culture. 4 Units.**

Focuses on Asian Americans' relationship to popular culture as both producers and consumers. Topics include consumer cultures and subcultures, cyberspace and public space, popular music, indy comics and other print media.

Repeatability: Unlimited as topics vary.

**ASIANAM 130. Undocumented Immigrant Experiences. 4 Units.**

Examines the experiences of undocumented immigrants and the policies that structure their educational, economic, social, and political participation.

Same as CHC/LAT 164A, CRM/LAW C187, SOCIOL 177C.

(III and VII ).

**ASIANAM 132. Comparative Minority Politics. 4 Units.**

Examines the political experiences of Blacks, Latinos, and Asian Americans in the United States from roughly 1950 to the present. Focuses on how each group has pursued political empowerment via both conventional political channels and social movements.

Same as AFAM 151, CHC/LAT 147, POL SCI 124C.

**ASIANAM 137. Asian American Labor. 4 Units.**

Explores history of Asian Americans and work from the nineteenth century to the present. Areas of study include migration, colonialism, family, social organization, and work culture.

Same as HISTORY 152A.

**ASIANAM 138. Race and Urban Space. 4 Units.**

Examines how ethnic and racial processes shape and structure interactions in urban settings, such as schools, housing, employment, and public spaces, with attention to the international impact of globalization and postcolonial forces.

**ASIANAM 142. Islam in America. 4 Units.**

Offers a critical academic study of Islam in America, focusing on the core tenets of belief, the diversity of practices, and historical transformations that have taken place since the arrival of Muslims in the United States.

Same as ANTHRO 125Z.

**ASIANAM 143. Religious Traditions of Asian Americans. 4 Units.**

Studies the religious traditions of Asian Americans, focusing on the transplantation of religious institutions, establishment of sacred spaces, celebration of religious holidays, socialization of children, as well as birth, marriage, gender relations, death, family.

Same as SOCIOL 136.

**ASIANAM 144. The Politics of Protest. 4 Units.**

Examines the Civil Rights, Black Power, and women's movements in relationship to the Asian American movement. Uses social movement theories to illuminate the cases, and the cases to critique and revise the theories.

Same as POL SCI 124A.

**(VII)****ASIANAM 150. Special Topics in Asian American Studies. 4 Units.**

Analyzes a variety of themes in Asian American Studies—identity, history, culture—from various interdisciplinary perspectives in humanities, arts, social sciences.

Repeatability: Unlimited as topics vary.

**ASIANAM 151C. Korean American Studies. 4 Units.**

Explores the factors that have distinctly shaped the Korean American experience, including patterns of racial domination, the profile of immigrant flow, immigrant roles in the urban political economy, politics in Korea, and the role of the church.

Same as SOC SCI 178C.

**ASIANAM 151D. Vietnamese American Studies. 4 Units.**

Studies the resettlement of Vietnamese in the United States following their exodus from Southeast Asia. Topics include the Vietnam War, the 1975 evacuation, boat and land refugees, the shaping of Vietnamese communities, and Vietnamese American literature.

Same as SOC SCI 178D.

**ASIANAM 151E. Japanese American Studies. 4 Units.**

Studies the settlement of Japanese in Hawaii and the continental United States since the late 19th century. Topics include sugar plantations, development of rural Japanese America, World War II internment, post-War community development, and persistence of Japanese American identity.

Same as SOC SCI 178E.



**ASIANAM 151F. South Asian American Studies. 4 Units.**

Examines and compares the experiences of South Asian immigrants in the U.S. over time. Looks at the economic, political, and social positions of the immigrants, with special emphasis on religious changes and the changes in the second and later generations.

Same as SOC SCI 178F.

Restriction: Asian American Studies Majors have first consideration for enrollment. Social Policy/Public Service Majors have first consideration for enrollment.

**ASIANAM 151H. Southeast Asian American Studies. 4 Units.**

Analyzes experiences of refugees and immigrants from Southeast Asia, which may include those from Cambodia, Laos, Vietnam, and the Philippines. Examines political and economic factors for their exodus and how they reconstruct their identities, histories, and communities.

Same as SOC SCI 178H.

**ASIANAM 151J. Chinese American Studies. 4 Units.**

Analyzes the experiences of Chinese in the United States. Immigration, Chinese exclusion, racial and gender identity. Historical overview and contemporary issues covered.

Same as SOC SCI 178J.

**ASIANAM 151K. Filipina/Filipino American Studies. 4 Units.**

Explores the experience of Filipina/Filipino Americans from the era of Spanish colonization of the Philippines to present-day community formations in the United States, with special emphasis on the 20th century. Topics include colonialism, nation, migration, gender, and culture.

Same as SOC SCI 178K.

**ASIANAM 162. Asian American Women. 4 Units.**

Examines the representations and experiences of Asian American women from diverse perspectives. Explores the commonalities and differences among various groups of Asian American women, with particular focus on history, culture, values, and family roles.

Same as SOC SCI 177B.

**ASIANAM 164. Topics in Intersectionality. 4 Units.**

Topics include intersectional analysis of various themes related to ethnicity, gender, sexuality, and race within Asian American communities.

Repeatability: Unlimited as topics vary.

**ASIANAM 166. Race and Citizenship. 4 Units.**

Explores historical and contemporary patterns of racialization in relation to citizenship. Topics may include racial categorization, immigration, and comparative racialization.

**ASIANAM 167. Asian American and African American Relations. 4 Units.**

Addresses relationships of Asian American and African American communities in the United States. Topics include race, class, gender, labor, economic systems, political mobilization, community, civil rights, activism, cultural expression.

Same as AFAM 117, HISTORY 152B.

**ASIANAM 168. Politics of Animal Rights. 4 Units.**

Examines animal rights/welfare movement's efforts to transform moral, practical, and legal standing of nonhuman animals in contemporary U.S. Explores intersection of racism, sexism, and speciesism informed by theories of race and ethnicity, including Asian American Studies.

Same as POL SCI 126F.

Restriction: Political Science Majors have first consideration for enrollment. Asian American Studies Majors have first consideration for enrollment.

**ASIANAM 199. Independent Study. 1-4 Units.**

Directed reading and research in consultation with a faculty member. Substantial written work required.

Repeatability: May be repeated for credit unlimited times.

**ASIANAM 200A. Theory and Methods in Asian American Studies. 4 Units.**

Introduction to the intersection of the social sciences, humanities, and other fields that constitute the theory and methodology of Asian American Studies. Focuses on the interventions and contestations within Asian American Studies that have transformed the discipline in recent years.

Restriction: Graduate students only.



**ASIANAM 200B. Contemporary Issues in Asian American Studies. 4 Units.**

Examines the interrelations between history, theory, and race in the aftermath of the twentieth-century decolonial movements, offering an account of race through postcolonial and postnationalist approaches in comparative contexts. Considers the interventions made by transnational feminist and racialized queer critiques.

Restriction: Graduate students only.

**ASIANAM 200C. Leadership and Social Change in Asian American Communities. 4 Units.**

Introduces students to models of community-engaged learning and leadership that are central to the field of Asian American studies. Designed to expose students to histories and models of organizing in Asian American communities and forms of community-based research.

Restriction: Graduate students only.

**ASIANAM 200D. Introduction to Asian American Studies Research. 4 Units.**

Introduces students to research topics and methods within the field of Asian American studies. Aims to expose students to core and affiliated faculty to help them identify possible advisors for master's research projects or members of doctoral committees.

Restriction: Graduate students only.

**ASIANAM 201. Graduate Topics in Asian American Studies. 4 Units.**

Seminars on various topics in Asian American Studies.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ASIANAM 250. Advanced Topics in Asian American Studies. 4 Units.**

Seminar covering various areas of research within Asian American Studies as an interdisciplinary field. Recommended for advanced graduate students.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ASIANAM 290. Directed Research. 4-12 Units.**

Directed graduate study/research in Asian American Studies.

Repeatability: May be taken for credit for 24 units.

Restriction: Graduate students only.

**ASIANAM 291. Directed Reading. 4 Units.**

Readings focused on specialized topics in consultation with, and with the consent of, a faculty member.

Repeatability: May be taken for credit for 12 units.

Restriction: Graduate students only.

**ASIANAM 399. University Teaching. 4 Units.**

Limited to teaching assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Emphasis in Asian American Studies graduate students only.

## Asian American Studies, B.A.

The Department of Asian American Studies examines the historical and contemporary experiences of Asians in the United States and in a global context. The curriculum seeks to provide an analysis of the cultural, political, and economical organization of Asian American communities. Students are invited to participate and partake in broadening their understanding of multicultural perspectives within U.S. society.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

**Department Requirements for the Major in Asian American Studies**

A. Three introductory Asian American Studies core courses:

ASIANAM 50 or ASIANAM 51 and	Asian American Histories The U.S. and Asia
ASIANAM 52 or ASIANAM 53 and	Asian American Communities Asian Americans and Race
ASIANAM 54 or ASIANAM 55	Asian American Stories Asian Americans and the Media

B. Complete the following:

ASIANAM 100W	Research Methodologies for Asian American Studies
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C. Select one course from each of the following areas:

Humanities/Arts: Asian American Studies 110–129
Social Science/Social Ecology: Asian American Studies 130–149
Asian American Sub-groups: Asian American Studies 151–160
Ethnic/Race/Gender Relations: Asian American Studies 161–170

D. Select four additional upper-division elective Asian American Studies courses. Students may request, by petition, one lower-division course to count as an elective. This course must be primarily focused on issues relevant to Asian American Studies.

**Residence Requirement for the Major:** A minimum of five upper-division courses required for the major must be completed successfully at UCI.

Many career opportunities exist for students who graduate with a B.A. in Asian American Studies, such as service with national and international organizations which seek knowledge of American multicultural society in general, and of Asian American peoples and cultures in particular; positions as area specialists with state and federal government agencies; careers in the private sector with corporations or private organizations which have a significant portion of their activities in the U.S. and the Pacific Rim; and positions of service and leadership within Asian American communities. Students may also continue their education and pursue professional or graduate degrees.

## Asian American Studies, Graduate Emphasis

The Department of Asian American Studies offers a graduate emphasis in Asian American Studies, which is available in conjunction with selected departmental graduate programs.

Students in the graduate emphasis complete a minimum of four courses, including ASIANAM 200A and ASIANAM 200B and two electives in Asian American Studies. Eligible courses include ASIANAM 200C; ASIANAM 200D; ASIANAM 201; ASIANAM 250; graduate seminar courses taught by Asian American Studies core or affiliate faculty; or directed reading courses with an Asian American Studies core or affiliate faculty.

Subject to the requirements of participating academic units, Ph.D. students in the emphasis should have at least one Asian American Studies core faculty member on their qualifying examination and dissertation committees. In consultation with the Asian American Studies Graduate Committee, the Director of Graduate Study may approve affiliated faculty members to sit in place of the core faculty. (There are no requirements concerning qualifying examinations or theses for master's students.)

Applicants to the emphasis must be admitted to a participating UCI graduate program. For complete information about application policies and procedures, as well as the requirements of the emphasis, please see the Director of Graduate Study.

## Asian American Studies, M.A. (4+1)

The combined Bachelor of Arts and Master of Arts in Asian American Studies is designed for students looking to engage in the most critical issues at the forefront of the field. At the conclusion of the program, graduates are trained in interdisciplinary theories and methods for social justice-driven research as well as have developed an understanding of issues facing local, national, and global Asian American communities through first-hand interaction and engagement.

All students wishing to participate in the program should first meet with the Director of Graduate Study to discuss eligibility and coursework opportunities. In order to be considered admissible, at minimum, students must meet the following criteria:

- Current UCI undergraduate student status
- Cumulative 3.0 GPA

- Cumulative 3.3 GPA in all Asian American Studies coursework
- Two Asian American Studies courses: one selected from ASIANAM 50, 51, 52, 53, or 54, and one other lower- or upper-division course in Asian American Studies

Applications are accepted on a rolling basis during the final year of undergraduate study. The process to apply is as follows:

- Set up an advising appointment with the Humanities Assistant Director of Graduate Study.
- Complete an online graduate application through UCI Graduate Division.
- Submit the following supplemental application materials: unofficial transcripts of all post-secondary work, one letter of recommendation from an Asian American Studies core or affiliate faculty member, and a writing sample (10 pages in length).

### Course Requirements

All students at the graduate level of the B.A./M.A. program must complete a total of nine courses (36 units) for the degree.

A. Complete the following:

ASIANAM 200A	Theory and Methods in Asian American Studies
ASIANAM 200B	Contemporary Issues in Asian American Studies
ASIANAM 200C	Leadership and Social Change in Asian American Communities
ASIANAM 200D	Introduction to Asian American Studies Research
ASIANAM 201	Graduate Topics in Asian American Studies
or ASIANAM 250	Advanced Topics in Asian American Studies

B. Complete three of the following:

ASIANAM 290	Directed Research
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C. Select one graduate level elective

### Language Requirement

Students must complete college-level coursework equivalent to UCI's sixth quarter of study (2C level, or for Latin or Greek, one 103 and one 104, or two 103s or 104s) in a language other than English or equivalent competence. The final course must be taken for a letter grade and passed with a grade of C or better.

### Degree Conferral

M.A. students may complete one of the following options as their degree capstone. Regardless of capstone track, all students must have a minimum GPA of 3.5 and complete a defense open to the public to earn the degree.

**Plan I – Thesis:** The thesis, approximately 25 to 35 pages in length, is a piece of independent research reviewed and approved by the faculty advisor and the thesis committee.

**Plan II – Comprehensive Exam:** At the end of the final quarter, the M.A. candidate must pass a comprehensive exam that illustrates mastery of key concepts and methods of inquiry in Asian American Studies. The final format of the exam is determined in consultation with the faculty advisor, but can take various forms, including a full-length creative work or a policy report. A written evaluation of said work, approximately 10 to 15 pages in length, is also to be submitted for review. The exam is administered by the faculty advisor and an exam committee comprised of at least two additional Asian American Studies faculty members.

### Time to Degree

Students complete all degree requirements and the Master's thesis/comprehensive exam within one year (three quarters) once they have transitioned to graduate student status. Maximum time to degree is two years after the Bachelor's degree.

## Asian American Studies, Minor

The Department of Asian American Studies examines the historical and contemporary experiences of Asians in the United States and in a global context. The curriculum seeks to provide an analysis of the cultural, political, and economical organization of Asian American communities. Students are invited to participate and partake in broadening their understanding of multicultural perspectives within U.S. society.

### Requirements for the Minor in Asian American Studies

#### Requirements for the Minor

A. Three introductory Asian American Studies core courses:

ASIANAM 50	Asian American Histories
or ASIANAM 51	The U.S. and Asia
and	

ASIANAM 52 or ASIANAM 53 and	Asian American Communities Asian Americans and Race
ASIANAM 54 or ASIANAM 55	Asian American Stories Asian Americans and the Media

B. Four upper-division courses selected from ASIANAM 100W–169, ASIANAM 199.

**Residence Requirement for the Minor:** Four upper-division courses required for the minor must be completed successfully at UCI. Two of the four may be taken through the UC Education Abroad Program, provided course content is approved in advance by the Department.

## Department of Classics

### Andromache Karanika, Department Chair

400 Murray Krieger Hall

949-824-6735

<http://www.humanities.uci.edu/classics/>

The Department of Classics aims to provide the undergraduate student with a working knowledge of the origins and heritage of Graeco-Roman civilization. The Department is committed to a twofold purpose: (1) disseminating interest in and knowledge of Classical Civilization through the teaching of Greek and Latin language and literature; and (2) helping students, through courses in Classical literature, history, civilization, mythology, and religion taught through English translations, to appreciate the achievements of Greek and Roman culture and their pervasive influence on our own civilization.

### Study Abroad

The Department of Classics encourages students to take advantage of educational opportunities abroad while making progress toward their UCI degree. Classics majors and minors can benefit from a broader perspective of the field by studying for periods ranging from one quarter to one year at any number of universities all over the world through the UC Education Abroad Program. Students can also augment their exposure to Greek, Latin, and Classical civilizations by studying for a summer or during the academic year in Greece or Italy at programs sponsored by other academic institutions. To determine how study abroad can fit into a Classics major, visit the UCI Study Abroad Center's website (<https://studyabroad.uci.edu/>). See the Department of Classics Undergraduate Program Advisor for additional information.

### Career Opportunities

The study of the ancient world is a valuable possession for modern life. The discipline of Classics is an important part of a well-rounded education. Greek and Latin language and literature, history, philosophy, mythology and religion make an excellent basis for exploring all periods of Western culture up to the present day. Classics is an interdisciplinary study, exploring human culture through a variety of methods and points of view. For this reason, the student who chooses to major in Classics may find many professional opportunities.

Graduate and professional schools in medicine, law, management, and other fields welcome students with training in Classics. So do many business corporations. Business, industry, and technology are well acquainted with the value of an education in Classics. They are aware that students with a strong background in a respected and challenging major such as Classics are disciplined thinkers who can express themselves in clear, coherent, and cogent language, capabilities that are considered valuable in future physicians, lawyers, and managers.

There are also specific vocational opportunities open to the graduate in Classics. A major in this field may lead to a career in high school teaching, or (after appropriate further study) in college or university teaching. It is also an excellent preparation for advanced study in other academic disciplines such as archaeology, history, comparative literature, philosophy, and linguistics, as well as for theological studies and for work in a wide range of the humanities and social sciences.

The UCI Division of Career Pathways (<http://career.uci.edu/>) provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on résumé preparation, job search, and interview techniques.

- Classical Civilization, Minor
- Classics, B.A.
- Classics, M.A.
- Classics, Ph.D.
- Greek, Minor
- Latin, Minor

### Faculty

Zina Giannopoulou, Ph.D. University of Illinois at Urbana-Champaign, *Associate Professor of Classics; European Languages and Studies* (Plato, philosophy and literature, Greek tragedy and epic, film, and reception of classics)

Aleah Hernandez, Ph.D. University of California, Irvine, *Assistant Professor of Teaching of Classics* (Greek epic and tragedy, classical reception, gender studies in Classics)

Andromache Karanika, Ph.D. Princeton University, *Department Chair and Associate Professor of Classics; European Languages and Studies; Religious Studies* (Greek epic poetry, Greek lyric, ritual, gender and performance, reception of antiquity in Byzantium)

Maria C. Pantelia, Ph.D. Ohio State University, *Director, Thesaurus Linguae Graecae® and Professor of Classics; Religious Studies* (Greek epic, Hellenistic poetry, digital technologies in the humanities)

Richard Snyder, Ph.D. University of Southern California, *Undergraduate Advisor and Assistant Professor of Teaching of Classics* (philosophy and literature, epic tradition, Latin poetry)

Paul Andrew Zissos, Ph.D. Princeton University, *Humanities Language Learning Program Director and Professor of Classics; European Languages and Studies* (Latin epic, medieval Latin, Roman history and culture, Classical reception)

## Classics Courses

### **CLASSIC 10. Scientific and Specialized Terminology. 4 Units.**

A study of English terms derived from Greek and Latin and important to contemporary medicine, science, and other professions, with emphasis on development of word-building skills. No prior knowledge of Greek or Latin required.

### **CLASSIC 36A. The Formation of Ancient Greek Society: Early Greece. 4 Units.**

A survey of ancient Greek civilization from its origins in the Bronze Age to the mid-Archaic period. Examines political and social history, as well as literature, art, religion, and archaeological remains.

Same as HISTORY 36A.

(IV)

### **CLASSIC 36B. The Formation of Ancient Greek Society: Late Archaic and Classical Greece. 4 Units.**

A survey of ancient Greek civilization from the Late Archaic period to the Classical period. Focuses on major institutions and cultural phenomena as seen through the study of ancient Greek literature, history, archaeology, and religion.

Same as HISTORY 36B.

(IV)

### **CLASSIC 36C. The Formation of Ancient Greek Society: Fourth-Century and Hellenistic Greece. 4 Units.**

A survey of ancient Greek civilization from the fourth century BCE through to the Hellenistic period. Focuses on major institutions and cultural phenomena as seen through the study of ancient Greek literature, history, archaeology, and religion.

Same as HISTORY 36C.

(IV)

### **CLASSIC 37A. The Formation of Ancient Roman Society: Origins to Roman Republic. 4 Units.**

A survey of the development of Roman civilization from its eighth century BCE beginnings to the civil wars of the first century BCE. Examines political and social history, as well as literature, art, architecture, and religion.

Same as HISTORY 37A.

(IV)

### **CLASSIC 37B. The Formation of Ancient Roman Society: Roman Empire. 4 Units.**

A survey of Roman civilization from Augustus's consolidation of power following the civil wars of the first century BCE to the crisis of the third century CE. Includes social history, literature, art, architecture, and religion.

Same as HISTORY 37B.

(IV)

### **CLASSIC 37C. The Formation of Ancient Roman Society: The Fall of Rome. 4 Units.**

A survey of Roman civilization from the crisis of the third century CE to the so-called "fall of Rome" in 476 CE. Examines political and social history, as well as literature, art, architecture, and religion.

Same as HISTORY 37C.

(IV)

**CLASSIC 45A. Classical Mythology: The Gods. 4 Units.**

An overview of the main myths of the gods of the ancient Greeks and Romans and their influence in contemporary and later literature and art. Includes readings from both ancient and modern sources.

(IV)

**CLASSIC 45B. Classical Mythology: The Heroes. 4 Units.**

An overview of the main myths of the heroes of the ancient Greeks and Romans and their influence in contemporary and later literature and art. Includes readings from both ancient and modern sources.

(IV)

**CLASSIC 45C. Classical Mythology: Ancient and Modern Perspectives of Classical Mythology. 4 Units.**

Detailed examination of key Greek and Roman myths, their interpretations, and the influence they have exerted on literature, art, and popular culture in subsequent periods.

(IV)

**CLASSIC 99. Special Studies in Classics. 1-4 Units.**

Lower-division level independent research with Classics faculty.

Repeatability: May be repeated for credit unlimited times.

**CLASSIC 140. Classics and History: The Ancient World. 4 Units.**

Selected topics in society and culture of the Graeco-Roman world. Readings in translation.

Repeatability: Unlimited as topics vary.

**CLASSIC 150. Classical Mythology. 4 Units.**

Selected myths and legends as used in Classical literature, and their modern interpretations.

**CLASSIC 160. Topics in Classical Literature in English Translation. 4 Units.**

Studies in selected areas of Classical literature. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**CLASSIC 160W. Topics in Classical Literature in English Translation. 4 Units.**

Studies in selected areas of Classical literature. Topics addressed vary each quarter.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

(Ib)

**CLASSIC 166. Topics in Classical Reception. 4 Units.**

Studies in selected areas of Classical reception. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**CLASSIC 170. Topics in Classical Civilization. 4 Units.**

Studies in selected areas of Classical civilization. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**CLASSIC 176. International Studies and the Classics. 4 Units.**

Develops a broader understanding of the formation of different cultures and countries of Classical times and their impact on the modern world.

Repeatability: Unlimited as topics vary.

**CLASSIC 192A. Senior Capstone. 2 Units.**

Under the guidance of a faculty mentor, majors design and execute a senior project. This project may be a research paper, dramatic production, school curriculum, etc. All projects must be approved by the faculty mentor.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Grading Option: In Progress (Letter Grade with P/NP).

**CLASSIC 192B. Senior Capstone. 4 Units.**

Under the guidance of a faculty mentor, majors design and execute a senior project. This project may be a research paper, dramatic production, school curriculum, etc. All projects must be approved by the faculty mentor.

Prerequisite: CLASSIC 192A. Satisfactory completion of the Lower-Division Writing requirement.

**CLASSIC 198. Directed Group Study. 4 Units.**

Special topics in Classical studies through directed reading and research.

Repeatability: May be repeated for credit unlimited times.

**CLASSIC 199. Independent Study in Classics. 1-4 Units.**

Independent research with Classics faculty.

Repeatability: May be repeated for credit unlimited times.

**CLASSIC 280. Independent Study. 4-12 Units.**

Supervised independent research. Subject varies.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CLASSIC 290. Research in Classics. 4-12 Units.**

Research under Classics faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CLASSIC 299. Dissertation Research. 4-12 Units.**

Dissertation research with Classics faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CLASSIC 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Greek Courses

**GREEK 1A. Fundamentals of Greek. 5 Units.**

Elements of Classical Greek grammar, syntax, and vocabulary.

Overlaps with GREEK S1AB.

Restriction: GREEK 1A and GREEK S1AB may not be taken for full credit.

**GREEK 1B. Fundamentals of Greek. 5 Units.**

Elements of Classical Greek grammar, syntax, and vocabulary.

Prerequisite: GREEK 1A. GREEK 1A with a grade of C or better

Overlaps with GREEK S1AB, GREEK S1BC.

Restriction: GREEK 1B and GREEK S1AB and GREEK S1BC may not be taken for full credit.

**GREEK 1C. Fundamentals of Greek. 5 Units.**

Introduction to reading texts.

Prerequisite: GREEK 1B. GREEK 1B with a grade of C or better

Overlaps with GREEK S1BC.

Restriction: GREEK 1C and GREEK S1BC may not be taken for full credit.

**(VI)****GREEK 99. Special Studies in Greek. 1-4 Units.**

Lower-division level independent research with Greek faculty.

Repeatability: May be repeated for credit unlimited times.

**GREEK 100. Topics in Attic Greek. 4 Units.**

Selected readings in Attic Greek prose and poetry. Authors may include Xenophon, Lysias, Antiphon, Euripides, and others. Selections from prose and poetry will be read each quarter. Grammar and syntax review included.

Prerequisite: GREEK 1C. GREEK 1C with a grade of C or better. Placement into GREEK 100 is also accepted.

Repeatability: Unlimited as topics vary.

**GREEK 103. Seminar in Greek Prose. 4 Units.**

Specialized and focused study of a particular Greek prose author or topic.

Prerequisite: GREEK 100

Repeatability: Unlimited as topics vary.

**GREEK 104. Seminar in Greek Poetry. 4 Units.**

Specialized and focused study of a particular topic or author of Greek poetry.

Prerequisite: GREEK 100

Repeatability: Unlimited as topics vary.

**GREEK 198. Directed Group Study. 4 Units.**

Special topics in Greek culture and civilization through directed reading and research.

Repeatability: May be repeated for credit unlimited times.

**GREEK 199. Independent Studies in Greek. 1-4 Units.**

Independent research with Greek faculty.

Repeatability: May be repeated for credit unlimited times.

**Latin Courses****LATIN 1A. Fundamentals of Latin. 5 Units.**

Elements of Latin grammar, syntax, and vocabulary.

Overlaps with LATIN S1AB.

Restriction: LATIN 1A and LATIN S1AB may not be taken for full credit.

**LATIN 1B. Fundamentals of Latin. 5 Units.**

Elements of Latin grammar, syntax, and vocabulary.

Prerequisite: LATIN 1A. LATIN 1A with a grade of C or better

Overlaps with LATIN S1AB, LATIN S1BC.

Restriction: LATIN 1B and LATIN S1AB and LATIN S1BC may not be taken for full credit.



**LATIN 1C. Fundamentals of Latin. 5 Units.**

Introduction to reading texts, including study of the poetry of Catullus and selected readings.

Prerequisite: LATIN 1B. LATIN 1B with a grade of C or better

Overlaps with LATIN S1BC.

Restriction: LATIN 1C and LATIN S1BC may not be taken for full credit.

**(VI)****LATIN 99. Special Studies in Latin. 1-4 Units.**

Lower-division level independent research with Latin faculty.

Repeatability: May be repeated for credit unlimited times.

**LATIN 100. Topics in Classical Latin. 4 Units.**

Selected readings in Classical Latin prose and poetry. Authors may include Cicero, Caesar, Ovid, Catullus, and others. Selections from prose and poetry will be read each quarter. Grammar and syntax review included.

Prerequisite: LATIN 1C. LATIN 1C with a grade of C or better. Placement into Latin 100 is also accepted.

Repeatability: Unlimited as topics vary.

**LATIN 103. Seminar in Latin Prose. 4 Units.**

Specialized and focused study of a particular Latin prose author or topic.

Prerequisite: LATIN 100

Repeatability: Unlimited as topics vary.

**LATIN 104. Seminar in Latin Poetry. 4 Units.**

Specialized and focused study of a particular topic or author in Latin poetry.

Prerequisite: LATIN 100

Repeatability: Unlimited as topics vary.

**LATIN 198. Directed Group Study. 1-4 Units.**

Special topics in Roman culture and civilization through directed reading and research.

Repeatability: May be repeated for credit unlimited times.

**LATIN 199. Independent Studies in Latin. 1-4 Units.**

Independent research with Latin faculty.

Repeatability: May be repeated for credit unlimited times.

## Classical Civilization, Minor

The Department offers Minors in Classical Civilization, Greek, and Latin for students who plan to follow a shorter but formally recognized program of study in the field of Classics. The Minor program in Classical Civilization approaches the ancient world from a broad interdisciplinary perspective with the goal to gain a deeper understanding and appreciation for the diverse cultures of the ancient Mediterranean. Students who minor in Classical Civilization have many of the same advantages as our majors, and benefit from being part of our inclusive community as they develop their study on civilizations that have had profound influence on our current socio-cultural, intellectual, and civic lives. Students further benefit from enhancing their critical thinking, creative and historically-informed problem-solving which can successfully complement their majors and studies in other areas, including Humanities, Social Sciences, STEM or professional fields.

A. Select one of the following:

CLASSIC 36A- 36B- 36C

The Formation of Ancient Greek Society: Early Greece  
and The Formation of Ancient Greek Society: Late Archaic and Classical  
Greece  
and The Formation of Ancient Greek Society: Fourth-Century and  
Hellenistic Greece

CLASSIC 37A- 37B- 37C

The Formation of Ancient Roman Society: Origins to Roman Republic  
 and The Formation of Ancient Roman Society: Roman Empire  
 and The Formation of Ancient Roman Society: The Fall of Rome

CLASSIC 45A- 45B- 45C

Classical Mythology: The Gods  
 and Classical Mythology: The Heroes  
 and Classical Mythology: Ancient and Modern Perspectives of Classical  
 Mythology

B. Select five upper-division Classics courses, one of which may be in a related field such as history, art history, or philosophy.

## Classics, B.A.

The Department offers a major in Classics with three possible emphases. Students may choose an emphasis in Greek and Latin Language and Literature, Latin Language and Literature, or Classical Civilization. Students are encouraged to consult with the Classics faculty regarding the appropriate choice of major and design of their programs.

For the emphasis in Greek and Latin Language and Literature, study of the Classics must be based on competence in both Greek and Latin. This emphasis is designed to provide the student with language competence as rapidly as possible, so that by the end of first-year Greek or Latin the student has already been introduced to some of the major Classical authors in the original language. From then on, courses are devoted to reading and interpreting the literature of ancient Greece and Rome. In addition to their training in the languages, students increase their knowledge of the literature, history, and thought of the ancient world through the close study of some of its finest writers.

The Latin Language and Literature emphasis is designed for those students who want to focus on Rome and the Latin language as their area of study. By the end of first-year Latin, students will be reading and analyzing some of the most influential works in Latin literature. In addition to gaining an expertise in Latin, students also devote a portion of their study to an examination of the history and culture of ancient Rome by taking upper-division Classical Civilization courses with Rome as their focus and/or additional Latin courses. Courses from other departments in the School of Humanities with a focus on later historical periods heavily influenced by Roman culture (such as the medieval period) may be used to satisfy some of the degree requirements, with prior approval of the Department of Classics.

The emphasis in Classical Civilization is designed for students who do not plan to concentrate on the Classical languages or pursue graduate study in the Classics, yet wish to obtain an undergraduate degree based on a sound knowledge of the Classical world. This major requires one year of study (or its equivalent) of either Greek or Latin and courses taught in English translation concerning such topics as Classical literature, civilization, history, archaeology, art, drama, and philosophy.

Students entering UCI with previous Greek or Latin training may be given advanced standing. Usually, one year of high school work is equated with one quarter of UCI work. For example, students with one, two, or three years of high school Latin (or Greek) will enroll in Latin (or Greek) 1B, 1C, and 100, respectively. Placement may vary (depending on the extent of the student's preparation) and a placement test may be required. Students with transfer credit for Greek and/or Latin may *not* repeat those courses for credit. Students with high school training in the Classical languages are required to consult with the Classics undergraduate advisor before enrolling in Greek or Latin courses.

The Department adheres to the policy of giving its students an opportunity to participate in the departmental decision-making process. Student representatives, elected from and by the undergraduate majors, participate in all open departmental meetings. Representatives are responsible for maintaining close liaison with their constituency, for representing the students' interest in curriculum and personnel matters.

Inquiries regarding language placement, prerequisites, planning a program of study, or other matters related to the Department's offerings should be directed to the Office of the Chair, 400 Murray Krieger Hall, telephone 949-824-6735.

### Planning a Program of Study

The Department believes in close consultation with students on academic advising and program planning. Students planning to major in Classics or minor in Greek, Latin, or Classical Civilization are strongly urged to consult with the departmental faculty at the earliest moment to learn about the various programs.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

**All students are subject to the Language Other Than English Placement and Progression policies.**

### Departmental Requirements for the Major

The B.A. program in Classics is devoted to the study of languages, literature, and culture of ancient Greece and Rome. Students select one of three emphases: (1) Greek and Latin Language and Literature; (2) Latin Language and Literature; or (3) Classical Civilization.

#### Emphasis in Greek and Latin Language and Literature

A. Choose either Greek Focus or Latin Focus:

1. Greek Focus:

## CLASSIC 36A- 36B- 36C

The Formation of Ancient Greek Society: Early Greece  
and The Formation of Ancient Greek Society: Late Archaic and Classical Greece  
and The Formation of Ancient Greek Society: Fourth-Century and Hellenistic Greece

and select six upper-division courses in GREEK 100–104, GREEK 120

and select three upper-division courses in LATIN 100–104

or

## 2. Latin Focus:

## CLASSIC 37A- 37B- 37C

The Formation of Ancient Roman Society: Origins to Roman Republic  
and The Formation of Ancient Roman Society: Roman Empire  
and The Formation of Ancient Roman Society: The Fall of Rome

and select six upper-division courses in LATIN 100–104

and select three upper-division courses in GREEK 100–104

B. One additional upper-division course in Greek or Latin. One upper-division Classics class (CLASSIC 140, CLASSIC 150, CLASSIC 160, CLASSIC 170, CLASSIC 176) may be substituted for the upper-division Greek or Latin course with prior approval of the departmental undergraduate advisor.

## C. Senior Capstone Requirement:

CLASSIC 192A-CLASSIC 192B (or equivalent) taken during the senior year. Under the guidance of a faculty mentor, students design and execute a senior project. Students may plan a project centering on an area of strong interest and may write a research paper, design a creative project, a primary or secondary school curriculum, or other similar projects. All project proposals must be approved by the end of CLASSIC 192A. Six units of CLASSIC 198, CLASSIC 199, or GREEK 199 may be substituted for CLASSIC 192A-CLASSIC 192B with prior approval of the departmental undergraduate advisor.

**Emphasis in Latin Language and Literature**

## A. Complete:

## CLASSIC 37A- 37B- 37C

The Formation of Ancient Roman Society: Origins to Roman Republic  
and The Formation of Ancient Roman Society: Roman Empire  
and The Formation of Ancient Roman Society: The Fall of Rome

B. Select six upper-division courses in LATIN 100–104.

C. Select four upper-division courses from the following:

## LATIN 103

Seminar in Latin Prose

## LATIN 104

Seminar in Latin Poetry

## CLASSIC 140

Classics and History: The Ancient World

## CLASSIC 150

Classical Mythology

## CLASSIC 160

Topics in Classical Literature in English Translation

## CLASSIC 170

Topics in Classical Civilization

## CLASSIC 176

International Studies and the Classics

Courses taken in another UCI department may be substituted with prior approval of the departmental undergraduate advisor; three of these courses must be Roman in topic (the fourth course may have a Greek topic).

## D. Senior Capstone Requirement:

CLASSIC 192A-CLASSIC 192B (or equivalent) taken during the senior year. Under the guidance of a faculty mentor, students design and execute a senior project. Students may plan a project centering on an area of strong interest and may write a research paper, design a creative project, a primary or secondary school curriculum, or other similar projects. All project proposals must be approved by the end of CLASSIC 192A. Six units of CLASSIC 198, CLASSIC 199, LATIN 198, or LATIN 199 may be substituted for CLASSIC 192A- CLASSIC 192B with prior approval of the departmental undergraduate advisor.

**Emphasis in Classical Civilization**

## A. Select one of the following:

## LATIN 1A- 1B- 1C

Fundamentals of Latin  
and Fundamentals of Latin  
and Fundamentals of Latin

## GREEK 1A- 1B- 1C

Fundamentals of Greek  
and Fundamentals of Greek  
and Fundamentals of Greek

or equivalent

and select one of the following:

CLASSIC 36A- 36B- 36C	The Formation of Ancient Greek Society: Early Greece and The Formation of Ancient Greek Society: Late Archaic and Classical Greece and The Formation of Ancient Greek Society: Fourth-Century and Hellenistic Greece
CLASSIC 37A- 37B- 37C	The Formation of Ancient Roman Society: Origins to Roman Republic and The Formation of Ancient Roman Society: Roman Empire and The Formation of Ancient Roman Society: The Fall of Rome
CLASSIC 45A- 45B- 45C	Classical Mythology: The Gods and Classical Mythology: The Heroes and Classical Mythology: Ancient and Modern Perspectives of Classical Mythology

B. Select five upper-division Classics courses.

C. Select two additional upper-division Classics courses. These courses may be in Classics, Greek, Latin, History, Art History, Philosophy, or other related field. Courses must focus on the ancient Mediterranean and if taken in another UCI department, must have the prior approval of the departmental undergraduate advisor.

D. Senior Capstone Requirement:

CLASSIC 192A-CLASSIC 192B (or equivalent) taken during the senior year. Under the guidance of a faculty mentor, students design and execute a senior project. Students may plan a project centering on an area of strong interest and may write a research paper, design a creative project, a primary or secondary school curriculum, or other similar projects. All project proposals must be approved by the end of CLASSIC 192A. Six units of CLASSIC 198 or CLASSIC 199 may be substituted for CLASSIC 192A-CLASSIC 192B with prior approval of the departmental undergraduate advisor.

**Residence Requirement for the Major:** At least five upper-division courses required for the major must be completed successfully at UCI.

## Classics, M.A.

### The University of California Tri-Campus Graduate Program in Classics

UC Irvine, UC Riverside, and UC San Diego

Michele Salzman, **Chair, Joint Executive Committee**

The UC Tri-Campus Graduate Program in Classics is a joint venture that combines faculty in Classics and related disciplines from the three southernmost University of California campuses—UC Irvine, UC Riverside, and UC San Diego.

The goal of the program is to provide a graduate education that unites the main currents of modern literary, cultural, and social theory with the traditional skills and methodologies of classical philology. Candidates for degrees are expected to exhibit facility in Greek and Latin, competence in research, including theoretical approaches to texts and objects, digital skills for research and teaching, and experience in teaching. These goals are realized through the four core courses (CLASSIC 200A, CLASSIC 200B, CLASSIC 200C and CLASSIC 201) and seminars (CLASSIC 220).

**NOTE: Admission to the program is not available at this time. Contact the Department for information.**

All entering students are admitted into the Ph.D. program. With the exception of those granted advanced standing because they hold the M.A. in Classics from another institution, entering students may be awarded an M.A. along the way.

The requirements for the M.A. are two years (six quarters) of course work, followed by a comprehensive examination or completion of a Master's thesis. A reading knowledge of either German, French, Italian, or an equivalent language, demonstrated by examination or appropriate course work, is also required. M.A. students must successfully complete a minimum of 12 approved, seminar-level courses. The normal course load is three 200-level courses each quarter distributed as follows: nine quarters of CLASSIC 220; three quarters of CLASSIC 200A, CLASSIC 200B, CLASSIC 200C; a fourth quarter may be substituted for a CLASSIC 220. Up to one quarter of CLASSIC 290 for research and writing of the Master's thesis may be substituted for a CLASSIC 220. If remedial work is required in Greek or Latin, with the Graduate Advisor's approval, one enhanced upper-division Greek or Latin course (enrolled as a CLASSIC 280) may be substituted for a CLASSIC 220. With the Graduate Advisor's approval, M.A. students may substitute one external graduate seminar in a relevant area outside of Classics (at any of the three participating campuses) for a CLASSIC 220. At the end of a student's M.A. studies, a positive vote of the program faculty is necessary for continuation in the Ph.D. program. The expected time for completion of the M.A. is two years.

Luci Berkowitz, Ph.D. Ohio State University, *Professor Emerita of Classics*, UCI (Greek literary history, computer application to literature)

Cynthia L. Claxton, Ph.D. University of Washington, *Senior Lecturer in Classics*, Undergraduate Program Director, and Humanities Language Learning Director, UCI (Greek prose, historiography)

Anthony Edwards, Ph.D. Cornell University, *Professor of Classics and Comparative Literature*, UCSD (epic, Greek comedy, critical theory)

Richard I. Frank, Ph.D. University of California, Berkeley, *Professor Emeritus of History and Classics*, UCI (Roman history, Latin elegy and satire, classical tradition)

Zina Giannopoulou, Ph.D. University of Illinois, *Associate Professor of Classics and Graduate Advisor*, UCI (literary theory and Platonic hermeneutics, Classical and Hellenistic philosophy, Greek tragedy and epic)

David Glidden, Ph.D. Princeton University, *Professor Emeritus of Philosophy*, UCR (Greek and Roman philosophy)

Denver Graninger, Ph.D. Cornell University, *Assistant Professor of History*, UCR (social and political implications of Greek religion)

Monte Johnson, Ph.D. University of Toronto, *Associate Professor of Philosophy*, UCSD (ancient philosophy)

Dayna Kalleres, Ph.D. Brown University, *Associate Professor of Literature and the Study of Religion*, UCSD (early to late antique Christian literature and culture)

Andromache Karanika, Ph.D. Princeton University, *Associate Professor of Classics*, UCI (Greek epic poetry, Greek lyric, folklore)

Marianne McDonald, Ph.D. University of California, Irvine, *Professor of Theatre and Classics*, UCSD (Greek and Roman theatre, ancient drama in modern plays, film, and opera)

Margaret M. Miles, Ph.D. Princeton University, *Professor of Art History and Classics*, UCI (Greek and Roman art and archaeology, ancient Sicily, Greek religion)

Jozef Müller, Ph.D. Princeton University, *Assistant Professor of Philosophy*, UCR (Aristotle, Plato, Hellenistic Philosophy, and Neoplatonism)

Sheldon Nodelman, Ph.D. Yale University, *Associate Professor of Visual Arts*, UCSD (Classical art and architecture, Roman portraiture, critical theory)

Maria C. Pantelia, Ph.D. Ohio State University, *Department Chair and Professor of Classics, Director, Thesaurus Linguae Graecae®*, UCI (Greek epic, Hellenistic poetry, digital technologies in the humanities)

Lisa Raphals, Ph.D. University of Chicago, *Professor of Chinese/Comparative Literature*, UCR (comparative philosophy, religion, history of science, and gender, with other interests in poetics and science fiction and media studies)

Wendy Raschke, Ph.D. State University of New York, Buffalo, *Lecturer in Classics*, UCR (Roman satire, Greek art and archaeology)

Michele Salzman, Ph.D. Bryn Mawr College, *Chair, Joint Executive Committee, UC Tri-Campus Graduate Program in Classics and Professor of History*, UCR (Late antiquity; Roman history and literature, religion, women's studies)

Thomas F. Scanlon, Ph.D. Ohio State University, *Professor of Classics*, UCR (Greek and Roman historiography, ancient athletics)

Dana F. Sutton, Ph.D. University of Wisconsin, *Professor Emeritus of Classics*, UCI (Greek and Latin drama, Greek poetry, Anglo-Latin literature)

Edward Watts, Ph.D. Yale University, *Professor of History*, UCSD (intellectual and religious history of the Early Byzantine Empire)

Andrew Zissos, Ph.D. Princeton University, *Associate Professor of Classics*, UCI (Latin epic, medieval Latin, Roman culture)

## Classics, Ph.D.

### The University of California Tri-Campus Graduate Program in Classics

#### UC Irvine, UC Riverside, and UC San Diego

Michele Salzman, **Chair, Joint Executive Committee**

The UC Tri-Campus Graduate Program in Classics is a joint venture that combines faculty in Classics and related disciplines from the three southernmost University of California campuses—UC Irvine, UC Riverside, and UC San Diego.

Students accepted into the program may enroll at any of the three campuses, but normally apply for admission through UCI, which is the main location for instruction and administration. Applications are reviewed by an admissions committee composed of faculty members from all three campuses.

The goal of the program is to provide a graduate education that unites the main currents of modern literary, cultural, and social theory with the traditional skills and methodologies of classical philology. Candidates for degrees are expected to exhibit facility in Greek and Latin, competence in research, including theoretical approaches to texts and objects, digital skills for research and teaching, and experience in teaching. These goals are realized through the four core courses (CLASSIC 200A, CLASSIC 200B, CLASSIC 200C and CLASSIC 201) and seminars (CLASSIC 220).

**NOTE: Admission to the program is not available at this time. Contact the Department for information.**

All entering students are admitted into the Ph.D. program. With the exception of those granted advanced standing because they hold the M.A. in Classics from another institution, entering students may be awarded an M.A. along the way.

The requirements for the Ph.D. are three years (nine quarters) of course work. Minimum course requirements are four quarters of CLASSIC 200A, CLASSIC 200B, CLASSIC 200C; 12 quarters of CLASSIC 220; two external graduate seminars, from departments or programs outside of Classics. These may be taken from the offerings of any of the three campuses. Students may take up to two quarters of enhanced upper-division Greek or Latin courses (enrolled as 280s) in place of CLASSIC 220s with permission of the Graduate Advisor if remedial work is required in Greek or Latin. Where appropriate, in the third year of course work, a second CLASSIC 200A, CLASSIC 200B, or CLASSIC 200C, may be substituted for a CLASSIC 220. CLASSIC 280, Independent Study (supervised research), may be substituted for CLASSIC 220s *only* with the permission of the Graduate Advisor.

Up to 12 equivalent graduate-level courses completed elsewhere may be substituted for Tri-Campus Program courses with approval of the Joint Executive Committee. CLASSIC 280 may be used, normally in the fourth year, to provide time to work on the Greek and Latin reading lists and to prepare for Qualifying Examinations, but these courses do not count toward the required 18 courses.

Students are encouraged to take courses and seminars in relevant areas outside the program at any of the three campuses. At this stage, and during the fourth year of study, students are expected to have read extensively in the primary texts, in literary history and theory, and in ancient history. In addition, experience in supervised teaching and/or research activity is normally required. In order to qualify as a candidate for the Ph.D. and enter the dissertation stage, a student must pass a set of five written qualifying examinations, including Greek translation and Latin translation; Greek history and Roman history; history of Greek and Roman literature. Once these examinations have been passed, a student must submit a substantial dissertation prospectus, comparable to a research paper in scope and detail, and pass an oral examination administered by the candidacy committee.

Ph.D. students must also demonstrate reading proficiency in one modern research language (normally German and French or Italian) by the end of their second year either through appropriate course work or by examination. Proficiency in a second modern research language is expected by the end of the third year. The normative time for advancement to candidacy is four years. The normative time for completion of the Ph.D. is six years, and the maximum time permitted is eight years.

Luci Berkowitz, Ph.D. Ohio State University, *Professor Emerita of Classics*, UCI (Greek literary history, computer application to literature)

Cynthia L. Claxton, Ph.D. University of Washington, *Senior Lecturer in Classics*, Undergraduate Program Director, and Humanities Language Learning Director, UCI (Greek prose, historiography)

Anthony Edwards, Ph.D. Cornell University, *Professor of Classics and Comparative Literature*, UCSD (epic, Greek comedy, critical theory)

Richard I. Frank, Ph.D. University of California, Berkeley, *Professor Emeritus of History and Classics*, UCI (Roman history, Latin elegy and satire, classical tradition)

Zina Giannopoulou, Ph.D. University of Illinois, *Associate Professor of Classics and Graduate Advisor*, UCI (literary theory and Platonic hermeneutics, Classical and Hellenistic philosophy, Greek tragedy and epic)

David Glidden, Ph.D. Princeton University, *Professor Emeritus of Philosophy*, UCR (Greek and Roman philosophy)

Denver Graninger, Ph.D. Cornell University, *Assistant Professor of History*, UCR (social and political implications of Greek religion)

Monte Johnson, Ph.D. University of Toronto, *Associate Professor of Philosophy*, UCSD (ancient philosophy)

Dayna Kalleres, Ph.D. Brown University, *Associate Professor of Literature and the Study of Religion*, UCSD (early to late antique Christian literature and culture)

Andromache Karanika, Ph.D. Princeton University, *Associate Professor of Classics*, UCI (Greek epic poetry, Greek lyric, folklore)

Marianne McDonald, Ph.D. University of California, Irvine, *Professor of Theatre and Classics*, UCSD (Greek and Roman theatre, ancient drama in modern plays, film, and opera)

Margaret M. Miles, Ph.D. Princeton University, *Professor of Art History and Classics*, UCI (Greek and Roman art and archaeology, ancient Sicily, Greek religion)

Jozef Müller, Ph.D. Princeton University, *Assistant Professor of Philosophy*, UCR (Aristotle, Plato, Hellenistic Philosophy, and Neoplatonism)

Sheldon Nodelman, Ph.D. Yale University, *Associate Professor of Visual Arts*, UCSD (Classical art and architecture, Roman portraiture, critical theory)

Maria C. Pantelia, Ph.D. Ohio State University, *Department Chair and Professor of Classics, Director, Thesaurus Linguae Graecae®*, UCI (Greek epic, Hellenistic poetry, digital technologies in the humanities)

Lisa Raphals, Ph.D. University of Chicago, *Professor of Chinese/Comparative Literature*, UCR (comparative philosophy, religion, history of science, and gender, with other interests in poetics and science fiction and media studies)

Wendy Raschke, Ph.D. State University of New York, Buffalo, *Lecturer in Classics*, UCR (Roman satire, Greek art and archaeology)



Michele Salzman, Ph.D. Bryn Mawr College, *Chair, Joint Executive Committee, UC Tri-Campus Graduate Program in Classics and Professor of History*, UCR (Late antiquity; Roman history and literature, religion, women's studies)

Thomas F. Scanlon, Ph.D. Ohio State University, *Professor of Classics*, UCR (Greek and Roman historiography, ancient athletics)

Dana F. Sutton, Ph.D. University of Wisconsin, *Professor Emeritus of Classics*, UCI (Greek and Latin drama, Greek poetry, Anglo-Latin literature)

Edward Watts, Ph.D. Yale University, *Professor of History*, UCSD (intellectual and religious history of the Early Byzantine Empire)

Andrew Zissos, Ph.D. Princeton University, *Associate Professor of Classics*, UCI (Latin epic, medieval Latin, Roman culture)

## Greek, Minor

The Department offers Minors in Classical Civilization, Greek, and Latin for students who plan to follow a shorter but formally recognized program of study in Classics. The Minor program in Greek enables the students to gain an in-depth knowledge of the ancient Greek language, literature and culture. Students who minor in Greek have many of the same advantages as our majors, and benefit from being part of our inclusive community as they develop their study of classical civilization with emphasis on the Greek language and culture. Students further benefit from enhancing their critical thinking, creative and historically-informed problem-solving, which can successfully complement their majors and studies in other areas, including Humanities, Social Sciences, STEM or professional fields.

A. Complete:

GREEK 1C	Fundamentals of Greek <sup>1</sup>
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B. Select six upper-division courses from GREEK 100-104. GREEK 120 may be substituted for one course at the 100 level.

<sup>1</sup> Students who are exempted from GREEK 1C must instead complete an additional upper-division Classics or Greek course offered by the Department.

## Latin, Minor

The Department offers Minors in Classical Civilization, Greek, and Latin for students who plan to follow a shorter but formally recognized program of study in Classics. The Minor program in Latin enables the students to gain an in-depth knowledge of the Latin language and literature and the ancient Roman culture. Students who minor in Latin have many of the same advantages as our majors, and benefit from being part of our inclusive community as they develop their study of classical civilization with emphasis on the Latin language and Roman culture. Students further benefit from enhancing their critical thinking, creative and historically-informed problem-solving, which can effectively complement their majors and studies in other areas, including Humanities, Social Sciences, STEM or professional fields.

A. Complete:

LATIN 1C	Fundamentals of Latin <sup>1</sup>
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B. Select six upper-division courses from LATIN 100-104.

<sup>1</sup> Students who are exempted from LATIN 1C must instead complete an additional upper-division Classics or Latin course offered by the Department.

## Department of Comparative Literature

**Jane O. Newman, Department Chair**

243 Humanities Instructional Building

949-824-6406

<http://www.humanities.uci.edu/complit/>

[complit@uci.edu](mailto:complit@uci.edu)

Comparative Literature is the study of the world through its literatures and cultures. Critical theory and translation provide frameworks for making moves: across languages, media, geographic borders, and political visions. In the Department of Comparative Literature, graduate and undergraduate students immerse themselves in national and regional literatures—of Asia, Africa, Latin America, North America, and Europe—while simultaneously placing those cultural practices within dynamic global exchanges, both historical and contemporary. Through courses, conferences, collaborative projects, and digital media, Comparative Literature at UCI advances critical cosmopolitanism—a kind of worldliness cultivated by creative engagements with power, peoples, and their symbolic practices. From novel to poetry, drama to film, monuments to political protest, comics to audio, urban space to visual culture—Comparative Literature introduces students to global cultures in the widest sense, and to the theoretical lenses essential for putting them in perspective. Writing, speaking, visualizing, blogging, social networking: through multiple media Comparative Literature students at every level interpret and engage with other academics and publics outside the academy. Together, students of Comparative Literature strive for a continually evolving practice of critical awareness and political action: a global literacy and citizenship through which to face the challenges of life and work in the 21st century.

The Department seeks to foster and maintain a lively community that includes undergraduates, graduates, and faculty, and to that end holds a variety of meetings and activities so that majors can get to know one another and other members of the Department.

- Comparative Literature, B.A.
- Comparative Literature, M.A.
- Comparative Literature, Minor
- Comparative Literature, Ph.D.

## Faculty

M. Ackbar Abbas, M.Phil. University of Hong Kong, *Professor of Comparative Literature* (Hong Kong culture and postcolonialism, visual culture, architecture and cinema, cultural theory, globalization)

Aijaz Ahmad, *Distinguished Professor of Comparative Literature* (critical theory, world literature, marxism, tricontinental social thought)

Eyal Amiran, Ph.D. University of Virginia, *Professor of Comparative Literature* (digital media theory, twentieth-century literature, narrative and textual theory, psychoanalysis, modern and postmodern intellectual history)

Alicia Cox, Ph.D. University of California, Riverside, *Assistant Professor of Comparative Literature; English* (19th-century American literature; Native American and Indigenous literature and cultural studies; gender and sexuality studies; queer Indigenous studies; Indigenous feminisms; autobiography; American Indian boarding school studies; settler colonialism)

Herschel Farbman, Ph.D. Yale University, *Department Chair and Associate Professor of Comparative Literature; French* (modernism, critical theory)

Alexander Gelley, Ph.D. Yale University, *Professor Emeritus of Comparative Literature* (eighteenth- and nineteenth-century European novel, critical theory)

David Theo Goldberg, Ph.D. The Graduate Center, City University of New York, *Director of the UC Humanities Research Institute and Professor of Comparative Literature; Anthropology; Criminology, Law and Society* (race, racism, race and the law, political theory, South Africa, digital humanities)

Susan C. Jarratt, Ph.D. University of Texas at Austin, *Professor Emerita of Comparative Literature; Education* (histories and theories of rhetoric, ancient Greek rhetoric, writing studies)

Adriana M. Johnson, Ph.D. Duke University, *Associate Professor of Comparative Literature* (Latin American literature and film, subaltern studies, postcolonial studies, politics and culture)

Steven J. Mailloux, Ph.D. University of Southern California, *Professor Emeritus of English; Comparative Literature* (rhetoric, critical theory, American literature, law and literature)

Catherine Malabou, Ph.D. Ecole des Hautes Etudes en Sciences Sociales, *UCI Distinguished Professor of Comparative Literature; French; German* (German idealism, contemporary French philosophy, cultural theory, neurobiology, epigenetics)

J. Hillis Miller, Ph.D. Harvard University, *UCI Endowed Chair and Distinguished Professor Emeritus of Comparative Literature; English* (Victorian literature, critical theory)

Liron Mor, Ph.D. Cornell University, *Assistant Professor of Comparative Literature* (literary and critical theory, contemporary Israeli and Palestinian literature and film, postcolonial theories, conflict, sympathy, questions of translation and literary adaptation)

Jane O. Newman, Ph.D. Princeton University, *Professor of Comparative Literature; English; European Languages and Studies; Religious Studies* (comparative Renaissance and early modern literature and culture [English, French, German, Italian, neo-Latin], Mediterranean Renaissance studies, Baroque, afterlives of antiquity, Walter Benjamin, Erich Auerbach, pre-modern lessons for the modern and post-modern)

Margot Norris, Ph.D. State University of New York College at Buffalo, *Professor Emerita of English; Comparative Literature* (modern Irish, British, American and continental modernism, literature and war)

Nasrin Rahimieh, Ph.D. University of Alberta, *Director of the Humanities Core Program and Howard Baskerville Professor of Comparative Literature; European Languages and Studies; Gender and Sexuality Studies* (Modern Persian literature and culture, diaspora studies, women's writing.)

John C. Rowe, Ph.D. State University of New York College at Buffalo, *Professor Emeritus of English; Comparative Literature*

Annette M. Schlichter, Ph.D. Humboldt University of Berlin, *Associate Professor Emerita of Comparative Literature* (feminist theory and criticism, queer theory, critiques of heterosexuality, contemporary American literature, gender and literature, voice studies)

Beryl F. Schlossman, Doctorate University of Paris 7, Ph.D. Johns Hopkins University, *Professor of Comparative Literature* (Modern literature, critical theory, film studies, psychoanalysis, the arts in society.)



Gabriele M. Schwab, Ph.D. University of Konstanz, *UCI Chancellor's Professor of Comparative Literature; Anthropology; Culture and Theory; English; European Languages and Studies; German* (modern literature, critical theory, psychoanalysis, comparative literature)

John H. Smith, Ph.D. Princeton University, *Professor of Comparative Literature; Culture and Theory; German; Religious Studies* (18th- and 19th-century literature and intellectual history, literary theory)

Rei Terada, Ph.D. Boston University, *Professor of Comparative Literature; Culture and Theory* (theory, poststructuralism, nineteenth- and twentieth-century poetry)

Ngugi Wa Thiong'O, B.A. Makerere University, *UCI Distinguished Professor of Comparative Literature; English* (African and Caribbean literatures, theater and film, performance studies, cultural and political theory)

Georges Y. Van Den Abbeele, Ph.D. Cornell University, *Professor of Comparative Literature; English; European Languages and Studies* (French and European philosophical literature, travel narrative and tourism/migration studies, critical theory and aesthetics, francophone literature, history of cartography, media history and theory)

## Affiliate Faculty

Elizabeth G. Allen, Ph.D. University of Michigan, *Associate Professor of English; Comparative Literature; European Languages and Studies; Religious Studies* (Chaucer, Gower, 15th century poetry; exemplary literature, romance, chronicle, episodic form; intersections between ethics and politics, politics and religion; hospitality, sovereignty, legal and constitutional history of England)

Nahum D. Chandler, Ph.D. University of Chicago, *Professor of African American Studies; Asian American Studies; Comparative Literature; English; European Languages and Studies* (modern philosophy, intellectual history, history of the human sciences)

Hu Ying, Ph.D. Princeton University, *Department Chair and Professor of Chinese; Comparative Literature* (narrative literature, translation theory, feminist theory)

Virginia W. Jackson, Ph.D. Princeton University, *Chair in Rhetoric and Communication and Associate Professor of English; Comparative Literature* (poetics, 19th, 20th and 21st century American poetry, 19th century American literature and culture, the history of literary theory)

Ketu H. Katrak, Ph.D. Bryn Mawr College, *Professor of Drama; Comparative Literature; English* (drama and performance, African drama and Ancient Sanskrit drama [from India], postcolonial literature and theory, women writers and feminist theory)

Jerry Won Lee, Ph.D. University of Arizona, *Associate Professor of English; Anthropology; Asian American Studies; Comparative Literature; Culture and Theory*

Horacio Legras, Ph.D. Duke University, *Professor of Spanish and Portuguese; Comparative Literature; Culture and Theory; European Languages and Studies* (Latin American literature and culture, Latin American film, visual arts in Latin America, psychoanalysis, and photography)

Margherita Long, Ph.D. Princeton University, *Associate Professor of Japanese; Comparative Literature* (modern Japanese literature and film, environmental humanities, feminism, eco-documentary)

Julia R. Lupton, Ph.D. Yale University, *Associate Dean for Research and Professor of English; Comparative Literature; Education; Religious Studies* (Renaissance literature, literature and psychology)

Tyrus Miller, Ph.D. Stanford University, *Dean of the School of Humanities and Professor of English; Art History; Comparative Literature; Visual Studies* (modernist and avant-garde studies in literature and visual arts; critical theory and aesthetics; modern architecture and urbanism; East-Central European studies; culture of socialism and post-socialism; Frankfurt School theory)

Carrie J. Noland, Ph.D. Harvard University, *Director of the International Center for Writing and Translation and Director of French and Professor of French; Comparative Literature* (20th-century poetry and poetics, avant-garde movements in art and literature, critical theory, performance studies)

Laura B. O'Connor, Ph.D. Columbia University, *Associate Professor of English; Comparative Literature* (Irish literature, twentieth-century poetry, Anglo-American modernism)

Rajagopalan Radhakrishnan, Ph.D. Binghamton University, State University of New York, *Distinguished Professor of English; African American Studies; Comparative Literature; Culture and Theory* (critical theory, postcoloniality, nationalisms and diasporas, poststructuralism, postmodernism, democracy and minority discourse, cultural studies, globalization and transnationalism)

Jennifer Terry, Ph.D. University of California, Santa Cruz, *Professor of Gender and Sexuality Studies; Comparative Literature* (cultural studies, social theory; science and technology studies, formations of gender and sexuality, critical approaches to modernity, American studies in transnational perspective, processes of militarization)

Tiffany Willoughby-Herard, Ph.D. University of California, Santa Barbara, *Associate Professor of African American Studies; Comparative Literature; Culture and Theory; Political Science* (South Africa, poor whites, race in foreign policy, diaspora, comparative racial politics, third world feminisms, feminist pedagogy, black political thought)

## Courses

### **COM LIT 3. Just Reading: Developing the Reading Experience . 4 Units.**

Develops the reading experience apart from writing. Develops tools for sustained attention in reading practice across a wide range of genres and media from across the globe. Students learn to appreciate elements of reading experience such as attention and perplexity.

(IV and VIII ).

### **COM LIT 8. Travels in Comparative Literature. 4 Units.**

Readings in English and in English translation on such topics as love, war, cities, travel writing, politics, fantasy and science fiction, violence.

Repeatability: Unlimited as topics vary.

(IV)

### **COM LIT 9. Introduction to Multiculturalism. 4 Units.**

Various themes and forms of literary and cultural production within a multicultural framework, including African American, Asian American, Chicano/Latino, and Native American literatures and cultures.

Repeatability: Unlimited as topics vary.

(IV, VII)

### **COM LIT 10. Topics in World Literature. 4 Units.**

Introduction to texts from across the globe and from different historical periods. Readings in English and English translation.

Repeatability: Unlimited as topics vary.

(IV and VIII ).

### **COM LIT 60A. World Literature. 4 Units.**

An introduction to the comparative study of literatures and cultures in a global context. Studies literary texts and other media across the borders of various cultures, historical periods, and traditions. All texts are read in English translation.

(IV and VIII ).

### **COM LIT 60B. Reading with Theory. 4 Units.**

Introduction to theory and methods of literary and cultural criticism in a global context. Students read theoretical approaches to literature, culture, and ideas. Marx and Freud, e.g., may be studied alongside readings in narrative poetry, film, song lyrics, novel.

(IV, VIII)

### **COM LIT 60C. Cultural Studies. 4 Units.**

Introduces students to a variety of cultural practices (literature, blogs, films, radio, comics) from across the globe. Focuses on the ways that context, genre, and medium (e.g., written, visual, oral) affect how these practices are produced, circulated, and received.

(IV, VIII)

### **COM LIT 100A. Nations, Regions, and Beyond. 4 Units.**

Intensive study of national and regional cultural and literary traditions from across the globe, among them the literary and cultural production of the Middle East, Africa, Europe, the Americas, and Asia.

Repeatability: Unlimited as topics vary.

### **COM LIT 101W. An Introduction to Translation Studies. 4 Units.**

Focuses on theories of translation and on how these theories help students understand the role of translation in the world. Students develop a critical vocabulary for discussing translation in multiple linguistic traditions and complete a final translation project.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**COM LIT 102. Comparative Studies in Literature and Theory. 4 Units.**

In-depth discussion of special topics.

Repeatability: Unlimited as topics vary.

**COM LIT 102W. Comparative Studies in Literature and Theory. 4 Units.**

In-depth discussion of special topics.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**(Ib)**

**COM LIT 105. Topics in Comparative Multiculturalism. 4 Units.**

Treats the literatures and cultures of one or more minority groups in California and the United States, including African Americans, Asian Americans, Chicano/Latinos, and Native Americans, and their relations to other national literatures.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Repeatability: May be repeated for credit unlimited times.

**COM LIT 107. Colonialisms and Postcolonialisms. 4 Units.**

Explores topics such as colonialism and race, decolonization, pre- and postcoloniality, globalization, and the cultural dynamics of colonization and subjectivity.

Repeatability: Unlimited as topics vary.

**COM LIT 108. Diasporic Literatures and Cultures. 4 Units.**

Literatures, cultures, and histories of diasporic groups, e.g., literature of the Persian diaspora; cinema of the African diaspora.

Repeatability: Unlimited as topics vary.

**COM LIT 120. Philosophy, Culture, and Literature. 4 Units.**

Discusses contemporary and historical philosophical questions and figures--for example, existentialism or debates about artificial intelligence--in interaction with culture and literature.

Repeatability: Unlimited as topics vary.

**COM LIT 121. Narrative, Pattern, and Text. 4 Units.**

Explores textual patterns, structures, and effects. May include topics such as novel, hypertext, genre, reader responses, intertextuality.

Repeatability: Unlimited as topics vary.

**COM LIT 122. Rhetorical Approaches to Literature. 4 Units.**

Studies the art and politics of rhetoric and persuasion in connection with cultural works from various times and places, for example, classical political speeches, Internet journalism.

Repeatability: Unlimited as topics vary.

**COM LIT 123. Literatures in Dialogue. 4 Units.**

Studies how texts interact across time and space in a global context. Uses concepts of influence, imitation, and parody, to ask, for example, how the Homeric epics can help us understand Caribbean novels and U.S. movies such as *Troy*.

Repeatability: Unlimited as topics vary.

**COM LIT 130. Gender, Sexuality, Race, Class. 4 Units.**

Discusses the roles of differences such as race, class, gender, and sexuality in society, culture, and literature across the globe, covering topics such as theoretical and literary representations of queer sexuality, gender performance, critical race theory.

Repeatability: Unlimited as topics vary.

**COM LIT 131. Psychoanalysis and Culture. 4 Units.**

Discusses major psychoanalytic writings of Freud and others in connection with questions of culture.

Repeatability: Unlimited as topics vary.

**COM LIT 132. Discourse, Ideologies, and Politics. 4 Units.**

Compares ideologies and systems, e.g., nationalism and fundamentalism, as they affect literature and culture in a global context.

Repeatability: Unlimited as topics vary.

**COM LIT 140. Critical Cultural Studies. 4 Units.**

Introduces a variety of ways of understanding cultural phenomena in relation to different power structures. These cultural phenomena may include comics, film, literature, sports, music, festivals, telling stories, or eating out.

Repeatability: Unlimited as topics vary.

**COM LIT 141. Topics in Popular Culture . 4 Units.**

Critical analyses of popular culture such as comics, oral narratives, films, TV, and music in an international framework.

Repeatability: Unlimited as topics vary.

**COM LIT 142. The Metropolis and Other Cultural Geographies. 4 Units.**

Examines the relationship between space and culture; cultural production in the city, suburb, and/or countryside; spaces in texts and artifacts (film, literature, comics, photographs) in a global context.

Repeatability: Unlimited as topics vary.

**COM LIT 143. Literature, Arts, and Media. 4 Units.**

Explores literature and other arts and media in a global context. May include film and electronic media, fine arts, oral cultures, architecture, in an international framework.

Repeatability: Unlimited as topics vary.

**COM LIT 144. Literature, History, and Society. 4 Units.**

Explores the relationship between literary texts and their historical and social contexts in an international framework. Courses may address, for example, literary and cultural expressions in social revolutions or the way literary texts talk back to medicine, religion, and anthropology.

Repeatability: Unlimited as topics vary.

**COM LIT 150. Literature in Translation. 4 Units.**

The study of literary works in one or more genres in English translation. May be a comparative study of works from several different original languages or a concentration on works from a single cultural/linguistic tradition.

Repeatability: Unlimited as topics vary.

**COM LIT 160. World Cinema . 4 Units.**

Comparative analysis of contemporary film in languages other than English.

Repeatability: May be taken for credit 2 times as topics vary.

**COM LIT 190W. Advanced Seminar in Comparative Literature and Theory. 4 Units.**

Capstone seminar for the Comparative Literature major. Deepens understanding of the field through investigation of a special topic and a substantial research and writing project.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: School of Humanities students only.

**(Ib)****COM LIT 199. Independent Study in Comparative Literature. 1-4 Units.**

To be taken only when the materials to be studied lie outside the normal run of departmental offerings.

Repeatability: May be repeated for credit unlimited times.

**COM LIT 200A. History of Comparative Literature and Introduction to Methods and Theories of CL. 4 Units.**

Seminar designed to introduce graduate students in Comparative Literature to the discipline of Comparative Literature. Issues and theories of comparative literary and cultural study are covered. Strongly recommended for first and second year students before the M.A. exam and review.

Restriction: Graduate students only.

**COM LIT 200B. Theories of Translation. 4 Units.**

The reproduction, translation, and transfer of literary and cultural, ideological and political, and symbolic codes and texts have long been the object of study in Comparative Literature. Addresses the diverse ways in which expressive systems interact and intersect.

Repeatability: Unlimited as topics vary.

**COM LIT 200C. Theories of Globalization, Inter-Nationalism, and Postcolonialism. 4 Units.**

Addresses both theories and the complex history of literary and cultural expression in a national, trans-, inter-, and post-national, global frame. Topics may include: globalism and nationhood, theories of citizenship and political subjecthood, postcolonial literature and theory.

Repeatability: Unlimited as topics vary.

**COM LIT 210. Comparative Studies . 4 Units.**

Studies in selected areas of Comparative Literature. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**COM LIT 220. Translation Workshop. 2-4 Units.**

Trains students in the methodologies and practice of translation. Students focus on the translating process in a series of case studies and individual projects.

Repeatability: May be taken for credit for 8 units.

**COM LIT 280A. Professionalization Seminar. 2 Units.**

The first of two required professionalization seminars in Comparative Literature. Intended for second and third year students and covers preparation for the M.A. and Ph.D. exams, conference presentations, teaching and classroom management, and publishing journals.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**COM LIT 280B. Professionalization Seminar. 2 Units.**

The second of two required professionalization seminars in Comparative Literature. Intended for fourth and fifth year students and covers course design, applying for grants, dissertation prospectus and support, and the job application process.

Prerequisite: COM LIT 280A. COM LIT 280A with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**COM LIT 290. Reading and Conference. 4-12 Units.**

Studies in selected areas. Topics addressed vary each quarter.

Repeatability: May be repeated for credit unlimited times.

**COM LIT 291. Guided Reading Course. 4 Units.**

Studies in selected areas. Topics addressed vary each quarter.

Repeatability: May be repeated for credit unlimited times.

**COM LIT 292. Teaching Practicum . 2 Units.**

Graduate students develop their pedagogical practices by accompanying a professor teaching a UCI undergraduate class. Meets individually with the professor to discuss relevant pedagogical practices, syllabus design, lecturing, assessment, classroom management, etc. Actively participates in one teaching component.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**COM LIT 299. Dissertation Research. 4-12 Units.**

A units-only course for students in the dissertation phase.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**COM LIT 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Comparative Literature, B.A.

Comparative Literature is the study of the world through its literatures and cultures. Critical theory and translation provide frameworks for making moves: across languages, media, geographic borders, and political visions.

In the Department of Comparative Literature, graduate and undergraduate students immerse themselves in national and regional literatures—of Asia, Africa, Latin America, North America, and Europe—while simultaneously placing those cultural practices within dynamic global exchanges, both historical and contemporary. Through courses, conferences, collaborative projects, and digital media, Comparative Literature at UCI advances critical cosmopolitanism—a kind of worldliness cultivated by creative engagements with power, peoples, and their symbolic practices. From novel to poetry, drama to film, monuments to political protest, comics to audio, urban space to visual culture—Comparative Literature introduces students to global cultures in the widest sense, and to the theoretical lenses essential for putting them in perspective. Writing, speaking, visualizing, blogging, social networking: through multiple media Comparative Literature students at every level interpret and engage with other academics and publics outside the academy. Together, students of Comparative Literature strive for a continually evolving practice of critical awareness and political action: a global literacy and citizenship through which to face the challenges of life and work in the 21st century.

The Department seeks to foster and maintain a lively community that includes undergraduates, graduates, and faculty, and to that end holds a variety of meetings and activities so that majors can get to know one another and other members of the Department.

### Planning a Program of Study

The Department offers close consultation for academic planning. All students should plan courses of study with faculty advisors. Students who wish to pursue double majors, special programs, or study abroad are urged to seek advising as early as possible.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

#### Department Requirements for the Major

A. Complete:

COM LIT 60A	World Literature
COM LIT 60B	Reading with Theory
COM LIT 60C	Cultural Studies

B. Complete:

COM LIT 190W	Advanced Seminar in Comparative Literature and Theory (capstone seminar)
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C. Two additional courses selected from upper- or lower-division Comparative Literature courses or other upper-division courses offered in the School of Humanities.

D. Completion of one of the three emphases:

#### 1. Emphasis in Comparative Literature and Critical Theory

(a) Select five upper-division courses in Comparative Literature.

(b) Competence in a foreign language sufficient for reading and understanding literature and culture in that language may be demonstrated through course work in one of the following ways:

(1) Two upper-division courses in a foreign literature or culture in which texts are read in the original, or

(2) One upper-division course in a foreign literature or culture in which texts are read in the original, plus one upper-division course in a literature or culture in translation, or

(3) Students of Chinese, Japanese, and Korean take three years of language training plus one approved upper-division course in a foreign literature or culture in which texts are read in the original language or in translation, or

(4) Students of languages for which no language training is offered past 2C may take any two upper-division courses in a foreign literature or culture in translation.

(5) Students who study Greek and Latin fulfill the entire requirement by successfully completing two years of college-level language training and one upper-division course in a foreign literature or culture in translation.

An Independent Study course may substitute for any part (i.e., either a language or literature course) of the foreign language requirement upon petition to the undergraduate studies director in Comparative Literature.

## 2. Emphasis in Cultural Studies

(a) Select six upper-division courses in Comparative Literature (three of which must be from the following list):

COM LIT 105	Topics in Comparative Multiculturalism
COM LIT 130	Gender, Sexuality, Race, Class
COM LIT 132	Discourse, Ideologies, and Politics
COM LIT 140	Critical Cultural Studies
COM LIT 141	Topics in Popular Culture
COM LIT 142	The Metropolis and Other Cultural Geographies
COM LIT 143	Literature, Arts, and Media
COM LIT 144	Literature, History, and Society

## 3. Emphasis in World Literature

Select six upper-division courses in Comparative Literature (three of which must be from the following list):

COM LIT 100A	Nations, Regions, and Beyond
COM LIT 105	Topics in Comparative Multiculturalism
COM LIT 107	Colonialisms and Postcolonialisms
COM LIT 108	Diasporic Literatures and Cultures
COM LIT 123	Literatures in Dialogue
COM LIT 150	Literature in Translation <sup>1</sup>

<sup>1</sup> COM LIT 150 may be replaced with other approved foreign literature-in-translation courses offered in the Humanities.

**Residence Requirement for the Comparative Literature Major:** COM LIT 190W and four additional upper-division courses in Comparative Literature or other upper-division courses offered in the School of Humanities must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved by the appropriate program advisor or chair.

Courses in Comparative Literature train students to read critically, to think and write analytically in a variety of genres and media, to learn languages, and to do independent research, always in a global context. This course of study helps qualify majors for careers in education, international relations, law, government, technology, communications and media, nonprofit organizations, and publishing. In recent years graduates from the Department of Comparative Literature have won Fulbrights, gone on to law school, nursing school, and master's programs in social work or psychology, and found jobs in public relations firms, done editorial work, and conducted clinical research in pharmaceutical firms. The Comparative Literature major is also excellent preparation for an academic career. Graduates have gone on to Ph.D. programs at Michigan, Cambridge, Harvard, Princeton, UCLA, UC Berkeley, and other schools. Many also teach English, world literature, and modern foreign languages at the high-school level.

# Comparative Literature, M.A.

Two features give Comparative Literature at UC Irvine its distinctive character. First, the department is committed to a conception of transnational comparatism in which the Euro-American zone is not accorded any privileged position while literatures and cultures of the Americas, Asia, Africa, and Latin America - the literatures of the colonized more generally - are accorded their rightful place. Second, the department trains its students in a range of theoretical perspectives that have been transforming scholarship over the past few decades. Ph.D. students in Comparative Literature pursue research that values lines of inquiry over pre-set national and genre categories.

The program views literary texts as one among many contexts of cultural production, such as environmental practices, rural and urban space production, and film images and visual representation. The interdisciplinary nature of the program involves reciprocal and mutually transformative relations with critical theory, informed by such well-established modes of thought as Marxism and psychoanalysis. Intensive, sustained work in critical theory is as important a part of the Ph.D. program as the study of literatures and literary pedagogies.

The M.A. is considered to be a step toward the Ph.D.; only students intending to complete the doctorate are admitted to the program. Applicants must hold a B.A. or equivalent degree and should normally have majored in Comparative Literature or another major involving cultural study. Majors in other disciplines (e.g., philosophy or history) will be considered seriously, provided that a sufficient background in literary and cultural studies and in at least one foreign language is demonstrated.

The M.A. is considered to be a step toward the Ph.D.; only students intending to complete the doctorate are admitted to the program. Applicants must hold a B.A. or equivalent degree and should normally have majored in Comparative Literature or another major involving cultural study. Majors in other disciplines (e.g., philosophy or history) will be considered seriously, provided that a sufficient background in literary and cultural studies and in at least one foreign language is demonstrated.

## Requirements

Entering students are assigned a faculty advisor who usually serves as the chair of the student's M.A. examination committee (which consists of at least two other members of the faculty). Nine courses and an examination are required to complete the degree. The normal academic load for both



M.A. and Ph.D. candidates is three courses a quarter; teaching assistants take two courses in addition to earning credit for University teaching. Only in exceptional circumstances will students be permitted to undertake programs of less than six full courses during the academic year.

### Examination

The M.A. examination is normally taken during the fifth quarter. For the examination, the candidate submits an M.A. paper and a statement of purpose outlining past and future course work and preliminary plans for the Ph.D. qualifying examination. The M.A. examination consists of a discussion of the student's paper and the statement of purpose. In practice, it resembles an extended advising session, but with particularly close attention to the student's paper.

## Comparative Literature, Minor

Comparative Literature is the study of the world through its literatures and cultures. Critical theory and translation provide frameworks for making moves: across languages, media, geographic borders, and political visions.

In the Department of Comparative Literature, graduate and undergraduate students immerse themselves in national and regional literatures—of Asia, Africa, Latin America, North America, and Europe—while simultaneously placing those cultural practices within dynamic global exchanges, both historical and contemporary. Through courses, conferences, collaborative projects, and digital media, Comparative Literature at UCI advances critical cosmopolitanism—a kind of worldliness cultivated by creative engagements with power, peoples, and their symbolic practices. From novel to poetry, drama to film, monuments to political protest, comics to audio, urban space to visual culture—Comparative Literature introduces students to global cultures in the widest sense, and to the theoretical lenses essential for putting them in perspective. Writing, speaking, visualizing, blogging, social networking: through multiple media Comparative Literature students at every level interpret and engage with other academics and publics outside the academy. Together, students of Comparative Literature strive for a continually evolving practice of critical awareness and political action: a global literacy and citizenship through which to face the challenges of life and work in the 21st century.

The Department seeks to foster and maintain a lively community that includes undergraduates, graduates, and faculty, and to that end holds a variety of meetings and activities so that majors can get to know one another and other members of the Department.

### Minor in Comparative Literature

#### Departmental Requirements for the Comparative Literature Minor

A. Complete:

COM LIT 60A	World Literature
COM LIT 60B	Reading with Theory
COM LIT 60C	Cultural Studies

B. Select three upper-division courses in Comparative Literature.

C. Select one additional upper-division course in Comparative Literature or another upper-division course offered in the School of Humanities.

**Residence Requirement for the Comparative Literature Minor:** Four upper-division courses must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved by the appropriate program advisor or chair.

## Comparative Literature, Ph.D.

Two features give Comparative Literature at UC Irvine its distinctive character. First, the department is committed to a conception of transnational comparatism in which the Euro-American zone is not accorded any privileged position while literatures and cultures of the Americas, Asia, Africa, and Latin America - the literatures of the colonized more generally - are accorded their rightful place. Second, the department trains its students in a range of theoretical perspectives that have been transforming scholarship over the past few decades. Ph.D. students in Comparative Literature pursue research that values lines of inquiry over pre-set national and genre categories.

The program views literary texts as one among many contexts of cultural production, such as environmental practices, rural and urban space production, and film images and visual representation. The interdisciplinary nature of the program involves reciprocal and mutually transformative relations with critical theory, informed by such well-established modes of thought as Marxism and psychoanalysis. Intensive, sustained work in critical theory is as important a part of the Ph.D. program as the study of literatures and literary pedagogies.

The M.A. is considered to be a step toward the Ph.D.; only students intending to complete the doctorate are admitted to the program. Applicants must hold a B.A. or equivalent degree and should normally have majored in Comparative Literature or another major involving cultural study. Majors in other disciplines (e.g., philosophy or history) will be considered seriously, provided that a sufficient background in literary and cultural studies and in at least one foreign language is demonstrated.

The doctoral program in Comparative Literature prepares the student for a professional career in the research and teaching of comparative literary and cultural studies. Some students also choose to enter professions (e.g., specialized research, nonprofit organizations, international cultural exchange) in which the specialized work in a specific field indicated by an advanced degree is highly desirable.



Applicants must hold a B.A. or equivalent degree and should normally have majored in Comparative Literature or another major involving cultural study. Majors in other disciplines (e.g., philosophy or history) will be considered seriously, provided that a sufficient background in literary and cultural studies and in at least one foreign language is demonstrated.

## Program Details

Rather than demanding that Ph.D. students compare two national literatures, graduate students in the program may explore the internal differences of a cultural and political phenomenon or pursue a problem that exists transverse to various categories. Graduate students plan individualized course work with their advisors to prepare them for research on their chosen questions. In addition, the Department offers an emphasis in Translation Studies (see the departmental graduate student handbook for a description of this emphasis). Graduate students in Comparative Literature may also complete collaborative Ph.D.s with other selected Humanities Ph.D. programs within UCI. They may also complete campus-wide interdisciplinary emphases such as the Critical Theory Emphasis, Graduate Feminist Emphasis, Visual Studies Emphasis, and the Graduate Emphasis in Race and Justice Studies.

A minor field specialization is recommended. This optional component promotes engagement with a field or methodology outside the student's specialization. It may be of a national, historical, disciplinary, or methodological nature, with the student of western postmodern literary theory and forms engaging in a focused study of ancient Greek or Roman philosophy and culture, for example, or the student of East Asian languages and diasporic literatures may work in anthropology or ethnography. This optional component of the student's program may be fulfilled through course work, independent studies, or a Qualifying Examination topic.

Graduate students in Comparative Literature must demonstrate a command of two foreign languages consistent with their particular focus of study within the program. Competence in two foreign languages is required for the Ph.D. and is verified through examination, a longer translation project, and/or course work.

## Teaching

The Department recognizes that most of its graduate students intend to become teachers, and believes that graduate departments should be training college teachers as well as scholars—indeed, that teaching and scholarship complement one another. Thus candidates for the Ph.D. are expected to acquire experience in teaching, and all Ph.D. candidates gain supervised training as part of the seminar work required for the degree.

## Fellowships

A range of fellowships offered by UC Irvine are available to students in the Department (<https://grad.uci.edu/funding/fellowships-awards/>).

## Requirements

Normally, students who have not done graduate work at another university must complete at least 18 courses. Upon completion of the course work, the student takes a qualifying examination on four areas formulated by the student in consultation with the four faculty members who make up the examination committee. The four areas are to cover a major field, a secondary field, a special topic, and theory. All four areas are to be related to each other and to work toward the dissertation. The examination is part written, part oral, according to a formula decided by the student and the committee. The examination as a whole should reflect the student's ability to work in at least two languages.

After passing the qualifying examination, the student forms a dissertation committee of three faculty members, formulates a dissertation topic in consultation with them, and submits a prospectus for the dissertation along with a preliminary bibliography. Study toward the Ph.D. culminates in the dissertation. The normative time for advancement to candidacy is four years. The normative time for completion of the Ph.D. is seven years, and the maximum time permitted is nine years. Program advising and timelines encourage completion in six years.

# Department of East Asian Studies

### Hu Ying, Department Chair

443 Humanities Instructional Building

<http://www.humanities.uci.edu/eastasian/>

Contemporary East Asian societies are vibrant and complex, and they are heirs to rich cultural traditions that continue to inform the present. The four majors offered by the Department of East Asian Studies provide students the opportunity to explore these societies and cultures in all their diversity, and to pursue their study of East Asia across national and regional boundaries. The Department houses both undergraduate and graduate (Ph.D.) programs.

- Chinese Language and Literature, Minor
- Chinese Studies, B.A.
- Chinese Studies, Minor
- East Asian Cultures, B.A.
- East Asian Studies, Ph.D.
- Japanese Language and Literature, B.A.
- Japanese Language and Literature, Minor
- Japanese Studies, Minor

- Korean Literature and Culture, B.A.
- Korean Literature and Culture, Minor

## Faculty

Jessica Chen, M.A. California State University, Long Beach, *Lecturer of Chinese*

Hyunju Choe, M.A. University of Utah, *Lecturer of Korean*

Chungmoo Choi, Ph.D. Indiana University, *Associate Professor of Korean Culture; Religious Studies* (women's literature and film, Christianity and ethics, popular culture, anthropology)

Ryuko Flores, M.A. University of California, Los Angeles, *Lecturer of Japanese*

Edward B. Fowler, Ph.D. University of California, Berkeley, *Professor Emeritus of Japanese* (modern Japanese literature, cultural studies, film)

James A. Fujii, Ph.D. University of Chicago, *Associate Professor Emeritus of Japanese* (modern Japanese literature, human-animal relations, cultural studies)

Michael A. Fuller, Ph.D. Yale University, *Professor of East Asian Studies; Chinese; Religious Studies* (Chinese poetry and poetics, the cultural and intellectual contexts for poetry, aesthetic theory, linguistic issues in classical Chinese)

Ruohmei Hsieh, M.A. State University of New York at Stony Brook, *Academic Coordinator and Lecturer of Chinese*

Hu Ying, Ph.D. Princeton University, *Department Chair and Professor of Chinese; Comparative Literature* (narrative literature, translation theory, feminist theory)

Martin W. Huang, Ph.D. Washington University, St. Louis, *Professor of Chinese* (late imperial Chinese literature, culture, gender)

Hyunyoung Hyun, M.A. Yonsei University, *Academic Coordinator and Lecturer of Korean*

Kyung Hyun Kim, Ph.D. University of Southern California, *Professor of Korean Culture; Asian American Studies; Film and Media Studies; Visual Studies* (East Asian cinema, modern Korea, critical theory)

Susan B. Klein, Ph.D. Cornell University, *Professor of Japanese; Religious Studies* (premodern and modern theater and dance, Japanese religions, feminist critical theory)

Margherita Long, Ph.D. Princeton University, *Associate Professor of Japanese; Comparative Literature* (modern Japanese literature and film, environmental humanities, feminism, eco-documentary)

Ayako Nagai, Ph.D. University of Illinois at Urbana-Champaign, *Lecturer of Japanese*

Jon Platt, Ph.D. University of California, Berkeley, *Assistant Professor of Japanese* (Japanese literature, cinema, and sound media, environmental philosophy, ecocriticism, affect theory, new materialism, speculative realism/object oriented ontology)

Ying Y. Petersen, Ph.D. University of California, Berkeley, *Lecturer of Chinese*

Hidemi Riggs, Ph.D. University of California, Los Angeles, *Academic Coordinator and Lecturer of Japanese*

Bert Scruggs, Ph.D. University of Pennsylvania, *Associate Professor of Chinese* (Taiwanese literature, postcolonial discourse)

Eiko Sithi-Amnuai, M.A. University of Sydney, *Lecturer of Japanese*

Serk Bae Suh, Ph.D. University of California, Los Angeles, *Associate Professor of Korean* (modern Korean literature)

Elizabeth Tinsley, Ph.D. Otani University, *Assistant Professor of Religious Studies; Chinese* (Buddhism in East Asia, Japanese Buddhism, East Asian religions, Buddhist visual and textual cultures, visual theory)

## Chinese Courses

### **CHINESE 1A. Fundamental Mandarin Chinese. 5 Units.**

Natural approach emphasizing four fundamental skills: listening, speaking, reading and writing. Specifically designed for students with no previous experience in any dialect of Chinese. Conducted in Mandarin Chinese using the Pinyin system of Romanization, traditional and simplified Chinese characters.

Prerequisite: Placement into CHINESE 1A is also accepted.

Overlaps with CHINESE S1AB, CHINESE 1MA, CHINESE 1DA.

Restriction: CHINESE 1A and CHINESE 1DA and CHINESE 1MA and CHINESE S1AB may not be taken for full credit.

### **CHINESE 1B. Fundamental Mandarin Chinese. 5 Units.**

Natural approach emphasizing four fundamental skills: listening, speaking, reading and writing. Specifically designed for students with no previous experience in any dialect of Chinese. Conducted in Mandarin Chinese using the Pinyin system of Romanization, traditional and simplified Chinese characters.

Prerequisite: CHINESE 1A. CHINESE 1A with a grade of C or better. Placement into CHINESE 1B is also accepted.

Overlaps with CHINESE S1AB, CHINESE S1BC, CHINESE 1MB, CHINESE 1DB.

Restriction: CHINESE 1B and CHINESE 1DB and CHINESE 1MB and CHINESE S1AB and CHINESE S1BC may not be taken for full credit.

### **CHINESE 1C. Fundamental Mandarin Chinese. 5 Units.**

Natural approach emphasizing four fundamental skills: listening, speaking, reading and writing. Specifically designed for students with no previous experience in any dialect of Chinese. Conducted in Mandarin Chinese using the Pinyin system of Romanization, traditional and simplified Chinese characters.

Prerequisite: CHINESE 1B or CHINESE S1AB. CHINESE 1B with a grade of C or better. CHINESE S1AB with a grade of C or better. Placement into CHINESE 1C is also accepted.

Overlaps with CHINESE 1DC, CHINESE 1MC, CHINESE S1BC.

Restriction: CHINESE 1C and CHINESE 1DC and CHINESE 1MC and CHINESE S1BC may not be taken for full credit.

## **(VI)**

### **CHINESE 1MA. Fundamentals of Mandarin Chinese - Mandarin Background Track. 5 Units.**

Natural approach emphasizing four fundamental skills: listening, speaking, reading and writing. Specifically designed for students with previous background in Mandarin Chinese. Conducted in Mandarin Chinese using the Pinyin system of Romanization, traditional and simplified Chinese characters.

Prerequisite: Placement into CHINESE 1MA.

Overlaps with CHINESE 1DA, CHINESE 1A, CHINESE S1AB.

Restriction: CHINESE 1MA and CHINESE 1DA and CHINESE 1A and CHINESE S1AB may not be taken for full credit.

### **CHINESE 1MB. Fundamentals of Mandarin Chinese - Mandarin Background Track. 5 Units.**

Natural approach emphasizing four fundamental skills: listening, speaking, reading and writing. Specifically designed for students with previous background in Mandarin Chinese. Conducted in Mandarin Chinese using the Pinyin system of Romanization, traditional and simplified Chinese characters.

Prerequisite: CHINESE 1MA. CHINESE 1MA with a grade of C or better. Placement into CHINESE 1MB is also accepted.

Overlaps with CHINESE 1B, CHINESE 1DB, CHINESE S1AB, CHINESE S1BC.

Restriction: CHINESE 1MB and CHINESE 1DB and CHINESE 1B and CHINESE S1AB and CHINESE S1BC may not be taken for full credit.

**CHINESE 1MC. Fundamentals of Mandarin Chinese - Mandarin Background Track. 5 Units.**

Natural approach emphasizing four fundamental skills: listening, speaking, reading and writing. Specifically designed for students with previous background in Mandarin Chinese. Conducted in Mandarin Chinese using the Pinyin system of Romanization, traditional and simplified Chinese characters.

Prerequisite: CHINESE 1MB. CHINESE 1MB with a grade of C or better. Placement into CHINESE 1MC is also accepted.

Overlaps with CHINESE 1C, CHINESE 1DC, CHINESE S1BC.

Restriction: CHINESE 1MC and CHINESE 1DC and CHINESE 1C and CHINESE S1BC may not be taken for full credit.

**(VI)****CHINESE S1AB. Fundamentals of Mandarin Chinese. 7.5 Units.**

First half of first-year Mandarin Chinese in an intensive setting using natural approach with emphasis on listening, speaking, reading, and writing.

Prerequisite: Placement into CHINESE 1A or CHINESE 1B or CHINESE 1MA or CHINESE 1MB.

Overlaps with CHINESE 1A, CHINESE 1B, CHINESE 1MA, CHINESE 1MB.

**CHINESE S1BC. Fundamentals of Mandarin Chinese. 7.5 Units.**

Second half of first-year Mandarin Chinese in an intensive setting using natural approach with emphasis on listening, speaking, reading, and writing.

Prerequisite: CHINESE S1AB or CHINESE 1B or CHINESE 1DB or CHINESE 1MB. CHINESE S1AB with a grade of C or better. CHINESE 1B with a grade of C or better. CHINESE 1DB with a grade of C or better. CHINESE 1MB with a grade of C or better. Placement into CHINESE 1C or CHINESE 1DC or CHINESE 1MC is also accepted.

Overlaps with CHINESE 1C, CHINESE 1B, CHINESE 1DB, CHINESE 1DC, CHINESE 1MB, CHINESE 1MC.

Restriction: CHINESE S1BC, CHINESE 1B, CHINESE 1C, CHINESE 1DB or CHINESE 1DC, CHINESE 1MB or CHINESE 1MC and may not be taken for full credit.

**(VI)****CHINESE 2A. Intermediate Mandarin Chinese. 5 Units.**

Both authentic and pedagogically-prepared materials are used to further develop students' ability to communicate in culturally, socially, and linguistically appropriate manners. Taught in Chinese using Pinyin romanization system and both traditional and simplified forms of Chinese.

Prerequisite: CHINESE 1C or CHINESE S1BC or CHINESE 1MC. CHINESE 1C with a grade of C or better. CHINESE S1BC with a grade of C or better. CHINESE 1MC with a grade of C or better. Placement into CHINESE 2A is also accepted.

Overlaps with CHINESE 2DA, CHINESE 2MA.

**(VIII)****CHINESE 2B. Intermediate Mandarin Chinese. 5 Units.**

Both authentic and pedagogically-prepared materials are used to further develop students' ability to communicate in culturally, socially, and linguistically appropriate manners. Taught in Chinese using Pinyin romanization system and both traditional and simplified forms of Chinese.

Prerequisite: CHINESE 2A. CHINESE 2A with a grade of C or better. Placement into CHINESE 2B is also accepted.

Overlaps with CHINESE 2DB, CHINESE 2MB.

Restriction: CHINESE 2B and CHINESE 2DB and CHINESE 2MB may not be taken for full credit.

**(VIII)****CHINESE 2C. Intermediate Mandarin Chinese. 5 Units.**

Both authentic and pedagogically-prepared materials are used to further develop students' ability to communicate in culturally, socially, and linguistically appropriate manners. Taught in Chinese using Pinyin romanization system and both traditional and simplified forms of Chinese.

Prerequisite: CHINESE 2B. CHINESE 2B with a grade of C or better. Placement into CHINESE 2C is also accepted.

Overlaps with CHINESE 2DC, CHINESE 2MC.

Restriction: CHINESE 2C and CHINESE 2DC and CHINESE 2MC may not be taken for full credit.

**(VIII)**

**CHINESE 2MA. Intermediate Mandarin Chinese - Mandarin Background Track. 5 Units.**

Authentic and pedagogically prepared materials are used to further develop communication in culturally, socially, and linguistically appropriate manners for students with initial experience in Mandarin Chinese. Conducted in Mandarin using the Pinyin Romanization system, traditional and simplified Chinese characters.

Prerequisite: CHINESE 1MC or CHINESE S1BC. CHINESE 1MC with a grade of C or better. CHINESE S1BC with a grade of C or better. Placement into CHINESE 2MA is also accepted.

Overlaps with CHINESE 2A, CHINESE 2DA.

Restriction: CHINESE 2MA and CHINESE 2DA and CHINESE 2A may not be taken for full credit.

**(VIII)****CHINESE 2MB. Intermediate Mandarin Chinese - Mandarin Background Track . 5 Units.**

Authentic and pedagogically prepared materials are used to further develop communication in culturally, socially, and linguistically appropriate manners for students with initial experience in Mandarin Chinese. Conducted in Mandarin using the Pinyin Romanization system, traditional and simplified Chinese characters.

Prerequisite: CHINESE 2MA. CHINESE 2MA with a grade of C or better. Placement into CHINESE 2MB is also accepted.

Overlaps with CHINESE 2B, CHINESE 2DB.

Restriction: CHINESE 2MB and CHINESE 2DB and CHINESE 2B may not be taken for full credit.

**(VIII)****CHINESE 2MC. Intermediate Mandarin Chinese - Mandarin Background Track . 5 Units.**

Authentic and pedagogically prepared materials are used to further develop communication in culturally, socially, and linguistically appropriate manners for students with initial experience in Mandarin Chinese. Conducted in Mandarin using the Pinyin Romanization system, traditional and simplified Chinese characters.

Prerequisite: CHINESE 2MB. CHINESE 2MB with a grade of C or better. Placement into CHINESE 2MC is also accepted.

Overlaps with CHINESE 2C, CHINESE 2DC.

Restriction: CHINESE 2MC and CHINESE 2DC and CHINESE 2C may not be taken for full credit.

**(VIII)****CHINESE 3A. Advanced Mandarin Chinese. 4 Units.**

A continuation of CHINESE 2A-CHINESE 2B-CHINESE 2C emphasizing conceptualization, self-expression and academic skills in Chinese. Authentic texts from modern Chinese prose and newspapers are used. Taught in Mandarin Chinese using both traditional and simplified forms of Chinese characters.

Prerequisite: CHINESE 2C or CHINESE 2DC or CHINESE 2MC. CHINESE 2C with a grade of C or better. CHINESE 2DC with a grade of C or better. CHINESE 2MC with a grade of C or better. Placement into CHINESE 3A is also accepted.

**(VIII)****CHINESE 3B. Advanced Mandarin Chinese. 4 Units.**

A continuation of CHINESE 2A-CHINESE 2B-CHINESE 2C emphasizing conceptualization, self-expression, and academic skills in Chinese. Authentic texts from modern Chinese prose and newspapers are used. Taught in Mandarin Chinese using both traditional and simplified forms of Chinese characters.

Prerequisite: CHINESE 3A. CHINESE 3A with a grade of C or better

**(VIII)****CHINESE 3C. Advanced Mandarin Chinese. 4 Units.**

A continuation of CHINESE 2A-CHINESE 2B-CHINESE 2C emphasizing conceptualization, self-expression, and academic skills in Chinese. Authentic texts from modern Chinese prose and newspapers are used. Taught in Mandarin Chinese using both traditional and simplified forms of Chinese characters.

Prerequisite: CHINESE 3B. CHINESE 3B with a grade of C or better

**(VIII)**

**CHINESE 10. Peer Tutoring Program . 1 Workload Unit.**

Tutoring Program in which advanced Chinese students provide assistance to students at a lower level. One hour of tutoring per week.

Grading Option: Workload Credit P/NP Only.

Repeatability: May be taken for credit 4 times.

**CHINESE 40. Topics in Professional Chinese. 4 Units.**

Designed for students with native or near native fluency in Chinese. Develops students' language learning to professional levels with cultural and contextual knowledge and with formal communication and presentation skills.

Prerequisite: CHINESE 3C. CHINESE 3C with a grade of C or better. Native speakers also accepted.

Repeatability: May be taken for credit 3 times as topics vary.

**(VIII)**

**CHINESE 100A. Classical Chinese. 4 Units.**

Introduction to classical Chinese grammar and vocabulary with emphasis on reading basic texts.

Prerequisite: CHINESE 3C or JAPANESE 3C or KOREAN 3C

**CHINESE 100B. Classical Chinese. 4 Units.**

Introduction to classical Chinese grammar and vocabulary with emphasis on reading basic texts.

Prerequisite: CHINESE 3C or JAPANESE 3C or KOREAN 3C

**CHINESE 100C. Classical Chinese. 4 Units.**

Introduction to classical Chinese grammar and vocabulary with emphasis on reading basic texts.

Prerequisite: CHINESE 3C or JAPANESE 3C or KOREAN 3C

**CHINESE 101A. Fourth-Year Mandarin Chinese. 4 Units.**

Continued emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation through intensive study and analysis of specific literary texts.

Prerequisite: CHINESE 3C

**CHINESE 101B. Fourth-Year Mandarin Chinese. 4 Units.**

Continued emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation through intensive study and analysis of specific literary texts.

Prerequisite: CHINESE 3C

**CHINESE 101C. Fourth-Year Mandarin Chinese. 4 Units.**

Continued emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation through intensive study and analysis of specific literary texts.

Prerequisite: CHINESE 3C

**CHINESE 115. Topics in Chinese Literature: Advanced Texts. 4 Units.**

Designed for students with near-fluency in reading Chinese. Readings may include both literary and philosophical work by important writers, but the emphasis is on literary texts and writings that interpret those texts.

Prerequisite: Consent of instructor required to enroll.

Repeatability: Unlimited as topics vary.

**CHINESE 199. Independent Study. 1-4 Units.**

Investigation of special topics through directed reading in Chinese. Paper required.

Repeatability: May be taken for credit for 12 units.

**CHINESE 201. Readings in Traditional Chinese Narrative and Prose. 4 Units.**

Close reading of selected premodern prose texts such as historical narratives, novels, short stories, and essays.

Prerequisite: CHINESE 101C

Repeatability: Unlimited as topics vary.

**CHINESE 202. Readings in Traditional Chinese Poetry. 4 Units.**

Close readings of selected premodern poetic texts.

Prerequisite: CHINESE 100C

Repeatability: Unlimited as topics vary.

**CHINESE 203. Readings in Modern Chinese Literature. 4 Units.**

Close readings of selected modern literary texts.

Prerequisite: CHINESE 101C

Repeatability: Unlimited as topics vary.

**CHINESE 204. Readings in Chinese Literary and Cultural Theory. 4 Units.**

Close readings of selected texts in premodern criticism and theory.

Prerequisite: CHINESE 100C

Repeatability: Unlimited as topics vary.

**CHINESE 211A. Studies in Traditional Chinese Narrative and Prose. 4 Units.**

Two-quarter seminar in traditional Chinese narrative and prose, with topics varying from year to year.

Prerequisite: CHINESE 100C

Repeatability: Unlimited as topics vary.

**CHINESE 211B. Studies in Traditional Chinese Narrative and Prose. 4 Units.**

Two-quarter seminar in traditional Chinese narrative and prose, with topics varying from year to year.

Prerequisite: CHINESE 211A

Repeatability: Unlimited as topics vary.

**CHINESE 212A. Studies in Traditional Chinese Poetry. 4 Units.**

Two-quarter seminar in traditional Chinese poetry, with topics varying from year to year.

Prerequisite: CHINESE 100C

Repeatability: Unlimited as topics vary.

**CHINESE 212B. Studies in Traditional Chinese Poetry. 4 Units.**

Two-quarter seminar in traditional Chinese poetry, with topics varying from year to year.

Prerequisite: CHINESE 212A

Repeatability: Unlimited as topics vary.

**CHINESE 213A. Studies in Modern Chinese Literature. 4 Units.**

Two-quarter seminar in modern Chinese literature, with topics varying from year to year. Research paper required.

Prerequisite: CHINESE 100C

Repeatability: Unlimited as topics vary.

**CHINESE 213B. Studies in Modern Chinese Literature. 4 Units.**

Two-quarter seminar in modern Chinese literature, with topics varying from year to year. Research paper required.

Prerequisite: CHINESE 213A

Repeatability: Unlimited as topics vary.

**CHINESE 214. Studies in Chinese Literature and Cultural Theory. 4 Units.**

Seminar in Chinese literature and cultural theory, with topics varying from year to year. Research paper required.

Prerequisite: CHINESE 100C or CHINESE 101C

Repeatability: Unlimited as topics vary.

**CHINESE 230. Topics in Chinese Literature and Culture. 4 Units.**

Seminar in Chinese literature and culture, with topics varying from year to year. Research paper required.

Prerequisite: CHINESE 100C or CHINESE 101A

Repeatability: Unlimited as topics vary.

**CHINESE 290. Independent Study. 4 Units.**

Directed research on topic determined in consultation with faculty member. A term paper or project is required.

Repeatability: May be repeated for credit unlimited times.

**CHINESE 299. Dissertation Research. 4-12 Units.**

Dissertation research with Chinese faculty.

Prerequisite: Advancement to Ph.D. candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## **East Asian Studies Courses**

**EAS 15C. Introductory Topics in Chinese Literature. 4 Units.**

Introduces students to major themes in Chinese literature and culture through the close reading, discussion, and analysis of selected texts in English translation.

Repeatability: Unlimited as topics vary.

Restriction: Korean Literature and Culture Majors only. Chinese Studies Majors only. Japanese Language Literature Majors only. East Asian Cultures Majors only.

**EAS 15J. Introductory Topics in Japanese Literature. 4 Units.**

Introduces students to major themes in Japanese literature and culture through the close reading, discussion, and analysis of selected texts in English translation.

Repeatability: Unlimited as topics vary.

Restriction: Korean Literature and Culture Majors only. Chinese Studies Majors only. Japanese Language Literature Majors only. East Asian Cultures Majors only.

**EAS 15K. Introductory Topics in Korean Literature. 4 Units.**

Introduces students to major themes in Korean literature and culture through the close reading, discussion, and analysis of selected texts in English translation.

Repeatability: Unlimited as topics vary.

Restriction: Korean Literature and Culture Majors only. Chinese Studies Majors only. Japanese Language Literature Majors only. East Asian Cultures Majors only.

**EAS 20. Topics in Asian Religions . 4 Units.**

An introduction to Asian religions (Hinduism, Buddhism, Confucianism, Taoism, Shamanism) including both elite doctrinal aspects and forms of more popular religiosity.

Repeatability: May be taken for credit 3 times as topics vary.

**(IV and VIII ).**



**EAS 40. Topics in East Asian Popular Culture. 4 Units.**

Selected topics in the popular cultural traditions of East Asia designed to introduce students both to problems in situating culture in a specific time and place and to contemporary theories of popular culture and their application to East Asian contexts.

Repeatability: Unlimited as topics vary.

(IV and VIII ).

**EAS 55. Introduction to East Asian Cultures . 4 Units.**

Interdisciplinary courses organized each year around a broad theme designed to introduce students to the cultures of East Asia. Topical organization of courses addresses issues that have been of importance historically and are reshaping East Asia today.

Repeatability: May be taken for credit 3 times as topics vary.

(IV and VIII ).

**EAS H84. Traveling East/West. 4 Units.**

Traveling East/West presents a wide range of travel writings by Chinese, Indian, and Euro-American authors in which they contemplate the complexities of cross-cultural encounters and how knowledge about others and knowledge of ourselves are closely intertwined.

Same as HUM H84.

Restriction: Campuswide Honors Collegium students only.

(IV)

**EAS 110. Topics in Chinese Literature and Society. 4 Units.**

Studies in Chinese texts in their social and cultural context(s). Conducted in English.

Repeatability: May be taken for credit 3 times as topics vary.

**EAS 116. Topics in East Asian Religions. 4 Units.**

Selected topics in the religions of East Asia, e.g., Buddhism, Daoism, Shintô, Christianity, popular religions.

Repeatability: May be taken for credit 3 times as topics vary.

**EAS 117. Topics in East Asian Philosophy. 4 Units.**

Selected topics in the philosophies of East Asia, e.g., Yoga, Buddhism, Vedanta, Confucianism, Taoism, and Shinto.

Repeatability: Unlimited as topics vary.

**EAS 120. Topics in Japanese Literature and Society. 4 Units.**

Studies in Japanese texts in their social and cultural context(s). Conducted in English.

Repeatability: May be taken for credit 3 times as topics vary.

**EAS 123. Structure of Japanese. 4 Units.**

An overview of the linguistic features of modern Japanese. Provides students with a systematic introduction to the nature and characteristics of the language.

Same as LSCI 165B.

**EAS 126. Topics in East Asian Linguistics. 4 Units.**

In-depth examination of selected topics in the linguistics of East Asian languages, including Chinese, Japanese, Korean, and Vietnamese.

Repeatability: May be taken for credit 3 times as topics vary.

**EAS 130. Topics in Korean Society and Culture. 4 Units.**

Studies of the social and cultural forces that affect the lives of the Koreans, including those in the United States. Considers traditional values and contemporary issues within a historical framework.

Repeatability: May be taken for credit 3 times as topics vary.

**EAS 140. Topics in Korean Literature and Society. 4 Units.**

Studies in Korean texts in their social and cultural context(s). Conducted in English.

Repeatability: May be taken for credit 3 times as topics vary.

**EAS 150. Topics in East Asian Literature in Translation. 4 Units.**

East Asian literary works in translation. Taught in English.

Repeatability: Unlimited as topics vary.

**EAS 155. Topics in Cultural Studies in East Asia. 4 Units.**

Interdisciplinary and theoretical introduction to issues in cultural studies that are pertinent to the study of East Asia. All readings in English.

Repeatability: Unlimited as topics vary.

**EAS 160. Topics in East Asian Cinema. 4 Units.**

Study of East Asian cinema from historical, theoretical, and comparative perspectives. Taught in English.

Repeatability: Unlimited as topics vary.

**EAS 170. Topics in Gender in East Asia . 4 Units.**

Explores the construction of gender in East Asian cultures and literatures. Pays close attention to the specificity of historical, cultural, and literary contexts of East Asia as it investigates various theoretical and critical perspectives on gender and sexuality.

Repeatability: Unlimited as topics vary.

**EAS 190. Junior-Senior Colloquium. 4 Units.**

Specialized courses dealing with primary sources; required reports and papers. Each colloquium reflects the instructor's intellectual interest and is conducted as a discussion group. Limited to 15 students.

Repeatability: May be taken for credit 3 times as topics vary.

Restriction: Upper-division students only. Korean Literature and Culture Majors only. Chinese Studies Majors only. Japanese Language Literature Majors only. East Asian Cultures Majors only.

**EAS 192W. Junior-Senior Seminar. 4 Units.**

Analysis of a literary or cultural topic or problem through research and writing of two short and one long research paper for a minimum of 4,000 total words. Seminar follows EAS 190; related to the colloquium's subject.

Prerequisite: EAS 190. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 3 times as topics vary.

**(Ib)****EAS 199. Independent Study. 1-4 Units.**

Investigation of special topics through directed reading in translation. Paper required.

Repeatability: May be taken for credit for 12 units.

**EAS 216. Topics in East Asian Religions . 4 Units.**

Selected topics in the religions of East Asia, e.g., Buddhism, Daoism, Shintô, Islam, shamanism.

Repeatability: May be taken for credit 3 times as topics vary.

**EAS 220. Topics in East Asian Cultural Studies. 4 Units.**

Seminar, with topics varying from year to year. Research paper required.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EAS 225. Topics in East Asian Applied Linguistics. 4 Units.**

In-depth examination of selected topics in applied linguistics, with a particular emphasis on language acquisition and language pedagogy.

Repeatability: May be taken for credit 3 times as topics vary.

Concurrent with EALL 125.

**EAS 260. Topics in East Asian Cinema. 4 Units.**

An examination of the possibilities of East Asian cinematic narrative. Possible topics: cinematic history; cinema in popular culture; comparisons with literary texts; major auteurs. Emphasis on technical as well as on thematic aspects. Includes readings in film theory.

Prerequisite: EAS 160

Repeatability: Unlimited as topics vary.

**EAS 290. Independent Study. 2-4 Units.**

Directed research on topic determined in consultation with faculty member. A term paper or project is required.

Repeatability: May be repeated for credit unlimited times.

**EAS 299. Dissertation Research. 4-12 Units.**

Dissertation research for students who are advanced to doctoral candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**EAS 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Japanese Courses

**JAPANESE 1A. Fundamental Japanese. 5 Units.**

Students develop listening, speaking, reading, and writing abilities in Japanese for meaningful communication. Content deals with daily life, society, and culture in Japan. Approximately 180 kanji (Chinese characters) are introduced in addition to the hiragana and katakana orthography.

Prerequisite: Placement into JAPANESE 1A is accepted.

Overlaps with JAPANESE S1AB.

Restriction: JAPANESE 1A and JAPANESE S1AB may not be taken for full credit.

**JAPANESE 1B. Fundamental Japanese. 5 Units.**

Students develop listening, speaking, reading, and writing abilities in Japanese for meaningful communication. Content deals with daily life, society, and culture in Japan. Approximately 180 kanji (Chinese characters) are introduced in addition to the hiragana and katakana orthography.

Prerequisite: JAPANESE 1A or JAPANESE S1AB. JAPANESE 1A with a grade of C or better. JAPANESE S1AB with a grade of C or better. Placement into JAPANESE 1B is also accepted.

Overlaps with JAPANESE S1AB, JAPANESE S1BC.

Restriction: JAPANESE 1B and JAPANESE S1AB and JAPANESE S1BC may not be taken for full credit.

**JAPANESE 1C. Fundamental Japanese. 5 Units.**

Students develop listening, speaking, reading, and writing abilities in Japanese for meaningful communication. Content deals with daily life, society, and culture in Japan. Approximately 180 kanji (Chinese characters) are introduced in addition to the hiragana and katakana orthography.

Prerequisite: JAPANESE 1B or JAPANESE S1AB. JAPANESE 1B with a grade of C or better. JAPANESE S1AB with a grade of C or better. Placement into JAPANESE 1C is also accepted.

Overlaps with JAPANESE S1BC.

Restriction: JAPANESE 1C and JAPANESE S1BC may not be taken for full credit.

(VI)

**JAPANESE S1AB. Fundamentals of Japanese. 7.5 Units.**

First half of first-year Japanese in an intensified form.

Prerequisite: Placement into JAPANESE 1A.

Overlaps with JAPANESE 1A, JAPANESE 1B.

Restriction: JAPANESE S1AB and JAPANESE 1A and JAPANESE 1B may not be taken for full credit.

**JAPANESE S1BC. Fundamentals of Japanese. 7.5 Units.**

Second half of first-year Japanese in an intensified form.

Prerequisite: JAPANESE S1AB or JAPANESE 1B. JAPANESE S1AB with a grade of C or better. JAPANESE 1B with a grade of C or better. Placement into JAPANESE 1C is also accepted.

Overlaps with JAPANESE 1C, JAPANESE 1B.

Restriction: JAPANESE S1BC and JAPANESE 1B and JAPANESE 1C may not be taken for full credit.

**(VI)**

**JAPANESE 2A. Intermediate Japanese. 5 Units.**

Japanese listening, speaking, reading, and writing abilities developed for meaningful communication. Content deals with daily life, society, and culture, including social issues in Japan. Approximately 180 kanji (Chinese characters) are introduced in addition to the 180 characters learned in 1A-B-C.

Prerequisite: JAPANESE 1C or JAPANESE S1BC. JAPANESE 1C with a grade of C or better. JAPANESE S1BC with a grade of C or better. Placement into JAPANESE 2A is also accepted.

Overlaps with JAPANESE S2AB.

Restriction: JAPANESE 2A and JAPANESE S2AB may not be taken for full credit.

**(VIII)**

**JAPANESE 2B. Intermediate Japanese. 5 Units.**

Japanese listening, speaking, reading, and writing abilities developed for meaningful communication. Content deals with daily life, society, and culture, including social issues in Japan. Approximately 180 kanji (Chinese characters) are introduced in addition to the 180 characters learned in 1A-B-C.

Prerequisite: JAPANESE 2A. JAPANESE 2A with a grade of C or better. Placement into JAPANESE 2B is also accepted.

Overlaps with JAPANESE S2AB.

Restriction: JAPANESE 2B and JAPANESE S2AB and JAPANESE S2BC may not be taken for full credit.

**(VIII)**

**JAPANESE 2C. Intermediate Japanese. 5 Units.**

Japanese listening, speaking, reading, and writing abilities developed for meaningful communication. Content deals with daily life, society, and culture, including social issues in Japan. Approximately 180 kanji (Chinese characters) are introduced in addition to the 180 characters learned in 1A-B-C.

Prerequisite: JAPANESE 2B or JAPANESE S2AB. JAPANESE 2B with a grade of C or better. JAPANESE S2AB with a grade of C or better. Placement into JAPANESE 2C is also accepted.

Overlaps with JAPANESE S2BC.

Restriction: JAPANESE 2C and JAPANESE S2BC may not be taken for full credit.

**(VIII)**

**JAPANESE S2AB. Intermediate Japanese. 7.5 Units.**

First half of second-year Japanese in an intensified form.

Prerequisite: JAPANESE 1C or JAPANESE S1BC. JAPANESE 1C with a grade of C or better. JAPANESE S1BC with a grade of C or better. Placement into JAPANESE 2A is also accepted.

Overlaps with JAPANESE 2A, JAPANESE 2B.

Restriction: JAPANESE S2AB and JAPANESE 2A and JAPANESE 2B may not be taken for full credit.

(VIII)

**JAPANESE S2BC. Intermediate Japanese. 7.5 Units.**

Second half of second-year Japanese in an intensified form.

Prerequisite: JAPANESE S2AB or JAPANESE 2B. JAPANESE S2AB with a grade of C or better. JAPANESE 2B with a grade of C or better. Placement into JAPANESE 2C is also accepted.

Overlaps with JAPANESE 2C, JAPANESE 2B.

Restriction: JAPANESE S2BC and JAPANESE 2B and JAPANESE 2C may not be taken for full credit.

(VIII)

**JAPANESE 3A. Advanced Japanese. 4 Units.**

Students are taught to conceptualize in Japanese as they learn to understand, read, write, and speak. Authentic Japanese texts are used. Approximately 360 kanji (Chinese characters) in addition to the 270 characters learned in 1A-B-C and 2A-B-C are introduced.

Prerequisite: JAPANESE 2C or JAPANESE S2BC or placement into JAPANESE 3A. JAPANESE 2C with a grade of C or better. JAPANESE S2BC with a grade of C or better.

(VIII)

**JAPANESE 3B. Advanced Japanese. 4 Units.**

Students are taught to conceptualize in Japanese as they learn to understand, read, write, and speak. Authentic Japanese texts are used. Approximately 360 kanji (Chinese characters) in addition to the 270 characters learned in 1A-B-C and 2A-B-C are introduced.

Prerequisite: JAPANESE 3A. JAPANESE 3A with a grade of C or better. Placement into JAPANESE 3B is also accepted.

(VIII)

**JAPANESE 3C. Advanced Japanese. 4 Units.**

Students are taught to conceptualize in Japanese as they learn to understand, read, write, and speak. Authentic Japanese texts are used. Approximately 360 kanji (Chinese characters) in addition to the 270 characters learned in first and second year are introduced.

Prerequisite: JAPANESE 3B. JAPANESE 3B with a grade of C or better. Placement into JAPANESE 3C is also accepted.

Restriction: Japanese Language Literature Majors have first consideration for enrollment.

(VIII)

**JAPANESE 100A. Classical Japanese. 4 Units.**

Introduction to classical Japanese grammar and vocabulary with emphasis on reading and analysis of basic texts.

Prerequisite: JAPANESE 3C. JAPANESE 3C with a grade of C or better

**JAPANESE 100B. Classical Japanese. 4 Units.**

Introduction to classical Japanese grammar and vocabulary with emphasis on reading and analysis of basic texts.

Prerequisite: JAPANESE 100A. JAPANESE 100A with a grade of C or better

**JAPANESE 101A. Fourth Year Japanese. 4 Units.**

Continued emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation through intensive study and analysis of a variety of texts.

Prerequisite: JAPANESE 3C

**JAPANESE 101B. Fourth Year Japanese. 4 Units.**

Continued emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation through intensive study and analysis of a variety of texts.

Prerequisite: JAPANESE 3C

**JAPANESE 115. Japanese Literature: Advanced Texts. 4 Units.**

Designed for students with near-fluency in reading Japanese. Texts include both fiction and nonfiction by important writers, and may be supplemented and contextualized where needed by literary criticism and cultural-studies texts in English.

Prerequisite: JAPANESE 101A or JAPANESE 101B or JAPANESE 101C

Repeatability: Unlimited as topics vary.

**JAPANESE 180. Topics in Japanese Literature. 4 Units.**

Special topics through directed reading in Japanese. Paper required.

Prerequisite: JAPANESE 3C. JAPANESE 3C with a grade of C or better

Repeatability: May be taken for credit 3 times as topics vary.

**JAPANESE 199. Independent Study. 1-4 Units.**

Investigation of special topics through directed reading in Japanese. Paper required.

Repeatability: May be taken for credit for 12 units.

**JAPANESE 201. Readings in Traditional Japanese Prose. 4 Units.**

Close reading of selected premodern prose texts, including tales, journals, travel journals, essays.

Prerequisite: JAPANESE 100B

Repeatability: Unlimited as topics vary.

**JAPANESE 202. Readings in Traditional Japanese Poetry or Drama. 4 Units.**

Close reading of selected premodern poetic or dramatic texts.

Prerequisite: JAPANESE 100B

Repeatability: Unlimited as topics vary.

**JAPANESE 203. Readings in Modern Japanese Literature. 4 Units.**

Texts include both fiction and nonfiction by important writers, and may be supplemented where needed by literary criticism and cultural-studies texts in English.

Prerequisite: JAPANESE 101C

Repeatability: Unlimited as topics vary.

**JAPANESE 204. Readings in Traditional Japanese Literary and Cultural Theory . 4 Units.**

Close reading of selected texts involving literary criticism and/or aesthetics.

Prerequisite: JAPANESE 100B

Repeatability: Unlimited as topics vary.

**JAPANESE 205. Readings in Japanese Religion. 4 Units.**

Close readings of selected Japanese religious texts.

Prerequisite: JAPANESE 101C

Repeatability: Unlimited as topics vary.

**JAPANESE 211A. Studies in Traditional Japanese Prose. 4 Units.**

Studies in selected areas of traditional Japanese prose. Topics addressed vary each quarter. Research paper required.

Prerequisite: JAPANESE 100B

Repeatability: Unlimited as topics vary.

**JAPANESE 211B. Studies in Traditional Japanese Prose. 4 Units.**

Studies in selected areas of traditional Japanese prose. Topics addressed vary each quarter. Research paper required.

Prerequisite: JAPANESE 100B and JAPANESE 211A

Repeatability: Unlimited as topics vary.

**JAPANESE 212A. Studies in Traditional Japanese Poetry or Drama. 4 Units.**

Studies in selected areas of traditional Japanese poetry or drama. Topics addressed vary each quarter. Research paper required.

Prerequisite: JAPANESE 100B

Repeatability: Unlimited as topics vary.

**JAPANESE 212B. Studies in Traditional Japanese Poetry or Drama. 4 Units.**

Studies in selected areas of traditional Japanese poetry or drama. Topics addressed vary each quarter. Research paper required.

Prerequisite: JAPANESE 212A

Repeatability: Unlimited as topics vary.

**JAPANESE 213A. Studies in Modern Japanese Literature. 4 Units.**

A two-quarter, in-depth look at a major author and/or issue in modern Japanese literature. Seminar format. The first quarter is devoted to reading of the requisite texts; the second quarter, to the writing of a research paper.

Prerequisite: JAPANESE 203

Repeatability: Unlimited as topics vary.

**JAPANESE 213B. Studies in Modern Japanese Literature. 4 Units.**

A two-quarter, in-depth look at a major author and/or issue in modern Japanese literature. Seminar format. The first quarter is devoted to reading of the requisite texts; the second quarter, to the writing of a research paper.

Prerequisite: JAPANESE 203 and JAPANESE 213A

Repeatability: May be repeated for credit unlimited times.

**JAPANESE 214. Studies in Japanese Literary and Cultural Theory. 4 Units.**

Studies in selected areas of Japanese literary and cultural theory. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**JAPANESE 215. Studies in Japanese Religion. 4 Units.**

Studies in selected areas of Japanese religion. Topics addressed vary each quarter. Research paper required.

Prerequisite: JAPANESE 101C

Repeatability: Unlimited as topics vary.

**JAPANESE 230. Topics in Japanese Literature and Culture. 4 Units.**

A topical study that addresses important issues in Japanese literature and culture. May focus on a specific writer or writers, or on a specific issue or set of related issues.

Prerequisite: JAPANESE 203

Repeatability: Unlimited as topics vary.

**JAPANESE 290. Independent Study. 4 Units.**

Directed research on topic determined in consultation with faculty member. A term paper or project is required.

Repeatability: May be repeated for credit unlimited times.

**JAPANESE 299. Dissertation Research. 4-12 Units.**

For Students who have been admitted to doctoral candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Korean Courses

### **KOREAN 1A. Fundamental Korean. 5 Units.**

Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing for students with no previous background in Korean. Conducted in both English and Korean.

Prerequisite: Placement into KOREAN 1A.

Overlaps with KOREAN 1KA, KOREAN S1AB.

Restriction: KOREAN 1A and KOREAN 1KA and KOREAN S1AB may not be taken for full credit.

### **KOREAN 1B. Fundamental Korean. 5 Units.**

Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing for students with no previous background in Korean. Conducted in both English and Korean.

Prerequisite: KOREAN 1A. KOREAN 1A with a grade of C or better. Placement into KOREAN 1B is also accepted.

Overlaps with KOREAN S1BC, KOREAN 1KB, KOREAN S1AB.

Restriction: KOREAN 1B and KOREAN 1KB and KOREAN S1AB and KOREAN S1BC may not be taken for full credit.

### **KOREAN 1C. Fundamental Korean. 5 Units.**

Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing for students with no previous background in Korean. Conducted in both English and Korean.

Prerequisite: KOREAN 1B or KOREAN S1AB. KOREAN 1B with a grade of C or better. KOREAN S1AB with a grade of C or better. Placement into KOREAN 1C is also accepted.

Overlaps with KOREAN 1KC, KOREAN S1BC.

Restriction: KOREAN 1C and KOREAN 1KC and KOREAN S1BC may not be taken for full credit.

## **(VI)**

### **KOREAN 1KA. Fundamental Korean for Students with a Previous Background in Korean. 5 Units.**

Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing for students with a previous background in Korean. Conducted in both English and Korean.

Prerequisite: Placement into KOREAN 1KA.

Overlaps with KOREAN 1A, KOREAN S1AB.

Restriction: KOREAN 1KA and KOREAN 1A and KOREAN S1AB may not be taken for full credit.

### **KOREAN 1KB. Fundamental Korean for Students with a Previous Background in Korean . 5 Units.**

Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing for students with a previous background in Korean. Conducted in both English and Korean.

Prerequisite: KOREAN 1KA. KOREAN 1KA with a grade of C or better. Placement into KOREAN 1KB is also accepted.

Overlaps with KOREAN 1B, KOREAN S1AB, KOREAN S1BC.

Restriction: KOREAN 1KB and KOREAN 1B and KOREAN S1AB and KOREAN S1BC may not be taken for full credit.

### **KOREAN 1KC. Fundamental Korean for Students with a Previous Background in Korean. 5 Units.**

Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing for students with a previous background in Korean. Conducted in both English and Korean.

Prerequisite: KOREAN 1KB. KOREAN 1KB with a grade of C or better. Placement into KOREAN 1KC is also accepted.

Overlaps with KOREAN 1C, KOREAN S1BC.

Restriction: KOREAN 1KC and KOREAN 1C and KOREAN S1BC may not be taken for full credit.

## **(VI)**



**KOREAN S1AB. Fundamentals of Korean. 7.5 Units.**

First half of first-year Korean in an intensified form.

Prerequisite: Placement into KOREAN 1A or KOREAN 1KA or KOREAN 1B or KOREAN 1KB.

Overlaps with KOREAN 1A, KOREAN 1B, KOREAN 1KA, KOREAN 1KB.

Restriction: KOREAN S1AB and KOREAN 1A and KOREAN 1KA and KOREAN 1B and KOREAN 1KB may not be taken for full credit.

**KOREAN S1BC. Fundamentals of Korean. 7.5 Units.**

Second half of first-year Korean in an intensified form.

Prerequisite: KOREAN S1AB or KOREAN 1B or KOREAN 1KB. KOREAN S1AB with a grade of C or better. KOREAN 1B with a grade of C or better. KOREAN 1KB with a grade of C or better. Placement into KOREAN 1C or KOREAN 1KC is also accepted.

Overlaps with KOREAN 1C, KOREAN 1KB, KOREAN 1KC, KOREAN 1B.

Restriction: KOREAN S1BC and KOREAN 1B and KOREAN 1KB and KOREAN 1C and KOREAN 1KC may not be taken for full credit.

**(VI)****KOREAN 2A. Intermediate Korean. 5 Units.**

Designed to develop writing and reading skills as well as communicative skills in authentic situations for students without previous initial background in Korean. Students also introduced to aspects of Korean culture as related to lesson topics and basic Chinese characters.

Prerequisite: KOREAN 1C or KOREAN S1BC. KOREAN 1C with a grade of C or better. KOREAN S1BC with a grade of C or better. Placement into KOREAN 2A is also accepted.

Overlaps with KOREAN 2KA.

**(VIII)****KOREAN 2B. Intermediate Korean. 5 Units.**

Designed to develop writing and reading skills as well as communicative skills in authentic situations for students without previous initial background in Korean. Students also introduced to aspects of Korean culture as related to lesson topics and basic Chinese characters.

Prerequisite: KOREAN 2A. KOREAN 2A with a grade of C or better. Placement into KOREAN 2B is also accepted.

Overlaps with KOREAN 2KB.

**(VIII)****KOREAN 2C. Intermediate Korean. 5 Units.**

Designed to develop writing and reading skills as well as communicative skills in authentic situations for students without previous initial background in Korean. Students also introduced to aspects of Korean culture as related to lesson topics and basic Chinese characters.

Prerequisite: KOREAN 2B. KOREAN 2B with a grade of C or better. Placement into KOREAN 2C is also accepted.

Overlaps with KOREAN 2KC.

**(VIII)****KOREAN 2KA. Intermediate Korean for Students with a Previous Background in Korean . 5 Units.**

Designed to develop writing and reading skills as well as communicative skills in authentic situations for students with previous background in Korean. Students also introduced to aspects of Korean culture as related to lesson topics and basic Chinese characters.

Prerequisite: KOREAN 1KC or KOREAN S1BC. KOREAN 1KC with a grade of C or better. KOREAN S1BC with a grade of C or better. Placement into KOREAN 2KA is also accepted.

Overlaps with KOREAN 2A.

**(VIII)**

**KOREAN 2KB. Intermediate Korean for Students with a Previous Background in Korean . 5 Units.**

Designed to develop writing and reading skills as well as communicative skills in authentic situations for students with previous background in Korean. Students also introduced to aspects of Korean culture as related to lesson topics and basic Chinese characters.

Prerequisite: KOREAN 2KA. KOREAN 2KA with a grade of C or better. Placement into KOREAN 2KB is also accepted.

Overlaps with KOREAN 2B.

(VIII)

**KOREAN 2KC. Intermediate Korean for Students with a Previous Background in Korean. 5 Units.**

Designed to develop writing and reading skills as well as communicative skills in authentic situations for students with previous background in Korean. Students also introduced to aspects of Korean culture as related to lesson topics and basic Chinese characters.

Prerequisite: KOREAN 2KB. KOREAN 2KB with a grade of C or better. Placement into KOREAN 2KC is also accepted.

Overlaps with KOREAN 2C.

(VIII)

**KOREAN 3A. Advanced Korean. 4 Units.**

Focuses on developing advanced reading/writing and translation skills with additional instruction in Chinese characters.

Prerequisite: KOREAN 2C or KOREAN 2KC or KOREAN S2BC. KOREAN 2C with a grade of C or better. KOREAN 2KC with a grade of C or better. KOREAN S2BC with a grade of C or better. Placement into KOREAN 3A is also accepted.

(VIII)

**KOREAN 3B. Advanced Korean. 4 Units.**

Focuses on developing advanced reading, writing, and translation skills.

Prerequisite: KOREAN 3A or KOREAN 2C or KOREAN 2KC or KOREAN S2BC. KOREAN 3A with a grade of C or better. KOREAN 2C with a grade of C or better. KOREAN 2KC with a grade of C or better. KOREAN S2BC with a grade of C or better. Placement into KOREAN 3B is also accepted.

(VIII)

**KOREAN 3C. Advanced Korean. 4 Units.**

Focuses on developing advanced reading, writing, and translation skills.

Prerequisite: KOREAN 2C or KOREAN 2KC or KOREAN S2BC or KOREAN 3A or KOREAN 3B. KOREAN 2C with a grade of C or better. KOREAN 2KC with a grade of C or better. KOREAN S2BC with a grade of C or better. KOREAN 3A with a grade of C or better. KOREAN 3B with a grade of C or better. Placement into KOREAN 3C is also accepted.

(VIII)

**KOREAN 101A. Fourth-Year Korean. 4 Units.**

Continued emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation through intensive study and analysis of a variety of modern texts.

Prerequisite: KOREAN 3A or KOREAN 3B or KOREAN 3C. KOREAN 3A with a grade of C or better. KOREAN 3B with a grade of C or better. KOREAN 3C with a grade of C or better

**KOREAN 115. Korean Literature: Advanced Texts. 4 Units.**

Designed for students with near-fluency in reading Korean. Readings include modern Korean literary works (poetry, prose, and drama) by important writers. Emphasis is on the interpretation of the texts and writings that interpret those texts in the original language.

Prerequisite: KOREAN 101A or KOREAN 101B or KOREAN 101C

Repeatability: Unlimited as topics vary.

**KOREAN 199. Independent Study. 1-4 Units.**

Investigation of special topics through directed reading in Korean. Paper required.

Repeatability: May be taken for credit for 12 units.

## Chinese Language and Literature, Minor

Minor in the Chinese program will give students foundational knowledge needed to pursue a career involving this important Pacific Rim nation. Students will be equipped with linguistic and cultural skills and be prepared in a variety of endeavors, such as international business, law, government service, journalism, teaching, and other careers involved with public affairs.

A. Three quarters of advanced Chinese language instruction, selected from the following:

CHINESE 3A	Advanced Mandarin Chinese
CHINESE 3B	Advanced Mandarin Chinese
CHINESE 3C	Advanced Mandarin Chinese
CHINESE 40	Topics in Professional Chinese
CHINESE 100A	Classical Chinese
CHINESE 100B	Classical Chinese
CHINESE 100C	Classical Chinese
CHINESE 101A	Fourth-Year Mandarin Chinese
CHINESE 101B	Fourth-Year Mandarin Chinese
CHINESE 101C	Fourth-Year Mandarin Chinese
CHINESE 115	Topics in Chinese Literature: Advanced Texts

B. Select four upper-division courses from the East Asian Studies offerings on Chinese topics.

**Residence Requirement for the Minor:** A minimum of four upper-division courses required for the minor must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate department chair.

## Chinese Studies, B.A.

The major in Chinese Studies offers two emphases: Chinese Language and Literature, and Chinese Culture and Society. The Language and Literature emphasis enables students to understand the extensive and rich literary, historical, social, and aesthetic achievements of China by studying its language, literature, film, religion, and other cultural accomplishments in depth. The Culture and Society emphasis stresses a multidisciplinary examination of modern Chinese culture and society that includes the perspectives of both the humanities and the social sciences. The major emphasizes the complementarity of these approaches in understanding the complexity of the forces that have shaped contemporary China.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

**All students are subject to the Language Other Than English Placement and Progression policies.**

### Departmental Requirements for the Major in Chinese Studies

#### Emphasis in Chinese Language and Literature

A. Complete:

CHINESE 3C	Advanced Mandarin Chinese <sup>1</sup>
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B. Complete:

CHINESE 100A- 100B- 100C	Classical Chinese and Classical Chinese and Classical Chinese
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C. Complete:

EAS 15C	Introductory Topics in Chinese Literature
EAS 190	Junior-Senior Colloquium

D. Select one upper-division course dealing with the literature or culture of another East Asian country.

E. Select five additional courses in Chinese literature, history, art history, linguistics, professional Chinese, comparative literature, film and media, religion, gender studies, or philosophy, of which two may be lower-division courses offered by the East Asian Studies department.

<sup>1</sup> If a student is exempted from CHINESE 3C based on examination or equivalent, a course on a Chinese topic offered by the Department is required.

#### Emphasis in Chinese Culture and Society

A. Complete one of the following:

CHINESE 2C	Intermediate Mandarin Chinese
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CHINESE 2MC or equivalent.	Intermediate Mandarin Chinese - Mandarin Background Track
B. Complete:	
HISTORY 171D- 171E	Chinese History to 1800 and Chinese History: 1800-1949
C. Complete:	
EAS 15C	Introductory Topics in Chinese Literature
EAS 190	Junior-Senior Colloquium
D. Select three upper-division courses on China offered by the Department.	
E. Select two approved upper-division courses dealing with the literature, religion, culture, history, or society of another East Asian country. <sup>1</sup>	
F. Select two approved upper-division courses in the School of Social Sciences dealing with China.	
G. Select two additional courses in Chinese language, literature, history, art history, linguistics, professional Chinese, comparative literature, film and media, religion, gender studies, or philosophy, of which one or both may be lower-division courses offered by the East Asian Studies Department. (Courses from the School of Social Sciences may be substituted with departmental approval by petition.) <sup>1</sup>	

<sup>1</sup> For a list of approved courses, please consult <http://www.humanities.uci.edu/eastasian/chinese/course/acourses2.php>

**Residence Requirement for the Major:** At least five upper-division courses required for the major must be completed successfully at UCI. Students are encouraged, however, to complete up to a year of their language study in approved programs of study abroad.

## Chinese Studies, Minor

Minoring in the Chinese program will give students foundational knowledge needed to pursue a career involving this important Pacific Rim nation. Students will be equipped with linguistic and cultural skills and be prepared in a variety of endeavors, such as international business, law, government service, journalism, teaching, and other careers involved with public affairs.

A. Complete:	
CHINESE 2C or CHINESE 2MC or equivalent	Intermediate Mandarin Chinese Intermediate Mandarin Chinese - Mandarin Background Track
B. Complete:	
EAS 55	Introduction to East Asian Cultures
C. One upper-division course in Chinese history	
D. One upper-division course on China, offered by the School of Social Sciences <sup>1</sup>	
E. One upper-division course on China, offered by the School of Humanities <sup>1</sup>	
F. Select three courses from the East Asian Studies offerings on Chinese topics, one of which may be lower-division.	

<sup>1</sup> A list of approved courses can be viewed on the East Asian Studies website (<https://www.humanities.uci.edu/eastasian/chinese/course/acourses.php>).

**Residence Requirement for the Minor:** A minimum of four upper-division courses required for the minor must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate department chair.

## East Asian Cultures, B.A.

The curriculum for the major in East Asian Cultures focuses on the regional dynamics of cultural and social transformations in East Asia. Students benefit from a multidisciplinary approach to the study of intra-regional relationships between East Asian countries in order to situate them in their broader global contexts. By integrating the study of East Asia with theoretical issues that shape the study of world culture in general, students gain the dual perspectives derived from examining East Asian cultures on their own terms and from recognizing the affinities these civilizations share, and the conflicts they encounter in their interactions with the rest of the world.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

**All students are subject to the Language Other Than English Placement and Progression policies.**

### **Departmental Requirements for the Major in East Asian Cultures**

A. Complete one of the following:

CHINESE 2C	Intermediate Mandarin Chinese
CHINESE 2MC	Intermediate Mandarin Chinese - Mandarin Background Track
JAPANESE 2C	Intermediate Japanese
KOREAN 2C	Intermediate Korean
KOREAN 2KC	Intermediate Korean for Students with a Previous Background in Korean

B. Select two quarters of:

EAS 155	Topics in Cultural Studies in East Asia
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C. Complete:

EAS 190	Junior-Senior Colloquium
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D. Select one of the following, corresponding to language of specialization:

EAS 15C	Introductory Topics in Chinese Literature
EAS 15J	Introductory Topics in Japanese Literature
EAS 15K	Introductory Topics in Korean Literature

E. Select eight additional courses in the areas of East Asian literature, culture, history, art history, linguistics, professional language, film and media, religion, philosophy, gender studies, or comparative literature, at least three of which must pertain to a country other than the one of language specialization, and up to two of which can be lower-division courses offered by the East Asian Studies Department. Up to four of these courses (or more by petition) may be taken outside the Department, with the approval of the undergraduate advisor.

**Residence Requirement for the Major:** At least five upper-division courses required for the major must be completed successfully at UCI. Students are encouraged, however, to complete up to a year of their language study in approved programs of study abroad.

## **East Asian Studies, Ph.D.**

The Department offers a Ph.D. program in East Asian Studies, with specializations in Chinese, Japanese, and East Asian Cultural Studies. The M.A. may be awarded to Ph.D. students in progress toward the doctoral degree.

The graduate program emphasizes rigorous training in language and textual analysis, with equal attention given to the historical, social, and cultural dimensions of literary study. In addition to more traditional vocabularies of criticism and theory, the curriculum encourages exploration of recent challenges to established conceptual and methodological frameworks. The program builds on the foundation of a faculty whose research interests engage major issues in Chinese, Japanese, and Korean literature and culture, while developing connections with the larger community of scholarship at UCI.

Because the graduate program is designed to prepare students for both college-level teaching and advanced research, each student will be required to serve, under direct faculty supervision, as a teaching assistant in an appropriate undergraduate course offered through the Department.

Assuming that a student is enrolled full-time and enters the program with no major deficiencies in background or training, the normative time needed to complete the Ph.D. is seven years from matriculation. The maximum time permitted is eight years. For students admitted with an M.A. or its equivalent from another institution, certain course requirements may be waived upon the approval of a faculty advisory committee, with a consequent reduction in normative time for completion of the Ph.D.

The following graduate emphases are available: Asian American (see the Humanities Special Programs section); Critical Theory (see the Emphasis in Critical Theory section); Feminist Studies (see the Gender and Sexuality Studies section); Latin American Studies (see the Humanities Special Programs section); Medical Humanities (see the Humanities Special Programs section); and Visual Studies (see the Visual Studies section).

### **Master of Arts in East Asian Studies**

Students are not admitted to an M.A.-only program but may be granted an M.A. in recognition of progress toward the Ph.D., normally after six quarters of course work and submission of two approved seminar papers, which will serve as the M.A. examination.

In addition to meeting the general requirements for admission to graduate study at UCI, specified by the Graduate Division, all students must present the following for review by an admissions committee composed of members of the faculty in East Asian Studies: records of prior scholastic performance, including all college transcripts; three letters of recommendation; and samples of written work. Although the Department does not require entering students to have received an undergraduate degree comparable to its own, it recommends as much preparation in an East Asian language as possible.

It also welcomes applications from students whose language training may not be as extensive but who have shown promise in the study of related disciplines. The study of appropriate European languages is encouraged as well.

Upon admission to the program, the student is assigned a graduate advisor, in consultation with whom an advisory committee consisting of two additional faculty members is constituted. The student and committee plan a program of study consisting of 15 graduate courses.

Before advancement to candidacy (normally after three years of graduate study), the student must have (1) completed required course work as detailed below; (2) prepared one paper of publishable quality; (3) completed language requirements as listed below; (4) prepared five research reports on current scholarly articles to be decided upon in consultation with the faculty advisor; and (5) passed the qualifying examinations on four topics to be selected in consultation with the faculty advisory committee no more than two quarters before the examinations are to be taken. At least one of the topics should be related directly to the student's projected area of specialization in dissertation research.

Students who complete the qualifying examinations successfully are advanced to candidacy for the Ph.D. The normative time for advancement to candidacy is four years. They then write their doctoral dissertation on a topic developed in consultation with the faculty advisory committee. Some period of study abroad, for enhancement of language proficiency and/or dissertation research, is strongly encouraged.

### Specialization in Chinese Course Requirements

Select three courses from Chinese 201-204.

Select either:

CHINESE 211A- 211B	Studies in Traditional Chinese Narrative and Prose and Studies in Traditional Chinese Narrative and Prose
or	
CHINESE 212A- 212B	Studies in Traditional Chinese Poetry and Studies in Traditional Chinese Poetry
CHINESE 213A- 213B	Studies in Modern Chinese Literature and Studies in Modern Chinese Literature
CHINESE 214	Studies in Chinese Literature and Cultural Theory

and select seven additional courses (of which one may be HUMAN 398A or HUMAN 398B) as determined upon consultation with faculty advisors. At least three of these additional courses must be taken outside the Department on a relevant topic in literary or cultural theory. Courses taken to fulfill language requirements may not be counted toward the course work requirement.

**Language Requirements.** Before advancement to candidacy, all students must have completed four years of modern Chinese, two years of classical Chinese, and three years of modern Japanese, and have demonstrated reading proficiency in another appropriate language. Much of this work may, of course, have been completed prior to admission. In addition, the requirement for a second year of classical Chinese may be fulfilled by taking three reading courses in classical literature.

### Specialization in Japanese Course Requirements

Select three courses from Japanese 201-205.

Select either:

JAPANESE 211A- 211B	Studies in Traditional Japanese Prose and Studies in Traditional Japanese Prose
or	
JAPANESE 212A- 212B	Studies in Traditional Japanese Poetry or Drama and Studies in Traditional Japanese Poetry or Drama
JAPANESE 213A- 213B	Studies in Modern Japanese Literature and Studies in Modern Japanese Literature
JAPANESE 214	Studies in Japanese Literary and Cultural Theory

and select seven additional courses (of which one may be HUMAN 398A or HUMAN 398B) as determined upon consultation with faculty advisors. At least three of these additional courses must be taken outside the Department on relevant topics in literary or cultural theory. Courses taken to fulfill language requirements may not be counted toward the course work requirement.

**Language Requirements.** Before advancement to candidacy, all students must have completed four years of modern Japanese and one year of classical Japanese, and have demonstrated reading proficiency in another appropriate language. In addition, students emphasizing classical Japanese are required to take one year of classical Chinese. Much of this work may, of course, have been completed prior to admission.

### Specialization in East Asian Cultural Studies Course Requirements

Select four Theory and Cultural Studies graduate courses

Select four graduate courses in Chinese, Japanese, or Korean

and select seven additional courses (of which one may be HUMAN 398A or HUMAN 398B) as determined upon consultation with faculty advisors. At least three of these additional courses must be taken outside the Department on relevant topics. Courses taken to fulfill language requirements may not be counted toward the course work requirement.

**Other Requirements.** Before advancement to candidacy, all students must have completed examinations in four areas as determined upon consultation with faculty advisors. These areas will vary according to the interests of the student; examples might be Colonial and Postcolonial Theories; Modernity and East Asia; Critique of Asian Studies as a field; Gender, Class and East Asia; Visual Culture and Japan; and Theorizing Minority Status in East Asia. All students must have completed four years of Chinese, Japanese, or Korean, or the equivalent. Three years or the equivalent in a second East Asian language is recommended. Much of this work may, of course, have been completed prior to admission.

## Japanese Language and Literature, B.A.

The curriculum for Japanese Language and Literature enables students to understand the extensive and rich literary, historical, social, and aesthetic achievements of Japan by studying its language, literature, film, religion, and other cultural accomplishments in depth.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

**All students are subject to the Language Other Than English Placement and Progression policies.**

### Departmental Requirements for the Major in Japanese Language and Literature

A. Complete:

JAPANESE 3C	Advanced Japanese
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B. Complete:

EAS 15J	Introductory Topics in Japanese Literature
EAS 190	Junior-Senior Colloquium

C. Select one of the following:

Two upper-division courses dealing with premodern Japanese literature or culture or

JAPANESE 100A- 100B	Classical Japanese and Classical Japanese
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D. Select one of the following: <sup>1</sup>

JAPANESE 101A	Fourth Year Japanese
JAPANESE 101B	Fourth Year Japanese

E. Select one upper-division course dealing with modern Japanese literature and culture

F. Select one upper-division course dealing with the literature or culture of another East Asian country

G. Select five additional courses in Japanese literature, culture, history, art history, linguistics, film and media, religion, philosophy, gender studies, or comparative literature, of which two may be lower-division courses offered by the East Asian Studies Department.

<sup>1</sup> If a student is exempted from 101, an upper-division course on a Japanese topic offered by the Department is required. JAPANESE 100A may be selected to fulfill this requirement only if the student has not selected JAPANESE 100A-JAPANESE 100B to satisfy requirement C.

**Residence Requirement for the Major:** At least five upper-division courses required for the major must be completed successfully at UCI. Students are encouraged, however, to complete up to a year of their language study in approved programs of study abroad.

## Japanese Language and Literature, Minor

Minoring in the Japanese program will give students foundational knowledge needed to pursue a career involving this important Pacific Rim nation. Students will be equipped with linguistic and cultural skills and be prepared in a variety of endeavors, such as international business, law, government service, journalism, teaching, and other careers involved with public affairs.

A. Three quarters of advanced Japanese language instruction, selected from the following:

JAPANESE 3A	Advanced Japanese
JAPANESE 3B	Advanced Japanese
JAPANESE 3C	Advanced Japanese
JAPANESE 100A	Classical Japanese
JAPANESE 100B	Classical Japanese
JAPANESE 101A	Fourth Year Japanese
JAPANESE 101B	Fourth Year Japanese
JAPANESE 115	Japanese Literature: Advanced Texts



B. Select four upper-division courses (or, if the 100A-B sequence or the 101A-B sequence has been chosen, up to two lower-division courses) from the East Asian Studies offerings on Japanese topics.

**Residence Requirement for the Minor:** A minimum of four upper-division courses required for the minor must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate department chair.

## Japanese Studies, Minor

Minor in the Japanese program will give students foundational knowledge needed to pursue a career involving this important Pacific Rim nation. Students will be equipped with linguistic and cultural skills and be prepared in a variety of endeavors, such as international business, law, government service, journalism, teaching, and other careers involved with public affairs.

A. Complete:

JAPANESE 2C	Intermediate Japanese (or equivalent)
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B. Complete:

EAS 55	Introduction to East Asian Cultures
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C. One upper-division course in Japanese history

D. One upper-division course on Japan, offered by the School of Social Sciences <sup>1</sup>

E. One upper-division course on Japan, offered by the School of Humanities <sup>1</sup>

F. Select three courses from the East Asian Studies offerings on Japanese topics, one of which may be lower-division.

<sup>1</sup> A list of approved courses can be viewed on the East Asian Studies website (<http://www.humanities.uci.edu/eastasian/japanese/course/acourses.php>).

**Residence Requirement for the Minor:** A minimum of four upper-division courses required for the minor must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate department chair.

## Korean Literature and Culture, B.A.

The curriculum for Korean Literature and Culture enables students to understand the extensive and rich literary, historical, social, and aesthetic achievements of Korea by studying its language, literature, film, religion, and other cultural accomplishments in depth.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

**All students are subject to the Language Other Than English Placement and Progression policies.**

### Departmental Requirements for the Major in Korean Literature and Culture

A. Select one of the following:

KOREAN 3A	Advanced Korean
KOREAN 3B	Advanced Korean
KOREAN 3C	Advanced Korean

B. Complete:

EAS 15K	Introductory Topics in Korean Literature
EAS 130	Topics in Korean Society and Culture
EAS 140	Topics in Korean Literature and Society
EAS 190	Junior-Senior Colloquium

C. Select four courses in Korean literature, culture, history, art history, linguistics, film and media, religion, philosophy, gender studies, or comparative literature, of which two may be lower-division courses offered by the East Asian Studies Department.

D. Select two upper-division courses dealing with the literature or culture of another East Asian country.

E. One upper-division course dealing with Korea either in Anthropology or History.

F. Select one course from either E ASIAN 155 or any upper-division course in translated literature and culture of foreign languages offered in Comparative Literature, European Languages and Studies, or Spanish and Portuguese, or courses in literature and culture offered by the English or Asian American Studies Departments.

**Residence Requirement for the Major:** At least five upper-division courses required for the major must be completed successfully at UCI. Students are encouraged, however, to complete up to a year of their language study in approved programs of study abroad.



## Korean Literature and Culture, Minor

Minor in the Korean program will give students foundational knowledge needed to pursue a career involving this important Pacific Rim nation. Students will be equipped with linguistic and cultural skills and be prepared in a variety of endeavors, such as international business, law, government service, journalism, teaching, and other careers involved with public affairs.

A. Complete:

KOREAN 2C	Intermediate Korean
or KOREAN 2KC	Intermediate Korean for Students with a Previous Background in Korean
or equivalent	

B. Complete:

EAS 130	Topics in Korean Society and Culture
EAS 140	Topics in Korean Literature and Society

C. Select one course dealing with Korean visual culture (examples: Korean cinema, visual art)

D. Select four courses from the East Asian Studies offerings on Korean topics, one of which may be lower-division.

**Residence Requirement for the Minor:** A minimum of four upper-division courses required for the minor must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate department chair.

## Department of English

**Michael F. Szalay, Department Chair**

435 Humanities Instructional Building

949-824-6712

<http://www.humanities.uci.edu/english/>

The Department of English comprises undergraduate and graduate programs in literature in English; the M.F.A. Program in Writing; Literary Journalism; and Composition. Among our faculty members are theorists and literary historians, scholars of rhetoric and experts in composition, journalists, writers of fiction, and poets.

Students in the Department explore a variety of models for literary analysis. They write stories and poems. They produce journalism. In every case, our students think about writing: its history, its changing functions, and its place in today's culture. The major prepares students for a world in which informed analysis of language and forceful writing continue to be crucial.

- Creative Writing, Minor
- English, B.A.
- English, M.F.A.
- English, Minor
- English, Ph.D.
- Literary Journalism, B.A.
- Literary Journalism, Minor
- Master of English

## Faculty

Jonathan Alexander, Ph.D. Louisiana State University, *Associate Dean, Division of Undergraduate Education and Campus Writing Coordinator and Chancellor's Professor of English; Culture and Theory; Education; Gender and Sexuality Studies; Informatics* (writing studies, sexuality studies, queer theory, new media studies)

Bobbie J. Allen, Ph.D. University of Washington, *Lecturer of English*

Elizabeth G. Allen, Ph.D. University of Michigan, *Associate Professor of English; Comparative Literature; European Languages and Studies; Religious Studies* (Chaucer, Gower, 15th century poetry; exemplary literature, romance, chronicle, episodic form; intersections between ethics and politics, politics and religion; hospitality, sovereignty, legal and constitutional history of England)

Michael Andreasen, M.F.A. University of California, Irvine, *Lecturer of English*

Stephen A. Barney, Ph.D. Harvard University, *Professor Emeritus of English*

Jami Bartlett, Ph.D. University of California, Berkeley, *Associate Professor of English* (The 19th-Century Novel, literature and philosophy, narrative theory)

Alice C. Berghof, Ph.D. University of California, Irvine, *Lecturer of Humanities; English*

Emily M. Brauer, M.A. University of Southern California, *Lecturer of English*

Carol M. Burke, Ph.D. University of Maryland, College Park, *Professor Emerita of English; Religious Studies* (literary and cultural theory, literary journalism, new media studies)

Ellen S. Burt, Ph.D. Yale University, *Professor Emerita of English* (eighteenth-century French literature and nineteenth-century poetry)

James L. Calderwood, Ph.D. University of Washington, *Professor Emeritus of English*

Ronald Carlson, M.A. University of Utah, *Professor Emeritus of English* (creative writing, fiction, contemporary literature, short stories)

Nahum D. Chandler, Ph.D. University of Chicago, *Professor of African American Studies; Asian American Studies; Comparative Literature; English; European Languages and Studies* (modern philosophy, intellectual history, history of the human sciences)

Chieh L. Chieng, M.F.A. University of California, Irvine, *Lecturer of English*

Jerome C. Christensen, Ph.D. Cornell University, *Professor Emeritus of English* (Hollywood motion pictures, corporate authorship, romantic literature)

Michael P. Clark, Ph.D. University of California, Irvine, *Professor Emeritus of English*

Rachael L. Collins, Ph.D. University of California, Irvine, *Lecturer of English*

Miles Corwin, M.A. University of Missouri-Columbia, *Professor of English* (law enforcement, the criminal justice system, homicide, inner-city education, affirmative action)

Alicia Cox, Ph.D. University of California, Riverside, *Assistant Professor of Comparative Literature; English* (19th-century American literature; Native American and Indigenous literature and cultural studies; gender and sexuality studies; queer Indigenous studies; Indigenous feminisms; autobiography; American Indian boarding school studies; settler colonialism)

Keith Danner, Ph.D. University of California, Riverside, *Lecturer of English*

Rebecca Davis, Ph.D. University of Notre Dame, *Associate Professor of English; Religious Studies* (Old and Middle English literature, Piers Plowman, medieval religious culture, women's writing, medieval philosophy)

Lorene D. Delany-Ullman, M.F.A. University of California, Irvine, *Lecturer of English*

Amy Depaul, B.A. Boston University, *Lecturer of English*

Jaya Dubey, M.A. University of California, Irvine, *Lecturer of English*

Kathryn Eason, M.A. University of Colorado Boulder, *Lecturer of English*

Loren P. Eason, Ph.D. University of California, Irvine, *Lecturer of English*

Christopher Fan, Ph.D. University of California, Berkeley, *Assistant Professor of English; Asian American Studies* (transnational Asia American, 20th, and 21st century literature, speculative fiction, political economy)

Anita W. Fischer, M.A. Loyola Marymount University, *Lecturer of English*

Linda M. Georgianna, Ph.D. Columbia University, *Professor Emerita of English*

Amy Gerstler, M.F.A. Bennington College, *Professor Emerita of English* (poetry, creative writing, fiction, creative nonfiction, hybrid literature, visual art, lyric essay, art and science, women writers)

Richard Godden, Ph.D. University of Kent, *Professor of English* (20th century and contemporary American literature, Faulkner)

Kyle Grady, Ph.D. University of Michigan, *Assistant Professor of English* (early modern literature and culture, African American literature and culture, critical race theory)

Daniel Gross, Ph.D. University of California, Berkeley, *Professor of English* (emotion studies, history and theory of rhetoric, early modern literature and culture, Heidegger and rhetoric)

Alberto D. Gullaba, M.F.A. University of California, Irvine, *Lecturer of English*

Linda G. Haas, Ph.D. University of South Florida, *Lecturer of English*

Martin Harries, Ph.D. Yale University, *Professor of English* (20th century theater, critical theory)

Erika Hayasaki, B.A. University of Illinois at Urbana–Champaign, *Associate Professor of English* (literary journalism in the digital age, narrative nonfiction, immersion journalism, youth, culture, crime, poverty, health, science, education, urban affairs, death)

Rebeca Louise Helfer, Ph.D. Columbia University, *Associate Professor of English; European Languages and Studies* (Renaissance literature and culture, memory, Spenser)

Andrea K. Henderson, Ph.D. University of Pennsylvania, *Professor of English* (19th century literature, literature and visual arts, literature and science)

John W. Hollowell, Ph.D. University of Michigan, *Professor of Teaching Emeritus of English*

Oren J. Izenberg, Ph.D. Johns Hopkins University, *Associate Professor of English* (poetics, modern and contemporary poetry, 20th century literature and culture, philosophy and literature)

Virginia W. Jackson, Ph.D. Princeton University, *Chair in Rhetoric and Communication and Associate Professor of English; Comparative Literature* (poetics, 19th, 20th and 21st century American poetry, 19th century American literature and culture, the history of literary theory)

Joseph Jonghyun Jeon, Ph.D. University of California, Berkeley, *Professor of English; Asian American Studies; Culture and Theory* (Asian-American literature, film modernism)

Ketu H. Katrak, Ph.D. Bryn Mawr College, *Professor of Drama; Comparative Literature; English* (drama and performance, African drama and Ancient Sanskrit drama [from India], postcolonial literature and theory, women writers and feminist theory)

Charlene J. Keeler, M.A. California State University, Fullerton, *Lecturer of English*

Jonathan I. Keeperman, M.F.A. University of California, Irvine, *Lecturer of English*

Tarah M. Keeperman, M.A. University of California, Irvine, *Lecturer of English*

Douglas V. Kiklowicz, M.F.A. University of California, Irvine, *Lecturer of English*

Peter O. Krapp, Ph.D. University of California, Santa Barbara, *Professor of Film and Media Studies; English; European Languages and Studies; Informatics; Music; Visual Studies* (digital culture, media history, cultural memory)

P. Michelle Latiolais, M.F.A. University of California, Irvine, *Professor of English* (creative writing, fiction, contemporary literature)

Karen R. Lawrence, Ph.D. Columbia University, *Professor Emerita of English*

Rodrigo Lazo, Ph.D. University of Maryland, College Park, *Associate Professor of English; Culture and Theory* (hemispheric American studies, nineteenth century, Latino studies and the Americas, Cuba, immigrant literature)

James K. Lee, Ph.D. University of California, Los Angeles, *Associate Professor of Asian American Studies; Culture and Theory; English; Religious Studies* (Asian American literature and culture, contemporary U.S. literature, race and ethnic studies, urban studies, religious studies)

Jerry Won Lee, Ph.D. University of Arizona, *Associate Professor of English; Anthropology; Asian American Studies; Comparative Literature; Culture and Theory*

Julia Hyoun Joo Lee, Ph.D. University of California, Los Angeles, *Department Chair and Associate Professor of Asian American Studies; Culture and Theory; English* (Asian American literature and culture, African American literature and culture, ethnic literature, twentieth-century American literature.)

Jayne Elizabeth Lewis, Ph.D. Princeton University, *Director of Humanities Honors Program and Professor of English; European Languages and Studies; Religious Studies* (literature and medicine, restoration and 18th century British literature, literature of the supernatural and gothic fiction, history and/of fiction, atmosphere as literary concept and construct within natural philosophy)

Julia R. Lupton, Ph.D. Yale University, *Associate Dean for Research and Professor of English; Comparative Literature; Education; Religious Studies* (Renaissance literature, literature and psychology)

Juliet F. MacCannell, Ph.D. Cornell University, *Professor Emerita of English*

Steven J. Mailloux, Ph.D. University of Southern California, *Professor Emeritus of English; Comparative Literature* (rhetoric, critical theory, American literature, law and literature)

Theodore Martin, Ph.D. University of California, Berkeley, *Associate Professor of English; Culture and Theory* (Contemporary literature, genre fiction, literary history, crime, and the novel)

Annie McClanahan, Ph.D. University of California, Berkely, *Associate Professor of English; Culture and Theory* (U.S. culture, the novel, political and economic theory)

Gregory J. McClure, M.F.A. University of California, Irvine, *Lecturer of English*

Lowell B. McKay, M.F.A. University of California, Irvine, *Lecturer of English*

James L. McMichael, Ph.D. Stanford University, *Professor Emeritus of English*

John Miles, Ph.D. Harvard University, *Professor Emeritus of English; Religious Studies* (religion, literature, international relations, western scriptures [Jewish, Christian, Muslim] as literature; religious poetry and music, religion, science, and the environment)

J. Hillis Miller, Ph.D. Harvard University, *UCI Endowed Chair and Distinguished Professor Emeritus of Comparative Literature; English* (Victorian literature, critical theory)

Tyrus Miller, Ph.D. Stanford University, *Dean of the School of Humanities and Professor of English; Art History; Comparative Literature; Visual Studies* (modernist and avant-garde studies in literature and visual arts; critical theory and aesthetics; modern architecture and urbanism; East-Central European studies; culture of socialism and post-socialism; Frankfurt School theory)

Ian Andrew Munro, Ph.D. Harvard University, *Associate Professor of Drama; English* (European drama and performance, early modern popular culture, theatrical performance of wit)

Jane O. Newman, Ph.D. Princeton University, *Professor of Comparative Literature; English; European Languages and Studies; Religious Studies* (comparative Renaissance and early modern literature and culture [English, French, German, Italian, neo-Latin], Mediterranean Renaissance studies, Baroque, afterlives of antiquity, Walter Benjamin, Erich Auerbach, pre-modern lessons for the modern and post-modern)

Robert W. Newsom, Ph.D. Columbia University, *Professor Emeritus of English*

Margot Norris, Ph.D. State University of New York College at Buffalo, *Professor Emerita of English; Comparative Literature* (modern Irish, British, American and continental modernism, literature and war)

Laura B. O'Connor, Ph.D. Columbia University, *Associate Professor of English; Comparative Literature* (Irish literature, twentieth-century poetry, Anglo-American modernism)

Robert L. Peters, Ph.D. University of Wisconsin-Madison, *Professor Emeritus of English*

Bradley A. Queen, Ph.D. Boston University, *Associate Professor of Teaching of English*

Rajagopalan Radhakrishnan, Ph.D. Binghamton University, State University of New York, *Distinguished Professor of English; African American Studies; Comparative Literature; Culture and Theory* (critical theory, postcoloniality, nationalisms and diasporas, poststructuralism, postmodernism, democracy and minority discourse, cultural studies, globalization and transnationalism)

Barbara L. Reed, Ph.D. Indiana University, *Associate Professor of Teaching Emerita of English*

Hugh J. Roberts, Ph.D. McGill University, *Associate Professor of English* (romantic literature, Shelley, literature and science, chaos theory and literature, politics and literature)

John C. Rowe, Ph.D. State University of New York College at Buffalo, *Professor Emeritus of English; Comparative Literature*

Michael Ryan, Ph.D. University of Iowa, *Professor of English; Religious Studies* (American literature, creative writing, poetry, poetics, autobiography)

Edgar T. Schell, Ph.D. University of California, Berkeley, *Professor Emeritus of English*

Gabriele M. Schwab, Ph.D. University of Konstanz, *UCI Chancellor's Professor of Comparative Literature; Anthropology; Culture and Theory; English; European Languages and Studies; German* (modern literature, critical theory, psychoanalysis, comparative literature)

Gretchen K. Short, Ph.D. University of California, Irvine, *Lecturer of Humanities; English*

Barry E. Siegel, M.S. Columbia University, *Professor of English* (literary journalism, English)

Victoria A. Silver, Ph.D. University of California, Los Angeles, *Professor of English; Religious Studies* (early modern literature and culture, religious studies, history and theory of rhetoric, literature and philosophy)

Richard A. Sims, M.F.A. University of California, Irvine, *Lecturer of English*

James Steintrager, Ph.D. Columbia University, *Director of the Emphasis in Critical Theory and Professor of English; European Languages and Studies* (eighteenth-century comparative literature, ethical philosophy and literature, systems theory, amatory and erotic fiction)

Michael F. Szalay, Ph.D. Johns Hopkins University, *Department Chair and Professor of English; Film and Media Studies; Visual Studies* (contemporary television and literature)

Ngugi Wa Thiong'O, B.A. Makerere University, *UCI Distinguished Professor of Comparative Literature; English* (African and Caribbean literatures, theater and film, performance studies, cultural and political theory)

Brook Thomas, Ph.D. University of California, Santa Barbara, *UCI Chancellor's Professor Emeritus of English* (U.S. literature and culture, law and literature, literature and history)

Hector Tobar, M.F.A. University of California, Irvine, *Associate Professor of Chicano/Latino Studies; English* (storytelling, literature, history of Los Angeles, Latin American history, Latino history)

Harold E. Toliver, Ph.D. University of Washington, *Professor Emeritus of English*

Andrew T. Tonkovich, M.F.A. University of California, Irvine, *Lecturer of English*

Irene Tucker, Ph.D. University of California, Berkeley, *Professor of English* (Victorian studies)

Georges Y. Van Den Abbeele, Ph.D. Cornell University, *Professor of Comparative Literature; English; European Languages and Studies* (French and European philosophical literature, travel narrative and tourism/migration studies, critical theory and aesthetics, francophone literature, history of cartography, media history and theory)

Ann J. Van Sant, Ph.D. University of California, Berkeley, *Associate Professor Emerita of English* (restoration and 18th century literature)

Andrzej J. Warminski, Ph.D. Yale University, *Associate Dean for Academic Personnel and Professor of English; Humanities* (romanticism, history of literary theory, contemporary theory, literature and philosophy)

Jacqueline Y. Way, Ph.D. University of California, Irvine, *Lecturer of English*

Amy Wilentz, B.A. Harvard University, *Professor of English* (formal mechanisms of literary journalism, travel journalism as a literary form, explanatory journalism, role of journalism for the everyday reader)

Geoffrey Wolff, B.A. Princeton University, *Professor Emeritus of English*

## Criticism/English Courses

### **CRITISM 200A. Political Economy: Methods and Critique. 4 Units.**

Introduction to canonical texts in Marxism coupled with an examination of the questions of race, gender, ethnicity, and sexuality that distend the calculus of the canon's assumptive logic. May be taken after CLT&THY 200B.

Same as CLT&THY 200A.

Restriction: Graduate students only.

### **CRITISM 220B. Studies in Literary Theory and Its History. 4 Units.**

Introduction to criticism and aesthetics for beginning graduate students. Readings from continental, English, and American theorists.

Same as HUMAN 220B.

Restriction: Graduate students only.

### **CRITISM 240. Advanced Theory Seminar. 4 Units.**

Studies in selected areas of Criticism Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

## English Courses

### **ENGLISH 8. Multicultural American Literature. 4 Units.**

Writings from at least two historically underrepresented groups in California and the United States with particular attention to historical conditions of literary production. Considers in-depth how literary works relate to racial constructions, economic conditions, and/or social movements.

(IV and VII ).

**ENGLISH 9. Shakespeare. 4 Units.**

Plays by William Shakespeare are used to explore the playwright's poetic gifts, theatrical imagination, and inquiry into human relationships and the human condition.

(IV)

**ENGLISH 10. Topics in English and American Literature. 4 Units.**

Explores the diversity of human expression manifested in selected works of literature. By engaging with substantial literary texts, students will think critically about how meaning is created and how experience is interpreted in literary language.

Repeatability: May be taken for credit 3 times as topics vary.

(IV)

**ENGLISH 10B. Topics in English and American Literature. 4 Units.**

Linked with Writing 39B. Explores the diversity of human expression manifested in selected works of literature. By engaging with substantial literary texts, students think critically about how meaning is created and how experience is interpreted in literary language.

Corequisite: WRITING 39B

Repeatability: May be taken for credit 3 times as topics vary.

Overlaps with ENGLISH 10.

(IV)

**ENGLISH 11. Society, Law, and Literature. 4 Units.**

Examines how works of literature represent and influence the relation between law and society. The primary readings will be works of literature, but selections of works of law, politics, and sociology may also be assigned.

(III or IV ).

**ENGLISH 11C. Society, Law, and Literature. 4 Units.**

Linked with Writing 39C. Explores how works of literature represent and influence the relation between law and society. The primary readings are works of literature, but selections of works of law, politics, and sociology may also be assigned.

Corequisite: WRITING 39C

Overlaps with ENGLISH 11.

(III or IV ).

**ENGLISH 12. Young Adult Fiction . 4 Units.**

Young adult fiction studied in historical context, including the publishing industry and mass marketing, as well as education and literacy. Primary readings will focus on young adult fiction, but works of history, advertising, and film will also be included.

(IV)

**ENGLISH 15. Introductory Seminar in English: Topics in Literary Studies. 4 Units.**

Discussion-based seminar on a faculty-chosen topic that introduces majors and those considering a major in English to interpretive methodologies and critical frameworks that characterize the field of English studies.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: English Majors have first consideration for enrollment.

**ENGLISH 16. The Craft of Poetry. 4 Units.**

Reading of selected texts to explore the ways in which these modes formulate experience. Students write several short analytic papers. Requires creative writing.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(IV)



**ENGLISH 17. The Craft of Fiction. 4 Units.**

Reading of selected texts to explore the ways in which these modes formulate experience. Students write several short analytic papers. Requires creative writing.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(IV)

**ENGLISH H80. Sanctuary: Medieval and Modern. 4 Units.**

Principles and significance of the practice of legal sanctuary in medieval English history, literature, and religion. Development of modern use of churches and other safe spaces in the American Civil Rights movement, immigrant sanctuary movements, and international asylum.

Restriction: Campuswide Honors Collegium students only.

(III or IV ).

**ENGLISH H81. What is a Person?. 4 Units.**

Contemporary debates about personhood in law, culture, and society. Beginning with the emergence of ideas of personhood in philosophy and theology, and culminating in the study of highly contested cases: slavery, abortion law, animal rights, corporate personhood, and artificial intelligence.

Restriction: Campuswide Honors Collegium students only.

(III)

**ENGLISH 100. Introduction to Literary Theory. 4 Units.**

Using Plato and Aristotle as points of departure, addresses a range of perspectives and problems in literary theory. To be taken by English majors in the junior year.

Prerequisite: Three courses selected from ENGLISH 8, ENGLISH 9, ENGLISH 10, ENGLISH 11, ENGLISH 12, ENGLISH 15, ENGLISH 16, ENGLISH 17, LIT JRN 20, LIT JRN 21.

**ENGLISH 101W. Undergraduate Seminar in Critical Writing: Topics in Literary History. 4 Units.**

Each instructor identifies a topic within literary history; special attention is given to mastering the conventions of academic argument and expression. To be taken as early as possible in the junior year.

Prerequisite: Three courses selected from ENGLISH 8, ENGLISH 9, ENGLISH 10, ENGLISH 11, ENGLISH 12, ENGLISH 15, ENGLISH 16, ENGLISH 17; or LIT JRN 20 and LIT JRN 21 and one course selected from the above list. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. English Majors have first consideration for enrollment.

(Ib)

**ENGLISH 102A. Topics in Medieval and Renaissance Literature. 4 Units.**

Studies of works representative of Medieval and Renaissance literature in English, with attention to literary history, treating at a minimum more than one author and more than one genre.

Prerequisite: Three courses selected from ENGLISH 8, ENGLISH 9, ENGLISH 10, ENGLISH 11, ENGLISH 12, ENGLISH 15, ENGLISH 16, ENGLISH 17. Or LIT JRN 20 and LIT JRN 21 and one course selected from the above list.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. English Majors have first consideration for enrollment.

**ENGLISH 102B. Topics in Restoration and 18th-Century Literature . 4 Units.**

Studies of works representative of Restoration and 18th-century literature in English, with attention to literary history, treating at a minimum more than one author and more than one genre.

Prerequisite: Three courses selected from ENGLISH 8, ENGLISH 9, ENGLISH 10, ENGLISH 11, ENGLISH 12, ENGLISH 15, ENGLISH 16, ENGLISH 17. Or LIT JRN 20 and LIT JRN 21 and one course selected from the above list.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. English Majors have first consideration for enrollment.

**ENGLISH 102C. Topics in Romantic and 19th-Century Literature. 4 Units.**

Studies of works representative of Romantic and 19th-century literature in English, with attention to literary history, treating at a minimum more than one author and more than one genre.

Prerequisite: Three courses selected from ENGLISH 8, ENGLISH 9, ENGLISH 10, ENGLISH 11, ENGLISH 12, ENGLISH 15, ENGLISH 16, ENGLISH 17. Or LIT JRN 20 and LIT JRN 21 and one course selected from the above list.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. English Majors have first consideration for enrollment.

**ENGLISH 102D. Topics in 20th-Century Literature. 4 Units.**

Studies of works representative of 20th-century literature in English, with attention to literary history, treating at a minimum more than one author and more than one genre.

Prerequisite: Three courses selected from ENGLISH 8, ENGLISH 9, ENGLISH 10, ENGLISH 11, ENGLISH 12, ENGLISH 15, ENGLISH 16, ENGLISH 17. Or LIT JRN 20 and LIT JRN 21 and one course selected from the above list.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. English Majors have first consideration for enrollment.

**ENGLISH 103. Topics in Literature, Theory, and Criticism. 4 Units.**

A series of lectures on and discussions of announced topics in literary criticism, theory, history, genres, modes, major authors.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Recommended: Upper-division students only.

**ENGLISH 105. Multicultural Topics in Literatures in English. 4 Units.**

Focuses on ethnic or minority literatures, or treats issues related to race and cultural identity.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Recommended: Upper-division students only.

**ENGLISH 106. Advanced Seminar: Topics in English Literature . 4 Units.**

Capstone course. Provides intensive work on a topic within the area of literatures in English with particular attention to the theoretical, critical, or conceptual issues it raises, with the goal of producing a substantive research paper.

Prerequisite: (ENGLISH 101W or WRITING 101W) and (ENGLISH 100 and 102A) or (ENGLISH 100 and 102B) or (ENGLISH 100 and 102C) or (ENGLISH 100 and 102D) or (ENGLISH 102A and 102B) or (ENGLISH 102A and 102C) or (ENGLISH 102A and 102D) or (ENGLISH 102B and 102C) or (ENGLISH 102C and 102D) or (ENGLISH 103 and 102A) or (ENGLISH 103 and 102B) or (ENGLISH 103 and 102C) or (ENGLISH 103 and 102D) or (ENGLISH 105 and 102A) or (ENGLISH 105 and 102B) or (ENGLISH 105 and 102C) or (ENGLISH 105 and 102D) or (ENGLISH 100 and 103) or (ENGLISH 103 and 105) or (ENGLISH 100 and 105).

Repeatability: Unlimited as topics vary.

Restriction: Seniors only. English Majors have first consideration for enrollment.

**ENGLISH 150. Topics in Literature for Nonmajors . 4 Units.**

Major texts in English, American, and Comparative Literature explored for basic humanistic issues and themes, on announced topics. Primarily for upper-division students, but not requiring previous training in literature.

Repeatability: Unlimited as topics vary.

Restriction: Recommended: Upper-division students only.



**ENGLISH 160. Topics in English Language Film and TV. 4 Units.**

Focuses on the analysis of film and/or television traditions in the English-speaking world, from a historical, theoretical, or comparative perspective.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Upper-division students only.

**ENGLISH 198. Special Topics. 4 Units.**

Directed group study of selected topics as arranged by instructor.

Repeatability: May be repeated for credit unlimited times.

**ENGLISH 199. Independent Study. 1-4 Units.**

To be taken only when the materials to be studied lie outside the normal run of departmental offerings, and when the student will have no formal chance to pursue the subject. Research paper required.

Repeatability: May be repeated for credit unlimited times.

**ENGLISH 210. Studies in Literary History. 4 Units.**

Studies in selected areas of literary history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**ENGLISH 225. Studies in Literary Genres. 4 Units.**

Studies in selected areas of literary genres. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**ENGLISH 230. Studies in Major Writers. 4 Units.**

Studies in selected areas of major writers. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**ENGLISH 255. Graduate Workshop in Academic Publishing. 4 Units.**

Reading and critique of student-authored essays with the goal of producing a publishable essay. Instructor leads discussion, meets with students individually, and provides an introduction to appropriate venues for publication and the process of submission, peer review, and revision.

Grading Option: Satisfactory/unsatisfactory only.

**ENGLISH 290. Reading and Conference. 4-12 Units.**

Studies in selected areas. Topics addressed vary each quarter.

Repeatability: May be repeated for credit unlimited times.

**ENGLISH 291. Guided Reading Course. 4 Units.**

Studies in selected areas. Topics addressed vary each quarter.

**ENGLISH 299. Dissertation Research. 4-12 Units.**

A units-only course for students in the dissertation phase.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**ENGLISH 398. Rhetoric/Teaching of Composition. 4 Units.**

Readings, lectures, and internship designed to prepare graduate students to teach composition. Formal instruction in rhetoric and practical work in teaching methods and grading.

**ENGLISH 399. University Teaching. 4 Units.**

A units-only course for students appointed as teaching assistants or associates.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Literary Journalism Courses

### **LIT JRN 20. Introduction to Literary Journalism. 4 Units.**

Reading of selected texts to explore the ways in which literary journalism and related nonfiction modes formulate experience. Students complete a range of writing projects.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Literary Journalism Majors have first consideration for enrollment.

#### **(IV)**

### **LIT JRN 21. Reporting for Literary Journalism. 4 Units.**

Instruction and hands-on training in how to interview, report, research, and collect the types of information needed to write literary journalism.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Literary Journalism Majors have first consideration for enrollment.

### **LIT JRN 100. Advanced Reporting. 4 Units.**

Practical engagement with advanced reporting techniques of Literary Journalism, emphasizing the importance of thorough and effective research in the production of high-quality journalistic writing. Prepares students to make good decisions about where and how to publish their writing.

Prerequisite: LIT JRN 21

### **LIT JRN 101A. Studies in the History, Theory, and Ethics of Literary Journalism. 4 Units.**

Lectures and discussion on topics that explore the historical and theoretical dimensions of literary journalism, with particular emphasis on the evolution of ethics in the field.

Prerequisite: LIT JRN 21 and LIT JRN 20 and (ENGLISH 28A or ENGLISH 28B or ENGLISH 28C or ENGLISH 28D or ENGLISH 28E or COM LIT 60A or COM LIT 60B or COM LIT 60C or ENGLISH 8 or ENGLISH 10 or ENGLISH 11 or ENGLISH 12 or ENGLISH 15 or ENGLISH 16 or ENGLISH 17)

### **LIT JRN 101BW. Literary Journalism Core Writing Workshop. 4 Units.**

Writing workshops in announced specialized genres that students will both study and practice. Examples include 'The Memoir,' 'Review Writing,' 'The Editorial,' 'Writing Biography,' 'The Profile,' and 'Political Writing.'

Prerequisite: LIT JRN 101A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 3 times as topics vary.

Restriction: Upper-division students only. Students may enroll in one LITJ 101BW course per quarter.

#### **(Ib)**

### **LIT JRN 103. Lectures on Topics in Literary Journalism. 4 Units.**

A series of lectures on, and discussions of, announced topics in literary journalism and the literature of fact. Examples include 'Travel Literary Journalism'; 'Literature of True Crime'; 'Narratives in the Digital Age'; 'Journalism on the Edge'.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Recommended: Upper-division students only.

### **LIT JRN 197. Community Reporting . 4 Units.**

Directed group study in which students work with an instructor to report and write about community news in a newsroom-style format. Students will partner with local publications to pitch, market, and publish their stories.

Prerequisite: Satisfactory completion of lower-division writing requirement.

Repeatability: May be repeated for credit unlimited times.

### **LIT JRN 198. Special Topics. 4 Units.**

Directed group study of selected topics.

Repeatability: Unlimited as topics vary.

**LIT JRN 199. Reading and Conference. 1-4 Units.**

To be taken only when the materials to be studied lie outside the normal run of departmental offerings.

Repeatability: May be repeated for credit unlimited times.

## Writing Courses

**WRITING 30. The Art of Writing: Poetry. 4 Units.**

Beginners' workshop in the writing of poetry, evaluation of student manuscripts, and parallel readings.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

Repeatability: May be taken for credit 2 times.

(Ia)

**WRITING 31. The Art of Writing: Prose Fiction. 4 Units.**

Beginners' workshop in fiction writing, evaluation of student manuscripts, and parallel readings.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

Repeatability: May be taken for credit 2 times.

(Ia)

**WRITING 37. Intensive Writing. 6 Units.**

Critical reading and analysis conducted through literary, academic, journalistic, and fictional genres with additional instruction in paragraph development and sentence-level mechanics. Students analyze and apply rhetorical principles in a range of writing assignments.

Prerequisite: Students must have taken the UC Analytical Writing Placement Examination.

Grading Option: Letter Grade only.

Overlaps with WRITING 39A, WRITING 39B.

(Ia)

**WRITING 39A. Introduction to Writing and Rhetoric. 4 Units.**

Introduction to the principles of rhetoric through readings and writing assignments across a range of genres, including fiction, non-fiction, journalism and academic essays. Rigorous instruction in composition and style, including organization, paragraph development, and sentence-level mechanics.

Prerequisite: Placement via the UC Analytical Writing Placement Examination is required.

Grading Option: Letter Grade only.

Overlaps with WRITING 37, WRITING 39AP.

**WRITING 39AP. Introduction to Writing and Rhetoric with Lab. 6 Units.**

Introduces the principles of rhetoric through readings and writing assignments across a range of genres. Rigorous instruction in composition and style. Designed for students seeking additional English language support.

Prerequisite: Students must have taken the UC Analytical Writing Placement Examination and the Academic English Placement Test.

Grading Option: Letter Grade only.

Overlaps with WRITING 39A, WRITING 37.

**WRITING 39B. Critical Reading and Rhetoric. 4 Units.**

Critical reading and analysis conducted through literary, academic, journalistic, and fictional genres. Students analyze and apply rhetorical principles in a range of writing assignments.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

Overlaps with WRITING 37.

(Ia)

**WRITING 39C. Argument and Research. 4 Units.**

Intensive instruction in research methods, argumentation, and rhetorical invention. Readings selected from current nonfiction and materials located by students from the University library's holdings, to include databases across a range of disciplines.

Prerequisite: WRITING 37 or WRITING 39B or AP36 or AP37. WRITING 37 with a grade of C or better. WRITING 39B with a grade of C or better. AP36 with a minimum score of 4. AP37 with a minimum score of 4

**(Ia)**

**WRITING 90. Intermediate Poetry Writing. 4 Units.**

Intermediate workshop in the writing of poetry, evaluation of student manuscripts, and parallel readings.

Prerequisite: WRITING 30

Repeatability: May be taken for credit 2 times.

**WRITING 91. Intermediate Fiction Writing. 4 Units.**

Intermediate workshop in the writing of fiction, evaluation of student manuscripts, and parallel readings.

Prerequisite: WRITING 31

Repeatability: May be taken for credit 2 times.

**WRITING 101W. Undergraduate Seminar: Applications in Literary Theory and Criticism for Creative Writing. 4 Units.**

Readings in literature, with discussions and written rhetorical responses on their making.

Prerequisite: (WRITING 30 or WRITING 31) and (WRITING 90 or WRITING 91) and (WRITING 30 or WRITING 31 or WRITING 90 or WRITING 91 or ENGLISH 16 or ENGLISH 17). Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: English Majors only. Literary Journalism Majors only.

**(Ib)**

**WRITING 110. Short Story Writing. 4 Units.**

Three-hour workshop in short fiction; discussion of student writing and of relevant literary texts.

Repeatability: May be taken for credit 2 times.

**WRITING 111. Poetry Writing. 4 Units.**

Three-hour advanced poetry writing workshop; discussion of student writing and of relevant literary texts.

Repeatability: May be taken for credit 2 times.

**WRITING 113. Novel Writing. 4 Units.**

Three-hour advanced workshop in fiction writing; discussion of student writing and of relevant literary texts.

**WRITING 139W. Advanced Expository Writing. 4 Units.**

Study of rhetoric, disciplinary genres, and modes of knowledge production; practice in writing effective prose. Essays of varying lengths, totaling at least 4,000 words.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only.

**(Ib)**

**WRITING 197. Writing Internship . 2-4 Units.**

Internships focused on writing. In consultation with a faculty advisor, students create a course from response essays, research essays, and assessment project data. Internships may include editing and publication projects, supervised teaching and tutoring assignments, community literacy projects.

Prerequisite: Satisfactory completion of the lower-division writing requirement.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**WRITING 250A. Graduate Writers' Workshop (Fiction). 4 Units.**

Graduate fiction workshop open to students enrolled in the MFA program in Writing.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**WRITING 250B. Graduate Writers' Workshop (Fiction). 4 Units.**

Graduate fiction workshop open to students enrolled in the MFA program in Writing.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**WRITING 250C. Graduate Writers' Workshop (Poetry). 8 Units.**

Graduate poetry workshop open to students enrolled in the M.F.A. Programs in Writing.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**WRITING 251A. Writing in Conference (Fiction). 4 Units.**

Graduate fiction workshop open to students enrolled in the MFA program in Writing.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**WRITING 251B. Writing in Conference (Fiction). 4 Units.**

Graduate fiction workshop open to students enrolled in the MFA program in Writing.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**WRITING 251C. Writing in Conference (Poetry). 8 Units.**

Graduate poetry workshop open to students enrolled in the M.F.A. Programs in Writing.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

## Creative Writing, Minor

The Department of English offers a minor in Creative Writing open to undergraduates across the UCI campus, giving them the opportunity to receive instruction and practice in the craft of prose fiction and poetry, and to learn the literary tradition of these art forms in English. The minor consists of workshop courses, writing courses, and literature courses, which serve to provide a foundation for students who wish to pursue creative writing professionally, as well as for those who have an amateur interest in the art.

Students who wish to minor in Creative Writing must submit an online form, available on the English Department website, in order to register for the minor, so that their coursework can be tracked for credit. Both majors and non-majors should contact the Department in order to receive further information about its requirements and schedules.

A. Select three of the following: <sup>1</sup>

WRITING 30

The Art of Writing: Poetry

WRITING 31

The Art of Writing: Prose Fiction

WRITING 90	Intermediate Poetry Writing
WRITING 91	Intermediate Fiction Writing
B. Complete two WRITING 101W courses with different topics	
C. Select two of the following:	
ENGLISH 102A	Topics in Medieval and Renaissance Literature
ENGLISH 102B	Topics in Restoration and 18th-Century Literature
ENGLISH 102C	Topics in Romantic and 19th-Century Literature
ENGLISH 102D	Topics in 20th-Century Literature
ENGLISH 103	Topics in Literature, Theory, and Criticism
ENGLISH 105	Multicultural Topics in Literatures in English
LIT JRN 103	Lectures on Topics in Literary Journalism

<sup>1</sup> Students can substitute one from ENGLISH 16 or ENGLISH 17 for the lower-division requirement.

**Residence Requirement for the Minor:** Four upper-division courses must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the department undergraduate chair.

## English, B.A.

This major seeks to introduce students to the entire range of literatures written in English, from British and American to African, Asian, and Australasian literatures. The major emphasizes the differences among historical periods and various genres, and encourages exploration of a broad range of literary theories. It also offers students the opportunity to do significant work in Creative Writing.

### B.A. in English

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

A. Select three of the following, at least one of which must be ENGLISH 15 <sup>1</sup>

ENGLISH 8	Multicultural American Literature
ENGLISH 9	Shakespeare
ENGLISH 10	Topics in English and American Literature
ENGLISH 11	Society, Law, and Literature
ENGLISH 12	Young Adult Fiction
ENGLISH 15	Introductory Seminar in English: Topics in Literary Studies
ENGLISH 16	The Craft of Poetry
ENGLISH 17	The Craft of Fiction

B. Complete the following:

ENGLISH 100	Introduction to Literary Theory
ENGLISH 101W	Undergraduate Seminar in Critical Writing: Topics in Literary History

C. Complete the following:

ENGLISH 102A	Topics in Medieval and Renaissance Literature
ENGLISH 102B	Topics in Restoration and 18th-Century Literature
ENGLISH 102C	Topics in Romantic and 19th-Century Literature
ENGLISH 102D	Topics in 20th-Century Literature
ENGLISH 105	Multicultural Topics in Literatures in English
ENGLISH 106	Advanced Seminar: Topics in English Literature

D. Select at least three more Departmental (English, Literary Journalism, Writing) courses numbered 102 or above, excluding ENGLISH 150, LIT JRN 197, LIT JRN 198, LIT JRN 199, WRITING 139W, and WRITING 197. An upper-division course in a foreign literature in the original language or in translation may be substituted for one of the three courses.

<sup>1</sup> ENGLISH 10 and ENGLISH 15 may be taken more than once as topics vary.

**Residence Requirement for the English Major:** ENGLISH 100, ENGLISH 101W, two ENGLISH 102s, and ENGLISH 106 must be completed successfully at UCI.

## B.A. in English with a Specialization in English for Future Teachers

All students must meet the University Requirements.

All students must meet the School Requirements.

A. Select three of the following, at least one of which must be ENGLISH 15 <sup>2</sup>

ENGLISH 8	Multicultural American Literature
ENGLISH 9	Shakespeare
ENGLISH 10	Topics in English and American Literature
ENGLISH 11	Society, Law, and Literature
ENGLISH 12	Young Adult Fiction
ENGLISH 15	Introductory Seminar in English: Topics in Literary Studies
ENGLISH 16	The Craft of Poetry
ENGLISH 17	The Craft of Fiction

B. Complete the following:

ENGLISH 100	Introduction to Literary Theory
ENGLISH 101W	Undergraduate Seminar in Critical Writing: Topics in Literary History

C. Complete the following:

ENGLISH 102A	Topics in Medieval and Renaissance Literature
ENGLISH 102B	Topics in Restoration and 18th-Century Literature
ENGLISH 102C	Topics in Romantic and 19th-Century Literature
ENGLISH 102D	Topics in 20th-Century Literature
ENGLISH 106	Advanced Seminar: Topics in English Literature

D. Complete two ENGLISH 105 courses with different topics.

E. Select at least two more Departmental (English, Literary Journalism, Writing) courses numbered 102 or above, excluding ENGLISH 150, LIT JRN 197, LIT JRN 198, LIT JRN 199, WRITING 139W, and WRITING 197. An upper-division course in a foreign literature in the original language or in translation may be substituted for one of the two courses. <sup>1</sup>

F. Select one from following:

EDUC 108	Adolescent Development and Education
EDUC 124	Multicultural Education in K-12 Schools
EDUC 128	Exceptional Learners
EDUC 131	Educational Technology
EDUC 173	Cognition and Learning in Educational Settings
EDUC 176	Psychology of Learning, Abilities, and Intelligence

G. Complete at least two units of field work from EDUC 100, WRITING 197, or other relevant experience with prior departmental approval.

<sup>1</sup> Foreign literature-in-translation courses are offered in Classics, Comparative Literature, East Asian Studies, French and Italian, German, and Spanish and Portuguese. COM LIT 150 and COM LIT 160, EAS 160, FLM&MDA 160, FRENCH 160, GERMAN 160, JAPANESE 180, KOREAN 180, and SPANISH 160 when appropriate, also qualify as foreign language literature-in-translation courses.

<sup>2</sup> ENGLISH 10 and ENGLISH 15 may be taken more than once as topics vary.

**Residence Requirement for the English Major:** ENGLISH 100, ENGLISH 101W, two ENGLISH 102s, and ENGLISH 106 must be completed successfully at UCI.

Students should plan coherent programs of study with their faculty advisors, including undergraduate seminars, workshops and seminars in writing (for students choosing a Literary Journalism major or Creative Writing minor), and courses in allied areas outside the Department. It is possible to combine a cluster of courses in literature with other majors in the sciences and social sciences, and to use an English or Literary Journalism major as preprofessional training in government, law, or medicine. Students who wish advice in planning such programs should consult both the Department and people in their prospective professional areas.

A student who intends to continue with graduate work is urged to study a second foreign language before graduation.

Students are also encouraged to take advantage of the opportunity to study abroad through the UC Education Abroad Program. Visit the Study Abroad Center website (<http://www.studyabroad.uci.edu/>) or an academic counselor for additional information.

The study of literature helps students express their ideas clearly, do independent research, and think analytically and imaginatively. These capabilities will help qualify majors for careers in education, law, technical writing, communications, journalism, public relations, business, marketing, and management. Departmental advisors encourage their students to investigate various career options before completing their undergraduate educations.

The Division of Career Pathways provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See the Division of Career Pathways website (<http://career.uci.edu/>) for additional information.

English, M.F.A.

The aim of the MFA Programs in Writing at the University of California, Irvine is the training of accomplished writers who intend to make writing their life. What the program expects of its students is passionate precision, character, and stamina. What the program wants most for its students is that each will sooner or later write something that lasts. To facilitate such writing, the faculty keeps the program small in order to ensure the high quality of the students, as well as to permit teaching on a one-to-one basis and to allow students to consult frequently with the faculty and staff for assistance with their work. Workshops in fiction and poetry are at the core of this two-to-three-year program. From over five hundred applicants, a maximum of twelve new students are enrolled each year. Graduates of the Programs in Writing receive a Master of Fine Arts (MFA) degree in English.

Each quarter the candidate will be enrolled in either the poetry or fiction section of the Graduate Writers' Workshop, which will constitute two-thirds of a course load, the other course to be selected in consultation with the student's advisor. It is expected that M.F.A. candidates will complete at least one supervised teaching seminar.

In addition to course work, the candidate is required to present as a thesis an acceptable book-length manuscript of poetry or short stories or a novel. The normative time for completion of the M.F.A. is three years, and the maximum time permitted is four years.

English, Minor

The English minor offers students in other majors an opportunity to study the global literatures written in English—British and American, African, Asian and Australasian—from historical, cultural, and theoretical perspectives. It attends to literary forms, their evolution and traditions, while emphasizing the diversity of literature's motives, occasions, influences and effects. Along with the considerable pleasure of reading the myriad expressions of literary art in English, what humanity has to say about itself over centuries and continents, the minor provides a substantial education in critical analysis and argument.

A. Select three of the following:

ENGLISH 8	Multicultural American Literature
ENGLISH 9	Shakespeare
ENGLISH 10	Topics in English and American Literature
ENGLISH 11	Society, Law, and Literature
ENGLISH 12	Young Adult Fiction
ENGLISH 15	Introductory Seminar in English: Topics in Literary Studies
ENGLISH 16	The Craft of Poetry
ENGLISH 17	The Craft of Fiction

B. Select at least five Departmental (English, Literary Journalism, Writing) courses numbered 102 or above, excluding ENGLISH 150, LIT JRN 197, LIT JRN 198, LIT JRN 199, WRITING 139W, and WRITING 197. Two courses from the following may be substituted:

ENGLISH 100	Introduction to Literary Theory
ENGLISH 101W	Undergraduate Seminar in Critical Writing: Topics in Literary History
WRITING 101W	Undergraduate Seminar: Applications in Literary Theory and Criticism for Creative Writing

**Residence Requirement for the English Minor:** Four upper-division courses must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the department undergraduate chair.

English, Ph.D.

The Ph.D. program in English at UCI is the #1 department for literary and critical theory nationally (US News and World Report). The research and teaching of department faculty represents and cuts across a range of fields, historical periods, and methodological approaches. Our graduates have gone on (<https://www.humanities.uci.edu/english/graduate/placement.php>) to faculty positions at a range of nationally ranked colleges and universities, including, in recent years, the University of Michigan, Tulane, Rice, Clemson, BYU, and Connecticut College.

Many of our Ph.D. faculty and students participate jointly in collaborative, interdisciplinary research clusters and reading groups. Some groups currently active include The Center for Early Cultures (<https://www.humanities.uci.edu/earlycultures/>), the Culture and Capital Center, Medieval Devysings (<https://sites.uci.edu/medievaldevysings/>), Poetics | History | Theory (<https://www.humanities.uci.edu/poeticshistorytheory/>), the Queer Theory Reading Group, and the Rhetoric Reading Group. Our Ph.D. program allows students to customize their study and research around their own intellectual interests. Students can also take seminars in other programs and departments, and can receive interdisciplinary certificates in Asian American studies (<https://www.humanities.uci.edu/aas/graduate/emphasis.php>), Chicano/Latino Studies (<https://www.humanities.uci.edu/aas/graduate/emphasis.php>),



[www.chicanolatinostudies.uci.edu/grad/emphasis.php](http://www.chicanolatinostudies.uci.edu/grad/emphasis.php)), Critical Theory (<https://www.humanities.uci.edu/critical/programs/cte.php>), Gender and Sexuality Studies (<https://www.humanities.uci.edu/genderandsexualitystudies/graduate/>), Latin American Studies (<https://www.humanities.uci.edu/las/graduate/>), Medical Humanities (<https://www.humanities.uci.edu/centermedicalhumanities/curriculum/emphasis.php>), Rhetoric and Composition (<https://www.humanities.uci.edu/english/graduate/rhetoric.php>), and Visual Studies (<https://www.humanities.uci.edu/visualstudies/program/emphasis.php>)

All admitted students receive a multi-year funding package, including a range of teaching opportunities. Students may enter the graduate program in English with either a B.A. or an M.A. In either case, the first two years are spent taking courses, completing the language requirement, and writing the M.A. paper. In the third year, students select two or three fields of study for their qualifying exams - exam lists are developed by the student in consultation with their advisor and are intended to help the student build expertise and confidence toward a future dissertation. After successfully completing the qualifying examination, students write a dissertation under the supervision of a three-person dissertation committee, which they select.

Applicants for graduate degrees in English must submit scores for the Graduate Record Examination (GRE). Ordinarily, students are not admitted to the English program unless they plan to continue, and are qualified to continue, to the Ph.D. Students are admitted to the M.F.A. program chiefly on the basis of submitted creative work.

Specific requirements for the graduate degrees will be established by consultation between members of the faculty and the candidate. First-year graduate students or candidates for the Master of Fine Arts in English (fiction/poetry) plan a program with an assigned advisor; candidates for the Ph.D. plan with an advisor and three-person committee. At the time of the M.A. examination, the Graduate Committee evaluates the student's graduate career up to that point and offers advice about future prospects. Candidates for literary degrees are also encouraged to study philosophy, history, foreign languages and literatures, and the fine arts.

Only in exceptional circumstances will students be permitted to undertake programs of less than six full courses during the academic year. The normal expectation is enrollment in three courses each quarter; Teaching Assistants take two courses in addition to earning credit for University Teaching. Students who are not teaching should be able to complete course work in two years. The Ph.D. qualifying examination should be taken within a couple of quarters after courses are finished. The normative time for completion of the Ph.D. in English is seven years.

The program for the Ph.D. in English requires about two years of full-time enrollment in regular courses beyond the B.A.; proficiency in the reading of one acceptable foreign language, modern or classical; satisfactory performance on designated examinations; and the dissertation.

The languages acceptable depends upon the nature of the student's program as determined by the student's advisors. Reading competence in this language must be established in the first year of residence. Competence in the language required for the Ph.D. is verified through examination.

Upon completion of course work the student is examined in three areas: (1) a primary field; (2) a secondary field; and (3) theory and/or criticism.

Upon satisfactorily completing this Qualifying Examination, the student is admitted to candidacy for the degree. As soon after completion of the Qualifying Examination as is practical, the student presents a dissertation prospectus for the approval of the doctoral committee. After submitting a full dissertation to their committee members, students will be required to pass an oral dissertation defense with their doctoral committee prior to filing the dissertation and graduating. All work for the Ph.D. degree must be in courses limited to graduate students. The normative time for advancement to candidacy is four years. The normative time for completion of the Ph.D. is seven years, and the maximum time permitted is nine years.

The Murray Krieger Fellowship in Literary Theory is intended for an outstanding entering graduate student who is pursuing the Ph.D. in English or Comparative Literature and who demonstrates a primary interest in theory as theory relates to literary texts. A range of other fellowships is also available to students in the Department.

### **Emphasis in Creative Nonfiction**

Students admitted to the emphasis in Creative Nonfiction must meet all course, language, and examination requirements for the Ph.D. in English. Their course work must include: 1) three writing workshops in nonfiction; 2) three courses in nonfictional literature or rhetoric; and 3) if needed for the projected dissertation, one course outside the Department.

Students must also conduct a dissertation defense.

## **Literary Journalism, B.A.**

This major was created to meet the needs of a growing number of students who wish to read, study, and write nonfiction prose that has transcended the limits of daily journalism. This is prose that has evolved into a distinct branch of literature, prose that adopts the aims and techniques of the finest fiction. The program provides majors with a solid foundation in nonfiction writing and an equally solid background in areas such as literary history, which together will help make students more informed writers. A Literary Journalism minor is also offered.

Literary Journalism majors take three intensive writing seminars, and are expected to develop a portfolio of work by graduation which they can present as evidence of their skill for purposes of employment or future education. At the same time, majors are asked to take a comprehensive look at the theory, history, and context of literary journalism. Among other forms, they study and write narratives, memoirs, profiles, histories, and personal essays, in subject areas as varied as science, politics, justice, travel, sports, food, and popular culture.

While it differs from an applied journalism major that focuses primarily on newspaper writing, the major in Literary Journalism is excellent preparation for students planning to enter graduate programs in journalism, as well as for those interested in the many careers requiring sophisticated writing and communication skills.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

A. Complete:

LIT JRN 20	Introduction to Literary Journalism
LIT JRN 21	Reporting for Literary Journalism
LIT JRN 100	Advanced Reporting

B. Select one course from the following: <sup>1</sup>

ENGLISH 8	Multicultural American Literature
ENGLISH 9	Shakespeare
ENGLISH 10	Topics in English and American Literature
ENGLISH 11	Society, Law, and Literature
ENGLISH 12	Young Adult Fiction
ENGLISH 15	Introductory Seminar in English: Topics in Literary Studies
ENGLISH 16	The Craft of Poetry
ENGLISH 17	The Craft of Fiction

C. Complete:

ENGLISH 105	Multicultural Topics in Literatures in English
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D. Complete:

LIT JRN 101A	Studies in the History, Theory, and Ethics of Literary Journalism
LIT JRN 101BW	Literary Journalism Core Writing Workshop (three times, on various topics)

E. Select at least three more Departmental (English, Literary Journalism, Writing) courses numbered 102 or above (excluding ENGLISH 150, LIT JRN 197, LIT JRN 198, LIT JRN 199, WRITING 139W, and WRITING 197). An upper-division course in a foreign literature in the original language or in translation may be substituted for one of the three courses.

F. Two upper-division History courses in a single regional or thematic focus area.

<sup>1</sup> Students can substitute COM LIT 60A or COM LIT 60C for the lower-division English course requirement.

**Residence Requirement for the Literary Journalism Major:** LIT JRN 20, LIT JRN 21, LIT JRN 100, LIT JRN 101A, and three LIT JRN 101BW courses must be completed successfully at UCI.

Students should plan coherent programs of study with their faculty advisors, including undergraduate seminars, workshops and seminars in writing (for students choosing a Literary Journalism major or Creative Writing minor), and courses in allied areas outside the Department. It is possible to combine a cluster of courses in literature with other majors in the sciences and social sciences, and to use an English or Literary Journalism major as preprofessional training in government, law, or medicine. Students who wish advice in planning such programs should consult both the Department and people in their prospective professional areas.

A student who intends to continue with graduate work is urged to study a second foreign language before graduation.

Students are also encouraged to take advantage of the opportunity to study abroad through the UC Education Abroad Program. Visit the Study Abroad Center website (<http://www.studyabroad.uci.edu/>) or an academic counselor for additional information.

The study of literature helps students express their ideas clearly, do independent research, and think analytically and imaginatively. These capabilities will help qualify majors for careers in education, law, technical writing, communications, journalism, public relations, business, marketing, and management. Departmental advisors encourage their students to investigate various career options before completing their undergraduate educations.

The Division of Career Pathways provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See the Division of Career Pathways website (<http://career.uci.edu/>) for additional information.

## Literary Journalism, Minor

The Literary Journalism minor was created for students who wish to study literary journalism as a complement to another major within or outside of the Humanities. Literary Journalism minors are asked to take a comprehensive look at the theory, history, and context of literary journalism. Among other forms, they study narratives, memoirs, profiles, histories, and personal essays, in subject areas as varied as science, politics, justice, travel, sports, food,

and popular culture. The minor is excellent preparation for students interested in the many careers requiring sophisticated writing and communication skills.

A. Complete:

LIT JRN 20	Introduction to Literary Journalism
LIT JRN 21	Reporting for Literary Journalism

B. Select one of the following: <sup>1</sup>

ENGLISH 8	Multicultural American Literature
ENGLISH 9	Shakespeare
ENGLISH 10	Topics in English and American Literature
ENGLISH 11	Society, Law, and Literature
ENGLISH 12	Young Adult Fiction
ENGLISH 15	Introductory Seminar in English: Topics in Literary Studies
ENGLISH 16	The Craft of Poetry
ENGLISH 17	The Craft of Fiction

C. Complete:

LIT JRN 100	Advanced Reporting
LIT JRN 101A	Studies in the History, Theory, and Ethics of Literary Journalism

D. Complete:

LIT JRN 103	Lectures on Topics in Literary Journalism (three times, on various topics.)
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<sup>1</sup> Students can substitute COM LIT 60A or COM LIT 60C for the lower-division English course requirement.

**Residence Requirement for the Literary Journalism Minor:** LIT JRN 20, LIT JRN 21, LIT JRN 100, and LIT JRN 101A must be completed successfully at UCI. By petition, two of the three LIT JRN 103 courses may be taken through the UC Education Abroad Program, providing course content is approved in advance by the Literary Journalism program.

## Master of English

The Department of English sponsors a Master of English program designed for teachers, returning students, and other who would benefit from advanced training in literary history and criticism, studies in related media, and in rhetoric and composition. The Master of English is awarded to candidates who complete 36 units of graduate course work and submit an acceptable master's essay.

The Master of English plan of study comprises:

1. 32 units of primary course work, usually completed over the course of two academic calendar years or six quarters (with part-time enrollment assumed as one course per quarter) and one intervening summer session (with enrollment in three courses taught during a six-week session).
2. The completion of 4 units of thesis research course work in the sixth quarter of instruction.
3. The completion of the master's thesis essay by the end of the sixth quarter.

## Department of European Languages and Studies

**David T. Pan, Department Chair**

243 Humanities Instructional Building  
949-824-6406  
<http://www.humanities.uci.edu/els/>

The Department of European Languages and Studies provides undergraduates with the opportunity to study Europe in its geographical, linguistic, historical, literary, artistic, and cultural diversity. The literatures, histories, and cultures of European nation-states have always been closely interconnected, even before the individual regions became nation-states. It is nearly impossible to study any era—the Renaissance, the Early Modern period, the Enlightenment, the Romantic period, or the Modern period—without taking into account the influence of one European nation on other European nations. Almost all significant European literary and artistic movements have been cross-cultural and transnational. The current configuration of Europe—the European Union—is merely the most recent socio-political and economic realization of the intense cross-pollination of ideas and institutions that defines—and has always defined—the continent. Immigration and the displacement of populations throughout the continent are constants of European history and have long inflected literary and artistic production in ways scholars continually explore. The history of European colonial enterprises and their afterlives have had a profound impact on the shape of the world in which we live; the Department is committed to a critical engagement with these legacies.

The Department offers majors in European Studies, French, and German Studies; minors in European Studies, French, German Studies, Italian Studies, and Russian Studies; as well as a graduate program (M.A., Ph.D.) in German. The Department also offers language training in French, German, Italian, and Russian with emphasis on the communicative and interpretive aspects of language learning. The goal is the achievement of translingual and transcultural competency. University language study is the critical investigation of a foreign linguistic system and the cultures defined by it. It is also an investigation of one's own native language(s): it is nearly impossible for us to scrutinize and analyze something we know as intimately as our native language and yet this is the order by which we formulate our thoughts and the order which may sometimes formulate our thoughts for us. The "foreignness" of a foreign language allows us to objectify an entire linguistic system, to observe its structure and its usage, and then to make comparisons with our own linguistic situation. This kind of knowledge of one's own languages is the foundation of critical reflection on texts of any nature—historical, philosophical, literary, political, legal, journalistic, and others. Thus serious study of a language other than English is crucial to a university education. The Department teaches its language courses with this principle in mind and seeks to provide its students with a framework for critical linguistic and cultural learning.

## UCI Division of Career Pathways

The UCI (<http://career.uci.edu/>) Division of Career Pathways Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on résumé preparation, job search, and interview techniques.

- European Studies, B.A.
- European Studies, Minor
- European Thought and Culture, M.A. (4+1)
- French, B.A.
- French, Minor
- German Studies, B.A.
- German Studies, Minor
- German, Ph.D.
- Italian Studies, Minor
- Russian Studies, Minor

## Faculty

Etienne Balibar, Ph.D. Catholic University of Nijmegen, *Professor Emeritus of French* (political philosophy, critical theory, epistemology of the social sciences, ethics)

Anke Biendarra, Ph.D. University of Washington, *Associate Professor of German* (20th- and 21st-century German literature, culture, and film, cultural studies)

David Carroll, Ph.D. Johns Hopkins University, *Professor Emeritus of French* (critical theory and twentieth-century French literature)

James T. Chiampi, Ph.D. Yale University, *Professor Emeritus of Italian; Religious Studies* (Dante and Italian Renaissance)

Fabrizio Di Maio, Ph.D. University of Rome II Tor Vergata, *Director of Italian Language Program and Lecturer of Italian* (didactics of Italian as a foreign language, Italian historical novels, politically engaged literature)

Kai Evers, Ph.D. Duke University, *Associate Professor of German* (20th-century German literature and film, modernism and Holocaust literature, theories of violence and catastrophic imagination)

Suzanne Gearhart, Ph.D. Johns Hopkins University, *Professor Emerita of French* (seventeenth- and eighteenth-century French literature, philosophy and literature)

Elizabeth Guthrie, Ph.D. University of Illinois at Urbana-Champaign, *Professor of Teaching Emerita of French* (second-language acquisition and teaching)

Gail K. Hart, Ph.D. University of Virginia, *Professor Emerita of German* (18th- and early-19th-century German drama and fiction, Schiller, history of punishment)

Laura Klein, Ph.D. University of California, Irvine, *Lecturer of French*

Ruth Klüger, Ph.D. University of California, Berkeley, *Professor Emerita of German* (Kleist, nineteenth-century literature, Stifter, Holocaust literature)

Meredith A. Lee, Ph.D. Yale University, *Professor Emerita of German* (lyric poetry, eighteenth-century literature, Goethe, music and literature)

Herbert H. Lehnert, Ph.D. University of Kiel, *Professor Emeritus of German* (Thomas Mann)

Glenn S. Levine, Ph.D. University of Texas at Austin, *German Language Program Director and Professor of German; Education; Language Science* (applied linguistics, foreign language pedagogy, German-Jewish culture and history, Yiddish language and culture, European culinary history)

William J. Lillyman, Ph.D. Stanford University, *Professor Emeritus of German* (Romanticism, Goethe, Tieck)

Christophe Litwin, Ph.D. New York University, *Program Director and Assistant Professor of French; German* (early modern French literature, early modern European moral and political philosophy)

Catherine Malabou, Ph.D. Ecole des Hautes Etudes en Sciences Sociales, *UCI Distinguished Professor of Comparative Literature; French; German* (German idealism, contemporary French philosophy, cultural theory, neurobiology, epigenetics)

Maryse J. Mijalski, Ed.D. University of Southern California, *Director of the French Language Program and Lecturer of French* (Second-language pedagogy and teaching.)

Lora D. Mjolsness, Ph.D. University of Southern California, *Lecturer of Russian* (Soviet and Russian Animation; 19th century, 20th century and Contemporary Children's Literature; Russian Folklore.)

Carrie J. Noland, Ph.D. Harvard University, *Director of the International Center for Writing and Translation and Director of French and Professor of French; Comparative Literature* (20th-century poetry and poetics, avant-garde movements in art and literature, critical theory, performance studies)

David T. Pan, Ph.D. Columbia University, *Professor of German* (18th-, 19th-, and early 20th-century German literature and intellectual history)

Zlatina Sandalska, Ph.D. University of Southern California, *Lecturer of Russian*

Gabriele M. Schwab, Ph.D. University of Konstanz, *UCI Chancellor's Professor of Comparative Literature; Anthropology; Culture and Theory; English; European Languages and Studies; German* (modern literature, critical theory, psychoanalysis, comparative literature)

Deanna Shemek, Ph.D. Johns Hopkins University, *Professor of Italian* (Italian literature and cultural history; Renaissance studies; early modern popular culture; early modern to contemporary narrative; women's and gender studies; literary theory; digital humanities; textual scholarship)

John H. Smith, Ph.D. Princeton University, *Professor of Comparative Literature; Culture and Theory; German; Religious Studies* (18th- and 19th-century literature and intellectual history, literary theory)

Georges Y. Van Den Abbeele, Ph.D. Cornell University, *Professor of Comparative Literature; English; European Languages and Studies* (French and European philosophical literature, travel narrative and tourism/migration studies, critical theory and aesthetics, francophone literature, history of cartography, media history and theory)

## Affiliate Faculty

Elizabeth G. Allen, Ph.D. University of Michigan, *Associate Professor of English; Comparative Literature; European Languages and Studies; Religious Studies* (Chaucer, Gower, 15th century poetry; exemplary literature, romance, chronicle, episodic form; intersections between ethics and politics, politics and religion; hospitality, sovereignty, legal and constitutional history of England)

David Brodbeck, Ph.D. University of Pennsylvania, *Professor of Music; European Languages and Studies*

Daniel R. Brunstetter, Ph.D. University of California, Davis, *Associate Professor of Political Science; European Languages and Studies* (political theory, international relations, French political thought)

Nahum D. Chandler, Ph.D. University of Chicago, *Professor of African American Studies; Asian American Studies; Comparative Literature; English; European Languages and Studies* (modern philosophy, intellectual history, history of the human sciences)

Vinayak Chaturvedi, Ph.D. University of Cambridge, *Associate Professor of History; Culture and Theory; European Languages and Studies; Religious Studies* (modern South Asia, social and intellectual history)

Ian Collier, Ph.D. University of Melbourne, *Professor of History; European Languages and Studies* (Europe and the Muslim world, the French Revolution and the global history of the Revolutionary age)

Herschel Farbman, Ph.D. Yale University, *Department Chair and Associate Professor of Comparative Literature; French* (modernism, critical theory)

Zina Giannopoulou, Ph.D. University of Illinois at Urbana-Champaign, *Associate Professor of Classics; European Languages and Studies* (Plato, philosophy and literature, Greek tragedy and epic, film, and reception of classics)

Sara Goodman, Ph.D. Georgetown University, *Associate Professor of Political Science; European Languages and Studies* (citizenship policy, immigration, immigrant integration, ethnic diversity in democracies, diaspora)

Sean Greenberg, Ph.D. Harvard University, *Associate Professor of Philosophy; European Languages and Studies; Religious Studies*

Rebeca Louise Helfer, Ph.D. Columbia University, *Associate Professor of English; European Languages and Studies* (Renaissance literature and culture, memory, Spenser)

Andromache Karanika, Ph.D. Princeton University, *Department Chair and Associate Professor of Classics; European Languages and Studies; Religious Studies* (Greek epic poetry, Greek lyric, ritual, gender and performance, reception of antiquity in Byzantium)

Peter O. Krapp, Ph.D. University of California, Santa Barbara, *Professor of Film and Media Studies; English; European Languages and Studies; Informatics; Music; Visual Studies* (digital culture, media history, cultural memory)

Horacio Legras, Ph.D. Duke University, *Professor of Spanish and Portuguese; Comparative Literature; Culture and Theory; European Languages and Studies* (Latin American literature and culture, Latin American film, visual arts in Latin America, psychoanalysis, and photography)

Jayne Elizabeth Lewis, Ph.D. Princeton University, *Director of Humanities Honors Program and Professor of English; European Languages and Studies; Religious Studies* (literature and medicine, restoration and 18th century British literature, literature of the supernatural and gothic fiction, history and/of fiction, atmosphere as literary concept and construct within natural philosophy)

Nancy Ann McLoughlin, Ph.D. University of California, Santa Barbara, *Associate Professor of History; European Languages and Studies; Religious Studies* (late Medieval Europe, intellectual history, gender)

Santiago Morales-Rivera, Ph.D. Harvard University, *Associate Professor of Spanish and Portuguese; European Languages and Studies* (Modern Peninsular literature and culture, critical theory, literary history, narrative, music)

Susan Katharine Morrissey, Ph.D. University of California, Berkeley, *Professor of History; European Languages and Studies* (Russia, terrorism and political violence, suicide)

Jane O. Newman, Ph.D. Princeton University, *Professor of Comparative Literature; English; European Languages and Studies; Religious Studies* (comparative Renaissance and early modern literature and culture [English, French, German, Italian, neo-Latin], Mediterranean Renaissance studies, Baroque, afterlives of antiquity, Walter Benjamin, Erich Auerbach, pre-modern lessons for the modern and post-modern)

Kevin E. Olson, Ph.D. Northwestern University, *Professor of Political Science; Culture and Theory; European Languages and Studies* (political theory, history of political thought, legal theory, philosophy of the social sciences)

Nasrin Rahimieh, Ph.D. University of Alberta, *Director of the Humanities Core Program and Howard Baskerville Professor of Comparative Literature; European Languages and Studies; Gender and Sexuality Studies* (Modern Persian literature and culture, diaspora studies, women's writing.)

Renee J. Raphael, Ph.D. Princeton University, *Associate Professor of History; European Languages and Studies; Religious Studies* (early modern Europe, history of science, intellectual history)

Gabriele M. Schwab, Ph.D. University of Konstanz, *UCI Chancellor's Professor of Comparative Literature; Anthropology; Culture and Theory; English; European Languages and Studies; German* (modern literature, critical theory, psychoanalysis, comparative literature)

James Steintrager, Ph.D. Columbia University, *Director of the Emphasis in Critical Theory and Professor of English; European Languages and Studies* (eighteenth-century comparative literature, ethical philosophy and literature, systems theory, amatory and erotic fiction)

Paul Andrew Zissos, Ph.D. Princeton University, *Humanities Language Learning Program Director and Professor of Classics; European Languages and Studies* (Latin epic, medieval Latin, Roman history and culture, Classical reception)

## European Languages and Studies Courses

### **EURO ST 9. Topics in Europe in the Middle Ages. 4 Units.**

Explores the literature, history, and thought of the European Middle Ages. Topics may include understandings of self and community, aristocratic power and courtly life, colonialism, crusading, religious beliefs and persecution, monasticism and reform, university culture, epic literature, and Arthurian romance.

Repeatability: Unlimited as topics vary.

**(IV and VIII ).**

### **EURO ST 10. Topics in Historical Foundations (1500-1800). 4 Units.**

Offers an overview of the European experience from its social, political, and cultural foundations to modern European issues and institutions in a globalized world. Topics include social, political, and cultural history up to the French Revolution.

Repeatability: Unlimited as topics vary.

Overlaps with EURO ST S10.

**((III or IV) and VIII ).**



**EURO ST S10. Historical Foundations: Europe and the Foundations of the Modern World. 4 Units.**

Encompasses a variety of perspectives in the social sciences and the humanities involving crucial developments coming out of Europe from roughly 1500 to 1800, (the Protestant Reformation through the French Revolution), that helped shape the modern (western) world.

Overlaps with EURO ST 10.

((III or IV) and VIII ).

**EURO ST 11. Issues and Institutions in Modern Europe (1789-1945). 4 Units.**

Offers an overview of modern European societies in social, political, and cultural terms. Topics include shifting geopolitical borders, social movements, and various forms of cultural expression (film, art, literature) as they intersect with and shape issues and events after 1800.

Repeatability: Unlimited as topics vary.

((III or IV) and VIII ).

**EURO ST S11. Europe's Futures: 1755-Present. 4 Units.**

Introduces students to competing approaches from humanities and social sciences to conceptualizing the future in politics, art, and literature. From the enlightenment to today, investigates the cultural and political context of moments when new ideas emerged to secure Europe's futures.

Overlaps with EURO ST 11.

((III or IV) and VIII ).

**EURO ST 12. What is the Origin of Language?. 4 Units.**

Teaches symbol-based logic and universal grammar in human language as tools to investigate the origin of language. Does language originate with reason? Is language inherently universal or diverse? Does it begin as something literal or figurative.

((III or IV) and Vb ).

**EURO ST 13. Topics in Contemporary Europe (1945 – Today). 4 Units.**

Offers a perspective on contemporary politics and social and cultural life of today's Europe. Introduces students to literature, film, and social theory crises of the contemporary world as they emanated from World War II, such as nationalism and populism.

Repeatability: Unlimited as topics vary.

(IV and VIII ).

**EURO ST 101A. European Studies Core I - Early Europe (Pre-1789). 4 Units.**

Introduction to multidisciplinary approaches to important themes in European society, culture, art, literature, and politics; encourages students to explore intersections among disciplines. Possible themes: Concept of Europe in Renaissance, Self and Other: Europe and Islam, Hybrid Cultures in Medieval Europe.

Repeatability: Unlimited as topics vary.

**EURO ST 101B. European Studies Core II: Modern Europe (Post-1789). 4 Units.**

Multidisciplinary approaches to important themes in modern European society, culture, art, literature, and politics, encouraging students to see points of intersection among disciplines. Possible themes: Subjects, Citizens, and Representation; Europe in the World; European Revolutions in Art and Society.

Repeatability: Unlimited as topics vary.

**EURO ST 102. Topics in Early European History and Culture: Pre-1789. 4 Units.**

Addresses historical and cultural events, issues, and texts (art, literature, music, political theory) from the pre-1789 period in more than one European country.

Repeatability: Unlimited as topics vary.

**EURO ST 103. Topics in Modern European History and Culture: Post-1789. 4 Units.**

Addresses historical and cultural events, issues, and texts (art, literature, music, political theory) from 1789 to present in more than one European country.

Repeatability: Unlimited as topics vary.

**EURO ST 190W. Senior Seminar in European Studies. 4 Units.**

Capstone research seminar. Students engage in rigorous, in-depth, interdisciplinary exploration of specific topics, periods, or themes, investigating and analyzing the intersection of material and discursive culture in different historical periods and geographical locations.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: School of Humanities students only.

(Ib)

**EURO ST 199. Independent Study. 1-4 Units.**

Directed reading and research in consultation with a faculty advisor. Substantial written work required.

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**EURO ST 200A. Core Seminar I: Foundations of European Thought and Culture. 4 Units.**

Provides a historical, geographical, and methodological overview of foundational texts and issues in European thought and culture. Covering several historical periods between the Middle Ages and the present, students will see how ideas and institutions change over time.

**EURO ST 200B. Core Seminar II: Theorizing Periods and Movements in European Thought and Culture. 4 Units.**

Periods and movements still form basic units for organizing European thought and theory, even as such categories are problematized. This course will allow for greater focus on a specific time period or constellation of issues around a period or movement.

**EURO ST 200C. Core Seminar III: European Thought and Culture Beyond Europe. 4 Units.**

Studies the intersection and afterlives of European thought and culture with and in non-European contexts, the way European thought and culture has been translated and transformed, taken up and challenged, in colonial, postcolonial, and other global situations.

**EURO ST 201. Topics in European Studies. 4 Units.**

Seminars on various topics related to European Studies.

Repeatability: Unlimited as topics vary.

**EURO ST 299. Independent Research. 4 Units.**

For students to do independent research with advisors on their master's thesis or master's examination reading lists.

Restriction: Graduate students only. School of Humanities students only.

## French Courses

**FRENCH 1A. Fundamentals of French. 5 Units.**

First quarter of first-year French in a hybrid format. Students are taught to conceptualize in French as they learn to understand, read, write, and speak. Classes are conducted entirely in French.

Overlaps with FRENCH S1AB, FRENCH 1AB, FRENCH 1ABSP.

**FRENCH 1AB. Intensive Fundamentals of French. 7.5 Units.**

Intensive first half of first-year French. Students are taught to conceptualize in French as they learn to read, write, and speak. Students develop an awareness of and sensibility to French and Francophone life and culture through reading, viewing, and discussion.

Overlaps with FRENCH 1A, FRENCH 1B, FRENCH S1AB.

**FRENCH 1ABSP. Accelerated Fundamentals of French for Spanish Speakers. 5 Units.**

Accelerated first half of first-year French for Hispanophone students. Teaches conceptualizing in French while learning to read, write, and speak using knowledge of Spanish. Develops awareness of and sensibility to French and Francophone life and culture through reading, viewing, discussing.

Prerequisite: Two years of high school Spanish, one semester of college Spanish, or heritage speaker of Spanish.

Overlaps with FRENCH 1A, FRENCH 1AB, FRENCH S1AB, FRENCH 1B.

**FRENCH 1B. Fundamentals of French. 5 Units.**

First quarter of first-year French in a hybrid format. Students are taught to conceptualize in French as they learn to understand, read, write, and speak. Classes are conducted entirely in French.

Prerequisite: FRENCH 1A. FRENCH 1A with a grade of C or better

Overlaps with FRENCH S1AB, FRENCH S1BC, FRENCH 1AB, FRENCH 1BC, FRENCH 1ABSP, FRENCH 1BCSP.



**FRENCH 1BC. Intensive Fundamentals of French. 7.5 Units.**

Intensive second half of first-year French. Students are taught to conceptualize in French as they learn to read, write, and speak. Students develop an awareness of and sensibility to French and Francophone life and culture through reading, viewing, and discussion.

Prerequisite: FRENCH 1AB or FRENCH 1B or FRENCH S1AB. FRENCH 1AB with a grade of C or better. FRENCH 1B with a grade of C or better. FRENCH S1AB with a grade of C or better. Placement into FRENCH 1BC is also accepted.

Overlaps with FRENCH 1B, FRENCH 1C, FRENCH S1BC.

(VI)

**FRENCH 1BCSP. Accelerated Fundamentals of French for Spanish Speakers. 5 Units.**

Accelerated second half of first-year French for Hispanophone students. Teaches conceptualizing in French while learning to read, write, and speak using knowledge of Spanish. Develops awareness of and sensibility to French and Francophone life and culture through reading, viewing, discussing.

Prerequisite: FRENCH 1ABSP or FRENCH 1AB or FRENCH S1AB or FRENCH 1B. FRENCH 1ABSP with a grade of C or better. FRENCH 1AB with a grade of C or better. FRENCH S1AB with a grade of C or better. FRENCH 1B with a grade of C or better. Two years of high school Spanish, one semester of college Spanish, or heritage speaker of Spanish.

Overlaps with FRENCH 1B, FRENCH 1BC, FRENCH S1BC, FRENCH 1C.

(VI)

**FRENCH 1C. Fundamentals of French. 5 Units.**

First quarter of first-year French in a hybrid format. Students are taught to conceptualize in French as they learn to understand, read, write, and speak. Classes are conducted entirely in French.

Prerequisite: FRENCH 1B. FRENCH 1B with a grade of C or better

Overlaps with FRENCH S1BC, FRENCH 1BC, FRENCH 1BCSP.

(VI)

**FRENCH S1AB. Intensive Fundamentals of French. 7.5 Units.**

First half of first-year French in an intensified form and hybrid format. Students are taught to conceptualize in French as they learn to understand, read, write, and speak. Classes are conducted entirely in French.

Overlaps with FRENCH 1A, FRENCH 1B, FRENCH 1AB, FRENCH 1ABSP.

**FRENCH S1BC. Intensive Fundamentals of French. 7.5 Units.**

Second half of first-year French in an intensified form and hybrid format. Students are taught to conceptualize in French as they learn to understand, read, write, and speak. Classes are conducted entirely in French.

Prerequisite: FRENCH S1AB or FRENCH 1B or FRENCH 1AB or FRENCH 1ABSP. FRENCH S1AB with a grade of C or better. FRENCH 1B with a grade of C or better. FRENCH 1AB with a grade of C or better. FRENCH 1ABSP with a grade of C or better

Overlaps with FRENCH 1B, FRENCH 1C, FRENCH 1BC, FRENCH 1BCSP.

(VI)

**FRENCH 2A. Intermediate French. 4 Units.**

Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in French.

Prerequisite: FRENCH 1C or FRENCH 1BC or FRENCH S1BC or FRENCH 1BCSP. FRENCH 1C with a grade of C or better. FRENCH 1BC with a grade of C or better. FRENCH S1BC with a grade of C or better. FRENCH 1BCSP with a grade of C or better. Placement into FRENCH 2A is also accepted.

Overlaps with FRENCH S2AB.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(VIII)

**FRENCH 2AB. Intensive Intermediate French . 6 Units.**

Intensive first half of second-year French. Texts and films of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in French.

Prerequisite: FRENCH 1C or FRENCH 1BC or FRENCH S1BC. FRENCH 1C with a grade of C or better. FRENCH 1BC with a grade of C or better. FRENCH S1BC with a grade of C or better. Prior high school or college French is recommended. Placement into French 2AB is also accepted.

Overlaps with FRENCH 2A, FRENCH 2B, FRENCH S2AB.

**(VIII)**

**FRENCH 2B. Intermediate French. 4 Units.**

Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in French.

Prerequisite: FRENCH 2A. FRENCH 2A with a grade of C or better

Overlaps with FRENCH S2AB, FRENCH S2BC.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment. FRENCH 2B and FRENCH S2AB and FRENCH S2BC may not be taken for full credit.

**(VIII)**

**FRENCH 2BC. Intensive Intermediate French . 6 Units.**

Intensive second half of second-year French. Texts and films of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in French.

Prerequisite: FRENCH S2AB or FRENCH 2AB. FRENCH S2AB with a grade of C or better. FRENCH 2AB with a grade of C or better. Prior high school or college French is recommended. Placement into French 2BC is also accepted.

Overlaps with FRENCH S2BC, FRENCH 2B, FRENCH 2C.

**(VIII)**

**FRENCH 2C. Intermediate French. 4 Units.**

Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in French.

Prerequisite: FRENCH 2B or FRENCH S2AB. FRENCH 2B with a grade of C or better. FRENCH S2AB with a grade of C or better

Overlaps with FRENCH S2BC.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment. FRENCH 2C and FRENCH S2BC may not be taken for full credit.

**(VIII)**

**FRENCH S2AB. Intermediate French. 6 Units.**

First half of second-year French in an intensified form. Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in French. Prior high school or college French recommended.

Prerequisite: FRENCH 1C or FRENCH 1BC or FRENCH S1BC. FRENCH 1C with a grade of C or better. FRENCH 1BC with a grade of C or better. FRENCH S1BC with a grade of C or better. Placement into FRENCH S2AB is also accepted.

Overlaps with FRENCH 2A, FRENCH 2B.

Restriction: FRENCH S2AB and FRENCH 2A and FRENCH 2B may not be taken for full credit.

**(VIII)**

**FRENCH S2BC. Intermediate French. 6 Units.**

Second half of second-year French in an intensified form. Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in French. Prior high school or college French recommended.

Prerequisite: FRENCH S2AB or FRENCH 2B. FRENCH S2AB with a grade of C or better. FRENCH 2B with a grade of C or better

Overlaps with FRENCH 2C, FRENCH 2B.

Restriction: FRENCH S2BC and FRENCH 2B and FRENCH 2C may not be taken for full credit.

**(VIII)****FRENCH 10. French Peer Tutoring. 1 Unit.**

Tutoring Program in which advanced French students provide assistance to students at a lower level. One hour of tutoring per week.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**FRENCH 50. Topics in French Culture and the Modern World. 4 Units.**

Introductory course for non-majors. Focuses on France's role in the modern world and its cultural connections to Asia, the Middle East, Africa, Europe, and the Americas. Taught in English.

Repeatability: May be taken for credit 3 times as topics vary.

**(IV and VIII ).****FRENCH 97. Fundamentals of French (with Emphasis on Reading). 4 Units.**

Designed primarily for students interested in acquiring a solid reading knowledge of French, and to facilitate the understanding and translating of French texts dealing with a variety of disciplines.

Restriction: No French Majors.

**FRENCH 101A. Introduction to 19th-Century French Literature. 4 Units.**

Fiction, nonfiction, drama, and poetry of the 19th century studied in relationship to a specific literary or historical problem.

Prerequisite: FRENCH 2C or FRENCH S2BC

**FRENCH 101B. Introduction to 18th-Century French Literature. 4 Units.**

Literature and philosophy of the 18th century studied in relationship to a specific literary or historical problem.

Prerequisite: FRENCH 2C or FRENCH S2BC

**FRENCH 101C. Introduction to 20th-Century French Literature. 4 Units.**

Literatures of the French-speaking world studied in relationship to a specific literary or historical problem.

Prerequisite: FRENCH 2C or FRENCH S2BC

**FRENCH 102A. Grammar and Composition. 4 Units.**

Review of grammar taught in FRENCH 2A-B-C. Students gain facility in writing French and increase reading comprehension. Short texts and films are introduced to generate substantive discussion, and multiple short writing exercises are assigned to solidify skills. Formerly FRENCH 60.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better

**FRENCH 102B. Topics in Issues in French and Francophone Culture. 4 Units.**

Investigation of an issue of cultural significance in the francophone world through historical documents, literary works, and newspaper articles. Supplemented with films and/or other elements of popular culture. Multiple short writing assignments to solidify writing skills. Formerly FRENCH 61.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 102C. Translation. 4 Units.**

Introduction to the theory and practice of translation from French to English and English to French. Many opportunities provided to improve skills in writing and comprehension. Formerly FRENCH 62.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better

**FRENCH 102D. Topics in the Work World in French. 4 Units.**

A view into the world of work in French. Areas of study include international relations; French administration; and tensions between management and workers. Attention given to vocabulary and grammar of professional interactions in French. Formerly FRENCH 63.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 102E. Advanced French Language and Style. 4 Units.**

Intended for advanced students who wish to improve their expressive capabilities in French. Review of more nuanced grammar points. Emphasis placed on rhetoric, syntax, and precision. Advanced readings increase comprehension. Formerly FRENCH 64.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better

**FRENCH 116. Topics in 16th-Century French Literature. 4 Units.**

Examines the diverse literature of the Renaissance and the Age of Exploration.

Repeatability: Unlimited as topics vary.

**FRENCH 117. Topics in 17th-Century French Literature. 4 Units.**

Examines the age of drama and other vibrant forms in French literature of the period.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC or FRENCH 60. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better. FRENCH 60 with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 118. Topics in 18th-Century French Literature. 4 Units.**

Examines the literature and philosophy of the Enlightenment, the Ancient Régime, Classicism, and/or Revolution.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC or FRENCH 60. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better. FRENCH 60 with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 119. Topics in 19th-Century French Literature. 4 Units.**

Focuses on the literature of an era that experienced many modernist transformations.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC or FRENCH 60. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better. FRENCH 60 with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 120. Topics in 20th-Century French and Francophone Literature. 4 Units.**

A study of modern and contemporary literature and culture.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC or FRENCH 60. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better. FRENCH 60 with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 125. Topics in African Literature of French Expression. 4 Units.**

Introduction to the principal African and Caribbean works written in French. Offers opportunity to study literature and culture in French in a non-European context. Lectures and papers in French.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC or FRENCH 60. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better. FRENCH 60 with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 127. Topics in Francophone Literature and Culture. 4 Units.**

Literature and cultures of the francophone world.

Repeatability: Unlimited as topics vary.

**FRENCH 139W. Literature and Society. 4 Units.**

In English. Readings of masterpieces of French literature in their social, political, and historical contexts. Requires at least 4,000 words of assigned composition based on French works. Several essays required.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. French Majors have first consideration for enrollment.

(Ib)

**FRENCH 140. Topics in French Literary Genre. 4 Units.**

Examines the development and transformation of a single genre, such as the poem or the novel.

Prerequisite or corequisite: FRENCH 2C or FRENCH 2BC or FRENCH S2BC or FRENCH 60. FRENCH 2C with a grade of C or better. FRENCH 2BC with a grade of C or better. FRENCH S2BC with a grade of C or better. FRENCH 60 with a grade of C or better

Repeatability: Unlimited as topics vary.

**FRENCH 150. Topics in French Literature and Culture. 4 Units.**

Study of a theme, movement, or problem crucial to understanding French Literature and Culture.

Repeatability: Unlimited as topics vary.

**FRENCH 160. French Cinema. 4 Units.**

Study of a period, movement, or theme in French or Francophone cinema.

Repeatability: May be taken for credit 2 times as topics vary.

**FRENCH 170. Topics in History and Literature. 4 Units.**

Examines the dialogue between historical events and literary texts.

Repeatability: Unlimited as topics vary.

**FRENCH 171. Politics and Literature. 4 Units.**

Examines the role played by politics and ethics in French literature, film, and culture.

Repeatability: Unlimited as topics vary.

**FRENCH 180. Topics in Theory and Criticism. 4 Units.**

Advanced study of theoretical and critical texts.

Repeatability: Unlimited as topics vary.

**FRENCH 185. Junior/Senior Seminar in French Literature and Culture. 4 Units.**

Required intensive writing course for French majors to explore in depth selected topic in French literature and culture. Students complete major independent research project on topic studied, making use of literary and critical materials in their capstone essay. In French.

Prerequisite: FRENCH 100A and FRENCH 100B and FRENCH 101A and FRENCH 101B and FRENCH 101C. One course from FRENCH 101A, FRENCH 101B, or FRENCH 101C may be taken as a corequisite.

**FRENCH 199. Special Studies in French. 1-4 Units.**

A project proposal is prepared by the student and approved by the faculty member who directs the project. Procedure must be completed by the end of the first week of classes.

Repeatability: Unlimited as topics vary.

Restriction: Repeatability: once for M.A. candidates; twice for Ph.D. candidates.

**FRENCH 216. Studies in Renaissance Literature. 4 Units.**

Advanced study of a topic in the Renaissance period.

Repeatability: Unlimited as topics vary.

**FRENCH 217. Studies in Seventeenth-Century Literature. 4 Units.**

Advanced study of a topic in the 17th century.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**FRENCH 218. Studies in Eighteenth-Century Literature. 4 Units.**

Advanced study of a topic in the 18th century.

Repeatability: Unlimited as topics vary.

**FRENCH 219. Studies in Nineteenth-Century Literature. 4 Units.**

Advanced study of a topic in the 19th century.

Repeatability: Unlimited as topics vary.

**FRENCH 220. Studies in Twentieth-Century Literature. 4 Units.**

Advanced study of a topic in the 20th and 21st century.

Repeatability: May be taken for credit 9 times as topics vary.

Restriction: Graduate students only.

**FRENCH 225. Francophone Literature and Culture. 4 Units.**

Studies in different francophone literatures and cultures (of Canada, the Caribbean, West and North Africa, and Southeast Asia).

Repeatability: Unlimited as topics vary.

**FRENCH 231. Studies in Fiction . 4 Units.**

Examines the art of fiction.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**FRENCH 232. Studies in Nonfictional Prose. 4 Units.**

Examines non-fictional genres such as the essay and the memoir.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**FRENCH 233. Studies in Poetry and Poetics. 4 Units.**

Examines the genre of poetry and theories of poetry.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**FRENCH 240. Studies on a Major Writer. 4 Units.**

Focused study of one author.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**FRENCH 250. Studies in Theory and Criticism. 4 Units.**

Advanced study of a topic in theory and/or criticism.

Repeatability: Unlimited as topics vary.

**FRENCH 254. History and Literature. 4 Units.**

Advanced study of literary works in their historical context.

Repeatability: Unlimited as topics vary.

**FRENCH 272. Cultural Studies . 4 Units.**

Examines the theoretical paradigm of cultural studies.

Repeatability: Unlimited as topics vary.

**FRENCH 290. Research in French Language and Literature. 4 Units.**

A project proposal is prepared by the student and approved by the faculty member who directs the project. Procedure must be completed by the end of the first week of classes. Limit: Once for M.A. candidates; twice for Ph.D. candidates.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only. French Majors only.

**FRENCH 299. Dissertation Research. 4-12 Units.**

For graduate students writing a dissertation with a faculty member in French.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Humanities students only.

**FRENCH 399. University Teaching. 4 Units.**

For graduate students completing a course on foreign language pedagogy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Humanities students only.

## German Courses

**GERMAN 1A. Fundamentals of German. 5 Units.**

Emphasizes the development of meaningful communicative skills in German for the purposes of interaction with German speakers and beginning study of German. With a learner-centered approach, the courses help students develop speaking, listening, reading, writing, and cultural skills and knowledge.

Overlaps with GERMAN S1AB, GERMAN 1AB.

**GERMAN 1AB. Intensive German Fundamentals . 7.5 Units.**

First half of first-year German in a time-intensive form. Development of meaningful communicative skills for the purposes of interaction with German speakers and beginning study of German. Learner-centered approach develops speaking, listening, reading, writing, and cultural skills and knowledge. Materials fee.

Prerequisite: Placement into GERMAN 1AB.

Overlaps with GERMAN S1AB, GERMAN 1A, GERMAN 1B.

Restriction: GERMAN 1AB and GERMAN 1A and GERMAN 1B and GERMAN S1AB may not be taken for full credit.

**GERMAN 1B. Fundamentals of German. 5 Units.**

Emphasizes the development of meaningful communicative skills in German for the purposes of interaction with German speakers and beginning study of German. With a learner-centered approach, students develop speaking, listening, reading, writing, and cultural skills and knowledge.

Prerequisite: GERMAN 1A. GERMAN 1A with a grade of C or better. Placement into GERMAN 1B is also accepted.

Overlaps with GERMAN S1AB, GERMAN S1BC, GERMAN 1AB, GERMAN 1BC.

**GERMAN 1BC. Intensive German Fundamentals. 7.5 Units.**

Second half of first-year German in a time-intensive form. Development of meaningful communicative skills for the purposes of interaction with German speakers and beginning study of German. Learner-centered approach develops speaking, listening, reading, writing, and cultural skills and knowledge. Materials fee.

Prerequisite: GERMAN 1AB or GERMAN 1B or GERMAN S1AB. GERMAN 1AB with a grade of C or better. GERMAN 1B with a grade of C or better. GERMAN S1AB with a grade of C or better. Placement into GERMAN 1BC is also accepted.

Overlaps with GERMAN 1B, GERMAN 1C, GERMAN S1BC.

Restriction: GERMAN 1BC and GERMAN 1B and GERMAN 1C and GERMAN S1AB may not be taken for full credit.

**(VI)**

**GERMAN 1C. Fundamentals of German. 5 Units.**

Emphasizes the development of meaningful communicative skills in German for the purposes of interaction with German speakers and beginning study of German. With a learner-centered approach, students develop speaking, listening, reading, writing, and cultural skills and knowledge.

Prerequisite: GERMAN 1B. GERMAN 1B with a grade of C or better. Placement into GERMAN 1C is also accepted.

Overlaps with GERMAN 1BC, GERMAN S1BC.

**(VI)**

**GERMAN S1AB. Fundamentals of German. 7.5 Units.**

First half of first-year German in a time-intensive form. Development of meaningful communicative skills for the purposes of interaction with German speakers and beginning study of German. Learner-centered approach develops speaking, listening, reading, writing, and cultural skills and knowledge.

Overlaps with GERMAN 1A, GERMAN 1B, GERMAN 1AB.

Restriction: GERMAN S1AB and GERMAN 1A and GERMAN 1B and GERMAN 1AB may not be taken for full credit.

**GERMAN S1BC. Fundamentals of German. 7.5 Units.**

Second half of first-year German in a time-intensive form. Development of meaningful communicative skills for the purposes of interaction with German speakers and beginning study of German. Learner-centered approach develops speaking, listening, reading, writing, and cultural skills and knowledge.

Prerequisite: GERMAN 1AB or GERMAN 1B or GERMAN S1AB. GERMAN 1AB with a grade of C or better. GERMAN 1B with a grade of C or better. GERMAN S1AB with a grade of C or better. Placement into GERMAN S1BC is also accepted.

Overlaps with GERMAN 1B, GERMAN 1C, GERMAN 1BC.

Restriction: GERMAN 1BC and GERMAN S1BC and GERMAN 1B and GERMAN 1C may not be taken for full credit.

**(VI)**

**GERMAN 2A. Intermediate German. 4 Units.**

Emphasizes communicative skills for the purposes of interaction with German speakers and intermediate study of German. With a learner-centered approach, helps students develop reading, writing, speaking, listening, grammatical, and cultural skills and knowledge. First-year grammar is reviewed and expanded.

Prerequisite: GERMAN 1BC or GERMAN 1C or GERMAN S1BC. GERMAN 1BC with a grade of C or better. GERMAN 1C with a grade of C or better. GERMAN S1BC with a grade of C or better. Placement into GERMAN 2A is also accepted.

Overlaps with GERMAN S2AB.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)**



**GERMAN 2B. Intermediate German. 4 Units.**

Emphasizes communicative skills for the purposes of interaction with German speakers and intermediate study of German. With a learner-centered approach, helps students develop reading, writing, speaking, listening, grammatical, and cultural skills and knowledge. First-year grammar is reviewed and expanded.

Prerequisite: GERMAN 2A. GERMAN 2A with a grade of C or better. Placement into GERMAN 2B is also accepted.

Overlaps with GERMAN S2AB, GERMAN S2BC.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)****GERMAN 2C. Intermediate German. 4 Units.**

Emphasizes communicative skills for the purposes of interaction with German speakers and intermediate study of German. With a learner-centered approach, helps students develop reading, writing, speaking, listening, grammatical, and cultural skills and knowledge. First-year grammar is reviewed and expanded.

Prerequisite: GERMAN 2B. GERMAN 2B with a grade of C or better. Placement into GERMAN 2C is also accepted.

Overlaps with GERMAN S2BC.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)****GERMAN S2AB. Intermediate German. 6 Units.**

First half of second-year German in a time-intensive form. Emphasizes communicative skills for the purposes of interaction with German speakers and intermediate study of German. Learner-centered approach develops reading, writing, speaking, listening, grammatical, and cultural skills and knowledge.

Prerequisite: GERMAN 1C or GERMAN S1BC

Overlaps with GERMAN 2A, GERMAN 2B.

Restriction: GERMAN S2AB and GERMAN 2A and GERMAN 2B may not be taken for full credit.

**(VIII)****GERMAN S2BC. Intermediate German. 6 Units.**

Second half of second-year German in a time-intensive form. Emphasizes communicative skills for the purposes of interaction with German speakers and intermediate study of German. Learner-centered approach develops reading, writing, speaking, listening, grammatical, and cultural skills and knowledge.

Prerequisite: GERMAN 2B or GERMAN S2AB. GERMAN 2B with a grade of C or better. GERMAN S2AB with a grade of C or better

Overlaps with GERMAN 2B, GERMAN 2C.

Restriction: GERMAN S2BC and GERMAN 2B and GERMAN 2C may not be taken for full credit.

**(VIII)****GERMAN 53. Advanced Conversation. 2 Units.**

Includes reading of political and cultural material. Conducted in German.

Prerequisite or corequisite: GERMAN 2C

Repeatability: May be repeated for credit unlimited times.

**GERMAN 97. Fundamentals of German (with Emphasis on Reading). 4 Units.**

Primarily for students interested in acquiring a solid reading knowledge of German. Facilitates comprehension and translation of texts in various disciplines. Does not serve as prerequisite for any higher-level German courses or fulfill any undergraduate foreign language requirement.

Repeatability: May be taken for credit 3 times.

Restriction: No German Studies Majors.

**GERMAN 101. Topics in Introduction to German Literature and Culture. 4 Units.**

Sample interpretations of texts in their cultural and historical contexts. Introduction to critical language in German.

Prerequisite or corequisite: GERMAN 2C. GERMAN 2C with a grade of C or better

Repeatability: Unlimited as topics vary.

**GERMAN 102. Topics in German Culture and Society. 4 Units.**

Interdisciplinary introduction to German culture from the perspective of its aesthetic, social, and political aspects. Methodological problems arising from an analysis of culture in its historical context.

Prerequisite or corequisite: GERMAN 2C. GERMAN 2C with a grade of C or better

Repeatability: Unlimited as topics vary.

**GERMAN 103. Topics in German Film. 4 Units.**

Introduction to the history and interpretation of German film within its cultural and social contexts. Enhances German grammar knowledge and vocabulary and develops sophisticated speaking, writing, and reading skills.

Prerequisite or corequisite: GERMAN 2C. GERMAN 2C with a grade of C or better

Repeatability: Unlimited as topics vary.

**GERMAN 104. Topics in German Linguistics. 4 Units.**

Introduces German or other Germanic-language linguistic, sociolinguistic, or ethnography-of-communication topics. Taught in German.

Prerequisite or corequisite: GERMAN 2C. GERMAN 2C with a grade of C or better

Repeatability: Unlimited as topics vary.

**GERMAN 105. German for Professions . 4 Units.**

Explores the structure of German business practices, including in scientific fields and engineering, while developing verbal and written skills important for professional life in Germany. Taught in German.

Prerequisite or corequisite: GERMAN 2C. GERMAN 2C with a grade of C or better

**GERMAN 115. Topics in Advanced German for Business and Economics. 4 Units.**

Explores the structure of the German economy and business practices while developing advanced verbal and written skills important for professional life in Germany. Taught in German.

Prerequisite or corequisite: GERMAN 101 or GERMAN 102 or GERMAN 103 or GERMAN 104 or GERMAN 105

Repeatability: Unlimited as topics vary.

**GERMAN 118. Topics in Studies in the Age of Goethe. 4 Units.**

Individual authors such as Lessing, Goethe, Schiller, Kleist, and Hölderlin, or the drama of the 'angry young men' of the German 1770s.

Prerequisite or corequisite: GERMAN 101 or GERMAN 102 or GERMAN 103 or GERMAN 104 or GERMAN 105

Repeatability: Unlimited as topics vary.

**GERMAN 119. Topics in 19th Century German Literature and Culture. 4 Units.**

Individual authors such as Büchner, Grillparzer, Keller, and Nietzsche, or broader social-literary phenomena.

Prerequisite or corequisite: GERMAN 101 or GERMAN 102 or GERMAN 103 or GERMAN 104 or GERMAN 105

Repeatability: Unlimited as topics vary.

**GERMAN 120. Topics in 20th Century German Literature and Culture. 4 Units.**

Individual authors such as Thomas Mann, Brecht, and Kafka, or topics addressing questions of genre and/or social-literary problems.

Prerequisite or corequisite: GERMAN 101 or GERMAN 102 or GERMAN 103 or GERMAN 104 or GERMAN 105

Repeatability: Unlimited as topics vary.

**GERMAN 130. Topics in German Literature and Culture. 4 Units.**

Literary and cultural topics not fully contained within the periods listed above, such as 'German Comedy' and 'Turn-of-the-Century Vienna.'

Prerequisite or corequisite: GERMAN 101 or GERMAN 102 or GERMAN 103 or GERMAN 104 or GERMAN 105

Repeatability: Unlimited as topics vary.

**GERMAN 140. Topics in Literary Theory and Criticism. 4 Units.**

In English. Theoretical dimensions of literary criticism and the German philosophical tradition. Topics have included Marxism, Freudian thought, German Idealist aesthetics, Historicism, twentieth-century hermeneutics, Frankfurt School, and Rezeptionsästhetik.

Repeatability: Unlimited as topics vary.

**GERMAN 140W. Topics in Literary Theory and Criticism. 4 Units.**

In English. Theoretical dimensions of literary criticism and the German philosophical tradition. Topics have included Marxism, Freudian thought, German Idealist aesthetics, Historicism, twentieth-century hermeneutics, Frankfurt School, and Rezeptionsästhetik.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only.

**(Ib)**

**GERMAN 150. German Literature and Culture in Translation. 4 Units.**

In English. Major works in Germanic literature and culture in context.

Repeatability: Unlimited as topics vary.

**GERMAN 150W. German Literature and Culture in Translation. 4 Units.**

In English. Major works in Germanic literature and culture in context.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only.

**(Ib)**

**GERMAN 160. German Cinema.**

Historical, theoretical, and comparative perspectives on German cinema.

Repeatability: Unlimited as topics vary.

**GERMAN 160W. German Cinema. 4 Units.**

Historical, theoretical, and comparative perspectives on German cinema.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only.

**(Ib)**

**GERMAN 170. Topics in German Linguistics. 4 Units.**

Explores linguistic, sociolinguistic, or ethnography-of-communication topics of German or other Germanic languages (Swedish, Icelandic, Yiddish, and others). Taught in English.

Repeatability: Unlimited as topics vary.

**GERMAN 170W. Topics in German Linguistics. 4 Units.**

Explores linguistic, sociolinguistic, or ethnography-of-communication topics of German or other Germanic languages (Swedish, Icelandic, Yiddish, and others). Taught in English.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only.

**(Ib)****GERMAN 197. German Internship . 4 Units.**

In this internship course, students will engage in professional practice (e.g., Engineering, Business Administration, government) in a German setting and thereby increase their knowledge of German language and culture in a setting beyond the academic classroom.

Prerequisite: GERMAN 2C

Grading Option: Pass/no pass only.

**GERMAN 199. Independent Study. 1-4 Units.**

Independent research with German faculty.

Repeatability: May be repeated for credit unlimited times.

**GERMAN 200. Literary Criticism . 4 Units.**

Topics in literary criticism.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**GERMAN 210. Literary Theory . 4 Units.**

Topics in literary theory.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**GERMAN 220. Selected Topics in German Linguistics . 4 Units.**

Topics in German linguistics.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**GERMAN 230. Literary and Cultural History. 4 Units.**

Topics in literary and cultural history.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**GERMAN 290. Independent Study. 4 Units.**

Counted toward course requirements for the M.A. or Ph.D. A term paper or project is required.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Humanities students only.

**GERMAN 298. Independent Directed Reading. 4-12 Units.**

For students preparing for doctoral examination.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**GERMAN 299. Dissertation Research. 4-12 Units.**

For students who have been admitted to doctoral candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Humanities students only.

**GERMAN 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Italian Courses

**ITALIAN 1A. Fundamentals of Italian. 5 Units.**

First quarter of first-year Italian in a hybrid format. Students are taught to conceptualize in Italian as they learn to understand, read, write, and speak. Classes are conducted entirely in Italian.

Overlaps with ITALIAN S1AB, ITALIAN 1AB.

**ITALIAN 1AB. Intensive Italian Fundamentals. 7.5 Units.**

First half of first-year Italian in a time-intensive form. Development of meaningful communicative skills for the purposes of interaction with Italian speakers and beginning study of Italian. Learner-centered approach develops speaking, listening, reading, writing, and cultural skills and knowledge.

Overlaps with ITALIAN 1A, ITALIAN 1B, ITALIAN S1AB.

Restriction: ITALIAN 1AB and ITALIAN 1A and ITALIAN 1B and ITALIAN S1AB may not be taken for full credit.

**ITALIAN 1B. Fundamentals of Italian. 5 Units.**

Second quarter of first-year Italian in a hybrid format. Students are taught to conceptualize in Italian as they learn to understand, read, write, and speak. Classes are conducted entirely in Italian.

Prerequisite: ITALIAN 1A. ITALIAN 1A with a grade of C or better. Placement into ITALIAN 1B is also accepted.

Overlaps with ITALIAN S1AB, ITALIAN S1BC, ITALIAN 1AB, ITALIAN 1BC.

**ITALIAN 1BC. Intensive Italian Fundamentals. 7.5 Units.**

Second half of first-year Italian in a time-intensive form. Development of meaningful communicative skills for the purposes of interaction with Italian speakers and beginning study of Italian. Learner-centered approach develops speaking, listening, reading, writing, and cultural skills and knowledge.

Prerequisite: ITALIAN 1AB or ITALIAN S1AB or ITALIAN 1B. ITALIAN 1AB with a grade of C or better. ITALIAN S1AB with a grade of C or better. ITALIAN 1B with a grade of C or better. Placement into ITALIAN 1BC is also accepted.

Overlaps with ITALIAN 1B, ITALIAN 1C, ITALIAN S1BC.

Restriction: ITALIAN 1AB and ITALIAN 1A and ITALIAN 1B and ITALIAN S1AB may not be taken for full credit.

## (VI)

**ITALIAN 1C. Fundamentals of Italian. 5 Units.**

Third quarter of first-year Italian in a hybrid format. Students are taught to conceptualize in Italian as they learn to understand, read, write, and speak. Classes are conducted entirely in Italian.

Prerequisite: ITALIAN 1B or ITALIAN 1AB or ITALIAN S1AB. ITALIAN 1B with a grade of C or better. ITALIAN 1AB with a grade of C or better. ITALIAN S1AB with a grade of C or better. Placement into ITALIAN 1C is also accepted.

Overlaps with ITALIAN S1BC, ITALIAN 1BC.

## (VI)

**ITALIAN S1AB. Italian Fundamentals. 7.5 Units.**

First-year Italian in an intensified form. Students are taught to conceptualize in Italian as they learn to understand, read, write, and speak. Classes are conducted entirely in Italian and meet daily three hours for five weeks each session.

Overlaps with ITALIAN 1A, ITALIAN 1B, ITALIAN 1AB.

Restriction: ITALIAN S1AB and ITALIAN 1A and ITALIAN 1B and ITALIAN 1AB may not be taken for full credit.

**ITALIAN S1BC. Italian Fundamentals. 7.5 Units.**

First-year Italian in an intensified form. Students are taught to conceptualize in Italian as they learn to understand, read, write, and speak. Classes are conducted entirely in Italian and meet daily three hours for five weeks each session.

Prerequisite: ITALIAN S1AB or ITALIAN 1B or ITALIAN 1AB. ITALIAN S1AB with a grade of C or better. ITALIAN 1B with a grade of C or better. ITALIAN 1AB with a grade of C or better

Overlaps with ITALIAN 1B, ITALIAN 1C, ITALIAN 1BC.

Restriction: ITALIAN S1BC and ITALIAN 1B and ITALIAN 1C and ITALIAN 1BC may not be taken for full credit.

**(VI)**

**ITALIAN 2A. Intermediate Italian. 4 Units.**

Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in Italian.

Prerequisite: ITALIAN 1C or ITALIAN 1BC or ITALIAN S1BC. ITALIAN 1C with a grade of C or better. ITALIAN 1BC with a grade of C or better. ITALIAN S1BC with a grade of C or better. Placement into ITALIAN 2A is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)**

**ITALIAN 2B. Intermediate Italian. 4 Units.**

Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in Italian.

Prerequisite: ITALIAN 2A. ITALIAN 2A with a grade of C or better. Placement into ITALIAN 2B is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)**

**ITALIAN 2C. Intermediate Italian. 4 Units.**

Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in Italian.

Prerequisite: ITALIAN 2B. ITALIAN 2B with a grade of C or better. Placement into 2C is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)**

**ITALIAN 50. Topics in Italian Culture. 4 Units.**

Examines Italian culture at home and from abroad, in cinema, literature, and popular culture.

Repeatability: Unlimited as topics vary.

**(IV and VIII ).**

**ITALIAN 99. Special Studies in Italian. 4 Units.**

Both student and instructor arrive at the theme of the course and the critical approach to be followed in consultation. Intended to offer courses in Italian otherwise unavailable.

Repeatability: May be repeated for credit unlimited times.

**ITALIAN 150. Topics in Italian Literature and Culture. 4 Units.**

Major themes, periods, and/or movements in Italian literature and culture. Taught in English.

Repeatability: Unlimited as topics vary.

**ITALIAN 199. Tutorial in Italian Literature and Culture. 4 Units.**

The student must submit a written description of the proposed course to the instructor and the Chair prior to the beginning of the course.

Repeatability: Unlimited as topics vary.

## Russian Courses

**RUSSIAN 1A. Fundamentals of Russian. 5 Units.**

Focuses on reading, comprehension, basic composition, and conversation skills, and gives the student an initial exposure to the Russian cultural scene.

Prerequisite: Placement into RUSSIAN 1A.

**RUSSIAN 1B. Fundamentals of Russian. 5 Units.**

Focuses on reading, comprehension, basic composition, and conversation skills, and gives the student an initial exposure to the Russian cultural scene.

Prerequisite: RUSSIAN 1A. RUSSIAN 1A with a grade of C or better. Placement into RUSSIAN 1B is also accepted.

**RUSSIAN 1C. Fundamentals of Russian. 5 Units.**

Focuses on reading, comprehension, basic composition, and conversation skills, and gives the student an initial exposure to the Russian cultural scene.

Prerequisite: RUSSIAN 1AB or RUSSIAN 1B. RUSSIAN 1AB with a grade of C or better. RUSSIAN 1B with a grade of C or better. Placement into RUSSIAN 1C is also accepted.

### (VI)

**RUSSIAN 2A. Intermediate Russian. 4 Units.**

Students read simple passages from contemporary Russian literary texts and newspapers. Development of oral skills and exposure to Russian culture continue.

Prerequisite: RUSSIAN 1BC or RUSSIAN 1C. RUSSIAN 1BC with a grade of C or better. RUSSIAN 1C with a grade of C or better. Placement into RUSSIAN 2A is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

### (VIII)

**RUSSIAN 2B. Intermediate Russian. 4 Units.**

Students read simple passages from contemporary Russian literary texts and newspapers. Development of oral skills and exposure to Russian culture continue.

Prerequisite: RUSSIAN 2A. RUSSIAN 2A with a grade of C or better. Placement into RUSSIAN 2B is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

### (VIII)

**RUSSIAN 2C. Intermediate Russian. 4 Units.**

Students read simple passages from contemporary Russian literary texts and newspapers. Development of oral skills and exposure to Russian culture continue.

Prerequisite: RUSSIAN 2B. RUSSIAN 2B with a grade of C or better. Placement into RUSSIAN 2C is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

### (VIII)

**RUSSIAN 50. Russian Culture . 4 Units.**

Study of varied topics in Russian culture, area studies, and society, both in the present and in historical perspective.

Repeatability: May be taken for credit 4 times as topics vary.

### (IV, VIII)

**RUSSIAN 99. Special Studies Russian. 1-5 Units.**

Special studies under faculty supervision.

Repeatability: May be taken for credit 2 times.

**RUSSIAN 150. Topics in Russian Literature. 4 Units.**

Examines major themes in Russian literature, film, and other media from the eighteenth to twenty-first centuries. Taught in English.

Repeatability: Unlimited as topics vary.

**RUSSIAN 190. Topics in Russian Language Through Film. 4 Units.**

Uses Russian films of the late 20th century to enhance students' language skills and deepen their cultural knowledge. Work involves intensive conversation, reading and listening comprehension, and the acquisition of written skills and grammatical accuracy. Conducted primarily in Russian.

Prerequisite or corequisite: RUSSIAN 2C

Repeatability: Unlimited as topics vary.

**RUSSIAN 199. Independent Study. 1-4 Units.**

Independent study under direct faculty supervision.

Repeatability: May be taken for credit 2 times.

## European Studies, B.A.

The European Studies program focuses on the study of Europe from the vantage points of several disciplines in the humanities and social sciences. Because Europe is both a geographical place and an idea that changes throughout history, it has had different meanings at different times and in different places. The study of Europe thus requires an open, pluralistic, and interdisciplinary curriculum that takes a critical approach to the idea (or ideas) of Europe.

The program provides a multidisciplinary view of Europe as a whole and of its historical, political, and cultural formation and global implications and encounters with the non-European world. It also provides a focus on a specific area of European experience that cuts across traditional disciplinary and national boundaries. Participation in the UC Education Abroad Program in a European country is strongly recommended for all European Studies majors.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

**Requirements for the Major**

Completion of two years of language (through the 2C level or equivalent) in French, German, classical Greek, Italian, Latin, Portuguese, Russian, or Spanish.

Twelve courses:

A. Select two of the following:

HISTORY 70B	Problems in History: Europe
EURO ST 9	Topics in Europe in the Middle Ages
EURO ST 10	Topics in Historical Foundations (1500-1800)
EURO ST S10	Historical Foundations: Europe and the Foundations of the Modern World
EURO ST 11	Issues and Institutions in Modern Europe (1789-1945)
EURO ST S11	Europe's Futures: 1755-Present
EURO ST 12	What is the Origin of Language?
EURO ST 13	Topics in Contemporary Europe (1945 – Today)

B. Complete:

EURO ST 101A- 101B	European Studies Core I - Early Europe (Pre-1789) and European Studies Core II: Modern Europe (Post-1789)
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C. Seven courses from the generally approved and quarterly approved lists, four of which must be upper-division and five of which must be in the student's specialization.

D. Complete:

EURO ST 190W	Senior Seminar in European Studies
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**Residence Requirement for the Major:** At least five upper-division courses required for the major must be completed successfully at UCI.



**Specializations and Approved Courses:** The following specializations are available in the major in European Studies:

- Early Europe (Pre-1789)
- Modern Europe (Post-1789)
- French Studies
- German Studies
- Italian Studies
- Russian Studies
- Spanish Studies

The list of approved courses is extensive and varies from quarter to quarter, depending upon course scheduling. For complete up-to-date information about approved courses, students are advised to consult the European Languages and Studies website (<http://www.humanities.uci.edu/els/>).

A degree in European Studies prepares its graduates to enter advanced degree programs in international business, history, law, political science, and cultural studies. The strong academic skills and professional orientation acquired by European Studies majors are necessary to pursue successful careers in such fields as international banking, law, journalism, management, public relations, publishing, and government service, as well as social justice and non-governmental organization (NGO) work both in the United States and abroad. Humanities graduates in general learn to express ideas clearly, do independent research, and think analytically and imaginatively—the required tools for success beyond the undergraduate career.

## European Studies, Minor

The European Studies program focuses on the study of Europe from the vantage points of several disciplines in the humanities and social sciences. Because Europe is both a geographical place and an idea that changes throughout history, it has had different meanings at different times and in different places. The study of Europe thus requires an open, pluralistic, and interdisciplinary curriculum that takes a critical approach to the idea (or ideas) of Europe.

The program provides a multidisciplinary view of Europe as a whole and of its historical, political, and cultural formation and global implications and encounters with the non-European world. It also provides a focus on a specific area of European experience that cuts across traditional disciplinary and national boundaries. Participation in the UC Education Abroad Program in a European country is strongly recommended for all European Studies majors.

A. Select one of the following:

HISTORY 70B	Problems in History: Europe
EURO ST 9	Topics in Europe in the Middle Ages
EURO ST 10	Topics in Historical Foundations (1500-1800)
EURO ST S10	Historical Foundations: Europe and the Foundations of the Modern World
EURO ST 11	Issues and Institutions in Modern Europe (1789-1945)
EURO ST S11	Europe's Futures: 1755-Present
EURO ST 12	What is the Origin of Language?
EURO ST 13	Topics in Contemporary Europe (1945 – Today)

B. Complete:

EURO ST 101A- 101B	European Studies Core I - Early Europe (Pre-1789) and European Studies Core II: Modern Europe (Post-1789)
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**In addition to requirements A and B, European Studies minors take:**

C. Three courses selected from a single specialization, two of which must be upper-division.

**Residence Requirement for the Minor:** At least four upper-division courses required for the minor must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, provided course content is approved by the appropriate department Undergraduate Director.

**Specializations and Approved Courses:** The following specializations are available in the major in European Studies:

- Early Europe (Pre-1789)
- Modern Europe (Post-1789)
- French Studies
- German Studies
- Italian Studies

- Russian Studies
- Spanish Studies

The list of approved courses is extensive and varies from quarter to quarter, depending upon course scheduling. For complete up-to-date information about approved courses, students are advised to consult the European Languages and Studies website (<http://www.humanities.uci.edu/els/>).

## European Thought and Culture, M.A. (4+1)

The M.A. in European Thought and Culture draws on expertise from faculty in the Schools of Humanities and Social Sciences in order to take an interdisciplinary approach to this area of study. The degree provides students with a rigorous course of study in the foundational philosophical texts and cultural products in literature and the arts produced in Europe from the Middle Ages to the present, locating them in their historical contexts.

Students may enter the program from two different tracks: the 4+1 B.A./M.A. program for current UCI undergraduates and the stand-alone M.A. track for students from outside UCI.

The M.A. program in European Thought and Culture has two tracks for admission, the UCI 4+1 B.A./M.A. and the stand-alone M.A. Standards of admissibility are specific to each track and are as follows:

### 4+1 B.A./M.A. Track

- Completed graduate application
- Official transcript
- One letter of recommendation from an ETC faculty member or faculty member in a related field
- Writing sample
- Current UCI undergraduate student status
- Cumulative 3.0 GPA
- Cumulative 3.3 GPA in major
- Completion of EURO ST 200A, EURO ST 200B, and EURO ST 200C with a grade of B or higher
- Completion of two additional European Studies courses as defined by the European Studies Generally Approved Courses (<http://www.humanities.uci.edu/els/euro/approved.php>) and/or the Quarterly Approved Courses (<http://www.humanities.uci.edu/els/euro/quarterly.php>) list.
- Demonstrated reading knowledge in one European language other than English. See Language Requirement.

Applications are accepted on a rolling basis during the final year of undergraduate study.

### Stand-Alone M.A. Track

- Completed graduate application
- Official transcript
- Three letters of recommendation from faculty in related fields
- Writing sample
- Cumulative 3.0 GPA
- Cumulative 3.3 GPA in B.A. major
- Completion of one European language other than English. See Language Requirement.

Applications are accepted for fall admission only.

## Course Requirement

All M.A. students must complete a total of nine courses (36 units) for the degree:

A. Complete:

EURO ST 200A	Core Seminar I: Foundations of European Thought and Culture
EURO ST 200B	Core Seminar II: Theorizing Periods and Movements in European Thought and Culture
EURO ST 200C	Core Seminar III: European Thought and Culture Beyond Europe
EURO ST 201	Topics in European Studies (four courses)
EURO ST 299	Independent Research (two courses)

## Language Requirement

Students are required to demonstrate reading knowledge in one European language other than English. For all students, this prerequisite requirement is expected to be completed by the time they receive their B.A. through completion of two years of a European language (2C level or equivalent).

## Degree Conferral

All M.A. students must complete one of the following options as their degree capstone:

### Plan I – Thesis

The thesis, approximately 25 pages in length, is a piece of independent research reviewed and approved by the faculty advisor and thesis committee.

### Plan II – Comprehensive Exam

In this examination, students will have a 48-hour period to answer and submit a total of three essays; one 10-page essay on a specialized topic of research, and two five-page essays related to topics covered throughout degree coursework.

## Time to Degree

Students are expected to complete all degree requirements and the Master's thesis/comprehensive exam within one year (three quarters). Maximum time to degree is two years.

## French, B.A.

The Undergraduate Program in French offers a broad humanistic course of study designed for students with many interests. The orientation of the program is multidisciplinary, where the study of literature is linked to critical, historical, and political concerns. Courses reflect the faculty's interest in the related disciplines of history, philosophy, anthropology, visual studies, gender and sexuality studies, political science, postcolonial studies, and comparative literature. Students should consult with the faculty to plan a coherent program of courses to fulfill the major requirements. Students also should consult with faculty members concerning career plans in areas such as teaching, business, journalism, law, public service, as well as social justice and international non-governmental organization (NGO) work.

Lower-division language courses encourage students to participate in the creative process of language, to think in French as they learn to understand, speak, read, and write. These courses are taught entirely in French, and the approach to teaching stresses the interdependence of the four basic language skills and makes them mutually reinforcing.

At the intermediate lower-division level, texts of contemporary literary and social interest provide the focus for advanced conversation, reading, and composition.

A series of more advanced grammar and composition courses are generally taken in the third year of language study. FRENCH 102A, FRENCH 102B, FRENCH 102C, FRENCH 102D, and FRENCH 102E carry on the work of the intermediate levels; FRENCH 102B and FRENCH 102D focus attention on particular issues and themes.

Upper-division offerings are taught either in the seminar mode or in small group settings. Because classes are limited in size, they promote and encourage participation and discussion and facilitate direct contact with professors. In recent years, courses have been offered in Literature and the Enlightenment, the Surrealist Imagination, Autobiography, Francophone Literature, Political Fictions, Women of Paris, Tales of the Fantastic, the French New Wave, the Body in Renaissance Literature and Art, Paris as Art Capital, Black Paris/Paris Noir, French Critical Theory, France and Algeria, and Marcel Proust. The content of courses changes yearly according to the interests of both faculty and students.

The program strongly encourages its students to take advantage of the study-abroad programs in French-speaking countries to improve their language skills and gain invaluable cultural experience in a foreign university setting. The program recommends the UC Education Abroad Program, which runs programs of differing lengths in France (Lyon, Bordeaux, and Paris). Credit for courses taken through study-abroad programs is available. Students are advised to discuss their course of study with the Undergraduate Director before their departure and to arrange to bring home proof of their work.

Language placement examinations are not required, although an optional placement examination is available. Students will be placed in French language courses according to their years of previous study. See Language Other Than English Placement and Progression.

Transfer students who have had a previous course (or courses) in French from another college or university who want to enroll in any FRENCH 1A through FRENCH 2C course at UCI must take a copy of their transcript to their academic counseling office in order to receive authorization to enroll in the appropriate course. In exceptional cases, students may be advised to take FRENCH 2C at the same time as FRENCH 102A, FRENCH 102B, FRENCH 102C, FRENCH 102D, or FRENCH 102E in order to move more quickly through the major or minor.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Departmental Requirements for the Major

A. Select two courses from the following:

FRENCH 102A	Grammar and Composition
FRENCH 102B	Topics in Issues in French and Francophone Culture
FRENCH 102C	Translation
FRENCH 102D	Topics in the Work World in French

**FRENCH 102E****Advanced French Language and Style**

B. Complete 10 additional upper-division French courses other than FRENCH 102A, 102B, 102C, 102D, or 102E:

A maximum of four courses may be taught entirely in English.

At least one course must be completed in each of the following historical periods:

- Pre-18th century literature and culture
- 18th or 19th century literature and culture
- 20th or 21st century literature and culture

**Residence Requirement for the Major:** Five upper-division courses must be successfully completed at UCI, of which a maximum of three may be taught entirely in English.

**Education Abroad Option:** A maximum of four upper-division courses taken during study abroad may be counted toward the major requirement. All such courses must be approved by the Undergraduate Director and students are advised to consult with the Undergraduate Director before and after their stay abroad. Course approval typically involves the following: 1) Presentation of syllabi and other pertinent course materials (term papers, exams, etc.) from the host university, and 2) approval from the Undergraduate Director and the Humanities Office of Undergraduate Study. In planning their undergraduate career, all students should keep in mind the Residence Requirement (stated above).

The great majority of students who major in French pursue careers in education, business, and commerce, where they can take advantage not only of their proficiency in French language but also of their knowledge of French and Francophone literature and culture. Students also go on to law school, to medical school, and to careers in the diplomatic service or NGOs. The multidisciplinary approach to the study of literature and culture teaches students to think critically and develops analytical skills that can be applied to a wide range of problems. It also helps students develop the interpretive and writing skills necessary to express their own ideas clearly and persuasively. Whether they enter business or professions such as law, education, or government, French majors acquire the intellectual and communicative skills requisite for success.

## French, Minor

The Undergraduate Program in French offers a broad humanistic course of study designed for students with many interests. The orientation of the program is multidisciplinary, where the study of literature is linked to critical, historical, and political concerns. Courses reflect the faculty's interest in the related disciplines of history, philosophy, anthropology, visual studies, gender and sexuality studies, political science, postcolonial studies, and comparative literature.

Lower-division language courses encourage students to participate in the creative process of language, to think in French as they learn to understand, speak, read, and write. These courses are taught entirely in French, and the approach to teaching stresses the interdependence of the four basic language skills and makes them mutually reinforcing.

At the intermediate lower-division level, texts of contemporary literary and social interest provide the focus for advanced conversation, reading, and composition.

A series of more advanced grammar and composition courses are generally taken in the third year of language study. FRENCH 102A, FRENCH 102B, FRENCH 102C, FRENCH 102D, and FRENCH 102E carry on the work of the intermediate levels; FRENCH 102B and FRENCH 102D focus attention on particular issues and themes.

Upper-division offerings are taught either in the seminar mode or in small group settings. Because classes are limited in size, they promote and encourage participation and discussion and facilitate direct contact with professors. In recent years, courses have been offered in Literature and the Enlightenment, the Surrealist Imagination, Autobiography, Francophone Literature, Political Fictions, Women of Paris, Tales of the Fantastic, the French New Wave, the Body in Renaissance Literature and Art, Paris as Art Capital, Black Paris/Paris Noir, French Critical Theory, France and Algeria, and Marcel Proust. The content of courses changes yearly according to the interests of both faculty and students.

The program strongly encourages its students to take advantage of the study-abroad programs in French-speaking countries to improve their language skills and gain invaluable cultural experience in a foreign university setting. The program recommends the UC Education Abroad Program, which runs programs of differing lengths in France (Lyon, Bordeaux, and Paris). Credit for courses taken through study-abroad programs is available. Students are advised to discuss their course of study with the Undergraduate Director before their departure and to arrange to bring home proof of their work.

Language placement examinations are not required, although an optional placement examination is available. Students will be placed in French language courses according to their years of previous study. See Language Other Than English Placement and Progression.

Transfer students who have had a previous course (or courses) in French from another college or university who want to enroll in any FRENCH 1A through FRENCH 2C course at UCI must take a copy of their transcript to their academic counseling office in order to receive authorization to enroll in the appropriate course. In exceptional cases, students may be advised to take FRENCH 2C at the same time as FRENCH 102A, FRENCH 102B, FRENCH 102C, FRENCH 102D, or FRENCH 102E in order to move more quickly through the major or minor.

A. Select two courses from the following:

**FRENCH 102A****Grammar and Composition**

FRENCH 102B	Topics in Issues in French and Francophone Culture
FRENCH 102C	Translation
FRENCH 102D	Topics in the Work World in French
FRENCH 102E	Advanced French Language and Style

B. Complete at least five upper-division French courses other than FRENCH 102A, 102B, 102C, 102D, or 102E:

A maximum of three courses may be taught entirely in English.

At least one course must be completed in each of the following historical periods:

- Pre-18th century literature and culture
- 18th or 19th century literature and culture
- 20th or 21st century literature and culture

**Residence Requirement for the Minor:** At least four upper-division courses required for the minor must be completed successfully at UCI, of which a maximum of two may be taught entirely in English. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate department Undergraduate Director.

## German Studies, B.A.

The German Studies programs emphasize the humanistic endeavor of understanding and evaluating culture. Courses are focused on language, literature, and film in context, that is, within the historical, social, philosophical, linguistic, intellectual, and political circumstances of their production and continuing reception. Courses on German, Austrian, and Swiss literature, film, and culture offer a variety of critical perspectives from historical, social, or politically engaged readings to feminist analysis and cultural studies. Topics range from authors, periods, and genres to the history of German-language literature and film, philosophy, theory and criticism, European cultural relations, and cultural artifacts in a globalized social and political context.

The German Studies major can be combined as a double major with any other UCI course of study, and the minor may be taken in tandem with any UCI major.

Courses in the program are taught in German to the extent compatible with the aim of the course. In the lower-division language courses students develop skills in speaking, listening, reading, and writing through an engaging, collaborative, task-based curriculum. The courses place a great deal of emphasis on meaningful cultural literacy in German, employing a diverse range of authentic texts and materials from the beginning. During the second year (intermediate), students benefit from a curriculum based on authentic literary and cultural content (theatre, media) and simulation of "real world" situations. These courses have the additional goal of contributing to students' education in the humanities and developing their skills in critical thinking.

After completion of the intermediate level, students enroll in the GERMAN 101–GERMAN 105 series, which emphasizes advanced reading, writing, and speaking skills while providing an introduction to a variety of German topics and texts in literature, culture, film, linguistics, and business. These courses are taken either in preparation for, or concurrently with GERMAN 115, GERMAN 118, GERMAN 119, GERMAN 120, GERMAN 130, which provide advanced instruction in periods ranging historically from the Reformation to the present and cover a variety of topics and approaches. A further series of courses (GERMAN 140, GERMAN 150, GERMAN 160, GERMAN 170) is taught in English for both German Studies students and those who do not speak the language, and covers topics in German, Austrian, and Swiss literature and culture, literary theory, philosophy, linguistics, and criticism as well as German-language cinema.

Students are encouraged to participate in work- and study-abroad programs in German-speaking countries. The Department recommends the UC Education Abroad Program (EAP) in Berlin where students may enroll at any of the city universities (Free University, Humboldt University, Berlin Technical University) and take courses at others as desirable. UCEAP students complete an advanced language program before enrolling in university courses.

German placement tests are recommended for students who have successfully completed foreign language classes in high school or elsewhere. To obtain information about the German placement test, contact the UCI Academic Testing Office at 949-824-6207. Students with college-level course work should present their transcript to their academic advising office, for assistance in determining which UCI course to take.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Departmental Requirements for the Major

A. Select six of the following:

GERMAN 101	Topics in Introduction to German Literature and Culture
GERMAN 102	Topics in German Culture and Society
GERMAN 103	Topics in German Film
GERMAN 104	Topics in German Linguistics
GERMAN 105	German for Professions
GERMAN 115	Topics in Advanced German for Business and Economics

GERMAN 117	
GERMAN 118	Topics in Studies in the Age of Goethe
GERMAN 119	Topics in 19th Century German Literature and Culture
GERMAN 120	Topics in 20th Century German Literature and Culture
GERMAN 130	Topics in German Literature and Culture
GERMAN 197	German Internship
B. Select six additional courses chosen from Section A and below: <sup>1</sup>	
GERMAN 140	Topics in Literary Theory and Criticism
GERMAN 150	German Literature and Culture in Translation
GERMAN 160	German Cinema
GERMAN 170	Topics in German Linguistics
EURO ST 9	Topics in Europe in the Middle Ages
EURO ST 10	Topics in Historical Foundations (1500-1800)
EURO ST S10	Historical Foundations: Europe and the Foundations of the Modern World
EURO ST 11	Issues and Institutions in Modern Europe (1789-1945)
EURO ST S11	Europe's Futures: 1755-Present
EURO ST 12	What is the Origin of Language?
EURO ST 13	Topics in Contemporary Europe (1945 – Today)
EURO ST 101A	European Studies Core I - Early Europe (Pre-1789)
EURO ST 101B	European Studies Core II: Modern Europe (Post-1789)
LSCI 3	Introduction to Linguistics
Comparative Literature <sup>2</sup>	
German history <sup>2</sup>	
German philosophy <sup>2</sup>	
German political science <sup>2</sup>	

<sup>1</sup> GERMAN 140, GERMAN 150, GERMAN 160, GERMAN 170 are variable topics courses and may be repeated for credit as topics vary; one of which can be taken in satisfaction of the upper-division writing requirement.

<sup>2</sup> Must be approved by the advisor for the major.

**Residence Requirements for the Major:** Five upper-division courses must be taken in residence at UCI for the major. However, if a student participates in the Education Abroad Program, two of those can be taken abroad, pending approval from the department.

The ability to speak and write German can open up opportunities in communications, international business and banking, transportation, government, science and technology, tourism, library services, and teaching, as well as in social justice and non-governmental organization (NGO) work. Because German plays an important role in modern technology, employers in international law, business, the film industry, the airline and travel industry, journalism, professional translating, and all levels of education increasingly seek students with a knowledge of German. German is excellent preparation for professional schools. It can be combined successfully with work in the natural sciences, business and management, and computer sciences, and it is invaluable for advanced work in the humanities and the arts.

## German Studies, Minor

The German Studies programs emphasize the humanistic endeavor of understanding and evaluating culture. Courses are focused on language, literature, and film in context, that is, within the historical, social, philosophical, linguistic, intellectual, and political circumstances of their production and continuing reception. Courses on German, Austrian, and Swiss literature, film, and culture offer a variety of critical perspectives from historical, social, or politically engaged readings to feminist analysis and cultural studies. Topics range from authors, periods, and genres to the history of German-language literature and film, philosophy, theory and criticism, European cultural relations, and cultural artifacts in a globalized social and political context.

The German Studies major can be combined as a double major with any other UCI course of study, and the minor may be taken in tandem with any UCI major.

Courses in the program are taught in German to the extent compatible with the aim of the course. In the lower-division language courses students develop skills in speaking, listening, reading, and writing through an engaging, collaborative, task-based curriculum. The courses place a great deal of emphasis on meaningful cultural literacy in German, employing a diverse range of authentic texts and materials from the beginning. During the second year (intermediate), students benefit from a curriculum based on authentic literary and cultural content (theatre, media) and simulation of “real world” situations. These courses have the additional goal of contributing to students’ education in the humanities and developing their skills in critical thinking.



After completion of the intermediate level, students enroll in the GERMAN 101 –GERMAN 105 series, which emphasizes advanced reading, writing, and speaking skills while providing an introduction to a variety of German topics and texts in literature, culture, film, linguistics, and business. These courses are taken either in preparation for, or concurrently with GERMAN 115 , GERMAN 118 , GERMAN 119 , GERMAN 120 , GERMAN 130 , which provide advanced instruction in periods ranging historically from the Reformation to the present and cover a variety of topics and approaches. A further series of courses (GERMAN 140 , GERMAN 150 , GERMAN 160 , GERMAN 170 ) is taught in English for both German Studies students and those who do not speak the language, and covers topics in German, Austrian, and Swiss literature and culture, literary theory, philosophy, linguistics, and criticism as well as German-language cinema.

Students are encouraged to participate in work- and study-abroad programs in German-speaking countries. The Department recommends the UC Education Abroad Program (EAP) in Berlin where students may enroll at any of the city universities (Free University, Humboldt University, Berlin Technical University) and take courses at others as desirable. UCEAP students complete an advanced language program before enrolling in university courses.

German placement tests are recommended for students who have successfully completed foreign language classes in high school or elsewhere. To obtain information about the German placement test, contact the UCI Academic Testing Office at 949-824-6207. Students with college-level course work should present their transcript to their academic counseling office, for assistance in determining which UCI course to take.

A. Select four of the following:

GERMAN 101	Topics in Introduction to German Literature and Culture
GERMAN 102	Topics in German Culture and Society
GERMAN 103	Topics in German Film
GERMAN 104	Topics in German Linguistics
GERMAN 105	German for Professions
GERMAN 115	Topics in Advanced German for Business and Economics
GERMAN 117	
GERMAN 118	Topics in Studies in the Age of Goethe
GERMAN 119	Topics in 19th Century German Literature and Culture
GERMAN 120	Topics in 20th Century German Literature and Culture
GERMAN 130	Topics in German Literature and Culture

B. Select three of the following:

GERMAN 101	Topics in Introduction to German Literature and Culture
GERMAN 102	Topics in German Culture and Society
GERMAN 103	Topics in German Film
GERMAN 104	Topics in German Linguistics
GERMAN 105	German for Professions
GERMAN 115	Topics in Advanced German for Business and Economics
GERMAN 117	
GERMAN 118	Topics in Studies in the Age of Goethe
GERMAN 119	Topics in 19th Century German Literature and Culture
GERMAN 120	Topics in 20th Century German Literature and Culture
GERMAN 130	Topics in German Literature and Culture
GERMAN 140	Topics in Literary Theory and Criticism
GERMAN 150	German Literature and Culture in Translation
GERMAN 160	German Cinema
GERMAN 170	Topics in German Linguistics
EURO ST 9	Topics in Europe in the Middle Ages
EURO ST 10	Topics in Historical Foundations (1500-1800)
EURO ST S10	Historical Foundations: Europe and the Foundations of the Modern World
EURO ST 11	Issues and Institutions in Modern Europe (1789-1945)
EURO ST S11	Europe's Futures: 1755-Present
EURO ST 12	What is the Origin of Language?
EURO ST 13	Topics in Contemporary Europe (1945 – Today)
EURO ST 101A	European Studies Core I - Early Europe (Pre-1789)
EURO ST 101B	European Studies Core II: Modern Europe (Post-1789)
LSCI 3	Introduction to Linguistics

Comparative Literature <sup>1</sup>German history <sup>1</sup>German philosophy <sup>1</sup>German political science <sup>1</sup><sup>1</sup> Must be approved by the advisor for the minor.

**Residence Requirement for the Minor:** Four upper-division courses required for the minor must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, provided that course content is approved in advance by the German Undergraduate Director and the Humanities Office of Undergraduate Study.

## German, Ph.D.

The graduate programs in German at UCI combine innovation with a solid foundation in traditional approaches. The course of study focuses on both the German literary tradition and foreign language pedagogy, with the goal of integrating works of literature, philosophy, and art into pertinent cultural, theoretical, and historical contexts in teaching and research. UC Irvine has a decades-long reputation for excellence in the study of Critical Theory, having placed first in most rankings, and the campus provides a learning context that encourages students to push the boundaries of thinking in their discipline.

Students may apply to either the M.A. program or the Ph.D. program, but only students applying to the Ph.D. program can be admitted with fellowship funding. Students with a B.A. may apply directly to the Ph.D. program and receive fellowship support, but their official advancement into the Ph.D. program is contingent upon successful completion of the M.A. before or during the second year of study. Students who already hold the M.A. degree are also encouraged to apply to the Ph.D. program.

The Ph.D. program is organized to encourage completion within five years, and there is special funding and potential employment available for those who do finish in five years. A student arriving with a B.A. normally will require three years to complete course work for the Ph.D. and qualify for advancement to candidacy. A student arriving with an M.A. will normally require two years to advance to candidacy. Most of the course work is done within the Department, but students are encouraged to broaden their studies by taking related courses in other departments in the School of Humanities, such as comparative literature, critical theory, feminist theory, or visual studies; other combinations of courses may be selected in consultation with the graduate advisor. Our innovative exam structure (involving course-syllabus development) and post-exam timeline are designed both to expedite progress to degree and to enhance the professional training of our students.

For students who enter with normal academic preparation and pursue a full-time program of study, the normative time to degree for the Ph.D. is six years or less.

The program requires a minimum of 22 approved courses from students entering with a bachelor's degree. These may include courses in philosophy, history, comparative literature, and others suitable for the individual student's program of study. The student also will participate in each of the German Program's colloquia. The student will augment the reading list and keep it current during the whole course of study. At least two years of residence are required.

Students entering with the master's degree will be advised individually as to remaining course requirements.

### Qualifying Examination

In order to advance to candidacy, the student must take and pass a qualifying examination. At least two months prior to the planned date of the exam, students must submit a comprehensive reading list, prepared in consultation with their committee chair, to the examination committee. The committee may make recommendations to the list. On the basis of that list, students must design three courses, drafted in consultation with the student's committee chair. These courses should be graduate seminars organized around topics, genres, authors, or periods. At least one of these courses must comprise the student's intended area of dissertation research. The three courses must be clearly distinct and have minimal overlap. These courses must include reading lists of required and optional texts, main secondary literature, a written justification/course description, and a basic syllabus (for a 13-week semester course). No more than one course may be a modification of a seminar taken in the program. These courses must be submitted to the committee members at least two weeks prior to an oral examination date. Students must submit a dissertation prospectus to their advisor and, following approval by the advisor, circulate it to the entire committee. The oral exam will be a three-hour exploration of the reading list, focusing on the courses. In addition, part of the qualifying exam will involve a discussion of the student's dissertation prospectus. Upon successful completion of the qualifying examination, the candidate will have advanced to Ph.D. candidacy.

### Dissertation Prospectus

Students must submit a dissertation prospectus to their advisor and, following approval by the advisor, circulate it to the entire committee.

### Dissertation Chapter Review

Students must submit a substantial piece of writing (approximately 45 pages) from their dissertation ordinarily in the form of a chapter and a comprehensive bibliography. In consultation with their dissertation committee chair, they schedule a date and time for the oral review with the committee,



which lasts approximately two-three hours. Prior to the oral review the student will make a public presentation, open to the UCI community and guests, in the form of a lecture with questions and answers.

### **Doctoral Colloquium**

Students who have advanced to candidacy and are in residence must attend a colloquium for doctoral candidates. The colloquium will be held at least two times per quarter. Students will be expected to present sections of their prospectus or dissertation.

### **Dissertation Defense**

The oral defense of the dissertation focuses on the adequacy of the student's research and thesis.

### **Normative Time to Degree and Expected Programs of Study**

*For students entering with a B.A.:*

Year 1: Course work;

Year 2: Course work; M.A. completed;

Year 3: Course work; Qualifying Examination and Dissertation Prospectus (latest, fall of year four); advance to candidacy;

Year 4: Dissertation chapter review and public presentation;

Year 5: Completion of dissertation; defense.

*For students entering with an M.A.:*

Year 1: Course work;

Year 2: Course work; Qualifying Examination and Dissertation Prospectus (latest, fall of year three); advance to candidacy;

Year 3: Dissertation chapter review and public presentation;

Year 4: Completion of dissertation; defense.

### **Teaching German**

Since the majority of German Ph.D. candidates choose careers that involve teaching, the faculty recognizes its obligation to offer them both outstanding pedagogical training and real-world preparatory experience. Therefore, all candidates for the German M.A. and Ph.D. are required to pass HUMAN 398A and HUMAN 398B - Foreign Language Teaching: Approaches and Methods - which together comprise one graduate seminar taught over two quarters. In addition, all candidates for the German M.A. and Ph.D. program are required to teach under the supervision of a faculty member one course in each of at least three quarters (for which they will receive credit as GERMAN 399). Three of these courses may be counted toward the 22 courses required for the Ph.D. HUMAN 398A and HUMAN 398B will not count toward the 22 courses required for the Ph.D.

### **Faculty Mentors**

Each graduate student will be assigned a faculty mentor to consult at least once each quarter about progress, the program, academic questions, or any other issues pertaining to the student's graduate career. A student may change mentors for any reason (indeed, without giving a reason) at any time after meeting with either the graduate advisor or chair.

### **First-Year Review**

Students ending their first year of study at UCI must undergo a more comprehensive review procedure. This applies to students entering with either a B.A. or an M.A. After the review, students will be apprised of the faculty's evaluation and advised on a future course of study or recommended for discontinuation of the program.

### **Annual Review**

All students will undergo an annual review by the faculty of the program. Each spring the faculty will meet to discuss students' progress in the program. Annual review and evaluation of student performance and progress assure both the student and the faculty that each student is meeting the academic standards, teaching standards (for teaching assistants and associates, readers, and "ABD" lecturers), and professional standards of conduct expected of graduate students in the program. The review process provides an opportunity to assess and make recommendations regarding any deficiencies in student performance and progress. The following factors will be considered in determining graduate student performance and progress: grade point average, time to degree, foreign language requirement, and teaching performance.

### **Grade Point Average**

All graduate students in German, including those in both the master's program and the doctoral program, are expected to maintain a 3.3 GPA. A GPA below 3.3 in any quarter falls below the academic standard expected by the program. Pursuant to the terms of appointment, a student whose GPA falls below 3.3 in any given quarter and whose cumulative GPA is not 3.3 by the end of the academic year may be ineligible for funding, and faculty may recommend the student be disqualified from the program.

## Foreign Language Requirements

Students must possess reading knowledge of one language other than German or English. This can be demonstrated by completing one year or the equivalent of University-level language study (1C), or passing one of the 97 graduate reading courses, or passing a translation examination administered by the Department. In the two-hour examination, the student translates selections from a scholarly book or article in the target language into English. A dictionary may be used during the examination. Full-time students must demonstrate near-native speaking abilities in German and English. Students with significant deficiencies in language competency that will adversely affect their academic progress normally will not be admitted to doctoral candidacy. Students in the doctoral program will meet language requirements on a schedule established by their doctoral committees, but in all cases the requirements must be met prior to taking the Ph.D. qualifying examination. If these requirements are not met in a timely manner, faculty may recommend disqualification from the program.

## Italian Studies, Minor

The Italian Program at the University of California, Irvine offers a minor in Italian Studies with courses both in Italian language from introductory to intermediate, and in English on a variety of literary and cultural subjects, such as Dante, Renaissance Theater, Holocaust literature, and contemporary migration. Taking an interdisciplinary approach, students study Italian culture through film, music, theater, history and literature. Beyond the Department of European Languages and Studies, Italian Studies students also take courses in history, art history, classics, and other areas.

Students may also choose to major or minor in European Studies (<https://www.humanities.uci.edu/els/euro/ugrad.php>) with a specialization in Italian Studies.

The University of California also offers students many opportunities to expand their knowledge of Italian by studying in Italy in the cities of Bologna, Florence, Rome, Milan, and other locations, applying a number of credits earned abroad directly to their major or minor at UCI. Learn more about UC Education Abroad by visiting the UCEAP (<https://uceap.universityofcalifornia.edu/study-abroad-in-italy/?f%5B0%5D=country%3A28>) website. For additional programs in Italy led by UC faculty see the Other UC Programs (<https://studyabroad.uci.edu/other-uc-programs/>) webpage.

The minor in Italian Studies is an interdisciplinary curriculum that allows students to go beyond second-year Italian and engage in various aspects of Italian culture by taking courses in Italian literature and other courses related to Italian history and culture in the Departments of Art History, Comparative Literature, English, Film and Media Studies, History, and Philosophy.

## Requirements for the Italian Studies Minor

A. Complete the following:

ITALIAN 2C	Intermediate Italian
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B. Three course topics from the following, no more than two of which may be lower-division:

ITALIAN 50	Topics in Italian Culture
ITALIAN 150	Topics in Italian Literature and Culture

C. Four courses selected from the following, when topics are appropriate. No more than two courses may be taken from any one department, with the exception of Italian courses.

ART HIS 120	Studies in Renaissance and Baroque Art
ART HIS 121	Studies in Southern Renaissance Art
ART HIS 125	Studies in Southern Baroque Art
EURO ST 101A	European Studies Core I - Early Europe (Pre-1789)
EURO ST 101B	European Studies Core II: Modern Europe (Post-1789)
FLM&MDA 160	National/Regional Cinemas and Media
ITALIAN 150	Topics in Italian Literature and Culture
ART HIS 107	Studies in Roman Art
CLASSIC 140	Classics and History: The Ancient World
CLASSIC 150	Classical Mythology
CLASSIC 170	Topics in Classical Civilization
HISTORY 112D	Topics in Early Modern Europe
HISTORY 135E	Topics in the History of Science and Technology

**Residence Requirement for the Minor:** At least four upper-division courses must be completed successfully at UCI. By petition, two of the four may be taken at an Italian university through the UC Education Abroad Program, at a UCEAP study center in Italy, or through a UC Faculty-Led Program in Italy.

The Department strongly encourages its students to take advantage of the study-abroad programs in Italy to improve their language skills and gain invaluable cultural experience in a foreign university setting. The Department recommends the UC Education Abroad Program in Italy and UC Faculty-Led Programs in Italy.

Credit for courses taken through study-abroad programs is available. Students are advised to discuss their course of study with the Undergraduate Director before their departure and to arrange to bring home proof of their work.

## Russian Studies, Minor

Spanning both Europe and Asia, Russia is one of the world's dominant political entities. Its rich cultural traditions have enhanced world literature, theatre, art, film, and dance. As the world's first socialist state, it became a major political rival of the United States after the Second World War. In the past decade, Russians have abandoned their socialist system and are now in the process of making a rocky transition to capitalism. Although Russia lost sizable amounts of territory in this transition, the Russian language now serves as the *lingua franca* throughout many areas formerly controlled by the Soviet Union.

While the demand for specialists in various sectors of government has eased, relationships between our countries at other levels of society are growing more active and business opportunities are exciting and rewarding. Other areas in which the need for Russian language competence is evident right now include trade, environmental protection, social services, law, medicine, and technology.

All students in Russian language courses are encouraged to take part in the UC Education Abroad Program and spend a portion of their junior or senior year studying in Russia. Visit the Study Abroad Center website (<http://www.studyabroad.uci.edu>) for additional information.

The Russian Studies minor is a multidisciplinary curriculum combining the Humanities and Social Sciences. It is designed to introduce students to the rich history and culture of Russia and provide them with the intellectual and linguistic tools necessary for sustained engagement with this area of the world.

A. Complete:

RUSSIAN 2C	Intermediate Russian (or equivalent)
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B. Complete:

RUSSIAN 50	Russian Culture (three different topics)
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C. Select sixteen units of upper-division courses from the following:

RUSSIAN 150	Topics in Russian Literature
RUSSIAN 190	Topics in Russian Language Through Film
HISTORY 124B	Twentieth-Century Russia
HISTORY 190	Colloquium (when topics are related to Russia)
POL SCI 154F/ANTHRO 164P	Peoples and Cultures of Post-Soviet Eurasia
POL SCI 159	Special Topics in Comparative Politics (when topics are related to Russia)

A maximum of four units may be chosen from the following courses devoted in part to Russian themes: HISTORY 114, HISTORY 126B, and POL SCI 142D.

Students may petition other relevant courses.

**Residence Requirement for the Minor:** At least four upper-division courses required for the minor must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, provided course content is approved in advance by the appropriate department chair.

## Department of Film and Media Studies

**Fatimah Tobing-Rony, Department Chair**

2000 Humanities Gateway

949-824-3532

[www.humanities.uci.edu/filmandmediastudies/](http://www.humanities.uci.edu/filmandmediastudies/) (<http://www.humanities.uci.edu/filmandmediastudies/>)

The Department of Film and Media Studies at UC Irvine offers students a liberal arts education in the film, broadcast, and digital media landscape. Our majors acquire skills in theoretical and historical cultural analysis, and broad knowledge of the history of moving images. Students strengthen their writing through active engagement with all aspects of cinematic, broadcast, and digital culture. The department also teaches courses in screenwriting and production, with the goal of deepening the understanding of media through some hands-on training.

Film and Media Studies focuses on nurturing our diverse student body and our students' varied backgrounds and interests. Courses reflect an interdisciplinary and historically grounded approach to the study of moving images, on big and small screens alike. From parsing the history of television policy to writing for video games, our students get a unique interdisciplinary education in the historical and social background of the study of film, television, and new media. Our outstanding faculty are engaged in innovative research on topics like globalization, gender studies, queer theory, broadcast studies, intellectual history, new media and critical game studies, history of photography, and national cinema approaches to the analysis of

Film and Media Studies, and our courses give our students access to this cutting-edge research. In our production and screenwriting courses, students get hands-on experience creating short films, television pilots, webisodes, computer games, and other visual media.

Film and Media Studies students join their professors and industry professionals in attending some of the most important film festivals in our area. The department regularly invites film directors, scholars, and industry professionals to offer a rich array of programming including screening original films and media and hosting production-based workshops. UC Irvine's location in the heart of Southern California, close to studios and some of the most important film and television archives in the United States, makes outstanding internship opportunities and serious research possible for our majors. Our location makes it convenient for our students to do internships for credit at some of the leading companies in the entertainment industry. Students also have the opportunity to collaborate on filmmaking through our student-run club, the Film-Arts-Drama Alliance (FADA). FADA members write, direct, produce, and craft short films through the Zotfilm program in fall and winter quarters. In spring quarter, FADA screens these and other student-created films at Zotfest, one of the longest-running student-organized film festivals in the United States.

Film and Media Studies encourages students to take advantage of the many opportunities that UC Irvine offers to study abroad. Our students have studied in UCEAP programs all over the world and regularly earn credit towards their degrees. Information on these programs is available through the UCI Study Abroad Center (<http://www.studyabroad.uci.edu/>).

In order to cover the extra costs generated by the purchase and rental of media demanded by the specialized Film and Media Studies curriculum, the School of Humanities charges a laboratory fee to students taking Film and Media Studies courses.

## Career Opportunities

Film and Media Studies at UC Irvine prepares students for graduate study and professional life in the Film and Media Studies areas. Our students have been admitted to Ph.D. and M.F.A. programs at UCLA, USC, New York University, and the University of Texas at Austin. Film and Media studies majors have gone on to law school and to get Ph.D.s in a variety of fields. Alumni also make careers in all aspects of the entertainment industry, finding work in the film, television, and game industries in Southern California and beyond. Film and Media Studies students find careers in directing, cinematography, editing, journalism, advertising, marketing, and distribution. Our students' diverse backgrounds have enabled them to work in bilingual or global media outlets. The Department encourages all qualified students to do professional internships. Visit the internship page on our website (<http://www.humanities.uci.edu/filmandmediastudies/undergraduate/interns.php>) for more information about the diverse array of internships that you can do for credit.

The UCI Division of Career Pathways provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on résumé preparation, job search, and interview techniques. See the UCI Division of Career Pathways website (<http://career.uci.edu/>) for additional information.

- Film and Media Studies, B.A.
- Film and Media Studies, Minor
- Graduate Program in Visual Studies

## Faculty

Catherine Benamou, Ph.D. New York University, *Associate Professor of Film and Media Studies; Culture and Theory; Visual Studies* (Hispanophone and Lusophone cinema and television, U.S. Latino media, Orson Welles and maverick cinema, transnational flows, spectatorship, cinematic memory and cultures of preservation)

Elizabeth M. Cane, M.F.A. University of California, Los Angeles, *Lecturer of Film and Media Studies*

Marie Cartier, Ph.D. Claremont Graduate University, *Lecturer of Film and Media Studies*

Desha Dauchan, M.F.A. University of California, Los Angeles, *Lecturer of Film and Media Studies*

Sohail Daulatzai, Ph.D. University of Southern California, *Associate Professor of Film and Media Studies; African American Studies; Visual Studies* (decolonization, empire, race, Muslim studies, Black studies)

Bambi Haggins, Ph.D. University of California, Los Angeles, *Associate Professor of Film and Media Studies; African American Studies; Visual Studies* (Black [African American] comedy in film, television, digital media and performance, television history, comedy as social and political discourse, African-American studies, American studies)

Kristen L. Hatch, Ph.D. University of California, Los Angeles, *Associate Professor of Film and Media Studies; Visual Studies* (classical Hollywood, stardom, melodrama, histories of gender, race and sexuality, girlhood studies)

Lucas Hilderbrand, Ph.D. New York University, *Professor of Film and Media Studies; Visual Studies* (Queer cultures and media, cultural studies, documentary, pornography, popular music, video art, histories of technology)

Victoria E. Johnson, Ph.D. University of Southern California, *Professor of Film and Media Studies; African American Studies; Culture and Theory; Visual Studies* (U.S. television, history, media industry studies, critical race theory, cultural geography, sound and music in popular media, media law and policy)

Peter O. Krapp, Ph.D. University of California, Santa Barbara, *Professor of Film and Media Studies; English; European Languages and Studies; Informatics; Music; Visual Studies* (digital culture, media history, cultural memory)

Felicidad (Bliss) Lim, Ph.D. New York University, *Professor of Film and Media Studies; Visual Studies* (Philippine cinema, temporality, postcolonial and feminist film theory, transnational horror and the fantastic, film archives)

Catherine Liu, Ph.D. Yale University, *Professor of Film and Media Studies; Visual Studies* (Hou Hsiao-hsien, culture wars, Frankfurt School, historiography of critical theory/cultural studies, surveillance, cold war culture and neoliberalism)

Glen M. Mimura, Ph.D. University of California, Santa Cruz, *Associate Professor of Film and Media Studies; Visual Studies* (minoritarian and political film; media and race; popular culture and social movements)

Allison J. Perlman, Ph.D. University of Texas at Austin, *Associate Professor of History; Film and Media Studies; Visual Studies* (history of broadcasting, American social movements, media law and policy, media activism, popular memory)

Fatimah Tobing Rony, Ph.D. Yale University, *Department Chair and Associate Professor of Film and Media Studies; Visual Studies* (ethnographic film, race and representation, film production)

Bonnie Ruberg, Ph.D. University of California, Berkeley, *Assistant Professor of Film and Media Studies; Visual Studies* (video games, digital media, digital cultures, queer studies, gender and sexuality)

Braxton Soderman, Ph.D. Brown University, *Assistant Professor of Film and Media Studies; Visual Studies* (digital and new media studies, video games, networks, digital art and electronic literature)

## Affiliate Faculty

Kyung Hyun Kim, Ph.D. University of Southern California, *Professor of Korean Culture; Asian American Studies; Film and Media Studies; Visual Studies* (East Asian cinema, modern Korea, critical theory)

Jared Charles Sexton, Ph.D. University of California, Berkeley, *Professor of African American Studies; Culture and Theory; Film and Media Studies; Visual Studies* (race and sexuality, policing and imprisonment, contemporary U.S. cinema and political culture, multiracial coalition, critical theory)

Michael F. Szalay, Ph.D. Johns Hopkins University, *Department Chair and Professor of English; Film and Media Studies; Visual Studies* (contemporary television and literature)

Roxanne Varzi, Ph.D. Columbia University, *Professor of Anthropology; Culture and Theory; Film and Media Studies; Religious Studies; Visual Studies* (Iran, media, war, visual anthropology, film studies, ethnographic and fiction writing)

## Courses

### FLM&MDA H80. Honors Seminar: Race Sport Media. 4 Units.

Honors seminar examining the intersection of race, sports, and media in everyday U.S. popular culture (film, TV, advertising, gaming, social media) and political culture. Materials fee.

Restriction: Campuswide Honors Collegium students only.

(IV and VII ).

### FLM&MDA 85A. Introduction to Film and Visual Analysis. 4 Units.

Introduces the language and techniques of visual and film analysis. Teaches students to analyze the moving image; emphasize framing, camera movement, and sound; and conveys how editing produces meaning, reproduces historical ideologies, fosters or disrupts narrative, and cues spectators.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

(IV)

### FLM&MDA 85B. Broadcast Media History and Analysis. 4 Units.

History of broadcast media from the radio era to the present day, including social, political, institutional, and audience analysis as well as methods of visual and aural analysis of these media.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

(IV)

**FLM&MDA 85C. New Media and Digital Technologies. 4 Units.**

The study of digital media, computer-mediated communication, and Internet cultures, from historical and theoretical perspectives.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

**(IV)****FLM&MDA 101A. History of Film I: The Silent Era. 4 Units.**

The aesthetic, industrial, and socio-historical developments of cinema in the U.S. and internationally from its invention to the adoption of synchronous sound. Includes early exhibition, developments in narrative and editing, the formation of the studio system, and avant-garde film movements. Materials fee.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 101B. History of Film II: The Studio Era. 4 Units.**

The aesthetic, industrial, and socio-historical developments of cinema in the U.S. and internationally from the 1930s through the 1960s. Includes the Hollywood studio system, propaganda films, Italian neorealism, post-war Japanese cinema, and the French New Wave. Materials fee.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 101C. History of Film III: The Contemporary Era. 4 Units.**

The aesthetic, industrial, and socio-historical developments of cinema in the U.S. and internationally from the late 1960s to the present. Includes New Hollywood and independent U.S. films, ethnic cinemas, postcolonial cinemas, East-Asian new waves, and digital filmmaking. Materials fee.

Prerequisite: FLM&MDA 85A and FLM&MDA 101B. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 110. Film and Media Theory. 4 Units.**

Survey of major directions in film and media theory. Various theories of mass culture, realism, auteurism, semiotics, feminism, cultural studies, and theories of other media, with an emphasis on developing the student's ability to analyze and articulate a theoretical argument. Materials fee.

Prerequisite: FLM&MDA 85A and FLM&MDA 85B and FLM&MDA 85C and (FLM&MDA 101A or FLM&MDA 101B or FLM&MDA 101C). Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 111. Film and Media Theory and Practice. 4 Units.**

Seminar focusing on issues in film and media production and editing. Reading and exercises to understand aspects of film and media production (montage, sound, film movement, directing, and mise en scène), and how ideology works in tandem with style.

Prerequisite: FLM&MDA 85A and FLM&MDA 85B and FLM&MDA 85C and FLM&MDA 120A and (FLM&MDA 101A or FLM&MDA 101B or FLM&MDA 101C). Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 112. Genre Study . 4 Units.**

Critical approaches to the serial productions we call 'genre' films such as westerns, weepies, musicals, horror films, and others; televisual genres, such as sitcoms, drama, comedy, news, docudrama, police; Internet categories, such as chat-rooms, listservs, Web pages.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 113. Narrative/Image . 4 Units.**

What relations do sound, image, and story assume in film, television, video, and Internet narratives? In what ways do these media interact with and borrow from each other and traditional story-telling media? How have the new media explored non-narrative strategies.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 114. Film, Media, and the Arts. 4 Units.**

A synthetic entity, film draws on both established and popular arts. Looks at visual media's exchanges with 'high' and 'low' culture, exploring its relation to areas such as photography, music, painting, and architecture.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.



**FLM&MDA 115. Authorship . 4 Units.**

Theoretical and analytical discussions of visual media authorship, focusing on case studies of directors, producers, scriptwriters, and film, video, and digital artists.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 117A. Introduction to Screenwriting. 4 Units.**

Introduction to the technique and format of the screenplay, with a particular focus on its three act structural elements: coverage, treatment, and 60 beat outline. Materials fee.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 117B. Intermediate Screenwriting. 4 Units.**

Exercises in the development of screenplays, with emphasis on formal and structural considerations of character development. Students work with the hero structure and other character development methodologies, such as method acting. Materials fee.

Prerequisite: FLM&MDA 117A. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 117C. Screenwriting Workshop. 4 Units.**

Continuation and intensification of work initiated in 117B. Students complete a full-length screenplay. Concentrates on both practical and technical concerns, addressing pragmatic and aesthetic questions in intensive small-group discussions. Materials fee.

Prerequisite: FLM&MDA 117B. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 118A. Writing Television I. 4 Units.**

Introduction to the technique and format of the television screenplay. Focuses on character, storytelling, structure, and scene development; culminating in a one-hour drama series treatment and first act of the pilot.

Prerequisite: FLM&MDA 85B. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 118B. Writing Television II. 4 Units.**

Intermediate-level screenwriting class exploring the one-hour television drama format. Students write and workshop an original pilot, continuing work started in 118A, and finish a complete draft of the pilot script.

Prerequisite: FLM&MDA 118A. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 120A. Basic Production. 4 Units.**

Introduction to the basic apparatus of video/film production. The elementary essentials of production, including the use of camera and lenses, lighting, editing, and sound. Materials fee.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 120B. Intermediate Production. 4 Units.**

Students work on individual and group projects, utilizing skills and insights introduced in Film and Media Studies 120A. Materials fee.

Prerequisite: FLM&MDA 120A. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 120C. Production Workshop. 4 Units.**

As film and video are collaborative media, students form production groups and ultimately produce final 10-15-minute film/video projects. Materials fee.

Prerequisite: FLM&MDA 120B. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 130. Multicultural Topics in the Media. 4 Units.**

Investigation of media representations of gender, race, and sexuality in the United States. Topics include media images of and by one or more minority groups in the United States, including African Americans, Asian Americans, Chicano/Latinos, Native Americans, gays, and lesbians.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 139W. Writing on Film and Media. 4 Units.**

Writing on cinema, television, and/or digital culture, emphasizing identification of reliable sources, close readings, addressing academic, professional, and/or popular audiences. Requires at least 4,000 words of assigned composition.

Prerequisite: FLM&MDA 85A or FLM&MDA 85B or FLM&MDA 85C. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Film and Media Studies Majors only.

**(Ib)**

**FLM&MDA 143. Critical Theory of Television. 4 Units.**

Introduction to critical, theoretical, and scholarly understandings and analyses of television, which offer in-depth analyses of television programming, audience reception practices, and industry strategies of address.

Prerequisite: FLM&MDA 85B. Satisfactory completion of the Lower-Division Writing requirement.

**FLM&MDA 144. Studies in New Media. 4 Units.**

Advanced analysis of the technologies, texts, theories, and cultures of computers, video games, networks, or platforms.

Prerequisite: FLM&MDA 85C. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 145. Popular Culture and Media. 4 Units.**

Considers the forms, ideologies, consumption, and marketing of popular entertainment and technologies. May focus on cultural studies methods, transnational approaches, and synergy between media.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 146. Sound Studies. 4 Units.**

Focuses on the production, theories, and meanings of sound recordings, music, and/or audio technologies. Topics may include the cultures of popular music and audio devices, music television, and theories of film sound.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 150. Audiences and Reception. 4 Units.**

Explores the dynamics of address, interpretation, and appropriation between film and media texts and their viewers. Topics may include reception studies, fandom, audience-defined modes of production, demographics, spectatorial pleasure, and historical approaches to audiences.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 151. Documentary and Experimental Film and Media. 4 Units.**

Examines nonfiction and/or experimental cinemas and media, such as documentary, the historical avant-garde, video art, and activist media. Students consider the specific aesthetics and ideologies of forms distinct from narrative feature films.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 160. National/Regional Cinemas and Media. 4 Units.**

National schools, period styles, or cultural movements beyond U.S. cinema, as defined by national borders or by geographic regions, such as Latin America. May be approached from a comparative perspective.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.



**FLM&MDA 161. Global/Transnational Cinemas and Media. 4 Units.**

Analyzes the multinational production, circulation, and reception of film and media texts beyond singular national borders or specific geographic regions. Topics may include transnational co-productions, exports, and diasporic reception.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 162. US Cinema . 4 Units.**

Explores the modes of production and distribution, aesthetics, and contexts that have shaped cinema in the United States. Topics may include classical Hollywood, American independent cinema, or periods such as 1970s cinema.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 185. Television and New Media. 4 Units.**

Advanced seminar focusing on special topics in television and new media. Past examples have included courses on media marketing and brand identity; television and sound; game theory; and other issues related to popular culture, broadcast media, and new media technologies.

Prerequisite: FLM&MDA 85B or FLM&MDA 85C. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 190. Special Topics in Film and Modern Media. 4 Units.**

Special issues concerned with film and media history, theory, and criticism.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 191. Special Topics in Critical Practice. 4 Units.**

Integrates critical analysis, historical, and theoretical methods with creative projects to illuminate film and media production and industries. May include courses in adaptation, writing television, media activism, writing the short film, performance studies, and movie title sequences.

Prerequisite: FLM&MDA 85A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 192. Special Topics in Advanced Film Production. 4 Units.**

Focuses on special topics in production. Culminates in final 6-10-minute group film projects. Topics include producing, acting, and/or directing in short films, experimental films, documentaries, television, and other media.

Prerequisite: FLM&MDA 120A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 193. Special Topics in Advanced Screenwriting. 4 Units.**

Focuses on special topics in screenwriting. Topics include adaptation, alternative screenwriting, writing the first feature, act two construction, and rewriting.

Prerequisite: FLM&MDA 117A or FLM&MDA 118A. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

**FLM&MDA 197. Professional Internship. 2-4 Units.**

Professional internship in the film, broadcast, and/or digital media industries designed to provide students with closely supervised professional experience to enhance their understanding of media from industrial, historical, and critical perspectives. Journal and final report required.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

Restriction: Upper-division students only.

**FLM&MDA 198. Creative Project. 2-4 Units.**

Creative project in screenwriting, filmmaking, videomaking, or Web or internet design intended to provide advanced production and creative writing training beyond the Film and Media Studies 117A-B-C or 120A-B-C series. Final project required.

Prerequisite: (FLM&MDA 85A and FLM&MDA 117A and FLM&MDA 117B and FLM&MDA 117C) or (FLM&MDA 120A and FLM&MDA 120B and FLM&MDA 120C). Satisfactory completion of the Lower-Division Writing requirement. Recommended: FLM&MDA 101A.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Upper-division students only.

**FLM&MDA 199. Directed Research. 4 Units.**

Directed reading and research under supervision of a faculty member in topic areas not covered by regular course offerings. Final research paper required.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only.

**FLM&MDA 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Film and Media Studies, B.A.

Film and Media Studies focuses on nurturing our diverse student body and our students' varied backgrounds and interests. Courses reflect an interdisciplinary and historically grounded approach to the study of moving images, on big and small screens alike. From parsing the history of television policy to writing for video games, our students get a unique interdisciplinary education in the historical and social background of the study of film, television, and new media. Our outstanding faculty are engaged in innovative research on topics like globalization, gender studies, queer theory, broadcast studies, intellectual history, new media and critical game studies, history of photography, and national cinema approaches to the analysis of Film and Media Studies, and our courses give our students access to this cutting-edge research. In our production and screenwriting courses, students get hands-on experience creating short films, television pilots, webisodes, computer games, and other visual media.

### Requirements for the B.A. in Film and Media Studies

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

#### Departmental Requirements for the Major

A. Complete the following:

FLM&MDA 85A	Introduction to Film and Visual Analysis
FLM&MDA 85B	Broadcast Media History and Analysis
FLM&MDA 85C	New Media and Digital Technologies
FLM&MDA 101A	History of Film I: The Silent Era
FLM&MDA 101B	History of Film II: The Studio Era
FLM&MDA 101C	History of Film III: The Contemporary Era

B. Complete either:

FLM&MDA 110	Film and Media Theory
or	
FLM&MDA 111	Film and Media Theory and Practice

C. Select one of the following:

FLM&MDA 117A	Introduction to Screenwriting
FLM&MDA 118A	Writing Television I
FLM&MDA 120A	Basic Production

D. Select four of the following:

FLM&MDA 112	Genre Study
FLM&MDA 113	Narrative/Image
FLM&MDA 114	Film, Media, and the Arts

FLM&MDA 115	Authorship
FLM&MDA 117B	Intermediate Screenwriting <sup>1</sup>
FLM&MDA 117C	Screenwriting Workshop <sup>1</sup>
FLM&MDA 118B	Writing Television II <sup>1</sup>
FLM&MDA 120B	Intermediate Production <sup>1</sup>
FLM&MDA 120C	Production Workshop <sup>1</sup>
FLM&MDA 130	Multicultural Topics in the Media
FLM&MDA 139W	Writing on Film and Media
FLM&MDA 143	Critical Theory of Television
FLM&MDA 144	Studies in New Media
FLM&MDA 145	Popular Culture and Media
FLM&MDA 146	Sound Studies
FLM&MDA 150	Audiences and Reception
FLM&MDA 151	Documentary and Experimental Film and Media
FLM&MDA 160	National/Regional Cinemas and Media
FLM&MDA 161	Global/Transnational Cinemas and Media
FLM&MDA 162	US Cinema
FLM&MDA 185	Television and New Media
FLM&MDA 190	Special Topics in Film and Modern Media
FLM&MDA 191	Special Topics in Critical Practice
FLM&MDA 192	Special Topics in Advanced Film Production
FLM&MDA 193	Special Topics in Advanced Screenwriting

<sup>1</sup> Only two of the courses marked may be applied toward this requirement.

**Residence Requirement for the Major:** At least five upper-division courses required for the major must be completed successfully at UCI.

Film and Media Studies at UC Irvine prepares students for graduate study and professional life in the Film and Media Studies areas. Our students have been admitted to Ph.D. and M.F.A. programs at UCLA, USC, New York University, and the University of Texas at Austin. Film and Media studies majors have gone on to law school and to get Ph.D.s in a variety of fields. Alumni also make careers in all aspects of the entertainment industry, finding work in the film, television, and game industries in Southern California and beyond. Film and Media Studies students find careers in directing, cinematography, editing, journalism, advertising, marketing, and distribution. Our students' diverse backgrounds have enabled them to work in bilingual or global media outlets. The Department encourages all qualified students to do professional internships. Visit the internship page on our website (<http://www.humanities.uci.edu/filmandmediastudies/undergraduate/interns.php>) for more information about the diverse array of internships that you can do for credit.

The UCI Division of Career Pathways provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on résumé preparation, job search, and interview techniques. See the UCI Division of Career Pathways website (<http://career.uci.edu/>) for additional information.

## Film and Media Studies, Minor

Film and Media Studies focuses on nurturing our diverse student body and our students' varied backgrounds and interests. Courses reflect an interdisciplinary and historically grounded approach to the study of moving images, on big and small screens alike. From parsing the history of television policy to writing for video games, our students get a unique interdisciplinary education in the historical and social background of the study of film, television, and new media. Our outstanding faculty are engaged in innovative research on topics like globalization, gender studies, queer theory, broadcast studies, intellectual history, new media and critical game studies, history of photography, and national cinema approaches to the analysis of Film and Media Studies, and our courses give our students access to this cutting-edge research. In our production and screenwriting courses, students get hands-on experience creating short films, television pilots, webisodes, computer games, and other visual media.

### Requirements for the Minor in Film and Media Studies

#### Departmental Requirements

A. Complete:

FLM&MDA 85A	Introduction to Film and Visual Analysis
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B. Select three of the following:

FLM&MDA 85B	Broadcast Media History and Analysis
FLM&MDA 85C	New Media and Digital Technologies

FLM&MDA 101A	History of Film I: The Silent Era
FLM&MDA 101B	History of Film II: The Studio Era
FLM&MDA 101C	History of Film III: The Contemporary Era
C. Select three of the following:	
FLM&MDA 110	Film and Media Theory
FLM&MDA 111	Film and Media Theory and Practice
FLM&MDA 112	Genre Study
FLM&MDA 113	Narrative/Image
FLM&MDA 114	Film, Media, and the Arts
FLM&MDA 115	Authorship
FLM&MDA 130	Multicultural Topics in the Media
FLM&MDA 143	Critical Theory of Television
FLM&MDA 144	Studies in New Media
FLM&MDA 145	Popular Culture and Media
FLM&MDA 146	Sound Studies
FLM&MDA 150	Audiences and Reception
FLM&MDA 151	Documentary and Experimental Film and Media
FLM&MDA 160	National/Regional Cinemas and Media
FLM&MDA 161	Global/Transnational Cinemas and Media
FLM&MDA 162	US Cinema
FLM&MDA 185	Television and New Media
FLM&MDA 190	Special Topics in Film and Modern Media
FLM&MDA 191	Special Topics in Critical Practice

**Residence Requirement for the Minor:** Four upper-division courses must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate department chair.

## Department of Gender and Sexuality Studies

**Jeanne Scheper, Department Chair**

3000 Humanities Gateway

949-824-2376

<http://www.humanities.uci.edu/genderandsexualitystudies/>

UCI's Department of Gender and Sexuality Studies is dedicated to the study of gender and sexuality in their complex articulation with other social categories such as race, ethnicity, class, religion, and nationality. The Department's goal is to foster critical and creative analysis of the various disciplinary perspectives—historical, political, economic, representational, technological, and scientific—that have constituted women, gender, and sexuality as objects of study. By emphasizing a rigorous interdisciplinary perspective in their teaching and research, the Gender and Sexuality Studies faculty seek to produce new knowledge about the social meanings of gender, race, class, and sexuality, and to equip students with a range of analytical and methodological skills.

The field of Gender and Sexuality Studies grew out of Women's Studies, an interdisciplinary field that developed at a phenomenal rate from a handful of student-initiated courses in the early 1970s to more than 600 programs in colleges and universities across the United States offering degrees at the B.A., M.A., and Ph.D. levels. UCI's Department of Women's Studies was founded as a program in 1975 and has grown significantly since that time. To reflect its expanding scope of inquiry, the department changed its name in 2014 to the Department of Gender and Sexuality Studies. The Department offers a B.A. in Gender and Sexuality Studies, a minor in Gender and Sexuality Studies, a minor in Queer Studies, and a graduate emphasis in Feminist Studies.

Gender and Sexuality Studies provides a unique intellectual community for undergraduate and graduate students, where faculty and students share a commitment to interactive teaching and learning. Students work closely with faculty to plan a coherent program of study and to anticipate work toward advanced degrees and a wide variety of career options.

### Career Opportunities

A degree in Gender and Sexuality Studies prepares students for multidisciplinary opportunities in graduate degree programs and for numerous careers in both the public and private sectors. Businesses, corporations, government and educational institutions increasingly find the need for expert knowledge about gender and sexuality. The growth of organizations and agencies that deal with women's, gender, and LGBTQ+ rights issues—at the local, national, and global levels—is expanding opportunities for graduates with degree specializations in Gender and Sexuality Studies. GSS graduates bring unique skills and knowledge to the professions of law, medicine, social work, education, counseling, and to government service, all of which increasingly

require expertise on issues concerning gender and sexuality. Students of Gender and Sexuality Studies develop critical and analytical skills that prove valuable in the full range of innovative career, employment, and philanthropic/humanitarian/social justice choices.

The UCI Division of Career Pathways (<http://career.uci.edu/>) provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques.

- Feminist Studies, Graduate Emphasis
- Gender and Sexuality Studies, B.A.
- Gender and Sexuality Studies, Minor
- Queer Studies, Minor

## Faculty

Jonathan Alexander, Ph.D. Louisiana State University, *Associate Dean, Division of Undergraduate Education and Campus Writing Coordinator and Chancellor's Professor of English; Culture and Theory; Education; Gender and Sexuality Studies; Informatics* (writing studies, sexuality studies, queer theory, new media studies)

Victoria Bernal, Ph.D. Northwestern University, *Professor of Anthropology; Culture and Theory; Gender and Sexuality Studies; Religious Studies* (gender, war, cyberspace, Islam, transnationalism, Africa)

Michele B. Goodwin, J.D. Boston College, *Director, Center for Biotechnology and Global Health Policy and UCI's Chancellor's Professor of School of Law; Criminology, Law and Society; Gender and Sexuality Studies; Program in Public Health*

Laura H. Kang, Ph.D. University of California, Santa Cruz, *Professor of Gender and Sexuality Studies* (feminist epistemologies and theories, cultural studies, ethnic studies)

Nasrin Rahimieh, Ph.D. University of Alberta, *Director of the Humanities Core Program and Howard Baskerville Professor of Comparative Literature; European Languages and Studies; Gender and Sexuality Studies* (Modern Persian literature and culture, diaspora studies, women's writing.)

Catherine Z. Sameh, Ph.D. Rutgers, The State University of New Jersey, *Assistant Professor of Gender and Sexuality Studies* (Iranian feminism, human rights, transnational feminisms, gender and social movements in the Middle East and Muslim world, Islam, women of color feminisms)

Jeanne Scheper, Ph.D. University of California, Santa Barbara, *Department Chair and Associate Professor of Gender and Sexuality Studies* (feminist performance studies and visual culture, cultural studies, theories of race, gender and sexuality, trans-Atlantic modernism)

Jennifer Terry, Ph.D. University of California, Santa Cruz, *Professor of Gender and Sexuality Studies; Comparative Literature* (cultural studies, social theory; science and technology studies, formations of gender and sexuality, critical approaches to modernity, American studies in transnational perspective, processes of militarization)

Heidi E. Tinsman, Ph.D. Yale University, *Department Chair and Professor of History; Gender and Sexuality Studies* (Latin America, gender and sexuality, world history)

## Courses

### GEN&SEX 20. Introduction to Queer Studies. 4 Units.

Study of sexuality from the perspective of lesbian, gay, queer, transgender scholarship spanning humanities, social sciences, and arts.

(IV and VII).

### GEN&SEX 50A. Gender and Feminism in Everyday Life. 4 Units.

What is gender? Why does studying it matter? Explores how feminism has understood not only gender as a category of social analysis, but how gender structures personal identities, family, citizenship, work and leisure, social policy, sexuality, and language.

(IV, VII)

### GEN&SEX 50B. Gender and Power. 4 Units.

From workplace to home to schools to prisons, how are societal institutions and politics "gendered"? Examines power and inequalities around gender, race, class, and sexuality in national and transnational contexts.

(IV, VII)

### GEN&SEX 50C. Gender and Popular Culture. 4 Units.

An investigation of gender, race, and sexuality in film, TV, video, music, and advertising, with attention to the ways that popular culture shapes understandings of technology, national identities, leisure and work, historical memory, international communication, and multicultural representation.

(IV, VII)

**GEN&SEX 60A. Gender and Science. 4 Units.**

Examines science from a variety of feminist viewpoints in order to explore how science influences everyday life. Special attention is given to the ways science shapes our understanding of gender, race, and sexuality.

(III)

**GEN&SEX 60B. Gender and Law. 4 Units.**

Introduction to the relationship between gender, race, sexuality, and the law. Critical thinking about how law defines citizenship, political representation, and democracy, focusing on the history of legal reform undertaken in the name of women as a social group.

(III)

**GEN&SEX 60C. Gender and Religion. 4 Units.**

Introduces the topic of religion in a feminist context by performing cross-cultural exploration of gender, authority, and faith in various traditions. Study includes (but is not limited to) writings of contemporary Jewish, Christian, and Muslim feminists.

Same as REL STD 61.

(III and VIII ).

**GEN&SEX 100A. Feminism and Social Change. 4 Units.**

Explores feminist modes of knowledge production in relation to histories and activist practices of various social movements. Examines the kinds of information, research, ideas, theories, and concepts that underlie feminist cultural analysis and social movement organizing.

**GEN&SEX 100B. Feminist Theory. 4 Units.**

Introduction to historical traditions in theory and various conceptual frameworks informing scholarship in gender studies, sexuality studies, and women's studies as a field of critical inquiry.

**GEN&SEX 100C. Feminist Cultural Studies. 4 Units.**

Investigation of the theories and methods that inform the feminist study of culture. Focuses on the interpretation of the visual arts and literature created by, and predominately for, women.

**GEN&SEX 100D. Queer Knowledges. 4 Units.**

Explores the emergence of historical elaboration of non-normative sexual identities, practices, and communities; focuses on medical, legal, literary, aesthetic, scientific, and religious notions about homosexuality and appropriations and subversions of these notions by queer people.

**GEN&SEX 110A. Gender, State, and Nation. 4 Units.**

Examination of gender and sexuality in relation to the production of identities created through participation in state and nation. Examines complexity of relationship between feminism and nationalism, feminism and the state.

**GEN&SEX 110B. Money, Sex, and Power. 4 Units.**

Examination of gender and sexuality in relation to the emergence of the modern world, modernity, and capitalism; commodification, circulation, and transnational exchanges relating to race, gender, class, sexuality, religion, and nationality.

**GEN&SEX 110D. The Politics of Health and Medicine. 4 Units.**

Focuses on cultural and political-economic analysis and representations of disease both within the U.S. and globally.

**GEN&SEX 120A. Histories of Sexuality. 4 Units.**

Examines the historical production of non-normative sexual and gender identities, bodies, practices, and communities. Explores how past formations inform and shape the present and future.

**GEN&SEX 120B. Image Problems. 4 Units.**

Examination of scholarly approaches to gender stereotypes and politics of representation as they present possibilities for critical analysis and produce problems and limitations; how powerful ideas of gender intersect with other forms of social differentiation such as race and class.

**GEN&SEX 120C. Practices of Embodiment. 4 Units.**

Explores how science, medicine, and law have shaped the understanding of differentiated bodies; examines shifting norms and ideals about producing, shaping, adorning, and dressing gendered bodies across diverse historical, cultural, social, economic, and spatial contexts.

**GEN&SEX 139. Topics in Gender Studies. 4 Units.**

Various topics in gender studies. Encompasses issues of gender, culture, race and class, including issues of sexualities and social justice.

Repeatability: Unlimited as topics vary.

**GEN&SEX 155. Topics in Gender and Sexuality Studies. 4 Units.**

Designed to provide students with an opportunity to conduct advanced work in Gender and Sexuality Studies.

Repeatability: Unlimited as topics vary.

**GEN&SEX 157. Topics in Queer Studies. 4 Units.**

Explores issues in queer studies from one or more of the following perspectives: theoretical, historical, legal, economic, political, sociological, and representation in the arts.

Repeatability: Unlimited as topics vary.

**GEN&SEX 165F. Gender and Technology. 4 Units.**

Using a variety of disciplinary methods, examines how various technological processes and products produce culturally complex meanings associated with gender and technology.

**GEN&SEX 167A. Militarism and Gender. 4 Units.**

Examination of feminist approaches to militarism, war, and political violence; drawing on representations of women as both victims of and participants in military violence; effects of militarism on formations of gender; effects of military industrial complex on nationalism and identity.

Same as INTL ST 153F.

**GEN&SEX 170. Topics in Gender, Feminism, Literature, and Language. 4 Units.**

Topics cover issues in language and literature which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 171. Topics in Gender, Feminism, and History. 4 Units.**

Topics cover issues in history which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 171A. Sex and Conquest in Latin America. 4 Units.**

Competing ideas of masculinity and femininity, sexual violence, sexual identities, and gendered hierarchies informed how the Spanish engaged in military and religious domination of Mexican and Andean communities, as well as the forms of native resistance throughout colonial Latin America.

Same as ANTHRO 140, CHC/LAT 150A, HISTORY 160.

**GEN&SEX 174. Topics in Gender, Feminism, and the Arts. 4 Units.**

Topics cover issues in the arts which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 175. Topics in Gender, Feminism, and the Media. 4 Units.**

Topics cover issues in the media which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 180. Topics in Gender, Feminism, and Anthropology. 4 Units.**

Topics cover issues in Anthropology which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 181. Topics in Gender, Feminism, and Cognitive Psychology. 4 Units.**

Topics cover issues in cognitive psychology which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 182. Topics in Gender, Feminism and Economics. 4 Units.**

Topics cover issues in economics which relate to women and gender or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 183. Topics in Gender, Feminism, and Sociology. 4 Units.**

Topics cover issues in sociology which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.



**GEN&SEX 184. Topics in Gender, Feminism, and Political Science. 4 Units.**

Topics cover issues in political science which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 185. Topics in Gender, Feminism, and Social Sciences. 4 Units.**

Topics cover issues in social sciences which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 187. Topics in Gender, Feminism, and Social Ecology. 4 Units.**

Topics cover issues in social ecology which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 188. Topics in Gender, Feminism, and Science. 4 Units.**

Topics cover issues in science which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 189. Topics in Gender, Feminism, and Interdisciplinary Studies. 4 Units.**

Topics cover issues in interdisciplinary studies which relate to women or gender, or which are taught from a feminist methodological perspective.

Repeatability: Unlimited as topics vary.

**GEN&SEX 190. Topics in Sexualities Studies. 4 Units.**

Topics cover issues in the humanities, social sciences, sciences, and arts that relate to critical inquiry of sexualities.

Repeatability: Unlimited as topics vary.

**GEN&SEX 197. Senior Seminar in Gender and Sexuality Studies. 4 Units.**

Students read advanced scholarship in Gender and Sexuality Studies and complete a major seminar paper.

Prerequisite: Satisfactory completion of the Upper-Division Writing requirement.

Restriction: Gender and Sexuality Studies Majors only.

**GEN&SEX 199. Independent Study . 1-4 Units.**

Directed reading and research in consultation with a faculty member. Substantial written work required. Includes independent study, involving 3-12 hours a week.

Repeatability: May be repeated for credit unlimited times.

**GEN&SEX 200A. Feminist Knowledge and Social Change. 4 Units.**

Provides a broad and introductory overview of Women's Studies and feminist knowledge, including key concepts, theoretical frameworks, disciplinary approaches and methods, and critical debates that have shaped the field.

Repeatability: May be taken for credit 2 times.

**GEN&SEX 200B. Problems in Feminist Research. 4 Units.**

Colloquium on analytic approaches to interdisciplinary feminist research in Women's Studies and exploration of how feminist knowledges are produced in different academic disciplines.

Repeatability: May be taken for credit 2 times.

**GEN&SEX 201. Special Topics in Feminist Studies. 4 Units.**

Seminars on various topics in feminist studies.

Repeatability: Unlimited as topics vary.

**GEN&SEX 210A. Topics in Graduate Feminist Theory. 4 Units.**

In-depth introduction to various theoretical frameworks that have and continue to inform scholarship in Women's Studies including (but not limited to) identity, representation, and political economy.

Repeatability: Unlimited as topics vary.



**GEN&SEX 290. Directed Research. 2-12 Units.**

Directed graduate study/research in Gender and Sexuality Studies.

Repeatability: May be taken for credit for 24 units.

Restriction: Graduate students only.

**GEN&SEX 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

## Feminist Studies, Graduate Emphasis

The Department of Gender and Sexuality Studies offers an emphasis in Feminist Studies, which is available to all graduate students at UCI. Satisfactory completion of the emphasis is certified by the Director of Graduate Study.

Students may apply for admission to the emphasis following successful completion of either GEN&SEX 200A or GEN&SEX 200B. For complete information about application policies and procedures, refer to the Gender and Sexuality Studies website (<http://www.humanities.uci.edu/genderandsexualitystudies/graduate/>) or contact the Director of Graduate Study.

### Emphasis Requirements

Minimum course work for the graduate emphasis in Feminist Studies consists of four courses: two core courses, GEN&SEX 200A-GEN&SEX 200B, a coherent sequence normally taken in consecutive quarters; one elective graduate seminar in the Department of Gender and Sexuality Studies; and one additional graduate seminar in feminist scholarship taught outside of the department. Within 30 days of completion of the outside course, students must submit a substantive narrative (500 words minimum) to the Director of Graduate Study about how their coursework sufficiently and effectively engaged with Feminist Studies. The narrative should include specific examples of how students engaged with feminist theories, frameworks, and key concepts in their coursework. In the event the Director of Graduate Study does not approve the narrative, the students will have the opportunity to repeat the process with another course.

The course requirements for Ph.D., M.A., and M.F.A. candidates are the same.

For doctoral students, the qualifying examination and dissertation topic should incorporate Feminist Studies in a meaningful way.

### Requirements for Completion

During the final year of their graduate program, students must complete a GFE checklist, which includes the submission of the outside course narrative and a sample of work related to Feminist Studies (e.g. a dissertation chapter or substantive paper, a video, or other creative work). Upon receipt, the Graduate Director will verify completion of four required graduate courses related to Feminist Studies.

NOTE: The dissertation may be accepted in fulfillment of the sample of work when Feminist Studies is incorporated in a substantive way.

## Gender and Sexuality Studies, B.A.

UCI's Department of Gender and Sexuality Studies is dedicated to the study of gender and sexuality in their complex articulation with other social categories such as race, ethnicity, class, religion, and nationality. The Department's goal is to foster critical and creative analysis of the various disciplinary perspectives—historical, political, economic, representational, technological, and scientific—that have constituted women, gender, and sexuality as objects of study. By emphasizing a rigorous interdisciplinary perspective in their teaching and research, the Gender and Sexuality Studies faculty seek to produce new knowledge about the social meanings of gender, race, class, and sexuality, and to equip students with a range of analytical and methodological skills.

The field of Gender and Sexuality Studies grew out of Women's Studies, an interdisciplinary field that developed at a phenomenal rate from a handful of student-initiated courses in the early 1970s to more than 600 programs in colleges and universities across the United States offering degrees at the B.A., M.A., and Ph.D. levels. UCI's Department of Women's Studies was founded as a program in 1975 and has grown significantly since that time. To reflect its expanding scope of inquiry, the department changed its name in 2014 to the Department of Gender and Sexuality Studies. The Department offers a B.A. in Gender and Sexuality Studies, a minor in Gender and Sexuality Studies, a minor in Queer Studies, and a graduate emphasis in Feminist Studies.

Gender and Sexuality Studies provides a unique intellectual community for undergraduate and graduate students, where faculty and students share a commitment to interactive teaching and learning. Students work closely with faculty to plan a coherent program of study and to anticipate work toward advanced degrees and a wide variety of career options.

## Undergraduate Program

### Requirements for the B.A. in Gender and Sexuality Studies

All students must meet the University Requirements.

All students must meet the School Requirements.

#### Departmental Requirements for the Major

A. Three introductory core courses:

GEN&SEX 50A	Gender and Feminism in Everyday Life
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and select two of the following:

GEN&SEX 20	Introduction to Queer Studies
GEN&SEX 50B	Gender and Power
GEN&SEX 50C	Gender and Popular Culture
GEN&SEX 60A	Gender and Science
GEN&SEX 60B	Gender and Law
GEN&SEX 60C	Gender and Religion

B. Five advanced core courses from:

GEN&SEX 100A	Feminism and Social Change
GEN&SEX 100B	Feminist Theory
GEN&SEX 100D	Queer Knowledges
GEN&SEX 110A	Gender, State, and Nation
GEN&SEX 110B	Money, Sex, and Power
GEN&SEX 110D	The Politics of Health and Medicine
GEN&SEX 120A	Histories of Sexuality
GEN&SEX 120B	Image Problems
GEN&SEX 120C	Practices of Embodiment

C. Three advanced elective core courses selected from GEN&SEX 139–190

D. Complete:

GEN&SEX 197	Senior Seminar in Gender and Sexuality Studies
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**Residence Requirement for the Major:** A minimum of five upper-division courses required for the major must be completed successfully at UCI.

A degree in Gender and Sexuality Studies prepares students for multidisciplinary opportunities in graduate degree programs and for numerous careers in both the public and private sectors. Businesses, corporations, government and educational institutions increasingly find the need for expert knowledge about gender and sexuality. The growth of organizations and agencies that deal with women's, gender, and LGBTQ+ rights issues—at the local, national, and global levels—is expanding opportunities for graduates with degree specializations in Gender and Sexuality Studies. GSS graduates bring unique skills and knowledge to the professions of law, medicine, social work, education, counseling, and to government service, all of which increasingly require expertise on issues concerning gender and sexuality. Students of Gender and Sexuality Studies develop critical and analytical skills that prove valuable in the full range of innovative career, employment, and philanthropic/humanitarian/social justice choices.

The UCI Division of Career Pathways (<http://career.uci.edu/>) provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques.

## Gender and Sexuality Studies, Minor

The Department offers a minor in Gender & Sexuality Studies which examines the complex articulations of gender and sexuality with systems that differentiate races, ethnicities, socio-economic classes, religions, and nationalities. Students examine how the authority of sciences, technologies, images, narratives, laws, and religions have been formative in producing prevailing ideas about gender and sexuality. Our teaching and research agendas reflect a commitment to refining three key methods: 1) Feminist Transnational Analysis; 2) Critical Interdisciplinarity; 3) Cultural Theory.

#### Departmental Requirements

A. Three introductory core courses selected from:

GEN&SEX 20	Introduction to Queer Studies
GEN&SEX 50A	Gender and Feminism in Everyday Life
GEN&SEX 50B	Gender and Power
GEN&SEX 50C	Gender and Popular Culture
GEN&SEX 60A	Gender and Science

GEN&SEX 60B	Gender and Law
GEN&SEX 60C	Gender and Religion
B. Three advanced core courses selected from the following:	
GEN&SEX 100A	Feminism and Social Change
GEN&SEX 100B	Feminist Theory
GEN&SEX 100D	Queer Knowledges
GEN&SEX 110A	Gender, State, and Nation
GEN&SEX 110B	Money, Sex, and Power
GEN&SEX 110D	The Politics of Health and Medicine
GEN&SEX 120A	Histories of Sexuality
GEN&SEX 120B	Image Problems
GEN&SEX 120C	Practices of Embodiment

C. One advanced elective course selected from GEN&SEX 139–190

**Residence Requirement for the Minor:** A minimum of four upper-division courses required for the minor must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, provided course content is approved in advance by the appropriate department chair.

## Queer Studies, Minor

The Department of Gender and Sexuality Studies offers a minor in Queer Studies. Taking as a point of departure that sexuality is a complex historical and cultural phenomenon, Queer Studies examines this complexity, drawing upon methods from anthropology, art, art history, biology, history, literature, philosophy, psychology, and sociology. Interdisciplinary insights from area studies, cultural studies, critical legal studies, ethnic studies, gender studies, religious studies, science and technology studies, visual studies, and women's studies also enrich this area of study.

### Departmental Requirements

A. Complete:

GEN&SEX 20	Introduction to Queer Studies
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B. Select two of the following:

GEN&SEX 50A	Gender and Feminism in Everyday Life
GEN&SEX 50B	Gender and Power
GEN&SEX 50C	Gender and Popular Culture
GEN&SEX 60A	Gender and Science
GEN&SEX 60B	Gender and Law
GEN&SEX 60C	Gender and Religion

C. Complete two upper-division core courses:

GEN&SEX 100D	Queer Knowledges
GEN&SEX 157	Topics in Queer Studies

D. Select two upper-division courses from the following:

GEN&SEX 100–190 (excluding GEN&SEX 100D and GEN&SEX 157)
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**Residence Requirement for the Minor:** A minimum of four upper-division courses required for the minor must be successfully completed at UCI. Two of the four may be taken through the UC Education Abroad Program, provided course content is approved in advance by the appropriate department chair.

## Department of History

**Heidi Tinsman, Department Chair**

200 Murray Krieger Hall

949-824-6521

<http://www.humanities.uci.edu/history/>

The undergraduate program in History is designed to develop critical intelligence and to foster an awareness of ourselves and our world through the study of the past. The Department presents a variety of approaches to history, and each emphasizes basic disciplinary skills: weighing evidence, constructing logical arguments, and exploring the role of theory in historical analysis and human action.

The Department offers a number of lower-division courses open to majors as well as non-majors, most of which fulfill part of the UCI general education requirements.

Students who are interested in the study of history but are majoring in other disciplines may minor in History. The minor incorporates elements of the Department's program for majors but allows students enough flexibility to pursue programs in other departments and schools.

Upper-division courses range from the examination of individual nation-states (e.g., Chinese history), to studies of the relations among nation-states (e.g., Emergence of the Modern Middle East), to historical analyses of political, socio-economic, and cultural factors (e.g., Women in the United States). Students are also provided the opportunity for small-group learning experiences through colloquia. The colloquia are conducted as discussion groups, involve close reading and analysis of primary and secondary texts, and require writing.

In addition, History students have the option of pursuing advanced study through programs offered by the Department, the School of Humanities, and the University. Within the Department of History, students have the opportunity to complete an advanced research seminar series or to design their own research project with a faculty advisor through Independent Study.

## Specialization in History for Future Teachers

The Specialization in History for Future Teachers is designed to prepare history majors who aspire to earn a post-baccalaureate teaching credential. Through specific history course requirements, courses in the School of Education, and a field work requirement, students will be well positioned for admission to teaching credential programs.

## Phi Alpha Theta

Phi Alpha Theta is a charter member of the Association of College Honor Societies for undergraduates, graduates, and faculty within the discipline of history. Becoming a member to the society will grant you honor cords for graduation and allow eligibility for several national and regional scholarships. To become eligible for initiation, students must have achieved junior standing, have completed seven or more history courses in residence at UCI, and have acquired a minimum 3.5 GPA in the major and a minimum 3.3 GPA overall. For more information, please contact the History Undergraduate Program Coordinator.

## Study Abroad

The department strongly encourages majors and minors to take advantage of the University's study abroad programs and to experience a different culture, for a quarter or longer, while making progress toward their UCI degree. Moreover, students who are particularly interested in the history of a specific country or region would greatly benefit from direct study and cultural interaction within that country or region. Information about studying abroad can be found at UCI's Study Abroad Center website. (<http://www.studyabroad.uci.edu/>)

- Armenian Studies, Minor
- History, B.A.
- History, M.A.
- History, Minor
- History, Ph.D.

## Faculty

Emily L. Baum, Ph.D. University of California, San Diego, *Associate Professor of History; Religious Studies* (modern Chinese history, history of medicine)

Houri Berberian, Ph.D. University of California, Los Angeles, *Director of the Armenian Studies Program and Meghrouni Family Chair in Armenian Studies and Professor of History; Religious Studies* (modern Armenian history, Middle East history)

Sharon B. Block, Ph.D. Princeton University, *Professor of History* (digital humanities, early American, race and sexuality)

Alex Borucki, Ph.D. Emory University, *Associate Professor of History; African American Studies* (African diaspora, early modern Atlantic world, slave trade, colonial Latin America)

Anita Casavantes Bradford, Ph.D. University of California, San Diego, *Associate Professor of Chicano/Latino Studies; Asian American Studies; History* (20th century U.S., U.S. in the world, Cuba and the Caribbean; history of childhood; history of immigration, race and ethnicity; transnational and comparative Latina/o history; religion, politics and social movements)

Vinayak Chaturvedi, Ph.D. University of Cambridge, *Associate Professor of History; Culture and Theory; European Languages and Studies; Religious Studies* (modern South Asia, social and intellectual history)

Yong Chen, Ph.D. Cornell University, *Associate Dean of Curriculum and Student Services and Professor of History; Asian American Studies; Religious Studies* (Asian American history and immigration, food and culture, U.S./China economic and cultural interactions)

Simon A. Cole, Ph.D. Cornell University, *Professor of Criminology, Law and Society; History; School of Law* (science, technology, law, criminal justice)

Ian Collier, Ph.D. University of Melbourne, *Professor of History; European Languages and Studies* (Europe and the Muslim world, the French Revolution and the global history of the Revolutionary age)

Touraj Daryaee, Ph.D. University of California, Los Angeles, *UCI Endowed Chair in Persian Studies and Culture and Professor of History; Religious Studies* (Iran, Zoroastrianism, Ancient Medieval World)

Alice Fahs, Ph.D. New York University, *Professor Emerita of History* (Civil War America, American cultural history, gender)

Sarah Bennett Farmer, Ph.D. University of California, Berkeley, *Associate Professor of History* (modern French history, twentieth-century Europe, social and cultural history)

David Fedman, Ph.D. Stanford University, *Assistant Professor of History* (Japan and Korea, environmental history, historical geography, global history, modern war)

Richard I. Frank, Ph.D. University of California, Berkeley, *Professor Emeritus of History* (Roman history, Classical tradition)

Dorothy B. Fujita-Rony, Ph.D. Yale University, *Associate Professor of Asian American Studies; Culture and Theory; History* (U.S. history, Asian American studies)

Howard A. Gillman, Ph.D. University of California, Los Angeles, *Chancellor and Professor of Political Science; Criminology, Law and Society; History; School of Law*

James B. Given, Ph.D. Stanford University, *Professor Emeritus of History*

Qitao Guo, Ph.D. University of California, Berkeley, *Associate Professor of History; Religious Studies* (social, cultural, and religious history of pre-modern China (the Ming and Qing dynasties))

Douglas M. Haynes, Ph.D. University of California, Berkeley, *Vice Chancellor for Equity, Diversity, and Inclusion and Professor of History; African American Studies* (social and cultural history of modern Britain, social history of modern medicine)

Andrew Highsmith, Ph.D. University of Michigan, *Associate Professor of History* (United States history since 1865; cities and suburbs in American life; public policy history; political history; social inequality; land-use policy)

Lamar M. Hill, Ph.D. University of London, *Professor Emeritus of History*

David B. Igler, Ph.D. University of California, Berkeley, *Professor of History* (U.S., American West, environmental, and Pacific history)

Adria Imada, Ph.D. New York University, *Associate Professor of History* (indigenous and Pacific Islands studies, race, gender and medicine, visual studies)

Winston A. James, Ph.D. University of London, *Professor of History* (Caribbean, African American, African diaspora)

Michael P. Johnson, Ph.D. Stanford University, *Professor Emeritus of History*

Mark A. LeVine, Ph.D. New York University, *Professor of History; Religious Studies* (modern Middle Eastern history, Islamic studies, histories of empire and globalization)

Matthias Lehmann, Ph.D. Freie Universität Berlin, *Director of the Interdisciplinary Minor in Jewish Studies and Teller Family Chair in Jewish History and Professor of History; Religious Studies* (early modern and modern Jewish history, Sephardic studies)

Joan Malczewski, Ph.D. Columbia University, *Associate Professor of History* (American political development, education, progressivism, philanthropy, and American south)

Lynn Mally, Ph.D. University of California, Berkeley, *Professor Emerita of History*

Joseph H. McKenna, Ph.D. Fordham University, *Lecturer of History; Religious Studies* (history of religious ideas)

Nancy Ann McLoughlin, Ph.D. University of California, Santa Barbara, *Associate Professor of History; European Languages and Studies; Religious Studies* (late Medieval Europe, intellectual history, gender)

Jessica Millward, Ph.D. University of California, Los Angeles, *Associate Professor of History; African American Studies; Culture and Theory* (U.S., slavery, African diaspora, African American gender and women)

Laura J. Mitchell, Ph.D. University of California, Los Angeles, *Associate Professor of History* (social and cultural history of South Africa, Africa, and the world)

Robert G. Moeller, Ph.D. University of California, Berkeley, *Professor Emeritus of History* (modern European history)

Susan Katharine Morrissey, Ph.D. University of California, Berkeley, *Professor of History; European Languages and Studies* (Russia, terrorism and political violence, suicide)

Keith L. Nelson, Ph.D. University of California, Berkeley, *UCI Endowed Chair and Edward A. Dickson Professor Emeritus of History; Religious Studies*

Rachel S. O'Toole, Ph.D. University of North Carolina at Chapel Hill, *Associate Professor of History* (Colonial Latin America, African Diaspora, colonialisms, race, racism, indigenous histories, gender, Atlantic worlds)

Spencer C. Olin, Ph.D. Claremont Graduate University, *Professor Emeritus of History*

Alka Patel, Ph.D. Harvard University, *Associate Professor of Art History; History; Religious Studies; Visual Studies* (South Asian and Islamic art and architecture, historiographies, Islamic diasporas in Cuba)

Allison J. Perlman, Ph.D. University of Texas at Austin, *Associate Professor of History; Film and Media Studies; Visual Studies* (history of broadcasting, American social movements, media law and policy, media activism, popular memory)

Kavita S. Philip, Ph.D. Cornell University, *Professor of History; Informatics* (history of modern South Asia, science and technology, political ecology, critical theoretical studies of race, gender, colonialism, new media, and globalization)

Kathryn Ragsdale, Ph.D. University of Chicago, *Lecturer of History* (Japan: Meiji to present; Asia-Pacific War; Japanese film and popular culture)

Renee J. Raphael, Ph.D. Princeton University, *Associate Professor of History; European Languages and Studies; Religious Studies* (early modern Europe, history of science, intellectual history)

James Robertson, Ph.D. New York University, *Assistant Professor of History* (intellectual and cultural history of Europe and the Balkans)

Jaime E. Rodriguez, Ph.D. University of Texas at Austin, *Professor Emeritus of History*

Ana Rosas, Ph.D. University of Southern California, *Associate Professor of Chicano/Latino Studies; History* (Chicana/o comparative history, immigration, ethnicity)

Emily S. Rosenberg, Ph.D. State University of New York at Stony Brook, *Professor Emerita of History* (U.S. and the world, transnational/global history, international relations)

Vicki L. Ruiz, Ph.D. Stanford University, *Professor Emeritus of History; Chicano/Latino Studies* (Chicana/Latina history, U.S. labor, immigration, gender)

Sharon V. Salinger, Ph.D. University of California, Los Angeles, *Professor Emerita of History* (early America and early Modern Caribbean—social and labor history, race, gender)

Chelsea Schields, Ph.D. City University of New York, *Assistant Professor of History* (history of modern Europe, colonialism, decolonization, gender and sexuality)

Patricia Seed, Ph.D. University of Wisconsin-Madison, *Professor of History; Informatics* (mapping: history and design, game design, navigation)

Timothy Tackett, Ph.D. Stanford University, *Professor Emeritus of History*

Heidi E. Tinsman, Ph.D. Yale University, *Department Chair and Professor of History; Gender and Sexuality Studies* (Latin America, gender and sexuality, world history)

Steven Topik, Ph.D. University of Texas at Austin, *Professor Emeritus of History* (Brazil, Latin America, world history, commodities especially coffee, the state in the economy)

Anne Walthall, Ph.D. University of Chicago, *Professor Emerita of History*

Jeffrey N. Wasserstrom, Ph.D. University of California, Berkeley, *UCI Chancellor's Professor of History; School of Law* (modern China, protest, world history)

Jonathan M. Wiener, Ph.D. Harvard University, *Professor Emeritus of History*

## Courses

### HISTORY 10. The Holocaust. 4 Units.

Introduction to the history of European Jewish communities before the Holocaust; the origins of Nazi antisemitism; the implementation of the 'Final Solution'; Jewish resistance to the Nazis; and attempts in film and literature to represent the Holocaust since 1945.

(IV, VIII)



**HISTORY 11. Genocide and Crimes Against Humanity Since WWII. 4 Units.**

Investigates instances of genocide since 1945 (including Cambodia, Bosnia, Rwanda, and others); explores the history behind these mass murders; considers why people kill, how victims survive, and questions whether international agreements are enough to prevent crimes against humanity.

(III, VIII)

**HISTORY 12. Introductory Topics in History . 4 Units.**

Introduces methods and premises of historical study. Topics include introductions to cultural, political, economic, social, and religious history.

Repeatability: Unlimited as topics vary.

(IV)

**HISTORY 15A. Native American History. 4 Units.**

An overview of major developments in Indian-white relations from the American Revolution to the present with an emphasis on political and legal history. How tribal sovereignty has been redefined over time is a central theme of the course.

(IV, VII)

**HISTORY 15C. Asian American Histories. 4 Units.**

Examines and compares diverse experiences of major Asian American groups since the mid-nineteenth century. Topics include origins of emigration; the formation and transformation of community; gender and family life; changing roles of Asian Americans in American society. Formerly ASIANAM 60A.

Same as ASIANAM 50, SOC SCI 78A.

((III or IV) and VII ).

**HISTORY 15D. History of Sexuality in the US . 4 Units.**

Explores intertwined histories of sexuality, race, and gender in the US. By examining how different cultures and times viewed sexuality, race and gender, it analyzes relationships between regulation of bodies/behaviors and construction of cultural, economic, and political norms.

(IV, VII)

**HISTORY 15F. What to Eat? Immigrants and the Development of American Cuisines. 4 Units.**

Relationship between immigration and changing American foodways; impact of several major culinary traditions of immigrants and racial minorities, such as African Americans, Asian Americans, Mexican Americans, Italian Americans, Irish Americans, and Jewish Americans, on America's gastronomical and socioeconomic landscape.

((III or IV) and VII ).

**HISTORY 15G. Racial Segregation in Modern U.S.. 4 Units.**

Explores the history of racial segregation in the United States from the late 19th century to the present.

(VII)

**HISTORY 16A. World Religions I. 4 Units.**

An introduction to the history, doctrine, culture, and writing of Judaism, Christianity, and Islam.

Same as REL STD 5A.

(IV and VIII ).

**HISTORY 16B. World Religions II. 4 Units.**

An introduction to various religious traditions in selected areas of the world—including India and South Asia, East Asia, Africa, and the Americas.

Same as REL STD 5B.

(IV and VIII ).

**HISTORY 16C. Religious Dialogue. 4 Units.**

Lectures and discussion on controversial topics in religion: sexual morality; religious violence; science; treatment of women and girls; religious truth, American Constitutional matters; secularization; the future of religion, and other topics.

Same as REL STD 5C.

(IV, VIII)

**HISTORY 18A. Major Jewish Texts. 4 Units.**

Introduction to the diversity of Jewish cultures from ancient to modern times. Surveys the Jewish experience in various societies and civilizations: ancient Mediterranean, Middle East and North Africa, Europe, and the Americas.

(IV and VIII ).

**HISTORY 21A. World: Innovations. 4 Units.**

Treats major themes of world historical development through the mid-seventeenth century, focusing on the Eurasian world, but with secondary emphasis on Africa and the Americas.

(IV, VIII)

**HISTORY 21B. World: Empires and Revolutions. 4 Units.**

Examines three major transformations that made the world of 1870 dramatically different from that of 1650: e.g., the scientific revolution, industrialization, and the formation of modern states and nations.

(IV, VIII)

**HISTORY 21C. World: Nation, War, and Rights. 4 Units.**

Considers several major currents of modern history: technological change and its social effects; changes in gender relations; totalitarianism; peasant revolutions and the crisis of colonization; international migration; and ecological problems.

(IV and VIII ).

**HISTORY 36A. The Formation of Ancient Greek Society: Early Greece. 4 Units.**

A survey of ancient Greek civilization from its origins in the Bronze Age to the mid-Archaic period. Examines political and social history, as well as literature, art, religion, and archaeological remains.

Same as CLASSIC 36A.

(IV)

**HISTORY 36B. The Formation of Ancient Greek Society: Late Archaic and Classical Greece. 4 Units.**

A survey of ancient Greek civilization from the Late Archaic period to the Classical period. Focuses on major institutions and cultural phenomena as seen through the study of ancient Greek literature, history, archaeology, and religion.

Same as CLASSIC 36B.

(IV)

**HISTORY 36C. The Formation of Ancient Greek Society: Fourth-Century and Hellenistic Greece. 4 Units.**

A survey of ancient Greek civilization from the fourth century BCE through to the Hellenistic period. Focuses on major institutions and cultural phenomena as seen through the study of ancient Greek literature, history, archaeology, and religion.

Same as CLASSIC 36C.

(IV)

**HISTORY 37A. The Formation of Ancient Roman Society: Origins to Roman Republic. 4 Units.**

A survey of the development of Roman civilization from its eighth century BCE beginnings to the civil wars of the first century BCE. Examines political and social history, as well as literature, art, architecture, and religion.

Same as CLASSIC 37A.

(IV)

**HISTORY 37B. The Formation of Ancient Roman Society: Roman Empire. 4 Units.**

A survey of Roman civilization from Augustus's consolidation of power following the civil wars of the first century BCE to the crisis of the third century CE. Includes social history, literature, art, architecture, and religion.

Same as CLASSIC 37B.

(IV)



**HISTORY 37C. The Formation of Ancient Roman Society: The Fall of Rome. 4 Units.**

A survey of Roman civilization from the crisis of the third century CE to the so-called "fall of Rome" in 476 CE. Examines political and social history, as well as literature, art, architecture, and religion.

Same as CLASSIC 37C.

(IV)

**HISTORY 40A. Colonial America: New Worlds. 4 Units.**

Important themes in the social, economic, political, and cultural development in North America that transformed part of the geographical space into the U.S. Topics include Native Americans, European colonization, African enslavement, borderlands, gender, economic stratification, the American Revolution, the Constitution.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

(IV)

**HISTORY 40B. Nineteenth-Century U.S.: Crisis and Expansion. 4 Units.**

Explores the transformation of American society, economy, and politics during the nineteenth century. Topics include industrial revolution, slavery, antislavery, women's rights, reform movements, Civil War and Reconstruction, immigration and ethnicity, and cultural and social transformation.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

(IV)

**HISTORY 40C. Modern America: Culture and Power. 4 Units.**

Important themes in U.S. history in the twentieth and early twenty-first centuries. Topics include corporate capitalism, empire, immigration, race, gender, consumer society, World Wars, Progressiveness, New Deal, Great Society, civil rights, women's movements, Vietnam War, conservative politics, and economic stratification.

Prerequisite: Satisfaction of the UC Entry Level Writing requirement.

(IV)

**HISTORY 50. Crises and Revolutions. 4 Units.**

Study of turning points in world history, illustrating themes and methods of historical analysis.

Repeatability: May be taken for credit 3 times as topics vary.

(IV, VIII)

**HISTORY 60. The Making of Modern Science. 4 Units.**

Surveys the history of science and mathematics since the Scientific Revolution, examining central developments both chronologically and thematically, as well as investigating their significance for contemporary philosophical debates about the role and status of current scientific theories.

Same as LPS 60.

(GE II or GE IV ).

**HISTORY 70A. Problems in History: Asia. 4 Units.**

An introduction to the historical problems, the issues of interpretation, the primary sources, and the historical scholarship of the history of Asia, with an emphasis on developing skills in historical essay-writing.

Repeatability: Unlimited as topics vary.

(IV, VIII)

**HISTORY 70B. Problems in History: Europe. 4 Units.**

An introduction to the historical problems, the issues of interpretation, the primary sources, and the historical scholarship of the history of Europe, with an emphasis on developing skills in historical essay-writing.

Repeatability: Unlimited as topics vary.

(IV, VIII)

**HISTORY 70C. Problems in History: United States. 4 Units.**

An introduction to the historical problems, the issues of interpretation, the primary sources, and the historical scholarship of the history of the United States, with an emphasis on developing skills in historical essay-writing.

Repeatability: Unlimited as topics vary.

(IV)

**HISTORY 70D. Problems in History: Latin America. 4 Units.**

An introduction to the historical problems, the issues of interpretation, the primary sources, and the historical scholarship of the history of Latin America, with an emphasis on developing skills in historical essay-writing.

Repeatability: Unlimited as topics vary.

(IV, VIII)

**HISTORY 70E. Problems in History: Middle East and Africa. 4 Units.**

An introduction to the historical problems, the issues of interpretation, the primary sources, and the historical scholarship of the history of the Middle East and Africa, with an emphasis on developing skills in historical essay-writing.

Repeatability: Unlimited as topics vary.

(IV, VIII)

**HISTORY 70F. Problems in History: Transregional History. 4 Units.**

An introduction to the historical problems, the issues of interpretation, the primary sources, and the historical scholarship of transregional history, with an emphasis on developing skills in historical essay-writing.

Repeatability: Unlimited as topics vary.

(IV, VIII)

**HISTORY 100W. Writing About History. 4 Units.**

Specialized courses focusing on history writing and research skills. Each class reflects the instructor's intellectual interests and is conducted as a discussion group. Limited to 18 students. Several short writing assignments and one longer project meeting the upper-division writing requirement.

Prerequisite: HISTORY 12 or HISTORY 15A or HISTORY 15C or HISTORY 15D or HISTORY 16A or HISTORY 16B or HISTORY 16C or HISTORY 18A or HISTORY 21A or HISTORY 21B or HISTORY 21C or HISTORY 40A or HISTORY 40B or HISTORY 40C or HISTORY 60 or HISTORY 70A or HISTORY 70B or HISTORY 70C or HISTORY 70D or HISTORY 70E or HISTORY 70F. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: History Majors have first consideration for enrollment.

(Ib)

**HISTORY 102B. Topics in Environmental History. 4 Units.**

Explores the many historical interfaces between climate change, modes of production, and culture. Topics include the environmental history of warfare, imperialism, and famine in the nineteenth century and the history of environmental thought.

Repeatability: Unlimited as topics vary.

**HISTORY 110D. Topics in Medieval Europe. 4 Units.**

Studies of the topics in Medieval Europe.

Repeatability: Unlimited as topics vary.

**HISTORY 112D. Topics in Early Modern Europe. 4 Units.**

Theme-based approach to the main social, political, and cultural developments in Europe between the fifteenth and eighteenth centuries. Topics included Renaissance humanism, Reformation and Counter-Reformation, scientific revolution, court culture and nation building, interactions with non-European peoples, cities and commerce.

Repeatability: Unlimited as topics vary.

**HISTORY 114. Topics in Modern European History. 4 Units.**

Course content changes with instructor. Topics include the Inquisition; science and religion in modern Europe; sex and society in modern Europe; French revolutions; culture in interwar Europe; the Holocaust; the fall of communism in Eastern Europe.

Repeatability: Unlimited as topics vary.

**HISTORY 120D. War and Empire: France and the World in the 20th Century. 4 Units.**

Examines French experience of World War I, the defeat and occupation by Germany in World War II, the violent struggles that came with the loss of the French empire in the 1950s and 1960s, immigration, French responses to globalization.

**HISTORY 122B. Hitler and the Germans. 4 Units.**

Focuses on Hitler's rise to power and Nazi society. Examines Germany's defeat in World War I; the political and cultural experimentation of the 1920s; the causes of Hitler's success; and life in Germany under the Nazis.

**HISTORY 123D. Topics in Spanish History. 4 Units.**

Topics include Spain in the nineteenth century, the Spanish Civil War, and dictatorship and democracy in modern Spain.

Repeatability: Unlimited as topics vary.

**HISTORY 124B. Twentieth-Century Russia. 4 Units.**

Political and social developments in Twentieth-Century Russia.

**HISTORY 126B. The Era of World War II: 1933-45. 4 Units.**

The era of World War II and its political, social and economic history.

**HISTORY 128C. Topics in the History of Women in Europe. 4 Units.**

Studies in selected areas of history of European women. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 130C. Topics in the Jewish History. 4 Units.**

Studies in selected areas of Jewish history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 130F. Jews and Power. 4 Units.**

Examines the relationship between the Jewish people and political power over a 3500 year period. How have Jews preserved their communal interests and personal safety? How have they defined the proper relationship of the people to political authority.

Same as POL SCI 154J, REL STD 130F.

**HISTORY 131A. History of Zoroastrianism. 4 Units.**

Reviews major trends in the history of Zoroastrianism.

Same as REL STD 131A.

**HISTORY 131B. Ancient Persia. 4 Units.**

Survey of the history of Persia in antiquity.

**HISTORY 131C. Medieval Persia. 4 Units.**

A survey of Persian history in the context of Late Antique and Medieval Islamic history.

**HISTORY 131D. Modern Iran. 4 Units.**

The history of Iran from the end of the Safavid Empire in the eighteenth century to the present.

**HISTORY 132B. The Emergence of the Modern Middle East. 4 Units.**

Offers a survey of the history of the Middle East from the 19th century to the present time. Formerly History 133A.

**HISTORY 132C. Women and Gender in the Middle East. 4 Units.**

Focuses on women and gender in the Middle East from the pre-modern to the contemporary.

**HISTORY 132D. Armenians and Armenia in Ancient to Early Modern World History. 4 Units.**

A history of Armenia and Armenians from ethnogenesis to the early modern period at the end of the 1700s within a regional and global context. Takes into account interactions and encounters with the empires, and peoples that encompassed their orbit.

**HISTORY 132E. Armenians and Armenia in Modern World History. 4 Units.**

Covers the most important themes in the history of Armenians and Armenia in the 19th, 20th, and 21st centuries within a regional (i.e., Middle East and Caucasus) and global context.

**HISTORY 132H. Topics in Middle Eastern History. 4 Units.**

Topics include the cultural, political, intellectual, social, and/or economic histories of one or many regions of the Middle East.

Repeatability: Unlimited as topics vary.

**HISTORY 134A. Africa: Societies and Cultures. 4 Units.**

Introduction to the variety of cultures, political organizations, social structures, and artistic expressions created by Africans over a broad time span. Indigenous development of African societies in distinct regions of the continent. Issues, themes, processes for understanding history of Africa.

**HISTORY 134C. Topics in the History of Africa. 4 Units.**

Studies in selected areas of African history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 134D. Topics in South African History. 4 Units.**

Introduction to important historical events and processes in Southern Africa. Focuses on particular themes and explores how those themes change over time. Topics include: changing ideas about race, the development of class structures, identity formation, the role of gender.

Repeatability: Unlimited as topics vary.

**HISTORY 134E. History of the African Diaspora. 4 Units.**

Examines the causes and consequences of the multiple diasporas of African peoples since the sixteenth century in the Atlantic world, especially the Americas and Europe.

Same as AFAM 137.

**HISTORY 135B. Crossing the World's Oceans: From Sail to Steam. 4 Units.**

Explores the basics of oceanography, the evolution of ships and sailing in the ancient Mediterranean world, the North Atlantic, Polynesia, the South China Sea, the Arab Indian Ocean, the global oceanic world, and the discovery of celestial and terrestrial navigation.

**HISTORY 135E. Topics in the History of Science and Technology. 4 Units.**

Studies in selected areas of science and technological history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 135G. Language Origins: Evolution, Genetics, and the Brain. 4 Units.**

Examines how human language(s) may have originated. Studies pertinent techniques (reconstruction) and addresses related questions, including is our language faculty inborn (i.e., genetically encoded)? Can brain imaging and population genetics research help to unlock this mystery of human evolution?.

Same as ANTHRO 152A, GLBLCLT 105, LSCI 175.

**HISTORY 136D. Topics in the History of Medicine and Health Care. 4 Units.**

Studies in selected areas of Medicine and Health Care history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 140B. Revolutionary America: 1740-1790. 4 Units.**

An exploration of why 13 continental colonies, whose commercial and cultural connections with Britain far exceed their interaction with one another, resisted imperial reform after 1763 to the point of war in 1775 and independence the following year.

**HISTORY 142A. California Dreaming: Conquest, Conflict, and Globalization in the Golden State. 4 Units.**

California as a case study of national trends and as a unique setting: its specific problems and culture. Major themes include: colonization, immigration, race relations, agricultural development, industrialization, urbanization, working class movements, social conflict, and political reform.

**HISTORY 142B. Topics in American Social and Economic History. 4 Units.**

Studies in selected areas of American social and economic history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 144G. Topics in American Cultural and Intellectual History. 4 Units.**

Studies in selected areas of American cultural and intellectual history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 146H. Topics in Women and Gender Relations in the United States. 4 Units.**

Studies in selected areas of women and gender relations in the United States. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 147. Education and the American Dream: Historical Perspectives on Democracy and Education. 4 Units.**

Examines the relationship between public schooling and the promotion of democratic ideals in American society over the past two centuries.

Same as EDUC 174.

**HISTORY 148B. Topics in Multicultural U.S. History. 4 Units.**

Examines the variety of cultural expressions through which the people who came to inhabit the United States historically signify their collective identities.

Repeatability: Unlimited as topics vary.

**HISTORY 149. Veterans in History and Society. 4 Units.**

Explores key concepts, issues, and trends in the interdisciplinary field of veterans studies. Students gain a deep understanding of the ways that social scientists and historians have analyzed the identities, experiences, and worldviews of U.S. military veterans.

Same as SOC SCI 132.

**HISTORY 150. Topics in African American History. 4 Units.**

Studies in selected areas of African American history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as AFAM 138.

**HISTORY 151A. Chicana/Chicano History: Pre-Colonial to 1900. 4 Units.**

Examines social history of the southwest region from antiquity to 1900. Discusses major questions, theory and research methods pertinent to Chicanas/Chicanos. Themes include: indigenous empires, conquest, colonialism, social stratification, ideology, marriage, sexuality, industrial capitalism, accommodation and resistance.

Same as CHC/LAT 132A.

**HISTORY 151B. Chicana/Chicano History: Twentieth Century. 4 Units.**

Examines social history of the Southwest with emphasis on Mexican-origin people. Discusses major questions, theory and research methods pertinent to Chicana/Chicano history. Themes explored include: immigration, xenophobia, class struggle, leadership, generational cohorts, unionization, education, barriozation, ethnicity, patriarchy, sexuality.

Same as CHC/LAT 132B.

**HISTORY 151C. Latinas in the Twentieth Century U.S.. 4 Units.**

Latinas in the U.S. from 1900 to present, offering a diversity of their cultures, regional histories, sexualities, generations, and classes.

Same as CHC/LAT 135.

**HISTORY 151D. Latina/Latino Pop: Latina/Latino Popular Culture. 4 Units.**

With a focus on the politics of language and space/place, prepares students to critically analyze sites of Latina/Latino popular culture including: music, film, performance, sports, media, and varied subcultures.

Same as CHC/LAT 121.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. History Majors have first consideration for enrollment.

**HISTORY 152. Topics in Asian-American History. 4 Units.**

Introduction to important themes in the history of people of Asian ancestry in the United States from the nineteenth century to the present.

Repeatability: Unlimited as topics vary.

**HISTORY 152A. Asian American Labor. 4 Units.**

Explores history of Asian Americans and work from the nineteenth century to the present. Areas of study include migration, colonialism, family, social organization, and work culture.

Same as ASIANAM 137.

**HISTORY 152B. Asian American and African American Relations. 4 Units.**

Addresses relationships of Asian American and African American communities in the United States. Topics include race, class, gender, labor, economic systems, political mobilization, community, civil rights, activism, cultural expression.

Same as AFAM 117, ASIANAM 167.

**HISTORY 154. American Urban History. 4 Units.**

A study of urban communities in the United States, from colonial times to the present. Traces the impact of industrialization and urbanization on social and cultural life, and investigates the significance of urban life for U.S. democratic culture.

**HISTORY 160. Sex and Conquest in Latin America. 4 Units.**

Competing ideas of masculinity and femininity, sexual violence, sexual identities, and gendered hierarchies informed how the Spanish engaged in military and religious domination of Mexican and Andean communities, as well as the forms of native resistance throughout colonial Latin America.

Same as ANTHRO 140, CHC/LAT 150A, GEN&SEX 171A.

**HISTORY 162. Topics in Brazilian History. 4 Units.**

Studies in selected areas of Brazilian history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 163. World of Coffee . 4 Units.**

History of consumption and production of coffee over the centuries, and coffee's cultural, economic, social, political consequences. Coffee's social life as a drug, symbol of hospitality, religious rite, sociability and bourgeois lifestyle, commodity, source of livelihoods, imperial revenues, corporate profits.

Same as INTL ST 111B.

**HISTORY 164A. Caribbean History: Colonization to Emancipation. 4 Units.**

Exploration of the history of the archipelago from pre-Columbian times to the end of slavery; examining the impact of European colonization, decimation of the indigenous populations, African slavery, resistance, and emancipation; the unity and diversity of experience in region.

Same as AFAM 134A.

**HISTORY 164B. Caribbean History: Emancipation to Independence. 4 Units.**

Post-emancipation and anti-colonial struggles ending with political independence for most of the region. Examines social, political, economic, cultural dimensions of post-emancipation period, including large-scale migration to Central America, the U.S., and Britain; the region's global cultural and political contribution.

Same as AFAM 134B.

**HISTORY 165. Race and Empire in Colonial Latin America. 4 Units.**

Explores how native people of Latin America with enslaved and free African incorporated and defied Spanish and Portuguese colonization. Focuses on religious adaptations, resistance movements, legal systems, and the emergence of multicultural communities to explain how race shaped European empires.

Same as ANTHRO 162C.

**HISTORY 165A. War and Revolution in Colonial Latin America. 4 Units.**

Comparison of how Andeans resurrected the leaders of the Inca, a defeated indigenous empire, to contest the Spanish empire with how enslaved Africans, with their descendants and others, defeated Spanish colonial rule in what would become the Cuban nation.

**HISTORY 166. U.S. Intervention in Latin America. 4 Units.**

Explores political, economic, social, and cultural ties that bind Latin America to the United States. Focuses on U.S. intervention and Latin American response from early nineteenth century to present day. Case studies include Mexico, Guatemala, Cuba, Chile, and Central America.

Same as POL SCI 142J, INTL ST 177D, CHC/LAT 150.

**HISTORY 166B. Revolution and Reaction in Cold War Latin America. 4 Units.**

Explores Latin American experiences of revolutionary change and military dictatorship during the Cold War (1945-1990). Pays particular attention to the lives of women, peasants, workers, and the urban middle classes. Case studies include Guatemala, Cuba, Chile, Argentina, Nicaragua, and Mexico.

Same as INTL ST 177G.

**HISTORY 166C. Cuban Society and Revolution. 4 Units.**

Explores the causes, development, and legacy of the 1959 Revolution. Themes include economic dependency, democracy, race, gender, culture, and the always volatile relations between Cuba and the United States.

Same as POL SCI 153G, INTL ST 177E, CHC/LAT 157.

**HISTORY 166D. Revolution in Latin America. 4 Units.**

Presents a comparative analysis of the causes, development, and consequences of selected revolutionary movements, focusing on outbreaks in Mexico, Bolivia, Cuba, Chile, Nicaragua, and Grenada. Explores topics of state formation, economic nationalism, social justice, ethnicity, and role of international affairs.

Same as CHC/LAT 151B, SOC SCI 173N, INTL ST 177C.

**HISTORY 169. Topics in Latin American History. 4 Units.**

Studies in selected areas of Latin American history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 170A. Ancient India. 4 Units.**

Examines the visual and religious history of the region defined as 'India' today, but necessarily encompassing modern Bangladesh and Pakistan. Culminates with the supposed Golden Age of the Gupta empire and its far-reaching legacies.

Same as ART HIS 155A, REL STD 122.

Concurrent with ART HIS 255A.

**HISTORY 170B. Medieval India. 4 Units.**

Begins with the Gupta period's aesthetic legacies in South Asia's architecture, sculpture, and painting. Explores the dispersal of Islam throughout South Asia, including the Muslim communities of southern India.

Same as ART HIS 155B, REL STD 123.

Concurrent with ART HIS 255B.

**HISTORY 171D. Chinese History to 1800. 4 Units.**

A survey of the history of China to 1800.

**HISTORY 171E. Chinese History: 1800-1949. 4 Units.**

An examination of Chinese society and thought from the late-eighteenth century to the 1949 revolution. Focuses on the role of intellectuals; popular culture; women in Chinese society; developments in commerce and urban life; rebellion; foreign imperialism.

**HISTORY 171G. Topics in the History of China. 4 Units.**

Topics include the cultural, political, economic, social, intellectual, and religious history of China.

Repeatability: Unlimited as topics vary.

**HISTORY 172G. Topics in the History of Japan. 4 Units.**

Topics include the cultural, political, economic, social, intellectual and religious history of Japan.

Repeatability: Unlimited as topics vary.

**HISTORY 173G. Topics in the History of Korea. 4 Units.**

Topics include the cultural, political, economic, social, intellectual, and religious history of Korea.

Repeatability: Unlimited as topics vary.

**HISTORY 174G. Topics in the History of South Asia. 4 Units.**

Topics include the cultural, political, economic, social, intellectual, and religious history of South Asia.

Repeatability: Unlimited as topics vary.

**HISTORY 180. Special Studies in Social History. 4 Units.**

Studies in selected areas of social history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 182. Special Studies in Intellectual-Cultural History. 4 Units.**

Studies in selected areas of intellectual-cultural history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 183. Special Studies in International History. 4 Units.**

Studies in selected areas of international history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 184. Special Studies in Comparative History. 4 Units.**

Studies in selected areas of comparative history. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 185. Special Studies in Social Theory. 4 Units.**

Studies in selected areas of social theory. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**HISTORY 190. Colloquium . 4 Units.**

Specialized courses dealing primarily with close reading and analysis of primary and secondary works; required reports and papers. Each colloquium reflects the instructor's intellectual interests and is conducted as a discussion group. Limited to 18 students.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. History Majors have first consideration for enrollment.

**HISTORY 193. Advanced Research Seminar I. 4 Units.**

The first course in a two-quarter advanced research sequence, this course allows upper-division history majors to undertake significant research and writing under close faculty supervision.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: History majors only. Upper-division students only.

**HISTORY 194. Advanced Research Seminar II. 4 Units.**

Second course in a two-quarter advanced research sequence. Allows upper division history majors to undertake significant research and writing under close faculty supervision.

Prerequisite: HISTORY 193. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. History Majors only.

**HISTORY 197. Internships in Public History. 4 Units.**

Students will sharpen their abilities to research, critically interpret, and present history by "doing history" beyond the formal classroom. Internships, which introduce students to the field of "public history," include working as archivists, oral historians, project advisers, and exhibit curators.

Grading Option: Pass/no pass only.

Restriction: Upper-division students only. History Majors only.

**HISTORY 198. Directed Group Study. 4 Units.**

Special topics through directed reading. Paper required.

Repeatability: Unlimited as topics vary.

**HISTORY 199. Independent Reading. 1-4 Units.**

Investigation of special topics through directed reading. Paper required.

Repeatability: May be repeated for credit unlimited times.



**HISTORY 200. History and Theory. 4 Units.**

Explores a variety of theoretical issues and methodological concerns that have sparked lively debate in the humanities and social sciences in past decades and which remain of urgent concern to 21st-century historical writing.

Repeatability: May be repeated for credit unlimited times.

**HISTORY 202A. First-Year Research Seminar. 4 Units.**

Introduction to historical methodologies and preparation for the first-year research paper. Required of all first-year doctoral students and M.A. students.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. History Majors only.

**HISTORY 202B. First-Year Research Seminar. 4 Units.**

Research and writing of a paper demonstrating command of historical methods explored in HISTORY 202A. Required of all first-year Ph.D. students and M.A. students.

Prerequisite: HISTORY 202A

Repeatability: May be taken for credit 1 times as topics vary.

**HISTORY 204A. Second-Year Research Seminar. 4 Units.**

Part one of a two-quarter sequence required of all Ph.D. students during the second year of the program; not required for M.A. students. Includes primary research and writing a research paper, often related to a future dissertation topic.

Restriction: Graduate students only. History Majors only.

**HISTORY 204B. Second-Year Research Seminar. 4 Units.**

Part two of a two-quarter sequence required of all Ph.D. students. Taken during the second year of the Ph.D. program; not required for M.A. students. Includes primary research and writing a research paper, often related to a future dissertation topic.

Prerequisite: HISTORY 204A

Restriction: Graduate students only. History Majors only.

**HISTORY 230. Topics in European History . 4 Units.**

Studies in selected themes and time periods in European history. Topics and period vary.

Repeatability: Unlimited as topics vary.

**HISTORY 240. Topics in World History. 4 Units.**

Studies in selected themes and time periods in world history. Topics and period vary.

Repeatability: Unlimited as topics vary.

**HISTORY 250. Topics in Latin American History . 4 Units.**

Studies in selected themes and time periods in Latin American history. Topics and period vary.

Repeatability: Unlimited as topics vary.

**HISTORY 260. Topics in American History. 4 Units.**

Studies in selected themes and time periods in U.S. history. Topics and period vary.

Repeatability: Unlimited as topics vary.

**HISTORY 270C. Seminar in Japanese History: 1600-Present. 4 Units.**

Studies in Japanese history since 1600. Topics addressed vary each quarter.

**HISTORY 273. Research Methods in Chinese History. 4 Units.**

Introduces major tools for research in Qing and twentieth-century Chinese history as well as an introduction to research tools for earlier periods.

**HISTORY 280. Topics in Asian History. 4 Units.**

Studies in selected themes and time periods in Asian history. Topics and period vary.

Repeatability: Unlimited as topics vary.

**HISTORY 290. Special Topics . 4 Units.**

Lectures, readings, and discussion on subjects more limited in scope than those included in the year-long colloquium series.

Repeatability: Unlimited as topics vary.

**HISTORY 291. Directed Reading. 4-12 Units.**

Reading courses focused on specialized topics.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. History Majors only.

**HISTORY 297. History Internship. 4 Units.**

Limited to History graduate students with Department-approved internships. Materials fee.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. History Majors only.

**HISTORY 298. Experimental Group Study. 4-12 Units.**

Open to four or more students.

Repeatability: May be repeated for credit unlimited times.

**HISTORY 299. Dissertation Research. 4-12 Units.**

Specifically designed for students researching and writing their dissertations.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Advancement to Ph.D. candidacy.

**HISTORY 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Armenian Studies, Minor

The minor in Armenian Studies encourages undergraduate students to acquire the academic breadth and depth to comprehend the major issues, themes, and concepts of Armenian culture and heritage. The interdisciplinary minor consists of courses in a variety of disciplines, including history, politics, anthropology, and Armenian language. Students will expand their understanding of the broader dynamics of the Armenian experience through different eras and geographic settings, both in Armenia and the Diaspora.

### Requirements for the Minor in Armenian Studies

A. Complete:

ARMN 1C	Elementary Armenian <sup>1</sup>
GLBL ME 60A	Humanities and Arts: Problems and Methods for Global Middle East Studies
HISTORY 132D	Armenians and Armenia in Ancient to Early Modern World History
HISTORY 132E	Armenians and Armenia in Modern World History

B. Select three from the following: <sup>2</sup>

HISTORY 124B	Twentieth-Century Russia
HISTORY 131B	Ancient Persia
HISTORY 132B	The Emergence of the Modern Middle East
HISTORY 132C	Women and Gender in the Middle East
HISTORY 132H	Topics in Middle Eastern History

INTL ST 117A/ANTHRO 125X	Transnational Migration
INTL ST 165/POL SCI 158D/SOC SCI 188A	Introduction to Contemporary Middle East Politics
POL SCI 154J	Jews and Power
COM LIT 100A	Nations, Regions, and Beyond <sup>3</sup>
COM LIT 107	Colonialisms and Postcolonialisms <sup>3</sup>
COM LIT 108	Diasporic Literatures and Cultures <sup>3</sup>
COM LIT 150	Literature in Translation <sup>3</sup>

- <sup>1</sup> Students who place above the 1C level are required to substitute a higher-level Armenian language course or an additional course from Area B.
- <sup>2</sup> With the approval of the Director, other relevant courses may satisfy the requirements for the minor.
- <sup>3</sup> These courses must have a Middle Eastern focus to be counted toward the minor.

**Residence Requirement for the Minor:** Four upper-division courses required for the minor must be successfully completed at UCI. Two of the four may be taken through the UC Education Abroad Program, provided course content is approved in advance by the Director.

## History, B.A.

The undergraduate program in History is designed to develop critical intelligence and to foster an awareness of ourselves and our world through the study of the past. The Department presents a variety of approaches to history, and each emphasizes basic disciplinary skills: weighing evidence, constructing logical arguments, and exploring the role of theory in historical analysis and human action.

Upper-division courses range from the examination of individual nation-states (e.g., Chinese history), to studies of the relations among nation-states (e.g., Emergence of the Modern Middle East), to historical analyses of political, socio-economic, and cultural factors (e.g., Women in the United States). Students are also provided the opportunity for small-group learning experiences through colloquia. The colloquia are conducted as discussion groups, involve close reading and analysis of primary and secondary texts, and require writing.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Departmental Requirements for the Major

Twelve courses are required:

A. Select two of the following:

HISTORY 70A	Problems in History: Asia
HISTORY 70B	Problems in History: Europe
HISTORY 70C	Problems in History: United States
HISTORY 70D	Problems in History: Latin America
HISTORY 70E	Problems in History: Middle East and Africa
HISTORY 70F	Problems in History: Transregional History

B. Two additional lower-division History courses

C. Four upper-division History courses

D. Complete the following:

HISTORY 100W	Writing About History
HISTORY 190	Colloquium

E. Two additional lower- or upper-division History courses

F. At least one of the twelve required courses must be devoted to the period prior to 1800.

**Residence Requirement for the History Major:** One course from the History 70 series, HISTORY 100W, HISTORY 190, and three upper-division History courses must be completed successfully at UCI. By petition, two of the six may be taken through the UC Education Abroad Program, provided that course content is approved in advance by the Chair of the History Undergraduate Program Committee.

The Specialization in History for Future Teachers is designed to prepare history majors who aspire to earn a post-baccalaureate teaching credential. Through specific history course requirements, courses in the School of Education, and a field work requirement, students will be well positioned for admission to teaching credential programs.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

Fifteen courses are required:

A. Select one of the following series:

HISTORY 21A- 21B- 21C	World: Innovations and World: Empires and Revolutions and World: Nation, War, and Rights
or	
HISTORY 40A- 40B- 40C	Colonial America: New Worlds and Nineteenth-Century U.S.: Crisis and Expansion and Modern America: Culture and Power

B. Complete the following:

HISTORY 70C	Problems in History: United States
HISTORY 100W	Writing About History
HISTORY 190	Colloquium

C. Select two courses from the following:

HISTORY 70A	Problems in History: Asia
HISTORY 70B	Problems in History: Europe
HISTORY 70D	Problems in History: Latin America
HISTORY 70E	Problems in History: Middle East and Africa
HISTORY 70F	Problems in History: Transregional History

D. Select one course in California History.

HISTORY 142A	California Dreaming: Conquest, Conflict, and Globalization in the Golden State
HISTORY 151A	Chicana/Chicano History: Pre-Colonial to 1900
HISTORY 151B	Chicana/Chicano History: Twentieth Century

E. Two upper-division U.S. History courses.

F. Two upper-division non-U.S. History courses.

G. Select one course from the School of Education.

EDUC 108	Adolescent Development and Education
EDUC 124	Multicultural Education in K-12 Schools
EDUC 128	Exceptional Learners
EDUC 131	Educational Technology
EDUC 173	Cognition and Learning in Educational Settings

H. Complete at least two units of field work from EDUC 100 or other relevant experience with prior departmental approval.

**Residence Requirement for the History Major with a Specialization in History for Future Teachers:** HISTORY 70C, HISTORY 100W, HISTORY 190, and three upper-division History courses must be completed successfully at UCI. By petition, two of the six may be taken through the UC Education Abroad Program, provided that course content is approved in advance by the Chair of the History Undergraduate Program Committee.

The training and discipline derived from historical studies provide a valuable experience for all educated persons seeking to understand themselves and their world. Many students who complete undergraduate degrees in the Department of History go on to graduate school in a variety of fields, including history, law, business, international relations, and education.

The study of history is valuable preparation for many other careers as well. The strong academic and professional orientation acquired by History majors is necessary to pursue successful careers in such diverse fields as advertising, the non-profit sector, journalism, management, public relations, publishing, international relations, and government service.

The UCI Division of Career Pathways provides services to students on resume preparation, job search, and interview techniques. See the UCI Division of Career Pathways website (<http://career.uci.edu/>) for additional information.

The department strongly encourages majors and minors to take advantage of the University's study abroad programs and to experience a different culture, for a quarter or longer, while making progress toward their UCI degree. Moreover, students who are particularly interested in the history of a specific country or region would greatly benefit from direct study and cultural interaction within that country or region. Information about studying abroad can be found at UCI's Study Abroad Center website. (<http://www.studyabroad.uci.edu/>)

## History, M.A.

The Department of History at the University of California, Irvine emphasizes graduate training in regional areas, world and transnational history, and thematic specialties as elaborated in the graduate handbook. Whatever the student's chosen emphasis, the History Graduate Program encourages

students to think across national and regional borders and to have a solid understanding of how the discipline of History contributes to debates about global and local transformation.

It is desirable that an applicant have the equivalent of an undergraduate major in History; however, the Department also considers students who have previously specialized in other subject areas and who have strong analytical and writing skills. The Department's required grade-point minimums and English Language Proficiency requirements for international student admission are consistent with university policy. A GRE score is not required for admission. Students are accepted for fall admission only.

### Program of Study

Masters students receive similar opportunities as those offered doctoral students to train in the history of area regions and thematic emphases. A total of nine courses are required: three in a first field (either area-based or thematic), two in a second field (area-based or thematic), the two-quarter first-year research seminar (HISTORY 202A and HISTORY 202B), and two electives that may be taken outside the Department. It is strongly recommended that at least one of these electives be a directed readings course (HISTORY 291) with the advisor to either work on the thesis or prepare for the comprehensive exam. Upon entering the program, M.A. students must choose a department faculty member to serve as their advisor.

### Time Limits

The M.A. is a one-year program in academic residence as a full-time student. However, it is understood that many M.A. students are employed and need to enroll on a part-time basis. Students are allowed up to three years of graduate study to complete the degree.

### Degree Conferral

**Degree Conferral Plan I- Thesis:** The master's thesis represents a revision of the first-year research paper, equivalent to a scholarly article, under the supervision of the faculty advisor. The project is reviewed and approved by the advisor and the thesis committee.

**Degree Conferral Plan II- Comprehensive Exam:** At the end of the final quarter, the M.A. candidate must pass a comprehensive oral exam administered by the faculty advisor and one other faculty member. Students are examined on their first field.

### Language Requirement

Students in the M.A. program whose major field requires use of foreign language sources must demonstrate competence in a foreign language in the process of writing the first-year research paper and thesis. Other M.A. students do not have to meet a foreign language or alternative skills requirement.

## History, Minor

Students who are interested in the study of history but are majoring in other disciplines may minor in History. The minor incorporates elements of the Department's program for majors but allows students enough flexibility to pursue programs in other departments and schools.

Upper-division courses range from the examination of individual nation-states (e.g., Chinese history), to studies of the relations among nation-states (e.g., Emergence of the Modern Middle East), to historical analyses of political, socio-economic, and cultural factors (e.g., Women in the United States). Students are also provided the opportunity for small-group learning experiences through colloquia. The colloquia are conducted as discussion groups, involve close reading and analysis of primary and secondary texts, and require writing.

### Departmental Requirements

Seven courses are required:

- A. Select three lower-division History courses.
- B. Select four upper-division History courses.

**Residence Requirement for the Minor:** All four upper-division History courses must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the Chair of the History Undergraduate Program Committee.

## History, Ph.D.

The Doctoral Program in History is designed to provide students with advanced historical research skills and a solid grounding in the theory and methodology of history. This combination reflects the Department's conviction that scholars should approach significant questions about the past with rigor and sophistication. The Department requires that students develop critical abilities in dealing with primary sources, secondary syntheses, and the interrelationship of history and theory. Candidates for the Ph.D. in History are expected to gain teaching experience as an integral part of their graduate training. This is accomplished through work as a teaching assistant.

### Coursework

Doctoral students take a minimum of 15 formal courses to be completed during the first two years of the program. Ten courses must be taken within the History Department.

## History and Theory

Required coursework for doctoral students includes a mandatory two-quarter sequence in History and Theory, during the first year. These courses explore a variety of theoretical issues and methodological concerns that have sparked debate in the humanities and social sciences in the past decades and which remain pertinent to 21st century historical writing. Topics may include the relationship between materialist approaches and cultural analysis; subjectivity and governance; gender and sexuality; ethnicity and racial formation; the politics of religion; 'the archive' and archival practice; nationalism and postcolonialism; world history and transnational studies.

## Field Emphases

Doctoral students are required to take a total of six courses satisfying requirements for specialization in two historical fields, in either area studies or thematic fields. Students take three courses in each field. The Department offers area studies fields in Asian History, European History, Latin American History, Middle East and African History, U.S. History, and World History. Thematic fields vary depending on demand. Students may take courses satisfying field requirements in any order.

## Research Seminars

Doctoral students are required to take a two-quarter course sequence in research and writing both their first and second year in the graduate program. In the first year, students take a proseminar on historical methodology (HISTORY 202A) followed by a second quarter (HISTORY 202B) in which they write a research paper that engages the methodologies and questions explored in the previous quarter. Students who enter the doctoral program with a master's may petition to be exempt from the first-year research sequence, pending acceptance of the M.A. thesis as an equivalent to the final research paper of the sequence.

In the second year of study, Ph.D. students take a two-course sequence (HISTORY 204A and HISTORY 204B) in which they research and write a paper on a topic of their choice. The second year research paper is required of all doctoral students.

## Language Requirement

All students must demonstrate a proficiency in one language other than English prior to taking the Ph.D. candidacy qualifying exam. Competency in a language may be established either by passing a departmental examination (proctored in the department office) or through extensive language use in one of the research seminars. The language used to satisfy this requirement is subject to their advisors' approval.

## Summary of Required Course of Study:

1. History and Theory - two courses
2. Research Seminars – four courses
3. First Field - three courses
4. Second Field – three courses
5. Electives - three courses
6. Foreign Language Proficiency

## First-Year Review

To be admitted formally into the doctoral program, students must satisfactorily pass a departmental evaluation at the end of their first year of study; this includes students who entered with a M.A. from another institution. Doctoral students can be awarded an M.A. from UCI after fulfilling requirements for residence, one language, and successfully completing 36 units, including 28 units in required courses.

## The Candidacy Qualifying Exam and Dissertation Prospectus

In the third year of the doctoral program, students prepare for their candidacy qualifying exam and write the dissertation prospectus. Most third year students enroll in the intensive readings course (HISTORY 298) or directed readings (HISTORY 291) to work closely with faculty in preparing for exams and writing their prospectus.

The candidacy qualifying exam is an oral, two-hour meeting during which a student is examined in their first and second field by a committee of four faculty members, plus an additional faculty referee. Upon successful completion of the exam, the student is officially advanced to doctoral candidacy (all but dissertation) and presents the dissertation prospectus in a colloquium including all members of the dissertation committee for formal approval. Both the exam and prospectus colloquium should be completed by the end of the third year.

## Dissertation Research and Writing

The dissertation is the most important part of the Department's doctoral program. The dissertation is an original piece of historical scholarship, involving extensive primary research and original analysis of secondary source material. Students spend a year or more engaged in intensive research, and another year or more writing the dissertation. Throughout this period, students work closely with the advisor and the dissertation committee members. The finished dissertation must be approved by all members of the dissertation committee.

## Teaching

Most graduate students begin work as a teaching assistant for the Department or School courses during their second year and continue throughout their tenure in the program, except when dissertation research or writing require their residency away from the university. Students have the opportunity

to apply to teach their own courses during summer session once they have advanced to doctoral candidacy. Students beyond their second year are required to also apply for teaching positions outside the department, e.g. in Composition or Humanities Core.

### Time to Degree for the Ph.D.

Normative time to degree for the doctoral program is seven years. Maximum time to degree permitted is nine years.

### Requirements for Admission to the Ph.D. Program

It is desirable that an applicant have the equivalent of an undergraduate major in History; however, the Department also considers students who have previously specialized in other subject areas and who have strong analytical and writing skills. Many students entering the program hold a Masters degree in History, or an associated field. The Department's required grade-point minimums and English Language Proficiency requirements for international student admission are consistent with university policy. A GRE score is not required for admission. Students are accepted for fall admission only.

## Department of Philosophy

### Annalisa Coliva, Department Chair

85 Humanities Instructional Building

949-824-6525

<http://www.humanities.uci.edu/philosophy/>

The Department of Philosophy is world-class and has particular strengths in three main areas. History of philosophy, including ancient, modern, and contemporary philosophy, both analytic and continental; epistemology, philosophy of mind and metaphysics, pursued with analytic methodologies but open to the influences of the continental tradition; ethics, legal, and political philosophy, social and value theory.

UC Irvine's philosophy graduate program (<https://www.humanities.uci.edu/philosophy/graduate/>) is jointly administered by the Department of Philosophy in the School of Humanities and the Department of Logic and Philosophy of Science in the School of Social Sciences (<https://lps.uci.edu/>). The graduate program is ranked among the top programs in the United States, and among the very best in a number of subfields of philosophy (see the Philosophical Gourmet Report (<https://leiterreports.typepad.com/blog/2017/12/2017-18-pgr-us-top-50-results.html>)). Graduate applications need to be addressed either to the Department of Philosophy, or to the Department of Logic and Philosophy of Science, depending on the dominant interests of the student. But graduate students have full access to all the courses and faculty of the two Departments. We have been able to place (<https://www.humanities.uci.edu/philosophy/graduate/placement.php>) our Ph.D. students at well-reputed universities and colleges.

The success of our undergraduate program is based on a rigorous education both in historical and in contemporary issues. Because of the collaboration between the two Departments undergraduate and graduate students can take courses ranging from philosophy of quantum mechanics and decision theory to medieval ethics and phenomenology. The fact that our majors have gone on to study in first-rate graduate programs and to pursue successful careers in law and medicine is a testament to the quality of the program.

- Medical Humanities, Graduate Emphasis
- Philosophy, B.A.
- Philosophy, Minor
- Philosophy, Ph.D. (School of Humanities)

## Faculty

Ermanno Bencivenga, Ph.D. University of Toronto, *Professor of Philosophy; Humanities*

Sven D. Bernecker, Ph.D. Stanford University, *Professor of Philosophy*

Anna Boncompagni, Ph.D. University of Roma Tre Italy, *Assistant Professor of Philosophy*

Annalisa Coliva, Ph.D. University of St. Andrews, *Professor of Philosophy*

Marcello Fiocco, Ph.D. University of California, Santa Barbara, *Associate Professor of Philosophy*

Margaret P. Gilbert, Ph.D. Oxford University, *Abraham I. Melden Chair in Moral Philosophy and Professor of Philosophy*

Sean Greenberg, Ph.D. Harvard University, *Associate Professor of Philosophy; European Languages and Studies; Religious Studies*

Jeffrey S. Helmreich, Ph.D. University of California, Los Angeles, *Assistant Professor of Philosophy; School of Law*

Aaron J. James, Ph.D. Harvard University, *Professor of Philosophy*

Stephen N. Jolley, Ph.D. Cambridge University, *Professor Emeritus of Philosophy*



Bonnie D. Kent, Ph.D. Columbia University, *Professor Emeritus of Philosophy; Religious Studies*

Joseph F. Lambert, Ph.D. Michigan State University, *Professor Emeritus of Philosophy*

Alan Nelson, Ph.D. University of Illinois at Chicago, *Professor Emeritus of Philosophy*

Casey C. Perin, Ph.D. University of California, Berkeley, *Associate Professor of Philosophy*

Duncan Pritchard, Ph.D. University of St. Andrews, *Professor of Philosophy*

Gerasimos X. Santas, Ph.D. Cornell University, *Professor Emeritus of Philosophy*

Karl Schafer, Ph.D. New York University, *Professor of Philosophy*

Martin Schwab, Ph.D. Heidelberg University, *Professor Emeritus of Philosophy*

David W. Smith, Ph.D. Stanford University, *Professor of Philosophy*

Nicholas P. White, Ph.D. Harvard University, *Professor Emeritus of Philosophy*

Peter W. Woodruff, Ph.D. University of Pittsburgh, *Professor Emeritus of Philosophy*

## Affiliate Faculty

Jeffrey A. Barrett, Ph.D. Columbia University, *Professor of Logic and Philosophy of Science; Philosophy*

Jeremy Heis, Ph.D. University of Pittsburgh, *Associate Professor of Logic and Philosophy of Science; Philosophy*

Brian Skyrms, Ph.D. University of Pittsburgh, *UCI Distinguished Professor of Logic and Philosophy of Science; Economics; Philosophy*

P. Kyle Stanford, Ph.D. University of California, San Diego, *Professor of Logic and Philosophy of Science; Philosophy*

Kai Wehmeier, Ph.D. University of Münster, *Director, Center for the Advancement of Logic, its Philosophy, History, and Applications and Professor of Logic and Philosophy of Science; Language Science; Philosophy*

## Courses

### **PHILOS 1. Introduction to Philosophy. 4 Units.**

A selection of philosophical problems, concepts, and methods, e.g., free will, cause and substance, personal identity, the nature of philosophy itself. Materials fee.

(IV)

### **PHILOS 2. Puzzles and Paradoxes. 4 Units.**

Introduction to the formal tools needed to comprehend and evaluate philosophical arguments and theoretical reasoning in general.

(IV and VB ).

### **PHILOS 3. Technology and Society. 4 Units.**

A study of the nature of technology, its relation to human values, the philosophical assumptions in its development, and the philosophical implications of technology.

(II)

### **PHILOS 4. Introduction to Ethics. 4 Units.**

Selected topics from the history of ethics, e.g., the nature of the good life and the moral justification of conduct.

(IV)

### **PHILOS 5. Contemporary Moral Problems. 4 Units.**

Selected moral issues of current interest, e.g., abortion, sexual morality, euthanasia, capital punishment, reverse discrimination, civil disobedience, or violence.

(IV)



**PHILOS 7. Introduction to Existentialism. 4 Units.**

An analysis of themes in phenomenology and existentialism and their philosophical origins, e.g., consciousness, self and other, freedom and individuality.

(IV)

**PHILOS 10. History of Ancient Philosophy. 4 Units.**

Examination of the central philosophical themes developed by the pre-Socratics, Socrates, Plato, Aristotle, the Stoics, the Epicureans, and the Skeptics.

(IV)

**PHILOS 11. History of Medieval Philosophy. 4 Units.**

A study of some of the major theological and philosophical texts from the Medieval period.

Prerequisite: Recommended: PHILOS 10.

(IV)

**PHILOS 12. History of Modern Philosophy. 4 Units.**

A study of major developments in western philosophy from Descartes to Kant with readings from Descartes, Leibniz, Locke, Berkeley, Hume, and Kant.

Prerequisite: Recommended: PHILOS 10 or PHILOS 11.

(IV)

**PHILOS 13. History of Contemporary Philosophy. 4 Units.**

A study of recent philosophical developments in Anglo-American and Continental philosophy with readings from such figures as Russell, Moore, Wittgenstein, Quine, Heidegger, and Sartre.

Prerequisite: Recommended: PHILOS 12.

(IV)

**PHILOS 21. Philosophy and Religion. 4 Units.**

Examines the intersection of religion and philosophy from a standpoint that does not presuppose previous academic study of either. Both Western and Eastern traditions and perspectives may be explored.

Repeatability: Unlimited as topics vary.

Same as REL STD 21.

(IV)

**PHILOS 22. Introduction to Law and Society. 4 Units.**

What constitutes a legal system? What does it mean for a society to have a system as a part of the social fabric. Examines the social status of law and its use as a tool for fashioning society.

(III)

**PHILOS 29. Critical Reasoning. 4 Units.**

Introduction to analysis and reasoning. The concepts of argument, premise, and conclusion, validity and invalidity, consistency and inconsistency. Identifying and assessing premises and inferences. Deductive versus inductive reasoning, and introduction to the probability calculus. Evaluating definitions. Informal fallacies.

Same as LPS 29.

(II and Vb ).

**PHILOS 30. Introduction to Symbolic Logic. 4 Units.**

An introduction to the symbolism and methods of the logic of statements, including evaluation of arguments by truth tables, the techniques of natural deduction, and semantic tableaux.

Same as LPS 30, LSCI 43.

(Vb)

**PHILOS 31. Introduction to Inductive Logic. 4 Units.**

Philosophical questions concerning the foundations of scientific inference, e.g., the traditional problem of induction, the Goodman paradox, the concept of cause, Mill's method of inductive reasoning, probability calculus, different interpretations of probability, and their interaction in inductive reasoning.

Same as LPS 31.

**(II, Va)**

**PHILOS 40. Special Topics in Philosophy. 4 Units.**

Lectures on selected topics at the lower-division level.

Repeatability: Unlimited as topics vary.

**PHILOS 91. The Philosophy of Sex. 4 Units.**

Discusses the origins of biological sex, dynamics of sexual selection, sex differences in humans, and the construction of gender in human societies. Seeks to understand the role social values play in the creation of science.

Same as LPS 91.

Overlaps with LPS H91.

**(III)**

**PHILOS 100W. Writing Philosophy. 4 Units.**

Discussion of those aspects of writing of special importance in philosophy, e.g., philosophical terminology, techniques for evaluating arguments, philosophical definitions and theories. At least 4,000 words of assigned composition based on philosophical readings.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as LPS 100W.

Restriction: Upper-division students only.

**(Ib)**

**PHILOS 101. Introduction to Metaphysics. 4 Units.**

A study of one or more of the problems of 'first philosophy,' e.g., substance, free will, causation, abstract entities, identity.

**PHILOS 102. Introduction to the Theory of Knowledge. 4 Units.**

A study of one or more of the basic issues in epistemology, e.g., the role of perception in the acquisition of knowledge, the nature of evidence, the distinction between belief and knowledge, and the nature of truth and certainty.

Same as LPS 102.

**PHILOS 102W. Introduction to the Theory of Knowledge. 4 Units.**

A study of one or more of the basic issues in epistemology, e.g., the role of perception in the acquisition of knowledge, the nature of evidence, the distinction between belief and knowledge, and the nature of truth and certainty.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Overlaps with PHILOS 102, LPS 102.

**(Ib)**

**PHILOS 103. Introduction to Moral Philosophy. 4 Units.**

A study of one or more of the problems of contemporary moral philosophy, e.g., the nature of justice, liberalism versus conservatism, happiness and its relation to virtue and right conduct, the objectivity of moral standards.

**PHILOS 104. Introduction to Logic. 4 Units.**

Introduction to sentence logic, including truth tables and natural deduction; and to predicate logic, including semantics and natural deduction.

Same as LPS 104, LSCI 142.

**PHILOS 105A. Elementary Set Theory. 4 Units.**

An introduction to the basic working vocabulary of mathematical reasoning. Topics include sets, Boolean operations, ordered n-tuples, relations, functions, ordinal and cardinal numbers.

Same as LPS 105A, LSCI 145A.

**PHILOS 105B. Metalogic. 4 Units.**

Introduction to formal syntax (proof theory) and semantics (model theory) for first-order logic, including the deduction, completeness, compactness, and Löwenheim-Skolem theorems.

Prerequisite: PHILOS 105A

Same as LPS 105B, LSCI 145B.

Overlaps with MATH 150.

**PHILOS 105C. Undecidability and Incompleteness. 4 Units.**

Introduction to the formal theory of effective processes, including recursive functions, Turing machines, Church's thesis, and proofs of Gödel's incompleteness theorem for arithmetic, and Church's undecidability theorem for first-order logic.

Prerequisite: PHILOS 105B

Same as LPS 105C, LSCI 145C.

Overlaps with MATH 152.

Concurrent with LPS 205C.

**PHILOS 106. Topics in Logic . 4 Units.**

Selected topics in mathematical or philosophical logic.

Prerequisite: PHILOS 105B or LPS 105B

Repeatability: Unlimited as topics vary.

Same as LPS 106.

**PHILOS 108. Topics in Induction, Probability, and Decision Theory. 4 Units.**

Selected topics in induction, probability, and decision theory.

Repeatability: Unlimited as topics vary.

Same as LPS 108.

**PHILOS 110. Topics in Ancient Philosophy. 4 Units.**

Selected topics from the writings of Plato and Aristotle, e.g., Aristotle's criticisms of Plato's metaphysics, ethics, or politics.

Repeatability: May be taken for credit 2 times as topics vary.

**PHILOS 111. Topics in Medieval Philosophy. 4 Units.**

Studies of some of the major issues of concern to Medieval philosophers, e.g., universals, the nature and existence of God, faith, and reason.

Repeatability: May be taken for credit 2 times as topics vary.

**PHILOS 113. Topics in Modern Philosophy. 4 Units.**

Focuses on the works of central philosophical figures of modern Philosophy (e.g., Descartes, Leibniz, Hobbes, Locke, Hume, Kant) or on the treatment of one or more central philosophical problems by a number of these figures.

Repeatability: Unlimited as topics vary.

Same as LPS 113.

**PHILOS 114. Topics in Nineteenth-Century Philosophy. 4 Units.**

Studies of some of the major figures after Kant (e.g., Hegel, Nietzsche, Marx, Kierkegaard), especially in German idealism and social thought.

Repeatability: Unlimited as topics vary.

**PHILOS 115. Topics in History of Analytic Philosophy. 4 Units.**

Review of central theories or figures in the history of analytic philosophy. Emphasis on writings of Frege, Russell, Schlick, Carnap, and Quine. Topics include the nature of meaning and truth, the synthetic/analytic distinction, and scientific knowledge.

Repeatability: Unlimited as topics vary.

Same as LPS 115.

**PHILOS 116. Topics in Continental Philosophy. 4 Units.**

Studies of some of the major figures (e.g., Husserl), movements (e.g., phenomenology, existentialism) in early twentieth-century continental European thought.

Repeatability: Unlimited as topics vary.

**PHILOS 117. Topics in Asian Philosophy. 4 Units.**

Selected topics in the philosophies of Asia, e.g. Jainism, Buddhism, Yoga, Vedanta, Confucianism, Taoism, and Shinto.

Repeatability: Unlimited as topics vary.

**PHILOS 120. Topics in Metaphysics. 4 Units.**

Examines central philosophical questions concerning our own fundamental nature and that of the world around us (e.g., causation and necessity, determination, free will, personal identity, the mind-body problem).

Repeatability: Unlimited as topics vary.

Same as LPS 120.

**PHILOS 121. Topics in the Theory of Knowledge . 4 Units.**

One or more topics in the theory of knowledge, e.g., the nature of rational justification, of perceptual knowledge, of a priori knowledge.

Repeatability: Unlimited as topics vary.

Same as LPS 121.

**PHILOS 121A. Medical Epistemology. 4 Units.**

Analysis of epistemological issues concerning medical research and health care. Topics may include medical evidence, transmission of medical knowledge, medical expertise, the epistemology of medical disagreement, classification of illnesses, well-being, philosophy of pain, and medical decision making.

**PHILOS 122. Topics in Philosophy of Mind. 4 Units.**

Selected topics involving the concept of mind, e.g., the relation between mind and body, the self, personal identity, consciousness, the unconscious.

Repeatability: Unlimited as topics vary.

**PHILOS 123. Topics in Philosophy of Religion. 4 Units.**

Critical examination of concepts involved in the theological literature, e.g., the nature and existence of God, miracles, the problem of evil, divine command theories in ethics.

Repeatability: Unlimited as topics vary.

**PHILOS 130. Topics in Moral Philosophy. 4 Units.**

Selected topics in ethics.

Repeatability: Unlimited as topics vary.

**PHILOS 131A. Applied Ethics. 4 Units.**

Topics may include capital punishment, world hunger, obligations to future generations, environmental ethics, animal rights, economic justice, sexual morality, affirmative action, racism and sexism, or legalization of drugs.

**PHILOS 131C. Medical Ethics. 4 Units.**

Analysis of moral issues concerning health care. Topics may include just allocation of scarce medical resources, the doctor/patient relationship, genetic engineering, surrogate motherhood, abortion, euthanasia, or social policy concerning AIDS.

**PHILOS 132. Topics in Political and Social Philosophy. 4 Units.**

Selected topics in social and political philosophy, e.g., the functions of government, the justification of political authority, the nature of democracy, the varieties of liberty, and social justice. Readings from classical and contemporary sources.

Repeatability: Unlimited as topics vary.

**PHILOS 133. Topics in Philosophy of Law. 4 Units.**

Selected topics concerning legal systems and the concept of law, e.g., the nature and purpose of law, the nature of authority, the relationship between law and morality, law and political-economic systems.

Repeatability: Unlimited as topics vary.

**PHILOS 140. Topics in Philosophy of Science. 4 Units.**

Selected topics in contemporary philosophy of science, e.g., the status of theoretical entities, the confirmation of theories, the nature of scientific explanation.

Repeatability: Unlimited as topics vary.

Same as LPS 140.

**PHILOS 141A. Topics in Philosophy of Physics. 4 Units.**

Selected topics in the philosophy of physics, e.g., the interpretation of quantum mechanics, the nature of spacetime, the problem of quantum field theories.

Repeatability: Unlimited as topics vary.

Same as LPS 141A.

**PHILOS 141B. Geometry and Spacetime. 4 Units.**

An examination of the foundations of the special theory of relativity, with emphasis on the geometry of Minkowski spacetime, and its relation to both Euclidean and non-Euclidean (hyperbolic) plane geometries.

Prerequisite: MATH 2D and (MATH 3A or MATH 6G)

Same as LPS 141B.

**PHILOS 141C. Philosophy of Quantum Mechanics. 4 Units.**

An examination of the standard von Neumann-Dirac formulation of quantum mechanics. The quantum measurement problem is discussed along with several proposed solutions, including GRW, many-worlds, man-minds, and Bohm's theory.

Same as LPS 141C.

**PHILOS 141D. Probability and Determinism. 4 Units.**

An examination of a cluster of interrelated issues concerning probability, determinism, logic, and the foundations of quantum mechanics.

Prerequisite: MATH 2D and (MATH 3A or MATH 6G)

Same as LPS 141D.

**PHILOS 142W. Writing/Philosophy of Biology. 4 Units.**

Philosophy of biology, e.g., scientific method in biology, the structure of evolutionary theory, teleology, ethics, and evolution. Course work includes one 4,000-word and four 1,000-word papers.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as LPS 142W, BIO SCI E142W.

Restriction: Juniors only.

**(Ib)****PHILOS 143. Topics in Philosophy of Psychology. 4 Units.**

Selected topics in the philosophy of psychology, e.g., the nature of psychological explanation, reductionism, issues in cognitive, behavioral, and neuroscience.

Repeatability: Unlimited as topics vary.

Same as LPS 143, PSYCH 123P.

Restriction: Psychology Majors have first consideration for enrollment. Philosophy Majors have first consideration for enrollment.

**PHILOS 144. Topics in Philosophy of Social Science. 4 Units.**

Selected topics in the philosophy of the social sciences, e.g., Is their goal to understand behavior or to predict and control it?; Are they normative and the natural sciences not?; Do they incorporate philosophical doctrines about language and mind?.

Repeatability: May be taken for credit for 4 units as topics vary.

Same as LPS 144.

**PHILOS 145. Topics in Philosophy of Language. 4 Units.**

Selected topics in the philosophy of language, e.g., the nature of meaning, mechanisms of reference, speech acts.

Repeatability: Unlimited as topics vary.

Same as LPS 145, LSCI 141.

**PHILOS 146. Topics in Philosophy of Logic. 4 Units.**

Selected topics in the philosophy of logic, e.g., the nature of logical truth and our knowledge of it, the status of propositions, definite descriptions, and existential presuppositions.

Repeatability: Unlimited as topics vary.

Same as LPS 146.

**PHILOS 147. Topics in Philosophy of Mathematics. 4 Units.**

Selected historical and contemporary topics in the philosophy of mathematics, e.g., mathematical truth and ontology, mathematical knowledge, the nature and role of proof, the workings of mathematics in application.

Repeatability: Unlimited as topics vary.

Same as LPS 147.

**PHILOS 150. Phenomenology . 4 Units.**

A study of the foundations of phenomenology in Husserl and its background in Bolzano, Frege, Brentano, Meinong, Kant, and Descartes.

**PHILOS 151. Existentialism. 4 Units.**

A study of such central existentialist thinkers as Heidegger and Sartre.

Prerequisite: Recommended: PHILOS 7 or PHILOS 150.

**PHILOS 162. Social Ontology. 4 Units.**

Examines how things in one's social environment exist. Such things are compared and contrasted to others in what might be regarded as the given, natural environment. Topics discussed include natural kinds; artifacts; essentialism; constructivism; intentionality; agency.

**PHILOS 163. Social Epistemology. 4 Units.**

Social epistemology is specifically concerned with questions concerning knowledge and justification that arise in a social context. Topics discussed include testimony, experts, disagreement, group knowledge, feminist epistemology, legal epistemology, and epistemology of education.

**PHILOS 164. Well-Being. 4 Units.**

Examines what it is that makes a life good (or bad) for the person who lives it. Topics include hedonism, desire-satisfaction theories of well-being (as well as other such theories), the notion of harm, the possibility of posthumous harm.

**PHILOS 165. Philosophy of Action. 4 Units.**

Philosophy of action is specifically concerned with questions concerning the nature of acting, and related phenomena such as intending, willing, trying, and trusting. It deals both with individual and group action and their moral and epistemological underpinnings.

**PHILOS 190. Special Topics in Philosophy. 4 Units.**

Lectures on selected topics to be given by regular faculty and visiting faculty.

Repeatability: Unlimited as topics vary.

**PHILOS 199. Directed Special Studies. 2-4 Units.**

Independent study on a research topic supervised by a faculty member.

Repeatability: May be repeated for credit unlimited times.

**PHILOS 199H. Honors Directed Special Studies. 2 Units.**

Independent study on a research topic supervised by a faculty member, with the objective of preparing the Department of Philosophy honors paper.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**PHILOS 200. Special Topics in Philosophy. 4 Units.**

Seminars on selected topics to be given by regular faculty and visiting faculty.

Repeatability: Unlimited as topics vary.

**PHILOS 201. First-Year Seminar. 4 Units.**

An examination of some standard works in the history of philosophy, value theory, metaphysics, or epistemology; required of all first-year Philosophy graduate students in the School of Humanities.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only. Philosophy Majors only. Logic and Philosophy of Sci Majors only.

**PHILOS 205A. Set Theory. 4 Units.**

The basic working vocabulary of mathematical reasoning. Topics include: sets, Boolean operations, ordered n-tuples, relations, functions, ordinal and cardinal numbers.

Same as LPS 205A.

**PHILOS 205B. Metalogic. 4 Units.**

Formal syntax (proof theory) and semantics (model theory) for first-order logic, including the deduction, completeness, compactness, and Loewenheim-Skolem theorems.

Prerequisite: PHILOS 205A or LPS 205A

Same as LPS 205B.

**PHILOS 205C. Undecidability and Incompleteness. 4 Units.**

Formal theory of effective processes, including recursive function, Turing machines, Church's thesis, proofs of Goedel's incompleteness theorem for arithmetics, and Church's undecidability for first-order logic.

Prerequisite: PHILOS 205B or LPS 205B

Same as LPS 205C.

Restriction: Graduate students only.

Concurrent with LPS 105C.

**PHILOS 206. Topics in Logic . 4 Units.**

Studies in selected areas of logic. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 206.

**PHILOS 210. Topics in Ancient Philosophy. 4 Units.**

Studies in selected areas of ancient philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 211. Topics in Medieval Philosophy. 4 Units.**

Studies in selected areas of medieval philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 212. Topics in Renaissance Philosophy. 4 Units.**

Studies in selected areas of renaissance philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 213. Topics in Modern Philosophy. 4 Units.**

Studies in selected areas of modern philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 213.

**PHILOS 214. Topics in Nineteenth-Century Philosophy. 4 Units.**

Studies in selected areas of nineteenth-century philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 215. Topics in Analytic Philosophy. 4 Units.**

Studies in selected areas of analytic philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 215.

**PHILOS 216. Topics in Continental Philosophy. 4 Units.**

Studies in selected areas of continental philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 218. Topics in Contemporary Philosophy. 4 Units.**

Studies in selected areas of contemporary philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 220. Topics in Metaphysics. 4 Units.**

Studies in selected areas of metaphysics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 220.

**PHILOS 221. Topics in Epistemology. 4 Units.**

Studies in selected areas of epistemology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 221.

**PHILOS 221A. Medical Epistemology. 4 Units.**

Analysis of epistemological issues concerning medical research and healthcare. Topics may include medical evidence, transmission of medical knowledge in the doctor-patient interaction, medical expertise, epistemology of medical disagreement, classification of illness, well-being, philosophy of pain, or medical decision making.

Same as LPS 221A.

Restriction: Graduate students only.

**PHILOS 222. Topics in Mind and Action. 4 Units.**

Studies in selected areas of mind and action. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 230. Topics in Ethics . 4 Units.**

Studies in selected areas of ethics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 232. Topics in Political and Social Philosophy. 4 Units.**

Studies in selected areas of political and social philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 232.

**PHILOS 234. Topics in Aesthetics . 4 Units.**

Studies in selected areas of aesthetics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 240. Topics in Philosophy of Science. 4 Units.**

Studies in selected areas of philosophy of science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 240.



**PHILOS 241. Topics in Philosophy of Physics. 4 Units.**

Studies in selected areas of philosophy of physics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 241.

**PHILOS 242. Topics in Philosophy of Biology. 4 Units.**

Studies in selected areas of philosophy of biology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 242.

**PHILOS 243. Topics in Philosophy of Psychology. 4 Units.**

Selected topics in the philosophy of psychology, e.g., the nature of psychological explanation, reductionism, issues in cognitive, behavioral, and neuroscience.

Repeatability: Unlimited as topics vary.

Same as LPS 243, PSYCH 231P.

**PHILOS 244. Topics in Philosophy of Social Science. 4 Units.**

Studies in selected areas of philosophy and social science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 244.

**PHILOS 245. Topics in Philosophy of Language. 4 Units.**

Studies in selected areas of philosophy of language. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 245.

**PHILOS 246. Topics in Philosophy of Logic. 4 Units.**

Studies in selected areas of philosophy of logic. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 246.

**PHILOS 247. Topics in Philosophy of Mathematics. 4 Units.**

Studies in selected areas of philosophy of mathematics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as LPS 247.

**PHILOS 250. Topics in Existentialism and Phenomenology. 4 Units.**

Studies in selected areas of existentialism and phenomenology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**PHILOS 298. Independent Study. 4-12 Units.**

Independent research with Philosophy faculty.

Repeatability: May be repeated for credit unlimited times.

**PHILOS 299. Directed Research. 4-12 Units.**

Directed research with Philosophy faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHILOS 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Philosophy, B.A.

Instruction in philosophy relies essentially upon discussion in which students are active participants. Wherever possible, therefore, classes are limited in size in order to permit sustained interchanges between students and instructor.

Some of the courses offered are of general interest to all students. Others are designed to explore issues that arise in selected and special disciplines such as art or science. The undergraduate advisor should be consulted for advice about courses best suited to the specialized needs of particular students.

The program of course offerings is also designed for those Philosophy majors whose intention may be either to enter some professional school upon graduation (e.g., law) or to engage in graduate work in philosophy.

The faculty encourages Philosophy majors and minors to seriously consider expanding their perspective through an experience of study abroad. The Study Abroad Center (<https://studyabroad.uci.edu/>) assists students in taking advantage of many worldwide opportunities for study and research. Specifically, those interested in analytic philosophy could consider the EAP programs in the United Kingdom, Canada, Sweden, Australia, and New Zealand, and those interested in Continental philosophy could consider the EAP programs in France, Germany, and Italy. See the Study Abroad Center section of the *Catalogue* or an academic counselor for additional information.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Departmental Requirements for the Major

A. Select one of the following:

PHILOS 1	Introduction to Philosophy
PHILOS 2	Puzzles and Paradoxes
PHILOS 3	Technology and Society
PHILOS 4	Introduction to Ethics
PHILOS 5	Contemporary Moral Problems

B. Select one of the following:

PHILOS 30	Introduction to Symbolic Logic
PHILOS 104	Introduction to Logic

C. Select two of the following:

PHILOS 10	History of Ancient Philosophy
PHILOS 11	History of Medieval Philosophy
PHILOS 12	History of Modern Philosophy
PHILOS 13	History of Contemporary Philosophy

D. Complete:

PHILOS 101	Introduction to Metaphysics
PHILOS 102	Introduction to the Theory of Knowledge
or	
PHILOS 102W	Introduction to the Theory of Knowledge
PHILOS 103	Introduction to Moral Philosophy

E. Select five of the following: <sup>1</sup>

PHILOS 100W	Writing Philosophy
PHILOS 105–199	

<sup>1</sup> Students planning to pursue graduate school are strongly advised to take PHILOS 105A and PHILOS 105B.

**Residence Requirement:** At least five upper-division courses required for the major must be completed successfully at UCI.

## B.A. in Philosophy with a Specialization in Medicine and Well-Being

All students must meet the University Requirements.

All students must meet the School Requirements.

A. Complete:

PHILOS 1 or PHILOS 2	Introduction to Philosophy Puzzles and Paradoxes
PHILOS 3	Technology and Society
PHILOS 91	The Philosophy of Sex

B. Select one of the following:

PHILOS 4	Introduction to Ethics
PHILOS 5	Contemporary Moral Problems

C. Complete:

PHILOS 101	Introduction to Metaphysics
PHILOS 102 or PHILOS 102W	Introduction to the Theory of Knowledge Introduction to the Theory of Knowledge
PHILOS 103	Introduction to Moral Philosophy

D. Select five of the following:

PHILOS 121A	Medical Epistemology
PHILOS 131C	Medical Ethics
PHILOS 140	Topics in Philosophy of Science
PHILOS 142W	Writing/Philosophy of Biology
PHILOS 162	Social Ontology
PHILOS 163	Social Epistemology
PHILOS 164	Well-Being

**Residence Requirement:** At least five upper-division courses required for the major must be completed successfully at UCI.

## B.A. in Philosophy with a Specialization in Law and Society

All students must meet the University Requirements.

All students must meet the School Requirements.

A. Complete:

PHILOS 1 or PHILOS 2	Introduction to Philosophy Puzzles and Paradoxes
PHILOS 3	Technology and Society
PHILOS 22	Introduction to Law and Society

B. Select one of the following:

PHILOS 4	Introduction to Ethics
PHILOS 5	Contemporary Moral Problems

C. Complete:

PHILOS 101	Introduction to Metaphysics
PHILOS 102 or PHILOS 102W	Introduction to the Theory of Knowledge Introduction to the Theory of Knowledge
PHILOS 103	Introduction to Moral Philosophy

D. Select five of the following:

PHILOS 130	Topics in Moral Philosophy
PHILOS 132	Topics in Political and Social Philosophy
PHILOS 133	Topics in Philosophy of Law
PHILOS 144	Topics in Philosophy of Social Science
PHILOS 162	Social Ontology
PHILOS 163	Social Epistemology
PHILOS 165	Philosophy of Action

**Residence Requirement:** At least five upper-division courses required for the major must be completed successfully at UCI.

The Department of Philosophy provides high-achieving students with the opportunity to work closely with a faculty member to gain advanced philosophical training and to produce a paper of exceptional quality. We deem such experience to have intrinsic value (though the additional training and paper might also be useful if a student intends to apply to graduate school). In recognition of the extra work needed to produce this paper - it is to be done in addition to all major requirements - a student will receive an honors designation on their degree.

To receive this honors designation, a student must take PHILOS 199H, the honors directed special studies course, in two consecutive quarters with the same faculty member. During these quarters, the student will prepare, under the supervision of the faculty member, a substantial piece of original work (a paper of approximately 5,000 words).

PHILOS 199H is a 2-unit course and is graded P/NP. The course does not count towards the major. Thus, the two PHILOS 199H courses are to be done in addition to all major requirements. PHILOS 199H may be taken in conjunction with a graduate seminar with the permission of the instructor of the seminar.

To be eligible to enroll in PHILOS 199H, a student must be a philosophy major, have a GPA of at least 3.7 in all philosophy courses (not just major courses) and be planning to graduate within three quarters. A student must find a faculty member from the Department willing to supervise and evaluate their work. The student, in consultation with their supervisor, must also find a second reader.

To receive the honors designation, the student must maintain a GPA of at least 3.7 to the conclusion of their coursework. The honors paper must be deemed of sufficient quality by both the supervisor and the second reader.

The study of argument and the precision and clarity of thought and writing required of Philosophy majors are excellent preparation for a variety of careers. Many undergraduates trained in Philosophy go on to professional schools in medicine, business, or law. The analytical skills developed in Philosophy courses are especially useful in legal education; indeed, many UCI Philosophy graduates have been successful at top law schools. Former Philosophy students have also used their skills to advantage in careers in government, business, teaching, law enforcement, and computer programming. Many Philosophy majors also continue their education at the graduate level, either in philosophy or a related discipline.

The UCI (<http://career.uci.edu/>) Division of Career Pathways Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on résumé preparation, job search, and interview techniques.

## Philosophy, Minor

Philosophy is a skill, not merely a subject matter. This skill, critical thinking, is what illuminates the traditional subject matter of the discipline, topics like the nature of reality or of knowledge or of goodness or God. As a skill, philosophy is more like riding a bike than geology or American history (although the discipline itself does have a venerable history). This skill of critical thinking enables one to question in such a way as to reveal the presuppositions of an issue, to discern the connections among those things relevant to that issue, and to recognize the consequences of these connections in light of further considerations. Critical thinking can be applied to issues well beyond those traditionally associated with philosophy—in fact, this sort of thinking can be applied to any issue that might be of interest to one (food, technology, social media, friendship, society, love, race, gender, etc.). Philosophy is, therefore, a most valuable and transferable skill.

The Minor in Philosophy is for those considering majoring in Philosophy or for those who would like to develop their critical thinking skills while majoring in another discipline. Regardless of what one studies or what one's interests are, one will benefit from becoming a more engaged and critical thinker.

The Minor in Philosophy comprises seven courses: three from a wide range of introductory courses and four from an even wider range of upper-division ones. There are many ways of designing the minor to fit with one's schedule and particular interests.

A. Select three of the following:

PHILOS 1	Introduction to Philosophy
PHILOS 2	Puzzles and Paradoxes
PHILOS 3	Technology and Society
PHILOS 4	Introduction to Ethics
PHILOS 5	Contemporary Moral Problems
PHILOS 10	History of Ancient Philosophy
PHILOS 11	History of Medieval Philosophy
PHILOS 12	History of Modern Philosophy
PHILOS 13	History of Contemporary Philosophy
PHILOS 22	Introduction to Law and Society
PHILOS 30	Introduction to Symbolic Logic

B. Complete four additional upper-division courses selected from PHILOS 100W–199. (PHILOS 199 may be taken for four units only.)

**Residence Requirement for the Minor:** Four upper-division courses must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate department chair.

## Philosophy, Ph.D. (School of Humanities)

The Ph.D. program in Philosophy is jointly and cooperatively administered by the Department of Philosophy in the School of Humanities and the Department of Logic and Philosophy of Science (LPS) in the School of Social Sciences. The graduate program has two distinct tracks—the Philosophy track and the LPS track—both of which begin from a common core of shared requirements in history of philosophy, logic, ethics, and metaphysics/epistemology. Students are advised to apply to the track whose faculty, areas of specialization, and curriculum most closely correspond to their interests. The Philosophy track is described here. See the Department of Logic and Philosophy of Science for a description of the LPS track.

UCI's Philosophy Department is committed to providing students a well-rounded graduate education, including central areas of contemporary philosophy and a solid foundation in the history of philosophy. Those with interests in mathematics, the natural sciences, or the social sciences are encouraged to take courses in Logic and Philosophy of Science and to include LPS faculty members on their dissertation committees. The cooperative two-track program provides students the benefits of faculty expertise in a host of areas.

Every year the Philosophy Department invites distinguished philosophers from other universities to present their work to faculty and graduate students. Participation in this colloquium series, though not mandatory, contributes significantly to graduate education. Colloquia sponsored by Logic and Philosophy of Science might also be of interest to Philosophy track students.

Every new graduate student is assigned a faculty member whose purpose is to oversee the student's progress through the major requirements for the advanced degree. The student consults with this faculty member each quarter about progress and any administrative or academic difficulties. After a student has satisfied course and distribution requirements and passed the Portfolio Exam (discussed below), he or she identifies a faculty member in the Philosophy Department as his or her principal dissertation advisor. Together they will recruit the other faculty members, from both inside and outside the Department of Philosophy, who will serve as the student's dissertation committee.

There is no set number of courses required for the Philosophy track, so that work can be tailored to the individual student's needs and interests. However, as a prerequisite for the Ph.D., every student is required to have some experience in teaching. Before students receive their first appointment as TAs in this department, they must complete the TA training program offered by UCI's Division of Teaching Excellence and Innovation.

Normative time to degree in the Philosophy track is seven years for the normally qualified student. Time to advancement to candidacy is four years. Time in candidacy is three years. Maximum time to degree permitted is nine years. A master's degree is not a prerequisite for the Ph.D. The following are requirements for the Ph.D.:

### First-Year Seminar

An examination of some standard works in the history of Philosophy, value theory, metaphysics, or epistemology; required of all first-year Philosophy graduate students in the School of Humanities.

### Distribution Requirements

Students are required to take a range of courses designed to expose them to the various historical periods and fields of philosophy. When course offerings are announced, students are notified about which courses can be used to satisfy which requirements. In some cases, the requirement satisfied will ultimately depend on the content of the student's term paper(s).

The Distribution Requirements are:

1. *History.* To satisfy this requirement, students must receive a grade of B or better in at least four courses covering at least three of the following areas: Ancient, Medieval, Modern Empiricism, Modern Rationalism, Kant, Nineteenth Century, and Twentieth Century.
2. *Field.* To satisfy this requirement, students must receive a grade of B or better in two courses in value theory, one course in logic, and two courses in metaphysics/epistemology, broadly construed.

These requirements must be completed by the end of the seventh quarter in residence.

### Logic Requirement

Students must receive a grade of B or better in an approved logic course. This requirement must be completed by the end of the seventh quarter in residence.

### Tools of Research

The student's dissertation advisor may require his or her advisee to pursue the tool(s) of research deemed useful for the advisee's dissertation research. A student might, for example, be required to take classes outside the Department of Philosophy or learn languages other than English. The Tools of Research requirement must be completed by the end of the 12th quarter in residence.

## **The Portfolio**

A portfolio of at least two papers is an extended writing sample designed to demonstrate a student's ability (a) to understand, analyze, and evaluate positions and arguments in the philosophical literature, and (b) to formulate and defend an original philosophical thesis. These virtues must be displayed at a level of sophistication indicating the student's ability to write a Ph.D. dissertation.

The portfolio must be submitted to the Graduate Coordinator at the end of the fifth week of the student's sixth quarter in residence. Portfolios will be evaluated by the entire faculty of the Philosophy Department. (Philosophy track students may request that relevant LPS faculty also be present at the evaluation meeting.)

## **Prospectus Examination**

In preparation for the prospectus examination, students choose a dissertation advisor and a dissertation committee. They consult with their thesis advisor and other appropriate faculty to prepare a reading list on their area of concentration and a brief dissertation proposal with a comprehensive bibliography. The exam is an oral exam and is normally completed at the end of the seventh quarter, but must be completed by the end of the ninth quarter in residence. The prospectus exam is to determine whether the dissertation project is viable and promises results that will fulfill standards expected for a dissertation in the profession.

## **Candidacy Examination**

In preparation for the candidacy examination, students prepare at least a draft chapter of their dissertation, an outline of the organization of the work, and update their prospectus and bibliography in consultation with their dissertation advisor and their dissertation committee. Students apply for candidacy by filing appropriate forms, including a list (devised in consultation with their advisor) of appropriate members for their Candidacy Committee; one of these, the External Examiner, must come from outside the Department of Philosophy. The Committee is then appointed by the Philosophy Department, on behalf of the Dean of the Graduate Division and the Graduate Council, to administer the oral candidacy examination on the prospectus and draft chapter(s) to determine whether or not the student will be approved to continue work on the dissertation.

The Candidacy Examination is normally completed at the end of the ninth quarter, but must be completed by the end of the 12th quarter in residence. The Philosophy Department Chair, on behalf of the Dean of the Graduate Division and the Graduate Council, then appoints a Doctoral Committee (typically taken from the Candidacy Committee and naturally including the dissertation advisor) to supervise the writing of the dissertation.

## **Dissertation Defense**

Students must defend their dissertation during an oral examination administered by their Doctoral Committee.

## **Optional Emphasis in Critical Theory**

The School of Humanities offers an emphasis in Critical Theory that can be appended to the Philosophy track. A student interested in the emphasis begins by taking the three-quarter Critical Theory Workshop. With the recommendation of a workshop instructor or a Critical Theory faculty member in the Philosophy Department, the student may then apply to the Critical Theory Committee for admission to the emphasis. Emphasis students must complete the following requirements in addition to the usual Philosophy track requirements.

### **The Critical Theory Workshop**

Students must successfully complete the three-quarter Critical Theory Workshop. This sequence is conceived as a reading group, normally conducted by a team of instructors, and developed with the input of all participants. Significant texts are discussed and analyzed in class; no term papers are required. (Students receive 0 units and In-progress grades for the fall and winter quarters; passing students receive 4 units and a Satisfactory grade for the spring quarter.

### **Advanced Critical Theory Requirement**

Students must receive a grade of B or better in three HUMAN 270 courses offered under the supervision of the Critical Theory Committee. At least three such courses will be offered each year. With the approval of the Philosophy Department, these courses can be used to satisfy the tools of research requirement.

### **Mini-Seminar Requirement**

Students must participate in two committee-sponsored mini-seminars (six–eight hours each) offered by visiting scholars on their ongoing research.

### **Research Paper Requirement**

Students must complete a research paper under the guidance of a three-member committee, selected in consultation with the Director; at least one member must be from outside of the Philosophy Department. This paper may (but need not) be part of the portfolio or dissertation.

Upon completion of the emphasis requirements, a letter certifying that fact, signed by the Dean of Humanities and the Director of the Critical Theory Emphasis, will be added to the student's dossier.

## **Program in Law and Graduate Studies (J.D./Ph.D.)**

Highly qualified students interested in combining the study of law with graduate research and/or professional qualifications in Logic and Philosophy of Science are invited to undertake concurrent degree study under the auspices of UC Irvine's Program in Law and Graduate Studies (PLGS). Students in this program pursue a coordinated curriculum leading to a J.D. degree from the School of Law in conjunction with a Ph.D. degree in the

Department of Logic and Philosophy of Science. Contact the PLGS Program Director's office for additional information at 949-824-4158, or by email to [plgs@law.uci.edu](mailto:plgs@law.uci.edu). A full description of the program, with links to all relevant application information, can be found at the School of Law Concurrent Degree Programs website (<http://www.law.uci.edu/academics/interdisciplinary-studies/concurrent-degrees.html>) and in the School of Law School section (<http://catalogue.uci.edu/schooloflaw/#lawandgraduatestudies>) of the *Catalogue*.

The Department of Philosophy and the Department of Logic and Philosophy of Science jointly administer an Exchange Program with the University of Salzburg. The program has two parts. The Scholarly Exchange provides opportunities for faculty and graduate students in Philosophy and LPS to visit Salzburg and for faculty and graduate students from Salzburg to visit one or the other of the UCI units. The Program also sponsors joint conferences, held alternately in Irvine and in Salzburg; these are co-sponsored by Salzburg and the UCI Interdisciplinary Program in the History and Philosophy of Science.

To be eligible for the Salzburg Exchange, a graduate student must have advanced to candidacy. The selected student spends one semester in Salzburg, usually teaching one course in the general area of the thesis topic. An upper-division course may be taught in English, but lower-division courses must be taught in German. (Some previous visitors have learned serviceable German by attending a Goethe institute during the preceding summer.) Typically, a Salzburg visitor will receive a Salzburg Fellowship intended to cover travel expenses, and a stipend; those who teach while in Salzburg will also receive a salary intended to cover living expenses (including health and dental insurance).

Application should be made to the Philosophy Department's Salzburg Exchange Director by November 1 and should include a curriculum vita and syllabi for possible courses to be taught. The Director and/or the Philosophy Department Graduate Coordinator should be consulted for further information.

## Department of Spanish and Portuguese

### Luis F. Avilés, Department Chair

322 Humanities Hall

949-824-6901

<http://www.humanities.uci.edu/spanishandportuguese/>

The Department of Spanish and Portuguese offers programs of study leading to the B.A. in Spanish with emphases in Literature and Culture, Spanish for Future Teachers, and Cinema: Spain, Latin America, and U.S. Latino; and an M.A. and Ph.D. in Spanish.

While members of the faculty are recognized nationally and internationally for their research, creative writing, and contributions to the academic profession, one of the Department's highest priorities is to maintain teaching excellence. The Department's goal is to provide students with a level-specific, solid education in the diverse fields of study that are offered. Many of the undergraduate and graduate courses reflect the faculty's interest in bringing together historical, critical-theoretical, and interdisciplinary perspectives in the study of literature and other cultural artifacts such as film. At the graduate level, students are encouraged to take courses in other UCI programs such as Gender and Sexuality Studies, the Critical Theory Emphasis, Comparative Literature, and Film and Media Studies.

The Department of Spanish and Portuguese offers a minor in Spanish and a minor in Spanish/English Bilingual Education. The Spanish minor provides the opportunity to develop language proficiency while expanding knowledge of Hispanic cultures, literature, and linguistics. Many Spanish minors combine their studies with fields such as political science (pre-law), pre-med, communications, psychology, and economics. The goal of the minor in Spanish/English Bilingual Education is to create a pathway to better prepare students who wish to become future bilingual teachers.

- Spanish, B.A.
- Spanish, M.A.
- Spanish, Minor
- Spanish, Ph.D.
- Spanish/English Bilingual Education, Minor

## Spanish Language Course Placement

### Lower-Division Spanish Language Courses

The goal of SPANISH 1A, SPANISH 1AB, SPANISH 1B, SPANISH 1C, SPANISH 2A, SPANISH 2B, and SPANISH 2C is to help students achieve beginning to intermediate proficiency in Spanish as well as an awareness of cultural perspectives and practices of Spanish-speaking communities in Spain, Latin America, and the United States. SPANISH 3 focuses on the development of academic writing skills in Spanish. SPANISH 3H is designed for students who grew up speaking Spanish at home.

At the same time, these beginning Spanish classes are an excellent portal to study abroad, be that in Spain or in Latin America. For an overview of relevant study sites, visit the Study Abroad Center website (<http://www.cie.uci.edu/>).

NOTE: SPANISH 1A, SPANISH S1AB, and SPANISH 1AB are open only to students who have no prior knowledge of Spanish.



## Enrollment Authorization

Students must take a copy of their high school transcript to their academic counseling office to activate their eligibility to enroll in SPANISH 1A, SPANISH S1AB, or SPANISH 1AB. Equivalent sequences/courses may not be repeated for credit. Other counseling offices are encouraged to call the Humanities Office of Undergraduate Study (<https://www.humanities.uci.edu/undergrad/>) if they have questions about a particular student's eligibility to enroll at a given level.

Students with prior coursework or knowledge in Spanish may need to take the Spanish placement test and adhere to the department's placement policies. Students who score above the range of scores required for SPANISH 3 or SPANISH 3H on the Spanish placement test may proceed to enroll in upper-division Spanish courses.

Students who earn a C or better in Spanish language courses at UCI will be allowed to enroll in the next course in the language sequence without taking a placement exam. Equivalent sequences/courses may not be repeated for credit.

## Enrollment in introductory level Spanish courses is determined based on the following categories of Spanish language experience:

**No previous experience in Spanish:** Students with no previous background in Spanish must submit their high school transcript to their academic counseling office to activate their eligibility to enroll in SPANISH 1A or SPANISH 1AB.

**High school courses in Spanish:** Students with a previous high school background in Spanish must take UCI's placement test. Eligibility to enroll will be based on the result of that placement test (see the UCI Academic Testing Center's website (<http://www.testingcenter.uci.edu/>) for more information).

**College or University courses in Spanish:** Students with a previous course (or courses) in Spanish from another college or university must take UCI's placement test. Eligibility to enroll will be based on the result of that placement test (see the UCI Academic Testing Center's website (<http://www.testingcenter.uci.edu/>) for more information).

**Graduation from a high school in a Spanish-speaking country or Spanish Academy:** Students who graduated from a high school or academy where the primary language of instruction was Spanish must take a copy of their transcripts to the Language Curriculum Director, Humanities Hall 322, to determine where they should be placed.

**Students with GE VI-satisfying SAT Subject Test scores, International Baccalaureate (IB) scores, or Advanced Placement (AP) examination scores:** Students who have completed one of the previously listed exams who plan to enroll in a Spanish course at UCI are still required to take UCI's Spanish placement test. Students cannot earn units or grade points at UCI in courses from which they have been exempted on the basis of IB or AP credit, even if the placement test result recommends enrollment in such a level. (see the UCI Academic Testing Center's website (<http://www.testingcenter.uci.edu/>) for more information).

## Progression in Spanish at UCI

Students who earn a C or better in Spanish language courses at UCI will be allowed to enroll in the next course in the language sequence without taking a placement exam.

To enroll in SPANISH 3, a student must have passed SPANISH 2C or must have earned a placement exam score qualifying for enrollment into SPANISH 3.

SPANISH 3H is designed for students who grew up speaking Spanish at home, and need to work on their writing skills. To enroll in this course, a student must have earned a placement exam score qualifying for enrollment into SPANISH 3H.

Students who score above the range of scores required for SPANISH 3 or SPANISH 3H on the Spanish placement test may proceed to enroll in upper-division Spanish courses.

**Placement testing** is offered throughout the academic year (summer included). For details about registering for a placement test, contact the Academic Testing Center:

3040 Anteater Instruction and Research Building  
949-824-6207

Email: [testcenter@uci.edu](mailto:testcenter@uci.edu) ([testoff@uci.edu](mailto:testoff@uci.edu))

<http://www.testingcenter.uci.edu> (<http://www.testingcenter.uci.edu/>)

Placement test results are valid for one calendar year.

## Faculty

Ana Maria Amar Sanchez, Ph.D. University of Buenos Aires, *Professor Emerita of Spanish and Portuguese*

Luis Avilés, Ph.D. Brown University, *Professor of Spanish and Portuguese* (Golden Age literature and critical theory)

Anne J. Cruz, Ph.D. Stanford University, *Professor Emerita of Spanish and Portuguese*



Lucia G. Cunningham, Ph.D. University of Kansas, *Professor Emerita of Spanish and Portuguese*

Ivette N. Hernandez-Torres, Ph.D. Brown University, *Associate Professor of Spanish and Portuguese* (Colonial Latin America, Latin America and Caribbean literatures and cultures)

Horacio Legras, Ph.D. Duke University, *Professor of Spanish and Portuguese; Comparative Literature; Culture and Theory; European Languages and Studies* (Latin American literature and culture, Latin American film, visual arts in Latin America, psychoanalysis, and photography)

Viviana A. Mahieux, Ph.D. Harvard University, *Associate Professor of Spanish and Portuguese* (Latin American avant-gardes, journalism and literature, material cultures, media studies, modern and contemporary Mexico)

Santiago Morales-Rivera, Ph.D. Harvard University, *Associate Professor of Spanish and Portuguese; European Languages and Studies* (Modern Peninsular literature and culture, critical theory, literary history, narrative, music)

Gonzalo Navajas, Ph.D. University of California, Los Angeles, *Distinguished Professor of Spanish and Portuguese* (eighteenth through twentieth-first century Spanish literature and intellectual history, film, critical theory, cultural criticism, creative writing)

Dayle S. Nunez, Ph.D. Stanford University, *Professor Emeritus of Spanish and Portuguese*

Hector H. Orjuela, Ph.D. University of Kansas, *Professor Emeritus of Spanish and Portuguese*

Julian I. Palley, Ph.D. University of New Mexico, *Professor Emeritus of Spanish and Portuguese*

Armin Schwegler, Ph.D. University of California, Berkeley, *Professor of Spanish and Portuguese* (Spanish linguistics, history of the Spanish language, Creole languages, language contact, African influences in Latin America, language origins)

Jacobo Sefami, Ph.D. University of Texas at Austin, *Professor of Spanish and Portuguese* (Latin American literature, with emphasis in 20th/21st century poetry; Latin American Jewish writers)

Julio R. Torres, Ph.D. Georgetown University, *Assistant Professor of Spanish and Portuguese; Language Science* (heritage and second language acquisition; multilingualism)

Juan Villegas, Ph.D. University of Chile, *Professor Emeritus of Spanish and Portuguese*

Zidia O. Webb, M.A. Michigan State University, *Associate Professor of Teaching Emeritus of Spanish and Portuguese*

## Portuguese Courses

### **PORTUG 121. Topics in Luso-Brazilian Literature. 4 Units.**

In English. Contextualized study of a major author, current, or genre in Brazilian, Portuguese, and/or Lusophone African literature. Examples: Gender, Race, and Sexualities in Postcolonial Lusophone Literatures; Women and Writing in Brazil and Portugal; The Short Story.

Repeatability: Unlimited as topics vary.

### **PORTUG 243. Studies in Luso-Brazilian Literature and Culture. 4 Units.**

Critical analysis of selected literary works from Portugal and/or Brazil. Contextualizes the works within their historical and literary specificity, and discusses pertinent theoretical issues raised by them. Taught in Portuguese.

Prerequisite: Reading knowledge of Portuguese.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

## Spanish Courses

### **SPANISH 1A. Fundamentals of Spanish. 5 Units.**

Communicative approach with emphasis on conversational skills: the students and their environment, their experiences, and their opinions about issues. Reading and writing skills also introduced.

Prerequisite: Placement into SPANISH 1A.

Overlaps with SPANISH 1AB, SPANISH S1AB.

Restriction: SPANISH 1A and SPANISH 1AB and SPANISH S1AB may not be taken for full credit.

**SPANISH 1AB. Fundamentals Intensive Spanish. 10 Units.**

An intensive, proficiency-oriented, and task-based approach, designed to develop basic oral communicative abilities in Spanish. Reading and writing skills, along with an introduction to Hispanic cultures.

Prerequisite: Placement into SPANISH 1A.

Overlaps with SPANISH 1A, SPANISH 1B, SPANISH S1AB.

Restriction: SPANISH 1AB and SPANISH 1A and SPANISH 1B and SPANISH S1AB may not be taken for full credit.

**SPANISH 1B. Fundamentals of Spanish. 5 Units.**

Communicative approach with emphasis on conversational skills: the students and their environment, their experiences, and their opinions about issues. Reading and writing skills also introduced.

Prerequisite: SPANISH 1A. SPANISH 1A with a grade of C or better. Placement into SPANISH 1B is also accepted.

Overlaps with SPANISH 1AB, SPANISH S1AB.

Restriction: SPANISH 1B and SPANISH 1AB and SPANISH S1AB may not be taken for full credit.

**SPANISH 1C. Fundamentals of Spanish. 5 Units.**

Communicative approach with emphasis on conversational skills: the students and their environment, their experiences, and their opinions about issues. Reading and writing skills also introduced.

Prerequisite: SPANISH 1AB or SPANISH 1B or SPANISH S1AB. SPANISH 1AB with a grade of C or better. SPANISH 1B with a grade of C or better. SPANISH S1AB with a grade of B or better. Placement into SPANISH 1C is also accepted.

Overlaps with SPANISH S1BC.

Restriction: SPANISH 1C and SPANISH S1BC may not be taken for full credit.

**(VI)**

**SPANISH S1AB. Fundamentals of Spanish. 7.5 Units.**

First half of first-year Spanish in an intensified form. Communicative approach with emphasis on conversational skills.

Prerequisite: Placement into SPANISH 1A.

Overlaps with SPANISH 1A, SPANISH 1B, SPANISH 1AB.

Restriction: SPANISH S1AB and SPANISH 1A and SPANISH 1B and SPANISH 1AB may not be taken for full credit.

**SPANISH S1BC. Fundamentals of Spanish. 7.5 Units.**

Second half of first-year Spanish in an intensified form. Communicative approach with emphasis on conversational skills.

Prerequisite: SPANISH S1AB or SPANISH 1A or SPANISH 1B. SPANISH S1AB with a grade of C or better. SPANISH 1A with a grade of C or better. SPANISH 1B with a grade of C or better. Placement into SPANISH 1B or SPANISH 1C is also accepted.

Overlaps with SPANISH 1B, SPANISH 1C, SPANISH 1AB.

Restriction: SPANISH S1BC and SPANISH 1B and SPANISH 1C and SPANISH 1AB may not be taken for full credit.

**(VI)**

**SPANISH 2A. Intermediate Spanish. 4 Units.**

Conversation, reading, and composition skills are developed using texts of literary and social interest. Emphasis on grammar review.

Prerequisite: SPANISH 1C or SPANISH S1BC. SPANISH 1C with a grade of C or better. SPANISH S1BC with a grade of C or better. Placement into SPANISH 2A is also accepted.

Overlaps with SPANISH 2AB, SPANISH S2AB.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)**

**SPANISH 2AB. Intermediate Intensive Spanish. 8 Units.**

Intensive intermediate course designed to improve student's abilities in reading, writing, speaking, and comprehension, including a thorough introduction to Hispanic cultures. Grammatical component of the language is gradually reviewed and tested.

Prerequisite: SPANISH 1C or SPANISH S1BC. SPANISH 1C with a grade of C or better. SPANISH S1BC with a grade of C or better. Placement into SPANISH 2A is also accepted.

Overlaps with SPANISH 2A, SPANISH 2B, SPANISH S2AB.

(VIII)

**SPANISH 2B. Intermediate Spanish. 4 Units.**

Conversation, reading, and composition skills are developed using texts of literary and social interest. Emphasis on grammar review.

Prerequisite: SPANISH 2A. SPANISH 2A with a grade of C or better. Placement into SPANISH 2B is also accepted.

Overlaps with SPANISH 2AB, SPANISH S2AB.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(VIII)

**SPANISH 2C. Intermediate Spanish. 4 Units.**

Conversation, reading, and composition skills are developed using texts of literary and social interest. Emphasis on grammar review.

Prerequisite: SPANISH 2AB or SPANISH 2B or SPANISH S2AB. SPANISH 2AB with a grade of C or better. SPANISH 2B with a grade of C or better. SPANISH S2AB with a grade of B or better. Placement into SPANISH 2C is also accepted.

Overlaps with SPANISH S2BC.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(VIII)

**SPANISH S2AB. Intermediate Spanish. 6 Units.**

First half of second-year Spanish in an intensified form. Conversation, reading, and composition skills are developed using texts of literary and social interest. Emphasis on grammar review.

Prerequisite: SPANISH 1C or SPANISH S1BC. SPANISH 1C with a grade of C or better. SPANISH S1BC with a grade of C or better. Placement into SPANISH 2A is also accepted.

Overlaps with SPANISH 2A, SPANISH 2B, SPANISH 2AB.

(VIII)

**SPANISH S2BC. Intermediate Spanish. 6 Units.**

Second half of second-year Spanish in an intensified form. Conversation, reading, and composition skills are developed using texts of literary and social interest. Emphasis on grammar review.

Prerequisite: SPANISH 2B or SPANISH S2AB or SPANISH 2A. SPANISH 2B with a grade of C or better. SPANISH S2AB with a grade of C or better. SPANISH 2A with a grade of B or better. Placement into SPANISH 2B or SPANISH 2C is also accepted.

Overlaps with SPANISH 2B, SPANISH 2C, SPANISH 2AB, SPANISH 2.

Restriction: SPANISH S2BC and SPANISH 2B and SPANISH 2C and SPANISH 2AB and SPANISH 2 may not be taken for full credit.

(VIII)

**SPANISH 3. US Latino Communities. 4 Units.**

Focuses on intermediate to advanced grammar and composition. Emphasis is placed on key elements of grammar, which constitutes about 70 percent of the curriculum, and composition writing, which constitutes the remaining 30 percent.

Prerequisite: SPANISH 2C or SPANISH S2BC. SPANISH 2C with a grade of C or better. SPANISH S2BC with a grade of C or better. Placement into SPANISH 3 is also accepted.

Overlaps with SPANISH 3H.

(VIII)

**SPANISH 3H. Heritage Spanish: Latinidad. 4 Units.**

Designed for students who grew up speaking Spanish in their homes/communities, whose schooling has been primarily in English, and need additional practice writing in Spanish.

Prerequisite: Placement into SPANISH 3H.

Overlaps with SPANISH 3.

**(VII)**

**SPANISH 44. Hispanic Literatures for Nonmajors. 4 Units.**

Focuses on major Spanish and Latin American literary texts within a historical and theoretical perspective. Taught in English with literary texts read in the original language.

Prerequisite: SPANISH 2 or SPANISH 2C or SPANISH S2BC

Restriction: No Spanish Majors.

**(VIII)**

**SPANISH 50. Latin America, U.S. Latino, and Iberian Cultures. 4 Units.**

Introduction (for non-majors) to the culture of the Spanish- and Portuguese-speaking worlds (Europe, Latin America, U.S., Africa). May focus on any time period. Taught in English.

Repeatability: May be taken for credit 3 times as topics vary.

**(IV and VIII ).**

**SPANISH 60E. Mexico and Central America: A Survey . 4 Units.**

Panoramic view of Mexico and Central America examining key texts throughout history. Shows the richness of the culture, and an appraisal of various forms of representation, including images, chronicles, novels, essays, poems, and a film. Taught in English.

Overlaps with SPANISH 60S.

**(IV and VIII ).**

**SPANISH 60S. Mexico and Central America: A Survey . 4 Units.**

Panoramic view of Mexico and Central America examining key texts throughout history. Shows the richness of the culture, and an appraisal of various forms of representation, including images, chronicles, novels, essays, poems, and a film. Taught in Spanish.

Prerequisite: Placement into SPANISH 2A or higher via Spanish Placement Test B is required.

Overlaps with SPANISH 60E.

**(IV and VIII ).**

**SPANISH 61. The Culture of the Visual Image in Latin America . 4 Units.**

A survey of visual forms of expression which have endured through more than five centuries of pre-colonial, colonial, and independent Latin America. Forms to be treated in the class include painting, monuments, sculpture, urban planning, graffiti, comics, and photography.

**(IV and VIII ).**

**SPANISH 62. Latinx, Multilingualism, and Social Justice . 4 Units.**

Explores the role of multilingualism (Spanish, indigenous languages, Latino English) in Latinx social justice movements in the United States with an emphasis on California. Course is taught in English.

**(VII)**

**SPANISH 97. Fundamentals of Spanish (with Emphasis on Reading). 4 Units.**

Designed for students interested in acquiring a solid reading knowledge of Spanish, and to facilitate the understanding and translating of Spanish texts covering a variety of disciplines. Does not fulfill any undergraduate foreign language requirement. Taught in English.

Prerequisite: Does not serve as prerequisite for any higher-level Spanish courses.

Restriction: No Spanish Majors.

**SPANISH 101A. Introduction to Iberian Literature and Culture. 4 Units.**

Introduction to the major authors and movements of Iberian literature and culture from the Middle Ages to the present.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 101B. Introductory Studies to Latin American Literature and Culture. 4 Units.**

A historical overview of Latin American literature and culture mainly focused on canonical texts. Topics include colonialism and postcolonialism, the nation, indigenismo, gender, and literary movements. Also introduces literary analysis, research methods, and cultural critique.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 104. Writing in Spanish. 4 Units.**

Focuses on the use of writing as a medium to encourage critical thinking and the practical analysis of literary texts, as well as the study of historical and social issues in the Spanish-speaking world.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 105. Spanish Communication. 4 Units.**

Designed to help students develop Spanish oral skills by exposing them to different verbal Spanish language registers. Special emphasis placed on abilities essential to professional or academic careers. Intended for Spanish majors as an important component of their overall education.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 107. Advanced Spanish Grammar. 4 Units.**

Designed for students who have demonstrated a substantial level of proficiency in their studies of the Spanish language. Takes thorough approach to advanced grammatical problems, in order to assist students in their mastery of the elements of the Spanish language.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 110A. Topics in Peninsular Literature and Cultures. 4 Units.**

Topics in Peninsular literature and cultures.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 110B. Topics in Latin American Literature and Cultures. 4 Units.**

Topics in Latin American literature and cultures.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 110C. U.S. Latino Literature and Cultures. 4 Units.**

Focuses on aspects of literature, art, cultural production, and history of the multifaceted Latino cultures that have developed within the United States. Focuses on one group, such as Caribbean Americans, Chicanos, Central Americans, or a comparative perspective of several groups.

Same as CHC/LAT 134.

**SPANISH 113A. Spanish Phonetics. 4 Units.**

Introduction to fundamental notions of Spanish phonetics. Particular attention paid to problems of pronunciation that arise in native and non-native speakers of Spanish due to interference between Spanish and English. Phonology (the system that underlies phonetics) and Spanish dialectology included.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 113B. Introduction to Spanish Linguistics. 4 Units.**

Application of basic notions of linguistics to Spanish, Spanish phonology, morphology, syntax, and semantics. Special attention to the application of linguistics to the teaching of Spanish.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 119. Textual Analysis and Interpretation. 4 Units.**

Focus on analysis and interpretation of literary texts. Emphasis on narrative, poetry, theater/performance, and visual media. Introduces students to major currents in theoretical thought, such as cultural studies, postmodernism, and others. Oral presentations and short essays required. Taught in Spanish.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

**SPANISH 121. Topics in Golden Age Literature and Culture. 4 Units.**

Golden Age Literature in Spain, including the Renaissance and Baroque periods. Works of poetry, narrative, and theater. Historical and cultural background.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: May be taken for credit 3 times as topics vary.

**SPANISH 122. Topics in 18th and 19th Century Spanish Literature and Culture. 4 Units.**

The main literary and ideological trends in 18th and 19th century Spain, including the enlightenment, romanticism, realism, and naturalism.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: May be taken for credit 3 times as topics vary.

**SPANISH 123. Topics in 20th and 21st Century Spanish Literature and Culture. 4 Units.**

20th century Spanish authors. Works of poetry, narrative, or theater. Historical context of the period and principles of literary theory.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: May be taken for credit 3 times as topics vary.

**SPANISH 130A. Topics in Latin American Colonial Literature and Culture. 4 Units.**

Topics in Latin American colonial literature and culture.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 130B. Topics in Latin American Literature and Culture of the 19th Century. 4 Units.**

Topics in Latin American literature and culture of the 19th century.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 130C. Topics in Latin American Literature and Culture of the 20th Century. 4 Units.**

Topics in Latin American literature and culture of the 20th century.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 140. Topics in Chicano Literature and Culture. 4 Units.**

Studies in selected areas of Chicano/Latino Studies. Topics addressed vary each quarter. Taught in English.

Repeatability: May be taken for credit 4 times as topics vary.

Same as CHC/LAT 110.

**SPANISH 150. Topics in Literature in Translation. 4 Units.**

Study of texts by modern and contemporary Peninsular, Latin American, and/or U.S. Latino writers in translation. Taught in English. Not applicable toward Spanish major or minor requirements.

Repeatability: Unlimited as topics vary.

**SPANISH 160. Topics in Luso-Hispanic Film Studies. 4 Units.**

Study of Peninsular, Latin-American, and/or U.S. Latino film. Taught in English or Spanish.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 185. Selected Topics in Peninsular Literature and Culture. 4 Units.**

Selection of representative topics in Spanish and/or Portuguese literature and culture.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 186. Selected Topics in Latin American Literature and Culture. 4 Units.**

Selection of representative topics in the history of Latin American literature and culture.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 187. Selected Topics in Spanish Linguistics. 4 Units.**

Major topics in Spanish linguistics.

Prerequisite: SPANISH 3 or SPANISH 3H. Placement into SPANISH 101A is also accepted.

Repeatability: Unlimited as topics vary.

**SPANISH 190. Colloquium. 4 Units.**

Specialized, discussion-based course dealing primarily with a research topic that reflects the instructor's current intellectual interests. Required oral presentation(s) and final research paper. Limited to 15 students.

Prerequisite: SPANISH 107 or SPANISH 113A

Restriction: Upper-division students only. Spanish Majors only.

**SPANISH 199. Independent Study. 1-4 Units.**

Research paper required.

Repeatability: May be repeated for credit unlimited times.

**SPANISH 201. History of the Spanish Language. 4 Units.**

Diachronic survey of phonological changes from Latin to Old Spanish to Modern Spanish. Focuses in Castilian including Romance languages and other peninsula dialects for comparative purposes. Morphological changes.

**SPANISH 204. Spanish in Contact. 4 Units.**

Sociohistorical and linguistic overview of Spanish in contact with Basque, Catalan, English, German, American Indian, and African languages in Spain, Latin America, and the United States. Examines theories about language contact, and linguistic changes in Spanish phonology and grammar.

**SPANISH 205. Spanish Dialectology. 4 Units.**

Phonological, morphological, and syntactic variations in Spanish as spoken in the Hispanic world, from synchronic and diachronic points of view. The study of Spanish as spoken in the United States.

Restriction: Graduate students only.

**SPANISH 214. Topics in Golden Age Literature and Culture. 4 Units.**

Topics in Golden Age literature and culture.

Repeatability: Unlimited as topics vary.

**SPANISH 218. Topics in Enlightenment and Romanticism. 4 Units.**

Topics in Enlightenment and Romanticism.

Repeatability: Unlimited as topics vary.

**SPANISH 219. Topics in Nineteenth Century. 4 Units.**

Topics in nineteenth-century Spanish literature and culture.

Repeatability: Unlimited as topics vary.

**SPANISH 220. Topics in Twentieth Century. 4 Units.**

Topics in twentieth-century Spanish literature and culture.

Repeatability: Unlimited as topics vary.

**SPANISH 221. Topics in Iberian Studies. 4 Units.**

Cross-cultural connections and interactions between different ethnicities in the Iberian Peninsula.

Repeatability: Unlimited as topics vary.

**SPANISH 231. Topics in Colonial Latin America. 4 Units.**

Topics in Colonial Latin America.

Repeatability: Unlimited as topics vary.

**SPANISH 232. Topics in Nineteenth-Century Latin America. 4 Units.**

Topics in nineteenth-century Latin America.

Repeatability: Unlimited as topics vary.

**SPANISH 233. Topics in Twentieth-Century Latin America. 4 Units.**

Topics in twentieth-century Latin America.

Repeatability: Unlimited as topics vary.

**SPANISH 234. Topics in Latin America. 4 Units.**

Topics in Latin America.

Repeatability: Unlimited as topics vary.

**SPANISH 235. Topics in Trans-Oceanic Studies. 4 Units.**

Focuses on meaningful connections between different geographical and cultural areas.

Repeatability: Unlimited as topics vary.

**SPANISH 239A. Topics in Literary Theory I. 4 Units.**

Traces the development of Western literary critical principles from Aristotle to the twentieth century through selected readings of key figures in intellectual history (Aristotle, St. Augustine, Descartes, Kant, Hegel, Marx, Nietzsche, William James, Freud).

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SPANISH 239B. Topics in Literary Theory II. 4 Units.**

Study of major critical movements of the twentieth century, from Modernism's varied trends to those of the Postmodern/Postcolonial period. Emphasis on the development of prior critical discourses as well as revisionary theories.

Prerequisite: SPANISH 239A

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SPANISH 239C. Special Topics in Theory. 4 Units.**

Focus on issues related to critical theory, theory of literature, cultural criticism and visual arts as they pertain specifically to Latin America, Spain, Portugal, and Brazil. Topics vary. Examples: Latin American cultural studies; theory, film, and media in post-war Spain.

Repeatability: Unlimited as topics vary.

**SPANISH 245. Topics in Luso-Hispanic Film. 4 Units.**

Topics in Luso-Hispanic Film.

Repeatability: Unlimited as topics vary.

**SPANISH 251. Topics in Chicano Literature and Culture. 4 Units.**

Topics in Chicano Literature and Culture.

Repeatability: Unlimited as topics vary.

**SPANISH 252. Topics in U.S. Latino Literature and Culture. 4 Units.**

Topics in U.S. Latino Literature and Culture.

Repeatability: Unlimited as topics vary.

**SPANISH 260. Seminar in Spanish . 4 Units.**

Topics in Spanish.

Repeatability: Unlimited as topics vary.



**SPANISH 270. Creative Writing Workshop in Spanish/English. 4 Units.**

Discussion of theory and practice of creative writing. Focus on critical analysis of participant's work in progress. Texts may be written in Spanish and/or English and may be written in poetry or prose format.

Repeatability: Unlimited as topics vary.

**SPANISH 290. Individual Study. 4 Units.**

Individual Study.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SPANISH 291. Directed Reading. 4 Units.**

Directed Reading in Spanish.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SPANISH 292. Teaching Practicum. 4 Units.**

Teaching Practicum.

Grading Option: Satisfactory/unsatisfactory only.

**SPANISH 299. Dissertation Research. 4-12 Units.**

Dissertation Research.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Humanities students only.

**SPANISH 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Spanish, B.A.

The B.A. program in Spanish is devoted to the study of the languages and cultures of Spanish-speaking countries.

Enrollment in introductory level Spanish courses is determined based on the following categories of Spanish language experience:

**No previous experience in Spanish:** Students with no previous background in Spanish must submit their high school transcript to their academic counseling office to activate their eligibility to enroll in SPANISH 1A or SPANISH 1AB.

**High school courses in Spanish:** Students with a previous high school background in Spanish must take UCI's placement test. Eligibility to enroll will be based on the result of that placement test (see the UCI Academic Testing Center's website (<http://www.testingcenter.uci.edu>) for more information).

**College or University courses in Spanish:** Students with a previous course (or courses) in Spanish from another college or university must take UCI's placement test. Eligibility to enroll will be based on the result of that placement test (see the UCI Academic Testing Center's website (<http://www.testingcenter.uci.edu>) for more information).

**Graduation from a high school in a Spanish-speaking country or Spanish Academy:** Students who graduated from a high school or academy where the primary language of instruction was Spanish must take a copy of their transcripts to the Language Curriculum Director, Humanities Hall 322, to determine where they should be placed.

**Students with GE VI-satisfying SAT Subject Test scores, International Baccalaureate (IB) scores, or Advanced Placement (AP) examination scores:** Students who have completed one of the previously listed exams who plan to enroll in a Spanish course at UCI are still required to take UCI's Spanish placement test. Students cannot earn units or grade points at UCI in courses from which they have been exempted on the basis of

IB or AP credit, even if the placement test result recommends enrollment in such a level. (see the UCI Academic Testing Center's website (<http://www.testingcenter.uci.edu>) for more information).

### **Progression in Spanish at UCI**

Students who earn a C or better in Spanish language courses at UCI will be allowed to enroll in the next course in the language sequence without taking a placement exam.

To enroll in SPANISH 3, a student must have passed SPANISH 2C or must have earned a placement exam score qualifying for enrollment into SPANISH 3.

SPANISH 3H is designed for students who grew up speaking Spanish at home, and need to work on their writing skills. To enroll in this course, a student must have earned a placement exam score qualifying for enrollment into SPANISH 3H.

Students who score above the range of scores required for SPANISH 3 or SPANISH 3H on the Spanish placement test may proceed to enroll in upper-division Spanish courses.

**Placement testing** is offered throughout the academic year (summer included). For details about registering for a placement test, contact the Academic Testing Center:

3040 Anteater Instruction and Research Building  
949-824-6207

Email: [testcenter@uci.edu](mailto:testcenter@uci.edu) ([testoff@uci.edu](mailto:testoff@uci.edu))

<http://www.testingcenter.uci.edu>

Placement test results are valid for one calendar year.

UC Irvine offers students the opportunity to live in an on-campus housing unit in Arroyo Vista where Spanish can be spoken on a daily basis. The name of this Spanish-only housing unit is *La Casa Nuestra*.

*La Casa Nuestra* is a residential Spanish language immersion program that relies on participants to comply with the Spanish-Only Language Rule that applies to all shared living spaces within the *Casa*. The rule applies at all times, including evenings and weekends. Residents may choose to speak English (or other languages) in their bedrooms, but, in the spirit of the *Casa*, are encouraged to make an effort to speak Spanish, even in their rooms, whenever possible. The program is open to all UCI students with 2-3 years of high school Spanish and/or 1 year of college Spanish. Visit the *La Casa Nuestra* information on the Department of Spanish and Portuguese Undergraduate Program website (<http://www.humanities.uci.edu/spanishandportuguese/undergrad/>).

The B.A. program in Spanish is devoted to the study of the languages and cultures of Spanish-speaking countries. Students are encouraged to participate in UC Irvine's *La Casa Nuestra* housing program, which offers Spanish-language immersion on a 24/7 basis as described above.

Students select one of three emphases:

1. Literature and Culture;
2. Spanish for Future Teachers; or
3. Cinema: Spain, Latin America, and U.S. Latino.

Each of these emphases strives to teach students to speak Spanish with fluency, and to carry out academic work in this language. NOTE: An emphasis may be chosen upon declaring the Spanish major, or at a later stage. The major, however, goes far beyond mere language learning, as it is designed to offer a broad humanistic education. The courses explore the literatures and cultures of Spain and Latin America from their first manifestations to the present. The faculty approach this rich cultural legacy from an interdisciplinary perspective that puts Latin American and Spanish texts in dialogue with other fields of knowledge such as anthropology, linguistics, history, women's studies, and studies on globalization, among others. The program also offers courses in Spanish and Latin American film, as well as in visual culture. Unless stated otherwise, courses in the three emphases are taught in Spanish.

Upper-division courses in the department are designed to help students achieve the learning outcomes of the Spanish major.

### **Learning outcomes:**

1. Students convey information and formulate opinions in Spanish across oral and written modalities while demonstrating control of grammatical structures, register, and style in Spanish.

SPANISH 104, SPANISH 105, SPANISH 107, and SPANISH 190

2. Students analyze and interpret the production of literary and cinematographic works from Spanish-speaking writers and filmmakers while understanding the historical and sociopolitical contexts of these works.

SPANISH 101A, SPANISH 101B, SPANISH 119, SPANISH 140, SPANISH 160, SPANISH 185, SPANISH 186, and SPANISH 190

3. Students identify and describe linguistic phenomena (e.g., sound system, word order, acquisition) that pertain to the Spanish-speaking world while taking into account speaker, regional, and situational variations.

SPANISH 113A, SPANISH 113B, SPANISH 187, and SPANISH 190

4. Students distinguish and describe cultural practices and diverse social and ethnic perspectives from the Spanish-speaking world, (including Iberian, Latin American, and U.S. Latino communities).

SPANISH 101A, SPANISH 101B, SPANISH 140, SPANISH 160, SPANISH 185, SPANISH 186, and SPANISH 190

The faculty encourages students who are serious about improving their Spanish language ability in reading, writing, and speaking to take advantage of opportunities to immerse themselves in the Spanish language by studying in Argentina, Chile, Mexico, Spain, or other Spanish-speaking countries through various study abroad programs administered through UCI's Study Abroad Center. Programs are available for the summer, one quarter, one semester, or one year. This allows students to complete a significant portion of their bachelor's degree requirements in Spain or Latin America (for details, see Residence Requirements below). While abroad, students are given the opportunity to improve their Spanish in a natural context, and to enjoy exposure to other cultures. Once back at UCI, students who have studied abroad typically use this newly gained knowledge to excel in advanced upper-division courses, and to successfully enter graduate school programs or the career path of their choice. See the Study Abroad Center section of the *Catalogue* or an academic counselor for additional information.

**Double Major:** Students in the B.A. program often double major. Double majoring in Spanish and a second department provides the best of both worlds: the requirements for the Spanish major give students the linguistic and humanistic skills that will qualify them for diverse career paths, while the second degree provides students with the additional expertise they are seeking. Together, these bachelor's degrees will reward students with a distinctively competitive edge. A double major is especially useful for pre-med, pre-law, and other students (future teachers included) who want an extensive education in the natural or social sciences and a strong liberal arts program as well.

## Requirements for the B.A. in Spanish

**All students must meet the** University Requirements.

**All students must meet the** School Requirements.

**All students must meet the** Language Other Than English Placement and Progression policies.

### Departmental Requirements for the Major in Spanish

SPANISH 2C or the equivalent is a prerequisite to SPANISH 3 (or SPANISH 3H). SPANISH 3 or SPANISH 3H is the prerequisite for most of the upper-division courses.

Students must choose one of the following emphases:

#### 1. Emphasis in Literature and Culture

A. Complete:

SPANISH 3	US Latino Communities
or SPANISH 3H	Heritage Spanish: Latinidad
SPANISH 101A	Introduction to Iberian Literature and Culture
SPANISH 101B	Introductory Studies to Latin American Literature and Culture
SPANISH 107	Advanced Spanish Grammar
or SPANISH 113A	Spanish Phonetics
or SPANISH 113B	
SPANISH 119	Textual Analysis and Interpretation
SPANISH 190	Colloquium

B. Seven additional upper-division Spanish courses (taken in the Department of Spanish and Portuguese), of which at least four must be in literature and culture.

#### 2. Emphasis in Spanish for Future Teachers <sup>1</sup>

A. Complete:

SPANISH 3	US Latino Communities
or SPANISH 3H	Heritage Spanish: Latinidad
SPANISH 101A	Introduction to Iberian Literature and Culture
SPANISH 101B	Introductory Studies to Latin American Literature and Culture
SPANISH 107	Advanced Spanish Grammar
SPANISH 113A	Spanish Phonetics
SPANISH 113B	Introduction to Spanish Linguistics
SPANISH 119	Textual Analysis and Interpretation
SPANISH 190	Colloquium

B. Four upper-division Spanish courses.

### 3. Emphasis in Cinema: Spain, Latin America, and U.S. Latino

A. Complete:

SPANISH 3 or SPANISH 3H	US Latino Communities Heritage Spanish: Latinidad
SPANISH 101A	Introduction to Iberian Literature and Culture
SPANISH 101B	Introductory Studies to Latin American Literature and Culture
SPANISH 107 or SPANISH 113A	Advanced Spanish Grammar Spanish Phonetics
SPANISH 119	Textual Analysis and Interpretation
SPANISH 190	Colloquium

B. Complete:

FLM&MDA 85A	Introduction to Film and Visual Analysis
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C. Six upper-division electives:

1. Four must be in film:

(a) One film course may come from any department

(b) Three film courses must be taken in the Department of Spanish and Portuguese

2. Two literature courses taught in Spanish, from the Department of Spanish and Portuguese

- <sup>1</sup> Students who wish to pursue a career in teaching are encouraged to complete the minor in Educational Studies in tandem with the emphasis. The following courses are recommended in fulfillment of the minor in Educational Studies: EDUC 108, EDUC 124, EDUC 128, EDUC 131, EDUC 173, EDUC 349; and EDUC 160, or two quarters of HUMAN 195.

**Residence Requirement for the Major (all emphases):** At least five upper-division courses required for the major must be completed successfully at UCI. By petition, two of the five may be taken through the UC Education Abroad Program, providing course content is approved by the Humanities Office of Undergraduate Study and the Undergraduate Director of the Department of Spanish and Portuguese. See also the Study Abroad Option information below.

Students are encouraged to study abroad, possibly satisfying a significant portion of their major requirements abroad. For the maximum number of courses allowed and other pertinent details, see the Spanish Undergraduate Program website (<http://www.humanities.uci.edu/spanishandportuguese/undergrad/>).

All courses taken abroad must be approved. Approval typically involves the following: (1) presentation of syllabi and other pertinent course materials (term papers, exams, etc.) from the host university, and (2) submission of a UCI Humanities Petition form (available online, and to be completed after the student's return to UCI) to the Undergraduate Director of the Department of Spanish and Portuguese, and to the Humanities Office of Undergraduate Study (HIB 143). Students are advised to consult with the Undergraduate Director and the Humanities Office of Undergraduate Study, both before and after their stay abroad. See also the Residence Requirement above.

With over 400 million speakers, Spanish is the third most widely spoken language in the world, which explains in part why Spanish has such a growing global reach and rapidly increasing national and international appeal—in business, education, the media, sports, as well as elsewhere. Knowledge of the Spanish language and cultures has thus become highly marketable in many professions (nursing, the entertainment and/or travel industry, tourism, among others).

The Spanish B.A. degree prepares students to have ready access to careers that require advanced knowledge of the Spanish language and the multiple cultures associated with it. At the same time, competitive students in the program obtain a solid preparation for graduate school. The students' graduate career paths vary widely and include literary and/or cultural studies, teaching, nursing, law/ business, nonprofit organizations, medicine, sociology, and other specialties.

The UCI Division of Career Pathways provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. For additional information, visit the Division of Career Pathways (<http://www.career.uci.edu>) and the Department's Careers in Foreign Language websites (<http://www.humanities.uci.edu/spanish/career.htm>).

## Spanish, M.A.

The Master of Arts degree in Spanish is a two-year program of study designed to expose the beginning graduate student to all periods of peninsular, Latin American, and Chicano/Latino literature and culture. The degree is awarded upon the successful completion of course work and written and oral comprehensive examinations. A minimum of eight graduate seminars must be completed in the Department of Spanish and Portuguese with a letter grade.

Students are required to take one course in Theory (SPANISH 239A or SPANISH 239B or equivalent). Master's candidates must complete a minimum of three quarters of course work in the Department; the maximum time to complete the master's program is two years. The M.A. exam must be taken no later than the fifth quarter of graduate study. Students entering with a bachelor's degree must satisfy the requirements for a master's degree before they proceed toward a Ph.D. This includes the master's level examinations and course work. Normally only students intending to work toward the Ph.D. are admitted to the graduate program.

## Spanish, Minor

The Department of Spanish and Portuguese offers a minor in Spanish and a minor in Spanish/English Bilingual Education. The Spanish minor provides the opportunity to develop language proficiency while expanding knowledge of Hispanic cultures, literature, and linguistics. Many Spanish minors combine their studies with fields such as political science (pre-law), pre-med, communications, psychology, and economics. The goal of the minor in Spanish/English Bilingual Education is to create a pathway to better prepare students who wish to become future bilingual teachers.

### Requirements for the Spanish Minor

**All students are subject to the** Language Other Than English Placement and Progression **policies.**

A. Complete the following:

SPANISH 3	US Latino Communities
or SPANISH 3H	Heritage Spanish: Latinidad

B. Six upper-division departmental Spanish courses, one of which may be taught in English (excluding SPANISH 150).

**Residence Requirement for the Spanish Minor:** At least four upper-division courses required for the minor must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate department or committee chair.

## Spanish, Ph.D.

The Department of Spanish and Portuguese offers a Ph.D. in Spanish with a focus in Spanish, Spanish-American, or Chicano/Latino literatures and cultures. The program integrates period and genre studies with work in literary and critical theory, linguistics, sociohistorical studies, and cultural studies. The Department seeks to professionalize its Ph.D. candidates not as narrow specialists but rather as scholars and critics acquainted with a range of fields that relate to and enhance their discipline. Graduate emphases in Comparative Literature, Critical Theory, and Women's Studies are available; other areas of study (for example, film, history) may be designed with approval from the student's Ph.D. guidance committee. The Department has been traditionally committed to excellence in teaching, both in its own practice and in the formation of its graduates.

### Language Requirements

An additional foreign language (with proficiency equivalent to the 2C level) is required; this requirement may be satisfied by examination or course work. The selection of a foreign language must be approved by the student's guidance committee and is based on the specific research interests and field of study of the candidate.

### Course Requirements

A minimum of 16 courses beyond the B.A. or eight beyond the M.A. are required. One course in linguistics (diachronic or synchronic) is required at the Ph.D. level. For incoming students who have not taken a graduate level foreign language teaching methodology course, the seminar course (HUMAN 398A-HUMAN 398B) is required. HUMAN 398A-HUMAN 398B will be completed over the course of two quarters; HUMAN 398A will be completed during the spring quarter of the first year, and HUMAN 398B in the fall quarter of the second year. HUMAN 398A-HUMAN 398B will not be part of the 16 required courses beyond the B.A. or eight beyond the M.A. Note that these requirements may include course work completed in the master's program; the remaining elective courses are selected with the approval of the student's guidance committee to prepare for the doctoral examination and the dissertation. Students are encouraged to take more than the minimum number of required courses.

Continuing students and students who transfer into the doctoral program from elsewhere must take a minimum of eight graduate courses at UCI, of which six must be in the Department of Spanish and Portuguese. With regard to students who enter the Ph.D. program with their master's degree from another institution, the Ph.D. guidance committee will determine the number of courses that will be accepted.

A student may pursue the Ph.D. with an emphasis in Comparative Literature by taking a minimum of five courses in the Comparative Literature program.

### Time to Degree

The normative time for completion of the Ph.D. is seven years; four years to candidacy, three years in candidacy. The maximum time permitted is eight years.

### Teaching

The Department recognizes its responsibility to train all Ph.D. candidates as teachers and requires that all doctoral students with no prior teaching experience complete a minimum of three quarters of language teaching (SPANISH 399). Moreover, all doctoral students are encouraged to complete a

teaching practicum by co-teaching an upper-division course with a professor and enrolling in SPANISH 292, which is graded Satisfactory/Unsatisfactory only.

### Qualifying Examination

Upon completion of course work, the Ph.D. student advances to candidacy by passing the written and oral qualifying examinations by unanimous decision. The qualifying examination requires the student to develop two topics in close consultation with the examination committee. One topic must present a critical problem from a historical perspective, while the other may focus on a more specific area within the student's major field of interest. Students are encouraged to incorporate theoretical and interdisciplinary components into the formulation of their topics. A two-hour oral examination that includes discussion of the written examinations is also required. The normative time for advancement to candidacy is four years.

### Dissertation

A dissertation topic is chosen by the candidate in consultation with the dissertation director and committee, and normally falls within the major field covered by the qualifying examinations. The candidate presents a study plan to the dissertation committee, which approves the proposal and a preliminary research outline. The student submits drafts of chapters to the dissertation director who corrects and approves the drafts and circulates them to other committee members for commentary. The defense of the dissertation will occur upon its completion during the residency of the candidate.

## Spanish/English Bilingual Education, Minor

The Department of Spanish and Portuguese offers a minor in Spanish and a minor in Spanish/English Bilingual Education. The Spanish minor provides the opportunity to develop language proficiency while expanding knowledge of Hispanic cultures, literature, and linguistics. Many Spanish minors combine their studies with fields such as political science (pre-law), pre-med, communications, psychology, and economics. The goal of the minor in Spanish/English Bilingual Education is to create a pathway to better prepare students who wish to become future bilingual teachers.

**All students are subject to the Language other than English Placement and Progression (<http://catalogue.uci.eduhttps://schoolofhumanities/#undergraduateprogramtext>) policies.**

A. Complete:

HUMAN/EDUC 52	Foundations of Bilingual Education and Bilingualism
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B. Complete:

EDUC 101	Strategies for Tutoring and Teacher Aiding in a Bilingual Classroom
EDUC 107	Child Development in Education
EDUC 124	Multicultural Education in K-12 Schools

C. Complete:

SPANISH 101B	Introductory Studies to Latin American Literature and Culture
SPANISH 113B	Introduction to Spanish Linguistics

One additional upper-division course taught in Spanish, in the Department of Spanish and Portuguese.

**Residence Requirement for the Spanish/English Bilingual Education Minor:** HUMAN 52/EDUC 52, EDUC 101, EDUC 107, EDUC 124, and at least one upper-division Spanish course must be completed successfully at UCI. By petition, the upper-division Spanish course may be taken through the UC Education Abroad Program, provided course content is approved in advance by the appropriate undergraduate studies advisor or department chair.

## Graduate Program in Visual Studies

**Roland Betancourt, Director**

2000 Humanities Gateway

949-824-1124

<http://www.humanities.uci.edu/visualstudies/>

The graduate program in Visual Studies, administered jointly by the faculties of the Department of Art History and the Department of Film and Media Studies, offers students the opportunity to pursue a doctorate in the cultural analysis of visual artifacts and experiences. Visual Studies synthesizes methodological insights from both component disciplines in order to examine the social practices of visual representation and visibility itself. The program leads to a Ph.D. in Visual Studies. While the program (in certain instances) grants an M.A. to students en route to their Ph.D., it admits only those students intending to complete their doctorate at UCI.

In addition, an emphasis in Visual Studies, described on the Requirements tab, is available to Ph.D. and M.F.A. students in all departments at UCI.

- Visual Studies, Graduate Emphasis
- Visual Studies, Ph.D.



## Faculty

Catherine Benamou, Ph.D. New York University, *Associate Professor of Film and Media Studies; Culture and Theory; Visual Studies* (Hispanophone and Lusophone cinema and television, U.S. Latino media, Orson Welles and maverick cinema, transnational flows, spectatorship, cinematic memory and cultures of preservation)

Roland Betancourt, Ph.D. Yale University, *Director of the Graduate Program in Visual Studies and Chancellor's Fellow and Associate Professor of Art History; Religious Studies; Visual Studies* (Byzantine and Medieval art, critical and queer theory; histories of race, gender, and sexuality)

Matthew P. Canepa, Ph.D. University of Chicago, *Elahe Omidyar Mir-Djali Presidential Chair and Professor of Art History; Religious Studies; Visual Studies* (Achaemenid, Seleucid, Parthian, and Sasanian art and archaeology; Iranian visual cultures and Afro-Eurasian exchange; critical approaches to space, place, landscape, urbanism, and memory)

Bridget R. Cooks Cumbo, Ph.D. University of Rochester, *Associate Professor of African American Studies; Art History; Culture and Theory; Visual Studies* (African American art, museum studies, feminist and post-colonial theory)

Sohail Daulatzai, Ph.D. University of Southern California, *Associate Professor of Film and Media Studies; African American Studies; Visual Studies* (decolonization, empire, race, Muslim studies, Black studies)

Bambi Haggins, Ph.D. University of California, Los Angeles, *Associate Professor of Film and Media Studies; African American Studies; Visual Studies* (Black [African American] comedy in film, television, digital media and performance, television history, comedy as social and political discourse, African-American studies, American studies)

Kristen L. Hatch, Ph.D. University of California, Los Angeles, *Associate Professor of Film and Media Studies; Visual Studies* (classical Hollywood, stardom, melodrama, histories of gender, race and sexuality, girlhood studies)

James D. Herbert, Ph.D. Yale University, *Professor of Art History; Visual Studies* (modern European art)

Lucas Hilderbrand, Ph.D. New York University, *Professor of Film and Media Studies; Visual Studies* (Queer cultures and media, cultural studies, documentary, pornography, popular music, video art, histories of technology)

Victoria E. Johnson, Ph.D. University of Southern California, *Professor of Film and Media Studies; African American Studies; Culture and Theory; Visual Studies* (U.S. television, history, media industry studies, critical race theory, cultural geography, sound and music in popular media, media law and policy)

Peter O. Krapp, Ph.D. University of California, Santa Barbara, *Professor of Film and Media Studies; English; European Languages and Studies; Informatics; Music; Visual Studies* (digital culture, media history, cultural memory)

Felicidad (Bliss) Lim, Ph.D. New York University, *Professor of Film and Media Studies; Visual Studies* (Philippine cinema, temporality, postcolonial and feminist film theory, transnational horror and the fantastic, film archives)

Catherine Liu, Ph.D. Yale University, *Professor of Film and Media Studies; Visual Studies* (Hou Hsiao-hsien, culture wars, Frankfurt School, historiography of critical theory/cultural studies, surveillance, cold war culture and neoliberalism)

Lyle Massey, Ph.D. University of California, Los Angeles, *Associate Professor of Art History; Visual Studies* (Italian Renaissance and early modern European art, gender theory, science studies)

Tyrus Miller, Ph.D. Stanford University, *Dean of the School of Humanities and Professor of English; Art History; Comparative Literature; Visual Studies* (modernist and avant-garde studies in literature and visual arts; critical theory and aesthetics; modern architecture and urbanism; East-Central European studies; culture of socialism and post-socialism; Frankfurt School theory)

Glen M. Mimura, Ph.D. University of California, Santa Cruz, *Associate Professor of Film and Media Studies; Visual Studies* (minoritarian and political film; media and race; popular culture and social movements)

James P. Nisbet, Ph.D. Stanford University, *Associate Professor of Art History; Visual Studies* (modern and contemporary art)

Alka Patel, Ph.D. Harvard University, *Associate Professor of Art History; History; Religious Studies; Visual Studies* (South Asian and Islamic art and architecture, historiographies, Islamic diasporas in Cuba)

Allison J. Perlman, Ph.D. University of Texas at Austin, *Associate Professor of History; Film and Media Studies; Visual Studies* (history of broadcasting, American social movements, media law and policy, media activism, popular memory)

Fatimah Tobing Rony, Ph.D. Yale University, *Department Chair and Associate Professor of Film and Media Studies; Visual Studies* (ethnographic film, race and representation, film production)

Bonnie Ruberg, Ph.D. University of California, Berkeley, *Assistant Professor of Film and Media Studies; Visual Studies* (video games, digital media, digital cultures, queer studies, gender and sexuality)

Braxton Soderman, Ph.D. Brown University, *Assistant Professor of Film and Media Studies; Visual Studies* (digital and new media studies, video games, networks, digital art and electronic literature)

Aaron Trammell, Ph.D. Rutgers University, *Assistant Professor of Visual Studies* (analog games and video games, sound, fan studies, digital subjectivity)

Cécile Marie Whiting, Ph.D. Stanford University, *Chancellor's Professor of Art History; Visual Studies* (American art, 20th century visual culture)

Bert Winther-Tamaki, Ph.D. New York University, *Department Chair and Professor of Art History; Asian American Studies; Visual Studies* (modern Japanese art and visual culture, Asian American art, art and globalization)

Roberta Wue, Ph.D. New York University, *Associate Professor of Art History; Visual Studies* (modern Chinese art, photography, print culture)

## Affiliate Faculty

Geoffrey C. Bowker, Ph.D. University of Melbourne, *Chancellor's and Donald Bren Professor of Informatics; Visual Studies* (values in design, social studies of databases, science and technology studies)

Kyung Hyun Kim, Ph.D. University of Southern California, *Professor of Korean Culture; Asian American Studies; Film and Media Studies; Visual Studies* (East Asian cinema, modern Korea, critical theory)

Jared Charles Sexton, Ph.D. University of California, Berkeley, *Professor of African American Studies; Culture and Theory; Film and Media Studies; Visual Studies* (race and sexuality, policing and imprisonment, contemporary U.S. cinema and political culture, multiracial coalition, critical theory)

Michael F. Szalay, Ph.D. Johns Hopkins University, *Department Chair and Professor of English; Film and Media Studies; Visual Studies* (contemporary television and literature)

Roxanne Varzi, Ph.D. Columbia University, *Professor of Anthropology; Culture and Theory; Film and Media Studies; Religious Studies; Visual Studies* (Iran, media, war, visual anthropology, film studies, ethnographic and fiction writing)

## Courses

### **VIS STD 290A. Art History: Theories and Methods. 4 Units.**

Examines canonical texts and explores current directions in Art History.

### **VIS STD 290B. Film & Media Studies: Theories and Methods. 4 Units.**

Examines canonical texts and explores current directions in Film and Media Studies.

### **VIS STD 290C. Visual Studies: Theories and Methods. 4 Units.**

Examines canonical texts and explores current directions in Visual Studies.

### **VIS STD 294. Getty Consortium Seminar. 4 Units.**

Special graduate seminar offered at the Getty Research Institute in Los Angeles, involving faculty and graduate students from the five graduate programs in Art History or Visual Studies located in southern California (UCI, UCLA, UCR, UCSB, and USC).

Repeatability: Unlimited as topics vary.

### **VIS STD 295. Graduate Seminar in Visual Studies. 4 Units.**

Studies in selected areas of Visual Studies. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

### **VIS STD 296. Directed Reading. 4 Units.**

Directed reading on a specific topic agreed upon by student and instructor.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

### **VIS STD 297. Writing Practicum. 4 Units.**

Offered winter quarter each year and taught in a workshop format. Assists students with the preparation and revision of the dissertation prospectus so that they may advance to candidacy.

Prerequisite: VIS STD 290A and VIS STD 290B and VIS STD 290C

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.



**VIS STD 298A. Reading for the Preliminary Examination. 4-12 Units.**

Directed reading in preparation for the preliminary examination. Formerly Visual Studies 298.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**VIS STD 298B. Prospectus Research. 4-12 Units.**

Research and writing of the dissertation prospectus.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**VIS STD 299. Dissertation Research. 4-12 Units.**

Research and writing of the dissertation.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Visual Studies, Graduate Emphasis

In addition to the doctoral program in Visual Studies described above, the Program in Visual Studies also offers an emphasis in Visual Studies available to Ph.D. and M.F.A. students in all departments at UCI. Satisfactory completion of the emphasis is certified by the Director of Visual Studies and is noted in the student's dossier.

Students must first be admitted to, or currently enrolled in, a Ph.D. or M.F.A. program at UCI. Applicants must submit to the Director of Visual Studies a summary of prior undergraduate and graduate course work related to Visual Studies, institutions attended, and major(s), together with a brief statement of purpose, including career objectives, areas of interest and research, record of research, teaching, professional accomplishments, and/or creative work. Lack of prior course work does not preclude admission, so long as a compelling statement of research interests, congruent with the emphasis, makes the case. Admission to the emphasis is on a rolling basis. The Director tracks students' progress toward fulfillment of the emphasis requirements and meets with students to advise them on a program of study, as required.

### Emphasis Requirements

Minimum course work for the graduate emphasis in Visual Studies consists of four courses: VIS STD 290C and three additional elective Visual Studies seminars.

For doctoral students, the qualifying examination and dissertation topic should incorporate Visual Studies as a central concern. One area of the Ph.D. qualifying examination should be on a Visual Studies topic, and one member of the candidate's qualifying examination committee and dissertation committee is normally a member of the Visual Studies faculty. There are no requirements concerning qualifying examinations or theses for M.F.A. students.

## Visual Studies, Ph.D.

The graduate program in Visual Studies, administered jointly by the faculties of the Department of Art History and the Department of Film and Media Studies, offers students the opportunity to pursue a doctorate in the cultural analysis of visual artifacts and experiences. Visual Studies synthesizes methodological insights from both component disciplines in order to examine the social practices of visual representation and visibility itself. The program leads to a Ph.D. in Visual Studies. While the program (in certain instances) grants an M.A. to students en route to their Ph.D., it admits only those students intending to complete their doctorate at UCI.

The program is open to students applying with either a bachelor's or a master's degree, and applicants must meet the general requirements for admission to graduate study at UCI.

The program accepts applicants for admission for the fall quarter only. Additional information is available on the Visual Studies website (<http://www.humanities.uci.edu/visualstudies/>).

## Language Requirements

All students are required to demonstrate a reading knowledge of at least one foreign language and are strongly encouraged to develop competence in a second. Students consult with the Director and/or their principal advisor(s) to determine the appropriate language on which the student will be tested, based on their interests and program of study. Advisors, moreover, may require the demonstration of reading knowledge in additional languages according to the scholarly demands of the student's specific field. All language requirements must be satisfied before students are advanced to candidacy for the Ph.D.

## Course Requirements

Beyond the core series (VIS STD 290A-VIS STD 290B-VIS STD 290C), students are required to complete an additional 11 courses for a total of 14 courses. Out of this total, at least 10 courses (including the core series and VIS STD 297) must be within the program in Visual Studies, and at least two courses are to be from outside the Visual Studies discipline.

Students admitted with an M.A. in a related field may petition the Visual Studies Graduate Committee to have some of their course requirements waived; such petitions will be considered in close consultation with the primary advisor and on a case-by-case basis (though all students must take the core sequence). While students may accrue units for University Teaching (ART HIS 399 or FLM&MDA 399), Reading for the Preliminary Examination (VIS STD 298A), and Prospectus Research (VIS STD 298B) these do not count toward the required number of courses.

## Master's Paper and M.A.

During their second year, students admitted without an M.A. in a related field will enroll in VIS STD 296 for the purpose of expanding and developing a seminar paper into a Master's paper under the supervision of a faculty advisor. The Master's paper is an essay of near-publication quality, approximately 30 pages in length. In addition to the advisor, two additional readers from the Visual Studies faculty will assess the Master's paper and the student's overall academic performance. The committee will assess whether or not the student has satisfied all requirements for the M.A. Those students who have satisfied the M.A. requirements, but whose committees assess their work as not meeting the standards for Ph.D. study, will receive a terminal M.A.

## Preliminary Examination

By the end of the first year, a student must reach an agreement with one of the program's core faculty members to serve as principal advisor. The student will work with the principal advisor to plan completion of their program requirements and to select the faculty who will supervise examination fields. The examination committee will be constituted in accordance with UCI Senate and Visual Studies program policies.

The student and principal advisor define two fields, one major and one minor to be examined by the faculty. The fields should combine historical breadth and some variety in media. Over the course of two quarters, students prepare reading lists in close consultation with their principal advisor and field supervisor, and complete the reading of those lists. The examination normally takes place at the end of each of the two quarters of study.

The first part of the examination consists of a written component, in which the student is called upon to respond to questions posed in the two examination fields. The student's written responses are assessed by the director of each exam reading as pass or fail; however, the responses are circulated to all committee members. There is also an oral component to the preliminary exam process.

## Prospectus and Advancement to Candidacy

During their third year, students draft a prospectus that defines the scope, approach, and rationale for a proposed dissertation and begin research on the dissertation. At the end of the third year the student should defend the written exams and prospectus with the entire five-person committee. Based on the student's written exam results, prospectus, oral defense, and overall progress, the committee will determine whether the student has successfully advanced to candidacy. Except in extraordinary circumstances, no student will be given more than two chances to pass any given section of the examination.

Advancement to candidacy for the Ph.D. is contingent upon successful completion of both the preliminary exams, subsequent approval of the prospectus by the dissertation committee, and satisfaction of all language requirements. The normative time for advancement to candidacy is three years.

## Dissertation

The student and the principal advisor consult to determine the composition of a doctoral committee of three members including the principal advisor, which then must unanimously approve the prospectus before the student proceeds with the dissertation. The doctoral committee, on the basis of the candidate's past academic performance and proposed dissertation topic, may require additional course work or other forms of preparation for the dissertation. The doctoral committee, under the direction of the principal advisor, supervises the student's research program and ultimately approves the dissertation. The normative time for completion of the Ph.D. program is six years, and the maximum permitted is seven years.

After submitting a full dissertation to their committee members, students will be required to pass an oral dissertation defense with their three-person doctoral committee prior to filing their dissertation and graduating. The examination will be open to all members of the academic community. Faculty and graduate students of the school (or academic unit) and the Graduate Dean must be given appropriate written notice at least five days in advance of the date, time, and place of the examination.

# Humanities Language Learning Program

## Andrew Paul Zissos, Director

400 Murray Krieger Hall  
949-824-6735  
<http://www.humanities.uci.edu/hllp/>

The learning of languages other than English is a crucial component of humanistic inquiry, global literacy, and academic diversity. The mission of the Humanities Language Learning Program (HLLP) is to support the learning and teaching of languages other than English on the UCI campus, provide instruction in languages not associated with undergraduate or graduate degree programs, foster intellectual and pedagogical connections between the fields of applied linguistics and the humanities, and provide local and national leadership in raising the profile and prominence of language learning as part of a university education in a rapidly changing, globally interconnected world.

The following languages are offered through the HLLP: Arabic, Persian, Hebrew, and Vietnamese. Students who would like to enroll in a HLLP language class should complete a language background questionnaire. This questionnaire is available on the HLLP Language Placement Information website (<http://www.humanities.uci.edu/hllp/resources/>) and should be submitted online. Students with previous exposure to Arabic, Hebrew, Persian, or Vietnamese may also need to take a placement test. These tests are administered by the UCI Academic Testing Center by appointment. Please contact the Testing Center at 949-824-6207 to schedule a time to take a placement test. Send any questions about placement to the HLLP Director.

See **Language Other Than English Placement and Progression**.

## Humanities Language Learning Program Peer-to-Peer Language Mentor Program

The HLLP Peer-to-Peer Language Mentor Program is designed both as a supplement to more formal language learning within the classroom and as a means for students not enrolled in language classes to maintain their language skills. Each language mentor will be paired with one to three mentees. Mentor and mentee(s) will meet for at least one hour each week and will engage in various activities conducted in the target language. These activities may include (but are not limited to) conversations in the target language; watching a film, television show, or news program in the target language; cooking a meal or snack that is typical of the culture of the target language; attending an appropriate cultural event, museum exhibition, or performance; producing a creative work (including dance) that is appropriate to the target culture; presentation of specialized vocabulary by the mentor (e.g., medical vocabulary); listening to music of the target culture; going to an ethnic grocery store or restaurant, etc. All conversation revolving around these activities should be in the target language to the greatest degree possible. Both the mentor and the mentee(s) will keep a journal and will reflect on each week's meeting and activities. Mentor and mentee(s) will also be required to attend two whole group meetings each quarter, one at the beginning of the quarter and one at the end.

Students must submit an application in order to participate in the program and the applications will be evaluated by the faculty of the Humanities Language Learning Program. Once chosen, mentors and mentees will be instructed to enroll in a 1 unit P/NP class corresponding to their language and level of participation.

### *Selection Requirements for Mentors (ARABIC 10A, HEBREW 10A, PERSIAN 10A, VIETMSE 10A) :*

- High-Intermediate to Advanced-level language skills (particularly oral language skills) in target language
- Sophomore to senior standing
- 2.7 (B-) G.P.A.
- Sincere interest in fostering the development of language skills of mentee(s)
- Leadership skills
- Active participation in planning of weekly activities
- Ability to meet with mentee(s) on a weekly basis and to attend whole group meetings

### *Selection Requirements for Mentees (ARABIC 10B, HEBREW 10B, PERSIAN 10B, VIETMSE 10B) :*

- Enrollment in an HLLP language is desirable, but not required
- Freshman to senior standing
- Commitment to improving speaking skills in target language
- Active participation in weekly activities
- Ability to meet with mentor on a weekly basis and to attend whole group meetings

## Faculty

Soheila Kian, Ph.D. University of California, Los Angeles, *Lecturer of Persian*

Raheela Maniar, M.A. University of California, Los Angeles, *Lecturer of Arabic*

Tri Chan Tran, Ph.D. University of California, Los Angeles, *Lecturer of Vietnamese; Vietnamese*

## Arabic Courses

### **ARABIC 1A. Fundamentals of Arabic. 5 Units.**

Designed for students with little or no exposure to Arabic. Using real world texts, provides a firm foundation in the orthography, grammar, syntax, and vocabulary of Modern Standard Arabic. Introduces students to Arab world cultures.

Prerequisite: Placement into ARABIC 1A.

Overlaps with ARABIC S1AB.

Restriction: ARABIC 1A and ARABIC S1AB may not be taken for full credit.

### **ARABIC 1B. Fundamentals of Arabic. 5 Units.**

Designed for students with little or no exposure to Arabic. Using real world texts, provides a firm foundation in the orthography, grammar, syntax, and vocabulary of Modern Standard Arabic. Introduces students to Arab world cultures.

Prerequisite: ARABIC 1A. ARABIC 1A with a grade of C or better. Placement into ARABIC 1B is also accepted.

Overlaps with ARABIC S1AB, ARABIC S1BC.

Restriction: ARABIC 1B and ARABIC S1AB and ARABIC S1BC may not be taken for full credit.

### **ARABIC 1C. Fundamentals of Arabic. 5 Units.**

Designed for students with little or no exposure to Arabic. Using real world texts, provides a firm foundation in the orthography, grammar, syntax, and vocabulary of Modern Standard Arabic. Introduces students to Arab world cultures.

Prerequisite: ARABIC 1B or ARABIC S1AB. ARABIC 1B with a grade of C or better. ARABIC S1AB with a grade of C or better. Placement is also accepted.

Overlaps with ARABIC S1BC.

## **(VI)**

### **ARABIC 2A. Intermediate Arabic Language and Culture. 4 Units.**

Designed for students to advance their Arabic language skills to intermediate level. Students will develop their understanding of grammar and syntax to a more sophisticated level. Facilitates intermediate-level reading, writing, and speaking skills. Fosters college-level cultural literacy.

Prerequisite: ARABIC 1C or ARABIC S1BC. ARABIC 1C with a grade of C or better. ARABIC S1BC with a grade of C or better. Placement into ARABIC 2A is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

## **(VIII)**

### **ARABIC 2B. Intermediate Arabic Language and Culture. 4 Units.**

Designed for students to advance their Arabic language skills to intermediate level. Students will develop their understanding of grammar and syntax to a more sophisticated level. Facilitates intermediate-level reading, writing, and speaking skills. Fosters college-level cultural literacy.

Prerequisite: ARABIC 2A. ARABIC 2A with a grade of C or better. Placement into ARABIC 2B is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

## **(VIII)**

### **ARABIC 2C. Intermediate Arabic Language and Culture. 4 Units.**

Designed for students to advance their Arabic language skills to intermediate level. Students will develop their understanding of grammar and syntax to a more sophisticated level. Facilitates intermediate-level reading, writing, and speaking skills. Fosters college-level cultural literacy.

Prerequisite: ARABIC 2B. ARABIC 2B with a grade of C or better. Placement into ARABIC 2C is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

## **(VIII)**

**ARABIC 10A. Arabic Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. ARABIC 10A is for language mentors.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**ARABIC 10B. Arabic Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. ARABIC 10B is for language mentees.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**ARABIC 51. Introduction to the Koran. 4 Units.**

An introduction to understanding the Koran and its significance to Muslim life, culture, and history. An overview of scholarly traditions related to the Koran, and its critics. Close readings of the Koran in English translation.

(IV, VIII)

**ARABIC 199. Independent Study. 4 Units.**

Research paper required.

Repeatability: May be repeated for credit unlimited times.

## Hebrew Courses

**HEBREW 1A. Fundamentals of Hebrew. 5 Units.**

Designed for students with little or no exposure to Hebrew. May focus on Biblical Hebrew and/or modern Hebrew. Students learn the writing system and basics of grammar via latest pedagogical materials. Topics in Jewish culture are also included.

Prerequisite: Placement into HEBREW 1A is also accepted.

**HEBREW 1C. Fundamentals of Hebrew. 5 Units.**

Designed for students with little or no exposure to Hebrew. May focus on Biblical Hebrew and/or modern Hebrew. Students learn the writing system and basics of grammar via latest pedagogical materials. Topics in Jewish culture are also included.

Prerequisite: HEBREW 1B. HEBREW 1B with a grade of C or better. Placement into HEBREW 1C is also accepted.

(VI)

**HEBREW 10A. Hebrew Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. HEBREW 10A is for language mentors.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**HEBREW 10B. Hebrew Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. HEBREW 10B is for language mentors.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**HEBREW 50. Jewish and Israeli Culture. 4 Units.**

Examination of subjects relevant to the culture of Israel and Judaism in their historical and modern day contexts through the study of film, literature, religious texts, artistic representations, etc.

(IV, VIII)

**HEBREW 199. Independent Study. 4 Units.**

Research paper required.

Repeatability: May be repeated for credit unlimited times.

## Persian Courses

**PERSIAN 1A. Fundamentals in Persian. 5 Units.**

Designed for students with little or no exposure to Persian. Students learn the modern writing system and grammar of Persian. Facilitates basic reading, writing, and speaking skills and fosters college-level literacy in Persian culture.

Prerequisite: Placement into PERSIAN 1A.

Overlaps with PERSIAN S1AB.

Restriction: PERSIAN 1A and PERSIAN S1AB may not be taken for full credit.

**PERSIAN 1B. Fundamentals in Persian. 5 Units.**

Designed for students with little or no exposure to Persian. Students learn the modern writing system and grammar of Persian. Facilitates basic reading, writing, and speaking skills and fosters college-level literacy in Persian culture.

Prerequisite: PERSIAN 1A. PERSIAN 1A with a grade of C or better. Placement into PERSIAN 1B is also accepted.

Overlaps with PERSIAN S1AB, PERSIAN S1BC.

Restriction: PERSIAN 1B and PERSIAN S1AB and PERSIAN S1BC may not be taken for full credit.

**PERSIAN 1C. Fundamentals in Persian. 5 Units.**

Designed for students with little or no exposure to Persian. Students learn the modern writing system and grammar of Persian. Facilitates basic reading, writing, and speaking skills and fosters college-level literacy in Persian culture.

Prerequisite: PERSIAN 1B or PERSIAN S1AB. PERSIAN 1B with a grade of C or better. PERSIAN S1AB with a grade of C or better. Placement into PERSIAN 1C is also accepted.

Overlaps with PERSIAN S1BC.

Restriction: PERSIAN 1C and PERSIAN S1BC may not be taken for full credit.

### (VI)

**PERSIAN 2A. Intermediate Persian. 4 Units.**

Designed for students to advance their Persian language skills from introductory to intermediate level. Student will advance their understanding of grammar and syntax. Facilitates intermediate-level reading, writing, and speaking skills. Fosters college-level cultural literacy.

Prerequisite: PERSIAN 1C or PERSIAN S1BC. PERSIAN 1C with a grade of C or better. PERSIAN S1BC with a grade of C or better. Placement into PERSIAN 2A is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

### (VIII)

**PERSIAN 2B. Intermediate Persian. 4 Units.**

Designed for students to advance their Persian language skills from introductory to intermediate level. Students will advance their understanding of grammar and syntax. Facilitates intermediate-level reading, writing, and speaking skills. Fosters college-level cultural literacy.

Prerequisite: PERSIAN 2A. PERSIAN 2A with a grade of C or better. Placement into PERSIAN 2B is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

### (VIII)

**PERSIAN 2C. Intermediate Persian. 4 Units.**

Designed for students to advance their Persian language skills from introductory to intermediate level. Students will advance their understanding of grammar and syntax. Facilitates intermediate-level reading, writing, and speaking skills. Fosters college-level cultural literacy.

Prerequisite: PERSIAN 2B. PERSIAN 2B with a grade of C or better. Placement into PERSIAN 2C is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(VIII)

**PERSIAN 10A. Persian Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. PERSIAN 10A is for language mentors.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**PERSIAN 10B. Persian Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. PERSIAN 10B is for language mentees.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**PERSIAN 50. Persian Culture. 4 Units.**

Study of varied topics in Persian culture, area studies, and society, both in the present and in historical perspective. Topics are not normally repeated for a two-year period.

Repeatability: Unlimited as topics vary.

(IV, VIII)

**PERSIAN 150. Topics in Advanced Persian Culture. 4 Units.**

In-depth examination of major works in premodern and modern Persian literature and/or the arts, with specific emphasis upon historical and cultural context and relevant societal issues and trends. Course is conducted in English.

Repeatability: May be taken for credit for 4 units as topics vary.

**PERSIAN 165A. Modern Iran: Cinema and the City. 4 Units.**

Exploring modern Iran through film, literature, photography, travel writing, and philosophy and social science texts that introduce students to important concepts in post-colonial studies, social thought, war culture, religion, and media as experienced through the paradigm of a non-Western modernity.

Same as ANTHRO 165A.

**PERSIAN 199. Independent Study. 4 Units.**

Independent research with Persian faculty.

Repeatability: May be repeated for credit unlimited times.

## Vietnamese Courses

**VIETMSE 1A. Fundamentals of Vietnamese. 5 Units.**

Designed for students with little or no exposure to Vietnamese. Natural approach with emphasis on four fundamental skills of listening, speaking, reading, and writing. Conducted in Vietnamese.

Prerequisite: Placement into VIETMSE 1A is required.

**VIETMSE 1B. Fundamentals of Vietnamese. 5 Units.**

Designed for students with little or no exposure to Vietnamese. Natural approach with emphasis on four fundamental skills of listening, speaking, reading, and writing. Conducted in Vietnamese.

Prerequisite: VIETMSE 1A. VIETMSE 1A with a grade of C or better. Placement into VIETMSE 1B is also accepted.



**VIETMSE 1C. Fundamentals of Vietnamese. 5 Units.**

Designed for students with little or no exposure to Vietnamese. Natural approach with emphasis on four fundamental skills of listening, speaking, reading, and writing. Conducted in Vietnamese.

Prerequisite: VIETMSE 1B or VIETMSE S1AB. VIETMSE 1B with a grade of C or better. VIETMSE S1AB with a grade of C or better. Placement into VIETMSE 1C is also accepted.

**(VI)**

**VIETMSE 2A. Intermediate Vietnamese. 4 Units.**

Designed for students to advance their Vietnamese language skills from introductory to intermediate level. Designed to develop writing and reading skills and communicative skills in authentic situations. Students are introduced to aspects of Vietnamese culture relating to lesson topics.

Prerequisite: VIETMSE 1C and VIETMSE S1BC. VIETMSE 1C with a grade of C or better. VIETMSE S1BC with a grade of C or better. Placement into VIETMSE 2A is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)**

**VIETMSE 2B. Intermediate Vietnamese. 4 Units.**

Designed for students to advance their Vietnamese language skills from introductory to intermediate level. Designed to develop writing and reading skills and communicative skills in authentic situations. Students are introduced to aspects of Vietnamese culture relating to lesson topics.

Prerequisite: VIETMSE 2A. VIETMSE 2A with a grade of C or better. Placement into VIETMSE 2B is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)**

**VIETMSE 2C. Intermediate Vietnamese. 4 Units.**

Designed for students to advance their Vietnamese language skills from introductory to intermediate level. Designed to develop writing and reading skills and communicative skills in authentic situations. Students are introduced to aspects of Vietnamese culture relating to lesson topics.

Prerequisite: VIETMSE 2B. VIETMSE 2B with a grade of C or better. Placement into VIETMSE 2C is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(VIII)**

**VIETMSE 10A. Vietnamese Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. VIETMSE 10A is for language mentors.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**VIETMSE 10B. Vietnamese Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. VIETMSE 10B is for language mentees.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**VIETMSE 50. Vietnamese Culture . 4 Units.**

Vietnamese culture and society in modern and historical contexts through the study of literary works, film, and other media. Philosophy and religious practices may also be examined. Course is taught in English.

**(IV)**

**VIETMSE 150. Vietnamese Literature and Culture in Translation. 4 Units.**

Major works in Vietnamese literature and culture in context.

Repeatability: Unlimited as topics vary.



## Special Programs

This section includes a variety of special programs that are available through the School of Humanities. Click on the tabs above for information about each program.

[Click here for the full list of Courses in Humanities.](#)

- Asian Studies, Minor
- Humanities and Law, Minor
- Jewish Studies, Minor
- Latin American Studies, Graduate Emphasis
- Latin American Studies, Minor
- Medical Humanities, Graduate Emphasis
- Medical Humanities, Minor
- Persian Studies, Minor
- Program in Academic English

## Academic English Courses

### **AC ENG 20A. Academic Writing. 5 Units.**

Grammar, sentence structure, paragraph and essay organization of formal written English.

Prerequisite: Placement into AC ENG 20A.

Grading Option: Pass/no pass only.

### **AC ENG 20B. Academic Writing. 5 Units.**

Grammar, sentence structure, paragraph and essay organization of formal written English.

Prerequisite: AC ENG 20A. Placement into AC ENG 20B is also accepted.

Grading Option: Pass/no pass only.

### **AC ENG 20C. Essentials of Academic Writing. 5 Units.**

Grammar, sentence structure, paragraph and essay organization of formal written English.

Prerequisite: AC ENG 20B. Placement into AC ENG 20C is also accepted.

Grading Option: Pass/no pass only.

### **AC ENG 20D. Academic Writing. 5 Units.**

Grammar, sentence structure, paragraph and essay organization of formal written English.

Prerequisite: AC ENG 20C

Grading Option: Pass/no pass only.

### **AC ENG 22A. Academic English Reading and Vocabulary. 2 Units.**

Intensive reading exercises with occasional practice in extensive reading, focusing on comprehension, development of vocabulary, syntax, rhetorical features, reading strategies, and study skills.

Prerequisite: Placement into AC ENG 22A is required.

### **AC ENG 22B. ESL Reading and Vocabulary. 2 Units.**

Extensive reading and discussion with emphasis on journal articles, textbook chapters, notetaking, and the interpretation of charts, diagrams, tables, and figures.

Grading Option: Pass/no pass only.

**AC ENG 23A. ESL Pronunciation I. 2 Units.**

Designed for international graduate students. Provides an emphasis on pronunciation. Development of listening and speaking skills in five fundamental areas: pronunciation, intonation, word stress, listening comprehension, and informal campus communication. Presentations of personal experiences and reports on graphs.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**AC ENG 23B. ESL Conversation II. 2 Units.**

Designed for international graduate students. Provides an emphasis on conversational fluency. Further development of listening and speaking skills: review of English sounds, sentence stress, and rhythm. Oral reports, debates, and reports on graphs and surveys.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**AC ENG 23C. ESL Advanced Communication III. 2 Units.**

Designed for international graduate students with advanced communication skills. Further development of listening and speaking skills: review of minimal pairs, consonant blends, intonation, stress and rhythm. Oral presentations emphasized utilizing graphs, syllabi, academic terms, and video presentations on academic work.

Prerequisite: AC ENG 23A or AC ENG 23B

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**AC ENG 24. ESL International TA Workshop. 2 Units.**

Designed for advanced-level international students preparing to be teaching assistants. Provides extensive practice in oral and written communication skills associated with teaching introductory-level college courses and participating in academic presentations and discussions. Review and analysis of language problems.

Prerequisite: AC ENG 23A or AC ENG 23B or AC ENG 23C

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**AC ENG 28. Grammar. 2-4 Units.**

A full review of English grammar covering the following areas: grammar terms, verb tenses, verb forms, conditionals, passive and word forms, punctuation, sentence structure. The concepts are applied in targeted sentence and paragraph writing practice.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**AC ENG 29. Special Topics in ESL. 2 Units.**

Directed and individualized work in English as a second language not covered in the AC ENG 20, 21, 22 sequence.

Grading Option: Pass/no pass only.

Repeatability: Unlimited as topics vary.

**AC ENG 139W. Advanced Academic Writing Across the Curriculum. 4 Units.**

Designed for transfer students who speak English as a second language. Focuses on developing academic reading and writing skills including essay content, organization, vocabulary, and grammar. Academic content also covered.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Restricted to students whose first language is not English.

(Ib)

## Medical Humanities Initiative Courses

### **MED HUM 1. Health, Wellness, and Conception of the Body. 4 Units.**

Asks what is health and who gets to have it? What is considered a “healthy” or “sick” body? We analyze historical and contemporary experiences of illness, medicine, and caregiving, including how patients represent their bodies and healing.

(GE III or IV ).

### **MED HUM 3. Art and Medicine . 4 Units.**

Analyzes the relationship between medicine and the visual arts from the late medieval to modern periods, covering topics such as anatomy, optical medical technologies, gender and race in medicine, and popular representations of disease and doctors.

(GE II or IV ).

### **MED HUM 195. Capstone Seminar: The Clinical Moral Laboratory. 4 Units.**

Interdisciplinary exploration of the clinical encounter, and the importance of meaning making in these “moral laboratories.” Students enter the clinical space as participant observers, and reflect on how the clinical site informs and challenges reading practices.

Prerequisite: MED HUM 1 or MED HUM 3 or GEN&SEX 60A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only.

### **MED HUM 200. Critical Perspectives in Medical Humanities. 4 Units.**

Analyzes social and cultural understandings of the body, health, illness, medicine, and disease. Themes include critical histories of the body; non-compliant subjects interacting with medicine; racial-sexual hierarchies of health; and theories and expressions of pain and suffering.

Restriction: Graduate students only.

## Persian Courses

### **PERSIAN 1A. Fundamentals in Persian. 5 Units.**

Designed for students with little or no exposure to Persian. Students learn the modern writing system and grammar of Persian. Facilitates basic reading, writing, and speaking skills and fosters college-level literacy in Persian culture.

Prerequisite: Placement into PERSIAN 1A.

Overlaps with PERSIAN S1AB.

Restriction: PERSIAN 1A and PERSIAN S1AB may not be taken for full credit.

### **PERSIAN 1B. Fundamentals in Persian. 5 Units.**

Designed for students with little or no exposure to Persian. Students learn the modern writing system and grammar of Persian. Facilitates basic reading, writing, and speaking skills and fosters college-level literacy in Persian culture.

Prerequisite: PERSIAN 1A. PERSIAN 1A with a grade of C or better. Placement into PERSIAN 1B is also accepted.

Overlaps with PERSIAN S1AB, PERSIAN S1BC.

Restriction: PERSIAN 1B and PERSIAN S1AB and PERSIAN S1BC may not be taken for full credit.

### **PERSIAN 1C. Fundamentals in Persian. 5 Units.**

Designed for students with little or no exposure to Persian. Students learn the modern writing system and grammar of Persian. Facilitates basic reading, writing, and speaking skills and fosters college-level literacy in Persian culture.

Prerequisite: PERSIAN 1B or PERSIAN S1AB. PERSIAN 1B with a grade of C or better. PERSIAN S1AB with a grade of C or better. Placement into PERSIAN 1C is also accepted.

Overlaps with PERSIAN S1BC.

Restriction: PERSIAN 1C and PERSIAN S1BC may not be taken for full credit.

(VI)

**PERSIAN 2A. Intermediate Persian. 4 Units.**

Designed for students to advance their Persian language skills from introductory to intermediate level. Student will advance their understanding of grammar and syntax. Facilitates intermediate-level reading, writing, and speaking skills. Fosters college-level cultural literacy.

Prerequisite: PERSIAN 1C or PERSIAN S1BC. PERSIAN 1C with a grade of C or better. PERSIAN S1BC with a grade of C or better. Placement into PERSIAN 2A is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(VIII)

**PERSIAN 2B. Intermediate Persian. 4 Units.**

Designed for students to advance their Persian language skills from introductory to intermediate level. Students will advance their understanding of grammar and syntax. Facilitates intermediate-level reading, writing, and speaking skills. Fosters college-level cultural literacy.

Prerequisite: PERSIAN 2A. PERSIAN 2A with a grade of C or better. Placement into PERSIAN 2B is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(VIII)

**PERSIAN 2C. Intermediate Persian. 4 Units.**

Designed for students to advance their Persian language skills from introductory to intermediate level. Students will advance their understanding of grammar and syntax. Facilitates intermediate-level reading, writing, and speaking skills. Fosters college-level cultural literacy.

Prerequisite: PERSIAN 2B. PERSIAN 2B with a grade of C or better. Placement into PERSIAN 2C is also accepted.

Restriction: School of Humanities students have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(VIII)

**PERSIAN 10A. Persian Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. PERSIAN 10A is for language mentors.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**PERSIAN 10B. Persian Peer-to-Peer Language Mentor Program. 1 Unit.**

Peer-to-Peer Language Mentor Program in which student mentors work with student mentees to increase the language skills of both participants. One hour weekly meetings. PERSIAN 10B is for language mentees.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 4 times.

**PERSIAN 50. Persian Culture. 4 Units.**

Study of varied topics in Persian culture, area studies, and society, both in the present and in historical perspective. Topics are not normally repeated for a two-year period.

Repeatability: Unlimited as topics vary.

(IV, VIII)

**PERSIAN 150. Topics in Advanced Persian Culture. 4 Units.**

In-depth examination of major works in premodern and modern Persian literature and/or the arts, with specific emphasis upon historical and cultural context and relevant societal issues and trends. Course is conducted in English.

Repeatability: May be taken for credit for 4 units as topics vary.

**PERSIAN 165A. Modern Iran: Cinema and the City. 4 Units.**

Exploring modern Iran through film, literature, photography, travel writing, and philosophy and social science texts that introduce students to important concepts in post-colonial studies, social thought, war culture, religion, and media as experienced through the paradigm of a non-Western modernity.

Same as ANTHRO 165A.

**PERSIAN 199. Independent Study. 4 Units.**

Independent research with Persian faculty.

Repeatability: May be repeated for credit unlimited times.

## Asian Studies, Minor

**Robert Uriu, Co-Director, School of Social Sciences**

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**Qitao Guo, Co-Director, School of Humanities**

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The countries and cultures of Asia are significant participants in the world community. They present compellingly different models for social organization, historical development, and cultural commitments. The many countries of this large and complex region provide challenges and opportunities whether one plans to be a scholar, a business person, or a diplomat. The minor in Asian Studies draws upon the expertise of faculty throughout UCI to create opportunities for students to explore Asian topics in a variety of fields, to develop advanced language skills, and to acquire a broader perspective as they apply the disciplinary training of their major field to effective and informed studies of Asian subjects. The minor is open to all UCI students.

### Requirements for the Interdisciplinary Minor in Asian Studies

Students choose one country and language of specialization. At the present the Asian Studies minor focuses on China, Japan, or Korea.

Requirements for the minor are met by taking eight courses (of which no more than four may be lower-division) as specified below.

A. One upper-division History course with a focus on Asia approved by the director.

B. Three quarters of course work in one Asian language of specialization beyond the first-year level. Approved courses are:

1. Second-, third-, or fourth-year language: <sup>1</sup>

CHINESE 2A- 2B- 2C	Intermediate Mandarin Chinese and Intermediate Mandarin Chinese and Intermediate Mandarin Chinese
CHINESE 2MA- 2MB- 2MC	Intermediate Mandarin Chinese - Mandarin Background Track and Intermediate Mandarin Chinese - Mandarin Background Track and Intermediate Mandarin Chinese - Mandarin Background Track
CHINESE 3A- 3B- 3C	Advanced Mandarin Chinese and Advanced Mandarin Chinese and Advanced Mandarin Chinese
CHINESE 101A- 101B- 101C	Fourth-Year Mandarin Chinese and Fourth-Year Mandarin Chinese and Fourth-Year Mandarin Chinese
JAPANESE 2A- 2B- 2C	Intermediate Japanese and Intermediate Japanese and Intermediate Japanese
JAPANESE 3A- 3B- 3C	Advanced Japanese and Advanced Japanese and Advanced Japanese
JAPANESE 101A- 101B	Fourth Year Japanese and Fourth Year Japanese
KOREAN 2A- 2B- 2C	Intermediate Korean and Intermediate Korean and Intermediate Korean
KOREAN 2KA- 2KB- 2KC	Intermediate Korean for Students with a Previous Background in Korean and Intermediate Korean for Students with a Previous Background in Korean and Intermediate Korean for Students with a Previous Background in Korean
KOREAN 3A- 3B- 3C	Advanced Korean and Advanced Korean and Advanced Korean
KOREAN 101A	Fourth-Year Korean

Other sequences in Asian languages as available.

2. Either Classical Chinese or Classical Japanese:	
CHINESE 100A- 100B- 100C	Classical Chinese and Classical Chinese and Classical Chinese
JAPANESE 100A- 100B	Classical Japanese and Classical Japanese (plus a third quarter of Japanese language study)
3. Literature courses taught in the original language: <sup>2</sup>	
CHINESE 115	Topics in Chinese Literature: Advanced Texts
JAPANESE 115	Japanese Literature: Advanced Texts
KOREAN 115	Korean Literature: Advanced Texts
Or graduate seminars	
C. Four additional courses selected from an approved list. <sup>3</sup>	
1. At least two of these courses must be taken in one (or more) department(s) other than the student's major department.	
2. The courses must cover at least two different Asian countries, one of which is the country of language specialization.	
3. No more than two of the courses may be lower-division (and only one may be lower-division if any combination of second- or third-year East Asian language is used for the language required above).	
<sup>1</sup>	These courses require placement examinations given by the Academic Testing Center. Students who, for example, place out of CHINESE 2B would then take CHINESE 2C, CHINESE 3A-CHINESE 3B to meet the requirement.
<sup>2</sup>	These courses have a prerequisite of completion of the fourth-year language sequence or its equivalent.
<sup>3</sup>	Available at the Asian Studies Minor website ( <a href="http://www.humanities.uci.edu/asianstudies/">http://www.humanities.uci.edu/asianstudies/</a> ).

NOTE: A maximum overlap of two courses is permitted between this minor and a student's major.

**Residence Requirement for the Minor:** Four upper-division (or graduate) courses must be successfully completed at UCI. Two of the four may be taken through the UC Education Abroad Program, provided course content is approved in advance by the appropriate department chair.

## Humanities and Law, Minor

**Jeffrey Helmreich, Director**  
 85 Humanities Instructional Building  
 949-824-6525  
<http://www.humanities.uci.edu/humlaw/>

The minor in Humanities and Law is comprised of courses in the School of Humanities that UCI graduates have found to be useful in developing skills and knowledge that prepare them for law-related careers. One set of courses develops skills in critical reading, writing, and analysis that are necessary in dealing with legal issues. Another set presents theoretical and analytical perspectives on ethical, political, and social issues relevant to the law. A final set focuses on specific legal issues from a humanistic perspective. Lower-division requirements primarily develop foundational skills in the first set, whereas upper-division requirements build on these skills by addressing the concerns from the other sets. The minor does not include how-to courses on particular legal practices.

### Requirements for the Minor in Humanities and Law

A. Complete:

PHILOS 22	Introduction to Law and Society
ENGLISH 11	Society, Law, and Literature <sup>1</sup>

B. Select one of the following options:

HUMAN 1A- 1AS- 1B- 1BS- 1C- 1CS	Humanities Core Lecture and Humanities Core Writing and Humanities Core Lecture and Humanities Core Writing and Humanities Core Lecture and Humanities Core Writing
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(or the Humanities Core Alternative) <sup>2</sup>

or

PHILOS 2 or PHILOS 29 and one course, not used above, chosen from: PHILOS 22, PHILOS 133, ENGLISH 11, or GEN&SEX 60B

C. Select five upper-division courses from among a list of quarterly approved courses, at least one each from philosophy, history, and either literature or classics. <sup>1,3</sup>

- <sup>1</sup> Additional courses may be substituted with prior approval of the Director of the Humanities and Law minor.
- <sup>2</sup> The Humanities Core Alternative is also an option. Visit the School of Humanities Undergraduate Study website (<http://www.humanities.uci.edu/SOH/students/core.php>) for additional information.
- <sup>3</sup> Consult the Humanities and Law website (<http://www.humanities.uci.edu/humlaw/>) for currently approved courses.

Students considering a career in law are strongly encouraged to take advantage of other law-related courses offered across the campus and of extracurricular activities such as the Pre-Law Society.

**Residence Requirement for the Minor:** Four upper-division courses required for the minor must be successfully completed at UCI. Two of the four may be taken through the UC Education Abroad Program, provided course content is approved in advance by the appropriate department chair.

## Jewish Studies, Minor

**Matthias Lehmann, Director**

400 Murray Krieger Hall

[JewishStudies@uci.edu](mailto:JewishStudies@uci.edu)

[www.humanities.uci.edu/jewishstudies/](http://www.humanities.uci.edu/jewishstudies/) (<http://www.humanities.uci.edu/jewishstudies/>)

The minor in Jewish Studies is an interdisciplinary program that introduces students to the many facets of Jewish cultures through the study of the history, philosophy, art, literature, languages, and social and political institutions of Jews from ancient to modern times. The minor provides students with grounding in areas of fundamental importance to the Humanities and Social Sciences, supporting and enriching the students' majors. The minor may be taken in tandem with any major and prepares students for graduate programs in Jewish Studies. The interdisciplinary approach of Jewish Studies exposes students to a wide range of disciplines and, like other established liberal arts fields, provides a foundation for pursuing a range of careers.

### Requirements for the Minor in Jewish Studies

A. Complete:

HISTORY 18A

Major Jewish Texts

B. Select at least four upper-division courses from the approved list on the Jewish Studies website.<sup>1</sup>

C. Select three additional, lower- or upper-division courses from the approved list on the Jewish Studies website.<sup>1</sup>

- <sup>1</sup> Students should consult the Jewish Studies website (<http://www.humanities.uci.edu/jewishstudies/program/minor.php>). With the approval of the Director, other relevant courses may satisfy the requirements for the minor.

**Residence Requirement for the Minor:** At least four upper-division courses required for the minor must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate program director.

## Latin American Studies, Graduate Emphasis

The Graduate Emphasis in Latin American Studies is open to students from all fields and allows students to gain interdisciplinary knowledge about the study of Latin America and form scholarly relationships with a range of faculty and graduate students interested in Latin America from across the UCI campus. The emphasis requires one year-long foundation workshop on Latin American Studies and two graduate seminars dealing centrally with issues related to Latin America.

Applicants must first be admitted to, or currently enrolled in, a Master's or Ph.D. program at UCI and submit an application form to the director of the emphasis. Students should ideally apply while they are still engaged in coursework, but exceptions may be considered by the committee.

### Requirements

Minimum course work for the graduate emphasis in Latin American Studies consists of three courses: a three quarter course entitled Issues in Latin American Studies (HUMAN 265A, HUMAN 265B, HUMAN 265C) and two approved electives that are centrally related to the study of Latin America. Many students may elect to take one of these seminars within their home departments as course-work that also satisfies other degree requirements. One of these seminars must be from outside the student's home department (and not cross-listed with their home department). For students completing an M.A. thesis or Ph.D. dissertation, the research project will engage the study of Latin America as part of the overall project and one member of the candidate's dissertation committee should be a core or affiliate faculty in Latin American Studies.

## Latin American Studies, Minor

**Alex Borucki, Director**

322 Humanities Hall

949-824-6901

<http://www.humanities.uci.edu/latinamericanstudies/>

Latin America is a complex cultural and historical region created by Spanish and Portuguese colonization in the New World and which encompasses territories and peoples from the southernmost tip of South America to the Caribbean Islands and the United States. As an area born out of a series of conquests, migrations, contacts, and conflicts, it is transcultural, multi-lingual, and multi-ethnic. It has been a vital part of the formation of the modern world even as it has continued to function as a source for the expression of economic, political, and cultural alternatives to dominant Western formations. The minor provides deeper knowledge and expertise in this region for students interested in a variety of careers. It complements the disciplinary training of a students' major field by asking that students engage with Latin America through a variety of disciplines and by working with faculty across different schools at UCI.

## Requirements for the Minor in Latin American Studies

Requirements for the minor are met by taking seven courses (of which no more than three may be lower-division) as specified below. No more than four courses may be taken in any one single department.

A. Complete one of the following core courses:

SPANISH 50	Latin America, U.S. Latino, and Iberian Cultures
HISTORY 70D	Problems in History: Latin America
HUMAN 100	

B. One course from each of the following three categories—History, Culture, and Social Sciences—selected from the approved list on the Latin American Studies website.<sup>1</sup>

C. Three additional courses selected from the approved list.<sup>1</sup>

<sup>1</sup> The approved list is available at the Latin American Studies website (<http://www.humanities.uci.edu/latinamericanstudies/>).

With the approval of the director, other relevant courses also may satisfy the requirements for the minor.

**Residence Requirement for the Minor:** Four upper-division courses required for the minor must be completed successfully at UCI. Two of the four may be taken through the UC Education Abroad Program, provided course content is approved in advance by the appropriate department chair.

## Medical Humanities, Graduate Emphasis

### Lyle Massey, Director

2116 Humanities Gateway

949-824-6525

[https://www.humanities.uci.edu/philosophy/graduate/52\\_course.php](https://www.humanities.uci.edu/philosophy/graduate/52_course.php)

The graduate emphasis in Medical Humanities is a formal component of graduate studies at UCI in addition to the fulfillment of requirements toward a Ph.D., M.F.A., or M.A. in an array of fields in the schools of Arts, Humanities, and Medicine.

The emphasis allows students to gain interdisciplinary knowledge about the study of illness, health, healthcare, and the body. The emphasis requires three graduate seminars offered through the Medical Humanities graduate course offerings. Satisfactory completion of the emphasis is certified by the Director or Co-Directors of the Medical Humanities Emphasis and is noted at the student's dossier.

Applicants must first be admitted to, or currently enrolled in, a Ph.D. program or state-supported Master's program and submit an application form to the director of the emphasis. The application should include a signature of approval from the student's advisor or program director.

### Requirements

Minimum course work for the graduate emphasis in Medical Humanities consists of three courses chosen in consultation with the Graduate Emphasis director. Students can count courses taken to fulfill their departmental requirements toward their emphasis, if said courses are comprised of pertinent material and art approved by the Graduate Emphasis director. One of the three courses has to be core course MED HUM 200. An upper-division undergraduate course with supplemental graduate level work after consultation with the instructor and the director can count toward the emphasis.

### Course Options for the Emphasis

ANTHRO 204A	Proseminar in Medicine, Science, and Technology
ANTHRO 232B	Medical Anthropology
ASIANAM 201	Graduate Topics in Asian American Studies
CHC/LAT 210A	Cultural and Historical Precedents for Latinos and Medical Care
CHC/LAT 210B	Cultural and Historical Precedents for Latinos and Medical Care
CHC/LAT 211A	Latinos/Latinas and Medical Care: Contemporary Issues
CHC/LAT 289	Special Topics in Chicano/Latino Studies
DANCE 201	Seminar in Kinesiology for Dance



ENGLISH 210

Studies in Literary History

PHILOS 242

Topics in Philosophy of Biology

MED HUM 200

Critical Perspectives in Medical Humanities

## Medical Humanities, Minor

**Sven Bernecker, Co-Director**

**Annalisa Coliva, Co-Director**

85 Humanities Instructional Building

<http://www.humanities.uci.edu/medicalhumanities/>

Medical Humanities is an interdisciplinary, humanistic, and cultural study of illness, health, health care, and the body. In contrast to the medical sciences, the medical humanities – which include bioethics, narrative medicine, history of medicine, culture studies, science and technology studies, medical anthropology, philosophy, dance, music, literature, film, and visual and performing arts – focus more on meaning making than measurement.

Students explore the boundaries between sickness and health, and learn to see life through a patient's eyes. Topics include the authority of the physician, the role of the hospital, the doctor-patient relationship, the social dimensions of racial and gender differences, and changing conceptions of disease and healing.

The minor may be combined with any major and of particular interest to those students planning to attend medical school, nursing school, pharmacy school, and public health school, as well as students in the humanities seeking to pursue graduate work in the field of medical humanities.

### Requirements for the Minor in Medical Humanities

A. Select one of the following:

MED HUM 1	Health, Wellness, and Conception of the Body
MED HUM 3	Art and Medicine

B. Select one of the following:

CLASSIC 10	Scientific and Specialized Terminology
DANCE 3	Scientific Concepts of Health
GEN&SEX 60A	Gender and Science
PHILOS 3	Technology and Society
PHILOS 4	Introduction to Ethics
PHILOS 5	Contemporary Moral Problems

C. Select two of the following:

GEN&SEX 110D	The Politics of Health and Medicine
PHILOS 121A	Medical Epistemology
PHILOS 131C	Medical Ethics
MED HUM 195	Capstone Seminar: The Clinical Moral Laboratory

D. Select three additional courses (two of which must be upper-division) chosen from those listed above in A, B, and C, and among a list of quarterly approved courses. With the approval of the Co-Directors of the Minor in Medical Humanities, other relevant courses may satisfy the requirements for the minor.<sup>1</sup>

<sup>1</sup> The list of quarterly approved courses is available on the Medical Humanities website (<http://www.humanities.uci.edu/medicalhumanities/>).

**Residence Requirement for the Minor:** Four upper-division courses required for the minor must be successfully completed at UCI. Two of the four may be taken through the UC Education Abroad Program, provided course content is approved in advance by the Co-Directors of the Minor in Medical Humanities.

## Persian Studies, Minor

**Touraj Daryaee, Director**

400 Murray Krieger Hall

949-824-6735

[www.humanities.uci.edu/persianstudiesminor/](http://www.humanities.uci.edu/persianstudiesminor/) (<http://www.humanities.uci.edu/persianstudiesminor/>)

The interdisciplinary minor in Persian Studies offers undergraduate students an opportunity to study the Iranian and the Persianate world through the study of language, literature, history, and culture. Students who complete the minor will acquire command of the Persian language and have a grasp of the history, literature, art and architecture, cinema, and/or music of the Iranian and the Persianate world. With a minor in Persian Studies, students will

learn how to study Persian literary and historical texts and selected cultural art forms as well as the history of Iran, Afghanistan, Tajikistan, and beyond. The minor may be taken in tandem with any major.

## Requirements

Requirements for the minor are met by taking eight courses (32 units) beyond PERSIAN 2C (of which no more than four may be lower-division, excluding first and second year Persian language courses) as specified below. No more than four courses may be taken in any one single discipline.

A. Complete the following:

PERSIAN 2C	Intermediate Persian (or equivalent proficiency)
PERSIAN 50	Persian Culture

B. Complete the following:

HISTORY 131B	Ancient Persia
HISTORY 131C	Medieval Persia
HISTORY 131D	Modern Iran

C. Select four courses chosen from an approved list. <sup>1</sup>

<sup>1</sup> Consult the Persian Studies minor website (<http://www.humanities.uci.edu/persianstudiesminor/>) for a list of approved courses. With the approval of the Director, other relevant courses also may satisfy the requirements for the minor.

**Residence requirement for the minor:** Four upper-division courses required for the minor must be completed successfully at UCI.

## Program in Academic English

**Jerry Lee, Director of Program in Academic English**

**Qian Du, Associate Director of Program in Academic English**

335 Humanities Instructional Building

949-824-6781

<https://www.humanities.uci.edu/ae/>

Academic English 20A-B-C-D through 29 and 139W are for students who have been admitted to UCI and who need additional coursework in Academic English. Enrollment in a number of the Academic English classes is restricted to those students who place into that particular course based on the results from the Academic English placement test. Students required to complete AC ENG 20A, AC ENG 20B, AC ENG 20C, AC ENG 20D, and/or AC ENG 22A must complete the lower-division reading/writing requirement before their seventh quarter or they will be subject to probation. They are to enroll in WRITING 39A immediately after they are authorized to do so by the Academic English/English as a Second Language Program. Academic English courses are required to be completed as a Pass/Not Pass only grade option which will apply toward the 12 baccalaureate unit limit on P/NP only coursework. Students will receive workload credit for Academic English courses taken beyond this 12-unit limit but will not receive additional credits applicable to the bachelor's degree.

## Undergraduate Program in Global Cultures

**Andrew Zissos, Director**

[pzissos@uci.edu](mailto:pzissos@uci.edu)

322 Humanities Hall

949-824-6901

[http://www.humanities.uci.edu/global\\_cultures/](http://www.humanities.uci.edu/global_cultures/)

Global Cultures is an innovative undergraduate major and minor in the School of Humanities with an exciting mission: to explore the problems and processes of globalization from a humanistic perspective. The major provides students with 21st century analytical skills and knowledge that is critical to understanding the complexities of the diverse world in which we live. In the process, Global Cultures equips students with the knowledge and tools that lead to successful careers in a wide range of professions and fields.

Global Cultures faculty offer high-quality lectures and, in advanced courses, interactive small group seminars. The major favors a multidisciplinary approach that draws on multiple departments and programs, housed in both the Humanities (including Art History, English, Film and Media Studies, History, Philosophy, Religious Studies, Spanish and Portuguese, and many more) and the Social Sciences (Anthropology, Chicano/Latino Studies, Political Science, Sociology, among others).

Up-to-date examples of the highly diverse courses taught in the major may be found at the Global Cultures website ([http://www.humanities.uci.edu/global\\_cultures/](http://www.humanities.uci.edu/global_cultures/)). The curricular offerings of Global Cultures are extraordinarily broad. With this intellectually stimulating learning environment, the major attracts students from a wide range of backgrounds. Global Cultures faculty provide these students with a critical understanding and a strong foundation for practice in a variety of occupations, both domestic and international.

Students majoring or minoring in Global Cultures must choose a primary emphasis and a secondary emphasis from the list that can be found by clicking the major tab. Each emphasis essentially consists of a geographic focus. Students may also design their own emphasis in consultation with a program advisor and with the approval of the Global Cultures Committee. All emphases are chosen in consultation with a faculty advisor and/or the approval of the Global Cultures Committee. Examples of how current students are combining their primary and secondary emphases are available at the Global Cultures website. ([http://www.humanities.uci.edu/global\\_cultures/](http://www.humanities.uci.edu/global_cultures/))

## Core Faculty

Sharon B. Block, *Department of History*

Yong Chen, *Department of History*

James Fujii, *Departments of East Asian Studies and of Comparative Literature*

David Theo Goldberg, *Departments of Comparative Literature and of Criminology, Law and Society*

Douglas M. Haynes, *Department of History*

Laura H. Y. Kang, *Departments of Gender and Sexuality Studies and Comparative Literature*

Ketu H. Katrak, *Departments of Drama, Comparative Literature, and English*

Rodrigo Lazo, *Department of English*

Liron Mor, *Department of Comparative Literature*

Keith L. Nelson, *Department of History*

Jane O. Newman, *Departments of Comparative Literature and English*

Rachel O'Toole, *Department of History*

Brook Thomas, *Department of English*

Armin Schwegler, *Department of Spanish and Portuguese*

Jacobo Sefamí, *Department of Spanish and Portuguese*

Bert Winther-Tamaki, *Department of Art History*

- Global Cultures, B.A.
- Global Cultures, Minor

## Courses

### **GLBLCLT 103A. Global Cultures I . 4 Units.**

Introduction to the processes by which economies, cultural practices, national entities, groups, individuals, and personal identities have undergone globalization. General background and methodological tools for understanding problems and processes of globalization.

Repeatability: Unlimited as topics vary.

### **GLBLCLT 103B. Global Cultures II . 4 Units.**

Introduction to the processes by which economies, cultural practices, national entities, groups, individuals, and personal identities have undergone globalization. Explores how globalization has manifested itself in specific topics, periods, or societies.

Repeatability: Unlimited as topics vary.

### **GLBLCLT 105. Language Origins: Evolution, Genetics, and the Brain. 4 Units.**

Examines how human language(s) may have originated. Studies pertinent techniques (reconstruction) and addresses related questions, including is our language faculty inborn (i.e., genetically encoded)? Can brain imaging and population genetics research help to unlock this mystery of human evolution?.

Same as ANTHRO 152A, LSCI 175, HISTORY 135G.

**GLBLCLT 191. Senior Seminar:Topics in Global Cultures. 4 Units.**

Students explore a topic(s) concerning processes and/or problems of globalization from an interdisciplinary perspective and build on their critical and analytical skills when investigating cultural and other phenomena that cut across national borders. Research assignments, class presentations, final seminar paper.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only.

**GLBLCLT 199. Independent Study. 1-4 Units.**

Directed reading and research in consultation with a faculty advisor. Substantial written work required.

Repeatability: May be repeated for credit unlimited times.

## Global Cultures, B.A.

Global Cultures is an innovative undergraduate major in the School of Humanities with an exciting mission: to explore the problems and processes of globalization from a humanistic perspective. The major provides students with 21st century analytical skills and knowledge that is critical to understanding the complexities of the diverse world in which we live. In the process, Global Cultures equips students with the knowledge and tools that lead to successful careers in a wide range of professions and fields.

Global Cultures faculty offer high-quality lectures and, in advanced courses, interactive small group seminars. The major favors a multidisciplinary approach that draws on multiple departments and programs, housed in both the Humanities (including Art History, English, Film and Media Studies, History, Philosophy, Religious Studies, Spanish and Portuguese, and many more) and the Social Sciences (Anthropology, Chicano/Latino Studies, Political Science, Sociology, among others).

Up-to-date examples of the highly diverse courses taught in the major may be found at the Global Cultures website ([http://www.humanities.uci.edu/global\\_cultures/](http://www.humanities.uci.edu/global_cultures/)). The curricular offerings of Global Cultures are extraordinarily broad. With this intellectually stimulating learning environment, the major attracts students from a wide range of backgrounds. Global Cultures faculty provide these students with a critical understanding and a strong foundation for practice in a variety of occupations, both domestic and international.

Students majoring in Global Cultures must choose a primary emphasis and a secondary emphasis from the list that can be found by clicking the major tab. Each emphasis essentially consists of a geographic focus. Students may also design their own emphasis in consultation with a program advisor and with the approval of the Global Cultures Committee. All emphases are chosen in consultation with a faculty advisor and/or the approval of the Global Cultures Committee. Examples of how current students are combining their primary and secondary emphases are available at the Global Cultures website. ([http://www.humanities.uci.edu/global\\_cultures/](http://www.humanities.uci.edu/global_cultures/))

The major requires a total of 14 courses. Six of these courses are specific, and eight are electives (see below). Students are encouraged to augment their foreign language competence beyond the School minimum. Participation in the UC Education Abroad Program is strongly recommended for all Global Cultures majors.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Requirements for the Major

A. Complete the following:

HISTORY 21A	World: Innovations
HISTORY 21B	World: Empires and Revolutions
HISTORY 21C	World: Nation, War, and Rights

B. Complete the following:

GLBLCLT 103A	Global Cultures I
GLBLCLT 103B	Global Cultures II

C. Complete the following:

GLBLCLT 191	Senior Seminar:Topics in Global Cultures
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D. Select seven upper-division courses from an approved list. <sup>1</sup>

E. Select one additional upper- or lower-division course from an approved list. <sup>2</sup>

<sup>1</sup> Five of the courses must focus on one emphasis and two on a second emphasis chosen from the approved course lists on the Global Cultures website ([http://www.humanities.uci.edu/global\\_cultures/](http://www.humanities.uci.edu/global_cultures/)). Quarterly consultation with a faculty advisor is also required.

<sup>2</sup> The selected course must focus on the primary or secondary emphasis chosen from the approved course lists on the Global Cultures website ([http://www.humanities.uci.edu/global\\_cultures/](http://www.humanities.uci.edu/global_cultures/)).

Students are encouraged to augment their language other than English competence beyond the School minimum. Participation in the UC Education Abroad Program is strongly recommended for all Global Cultures majors.

**Residence Requirement for the Major:** At least five upper-division courses required for the major must be completed successfully at UCI. By petition, two of the five may be taken through the UC Education Abroad Program, provided that course content is approved—usually in advance—by the Director of the Global Cultures Program.

**Hispanic, U.S. Latino/Latina, and Luso-Brazilian Cultures:** Examines the historical, political, and cultural formations of regions where Spanish and Portuguese are spoken, including Spain, Portugal, Spanish- and Portuguese-speaking countries in the Western Hemisphere, and the Latino/Latina population in the United States.

**Africa (Nation, Culture) and Its Diaspora:** Examines Africa as a diverse geographical and political expression, including its historical, political, and cultural formation locally, regionally, and globally.

**Asia (Nation, Culture) and Its Diaspora:** Examines Asia as a diverse geographical and political expression, including its historical and cultural formation locally, regionally, and globally.

**Europe and Its Former Colonies:** Examines Europe and its former colonies as a diverse geographical and political expression, including its historical and cultural formation locally, regionally, and globally.

**Global Middle East:** Examines the people and cultures of North Africa and the Arab world, Turkey and Iran, as well as their relationship with other regions such as sub-Saharan Africa, Central and South Asia, and the broader Muslim diaspora in Europe and the Americas.

**Atlantic Rim:** Explores the movement of people and cultures in relationship to the historical and contemporary experience of societies that are adjacent to the Atlantic Ocean, including, among others, west Africa, the Americas, the Caribbean, and western and northern Europe, as well as the British archipelago.

**Pacific Rim:** Explores the movement of people and cultures in relationship to the historical and contemporary experience of societies that are adjacent to the Pacific Ocean, including, among others, India, China, Japan, Korea, Vietnam, the United States, Central and South America, and Malaysia.

**Inter-Area Studies:** Includes comparative studies of the geographical regions outlined in the above six emphases, for instance, the analysis of Africans in Asia, or the cultural, historical, and political connections between the Atlantic and the Pacific Rim.

Students may also design their own emphasis by combining two or more regional emphases in a non-traditional fashion. For instance, a student may wish to study what is known as “Creole” (oral) literatures, found in multiple locations in Africa, Asia, and the Americas.

Students are encouraged to study abroad, and may be able to satisfy a significant portion of their major requirements abroad. For maximum number of courses allowed and other pertinent details, visit the Global Cultures website. ([http://www.humanities.uci.edu/global\\_cultures/](http://www.humanities.uci.edu/global_cultures/))

All courses taken abroad must be approved. Course approval typically involves the following: (1) presentation of syllabi and other pertinent course materials (term papers, exams, etc.) from the foreign host university, and (2) submission of a UCI Humanities Petition form (available online, and to be completed after student's return to UCI) to the Undergraduate Director of the Program in Global Cultures, and to the Office of Undergraduate Study. Students are advised to consult with the Humanities Office of Undergraduate Study (HIB 143) and the Global Cultures Director both before and after their stay abroad. NOTE: See also the residence requirement in the major and minor.

The major prepares students particularly well for careers in all fields in which analysis, judgment, argument, and a wide (global) rather than narrow perspective are important. The Global Cultures major equips students with a knowledge that is critical to understanding the complexities of the diverse world in which we live.

The following careers are especially well-suited for Global Cultures majors: business (national as well as international), law, management, education (primary and secondary teaching), politics, public policy, academia, print media, television, foreign service, tourism, travel industry, and graduate studies in a wide variety of fields (business, law, education, public policy, and others).

The UCI (<http://career.uci.edu/>) Division of Career Pathways provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on résumé preparation, job search, and interview techniques.

## Global Cultures, Minor

Global Cultures is an innovative undergraduate minor in the School of Humanities with an exciting mission: to explore the problems and processes of globalization from a humanistic perspective.

Students minoring in Global Cultures must choose a primary emphasis and a secondary emphasis from the list. Each emphasis essentially consists of a geographic focus. Students may also design their own emphasis in consultation with a program advisor and with the approval of the Global Cultures Committee. All emphases are chosen in consultation with a faculty advisor and are subject to the approval of the Global Cultures Committee or the

Program Director. Examples of how current students are combining their primary and secondary emphases are available at the Global Cultures website. ([http://www.humanities.uci.edu/global\\_cultures/](http://www.humanities.uci.edu/global_cultures/))

## Requirements for the Minor in Global Cultures

### Departmental Requirements

A. Select two of the following:

HISTORY 21A	World: Innovations
HISTORY 21B	World: Empires and Revolutions
HISTORY 21C	World: Nation, War, and Rights

B. Complete the following:

GLBLCLT 103A	Global Cultures I
GLBLCLT 103B	Global Cultures II

C. Select three upper-division courses from one emphasis.<sup>1</sup>

D. Select one upper-division course from a second emphasis.<sup>1</sup>

<sup>1</sup> List of emphases can be found on the major tab.

**Residence Requirement for the Minor:** A minimum of four upper-division courses required for the minor must be completed successfully at UCI. Two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate department chair.

**Emphases and Approved Courses:** The lists of approved courses are extensive and vary from quarter to quarter, depending upon course scheduling. For complete up-to-date information, consult the Global Cultures website. ([http://www.humanities.uci.edu/global\\_cultures/](http://www.humanities.uci.edu/global_cultures/))

**Hispanic, U.S. Latino/Latina, and Luso-Brazilian Cultures:** Examines the historical, political, and cultural formations of regions where Spanish and Portuguese are spoken, including Spain, Portugal, Spanish- and Portuguese-speaking countries in the Western Hemisphere, and the Latino/Latina population in the United States.

**Africa (Nation, Culture) and Its Diaspora:** Examines Africa as a diverse geographical and political expression, including its historical, political, and cultural formation locally, regionally, and globally.

**Asia (Nation, Culture) and Its Diaspora:** Examines Asia as a diverse geographical and political expression, including its historical and cultural formation locally, regionally, and globally.

**Europe and Its Former Colonies:** Examines Europe and its former colonies as a diverse geographical and political expression, including its historical and cultural formation locally, regionally, and globally.

**Global Middle East:** Examines the people and cultures of North Africa and the Arab world, Turkey and Iran, as well as their relationship with other regions such as sub-Saharan Africa, Central and South Asia, and the broader Muslim diaspora in Europe and the Americas.

**Atlantic Rim:** Explores the movement of people and cultures in relationship to the historical and contemporary experience of societies that are adjacent to the Atlantic Ocean, including, among others, west Africa, the Americas, the Caribbean, and western and northern Europe, as well as the British archipelago.

**Pacific Rim:** Explores the movement of people and cultures in relationship to the historical and contemporary experience of societies that are adjacent to the Pacific Ocean, including, among others, India, China, Japan, Korea, Vietnam, the United States, Central and South America, and Malaysia.

**Inter-Area Studies:** Includes comparative studies of the geographical regions outlined in the above six emphases, for instance, the analysis of Africans in Asia, or the cultural, historical, and political connections between the Atlantic and the Pacific Rim.

Students may also design their own emphasis by combining two or more regional emphases in a non-traditional fashion. For instance, a student may wish to study what is known as "Creole" (oral) literatures, found in multiple locations in Africa, Asia, and the Americas.

## Undergraduate Program in Religious Studies

**Susan Klein, Director**

400 Murray Krieger Hall

949-824-6735

[http://www.humanities.uci.edu/religious\\_studies/](http://www.humanities.uci.edu/religious_studies/)

Religious Studies includes an interdisciplinary major and minor that focus on the comparative understanding of the various ways different peoples, across space and through time, have developed their religious ideas, values, systems, beliefs, rituals, and traditions in response to fundamental questions of human existence. The curriculum seeks to provide a wide-ranging academic understanding and knowledge of the religious experience in

society through study in the Schools of Humanities, Social Sciences, Social Ecology, and the Claire Trevor School of the Arts. As an interdisciplinary academic discipline, the study of religion offers a rigorous, systematic, and dispassionate intellectual inquiry into various aspects of religious systems, their practitioners and outlooks, and their goals and expressions. It employs a wide variety of approaches and methods in order to understand the role of religion in both human experience and thought.

Students in the Religious Studies major complete an emphasis either in World Religious Traditions or, more particularly, in Judaism/Christianity/Islam.

## Categories and Approved Courses

The complete list of approved courses varies from quarter to quarter, depending upon course scheduling. For complete up-to-date information on approved courses, please consult the Religious Studies website ([http://www.humanities.uci.edu/religious\\_studies/](http://www.humanities.uci.edu/religious_studies/)).

- Religious Studies, B.A.
- Religious Studies, Minor

## Courses

### REL STD 5A. World Religions I. 4 Units.

An introduction to the history, doctrine, culture, and writing of Judaism, Christianity, and Islam.

Same as HISTORY 16A.

(IV and VIII ).

### REL STD 5B. World Religions II. 4 Units.

An introduction to various religious traditions in selected areas of the world—including India and South Asia, East Asia, Africa, and the Americas.

Same as HISTORY 16B.

(IV and VIII ).

### REL STD 5C. Religious Dialogue. 4 Units.

Lectures and discussion on controversial topics in religion: sexual morality; religious violence; science; treatment of women and girls; religious truth, American Constitutional matters; secularization; the future of religion, and other topics.

Same as HISTORY 16C.

(IV, VIII)

### REL STD 17. An Economic Approach to Religion. 4 Units.

Introduction to how basic economic concepts such as demand, supply, consumption, production, competition, free-riding, innovation, regulation, and rent-seeking can be applied to understand observed religious behavior.

Same as ECON 17.

(III)

### REL STD 21. Philosophy and Religion. 4 Units.

Examines the intersection of religion and philosophy from a standpoint that does not presuppose previous academic study of either. Both Western and Eastern traditions and perspectives may be explored.

Repeatability: Unlimited as topics vary.

Same as PHILOS 21.

(IV)

### REL STD 61. Gender and Religion. 4 Units.

Introduces the topic of religion in a feminist context by performing cross-cultural exploration of gender, authority, and faith in various traditions. Study includes (but is not limited to) writings of contemporary Jewish, Christian, and Muslim feminists.

Same as GEN&SEX 60C.

(III and VIII ).



**REL STD 90. Aspects of Religion. 4 Units.**

A presentation of selected issues in the study of religion.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 91. Topics in Aspects of Asian Religions. 4 Units.**

A survey course of a specific Asian religious tradition such as Hinduism, Buddhism, Jainism, Sikhism, Daoism, Confucianism, or Shinto in its manifestation in Asia or in its transmission to the Americas.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 100. Topics in the Study of Religion. 4 Units.**

The intersection of religious belief and practices with selected subjects of continuing interest.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 103. Topics in the Philosophy of Religion. 4 Units.**

Critical examination of philosophical concepts in religious scripture and theology, e.g., the nature and existence of God, miracles, the problem of evil, and divine command theories in ethics. May include any religious tradition.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 106. Topics in Gender and Religion. 4 Units.**

Critical examination of how religious beliefs and practices have shaped (and been shaped by) attitudes toward gender and sexuality in modern and/or premodern society.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 110. Thinking about Religion: Theories and Methodologies. 4 Units.**

A survey and investigation of the major thinkers, theories, and methodologies in the study of religions. Designed to develop the student's ability to analyze and articulate theoretical arguments; includes a paper on relevant Religious Studies topics.

Prerequisite: (REL STD 5A or HISTORY 16A) and (REL STD 5B or HISTORY 16B) and (REL STD 5C or HISTORY 16C)

Overlaps with REL STD 110W.

Restriction: Religious Studies Majors have first consideration for enrollment.

**REL STD 110W. Thinking about Religion: Theories and Methodologies. 4 Units.**

A survey and investigation of the major thinkers, theories, and methodologies in the study of religions. Designed to develop the student's ability to analyze and articulate theoretical arguments in writing; includes a paper on relevant Religious Studies topics.

Prerequisite: (REL STD 5A or HISTORY 16A) and (REL STD 5B or HISTORY 16B) and (REL STD 5C or HISTORY 16C). Satisfactory completion of the Lower-Division Writing requirement.

Overlaps with REL STD 110.

Restriction: Religious Studies Majors have first consideration for enrollment.

**(Ib)**

**REL STD 115. Religion and World Politics. 4 Units.**

Examines the relationship between religion and world politics historically and today, focusing on connections with peace/war, democracy, human rights, secularism(s), and globalization. Covers major debates, scholarship, concepts, and theories through class exercises, exams, and essays.

Prerequisite: POL SCI 41A or INTL ST 11 or INTL ST 12 or REL STD 5A or REL STD 5B or REL STD 5C

Same as POL SCI 146B, INTL ST 151B.

**REL STD 120. Topics in Asian Religious Traditions. 4 Units.**

Studies involving (but not limited to) Hinduism, Buddhism, Confucianism, Jainism, Sikhism, Daoism, Shinto or Shamanism, including both elite and doctrinal aspects and forms of more popular religiosity.

Repeatability: May be taken for credit 3 times as topics vary.



**REL STD 122. Ancient India. 4 Units.**

Examines the visual and religious history of the region defined as 'India' today, but necessarily encompassing modern Bangladesh and Pakistan. Culminates with the supposed Golden Age of the Gupta empire and its far-reaching legacies.

Same as HISTORY 170A, ART HIS 155A.

Concurrent with ART HIS 255A.

**REL STD 123. Medieval India. 4 Units.**

Begins with the Gupta period's aesthetic legacies in South Asia's architecture, sculpture, and painting. Explores the dispersal of Islam throughout South Asia, including the Muslim communities of southern India.

Same as HISTORY 170B, ART HIS 155B.

Concurrent with ART HIS 255B.

**REL STD 124. Topics in Modern Indian Religion. 4 Units.**

Topics in religions of the Indian subcontinent including, but not confined to, Hinduism, Jainism, Sikhism, Islam, and Buddhism from the founding of the Mughal Empire in 1526 to the creation of the several modern states of the Indian subcontinent.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 130. Jewish, Islamic, and Middle Eastern Religious Traditions. 4 Units.**

Character and evolution of Egyptian, Jewish, Zoroastrian, Muslim, and other religious communities of the region from their formative periods to the present era.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 130F. Jews and Power. 4 Units.**

Examines the relationship between the Jewish people and political power over a 3500 year period. How have Jews preserved their communal interests and personal safety? How have they defined the proper relationship of the people to political authority.

Same as HISTORY 130F, POL SCI 154J.

**REL STD 131A. History of Zoroastrianism. 4 Units.**

Reviews major trends in the history of Zoroastrianism.

Same as HISTORY 131A.

**REL STD 140. Early Western Religious Traditions. 4 Units.**

Religious perspectives of the Mediterranean and European regions from the earliest times to approximately 1500 C.E.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 141. Recent Western Religious Traditions. 4 Units.**

Studies related to Catholic, Protestant, and Orthodox Christianity as well as alternative belief systems in Europe of the early modern and modern eras.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 150. Religion in the Americas. 4 Units.**

Religious belief and social context in North and South America from the earliest human societies to the present.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 160. Diaspora Religions. 4 Units.**

Examination of what happens to belief and practice as religious communities are scattered geographically.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 170. Topics in Comparative Studies in Religion. 4 Units.**

Literary, historical, or philosophical comparison of selected religious and quasi-religious traditions, their beliefs and practices.

Repeatability: May be taken for credit 3 times as topics vary.

**REL STD 199. Independent Study. 1-4 Units.**

Directed reading and research in consultation with a faculty member. Substantial written work required.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only.

**REL STD 399. University Teaching . 4 Units.**

Limited to teaching assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Religious Studies, B.A.

The Religious Studies major includes an interdisciplinary focus on the comparative understanding of the various ways different peoples, across space and through time, have developed their religious ideas, values, systems, beliefs, rituals, and traditions in response to fundamental questions of human existence. The curriculum seeks to provide a wide-ranging academic understanding and knowledge of the religious experience in society through study in the Schools of Humanities, Social Sciences, Social Ecology, and the Claire Trevor School of the Arts. As an interdisciplinary academic discipline, the study of religion offers a rigorous, systematic, and dispassionate intellectual inquiry into various aspects of religious systems, their practitioners and outlooks, and their goals and expressions. It employs a wide variety of approaches and methods in order to understand the role of religion in both human experience and thought.

Students in the Religious Studies major complete an emphasis either in World Religious Traditions or, more particularly, in Judaism/Christianity/Islam.

### Categories and Approved Courses

The complete list of approved courses varies from quarter to quarter, depending upon course scheduling. For complete up-to-date information on approved courses, please consult the Religious Studies website ([http://www.humanities.uci.edu/religious\\_studies/](http://www.humanities.uci.edu/religious_studies/)).

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

#### Requirements for the Major

A. Complete:

REL STD 5A	World Religions I
REL STD 5B	World Religions II
REL STD 5C	Religious Dialogue
REL STD 110 or REL STD 110W	Thinking about Religion: Theories and Methodologies

B. Select six upper-division electives, two in each of the following categories: <sup>1</sup>

1. Judaism/Christianity/Islam
2. World Religious Traditions
3. Thematic Approaches to Religion

C. Select two additional upper-division courses from either category 1 or 2 above in order to complete an emphasis in Judaism/Christianity/Islam or in World Religious Traditions.

<sup>1</sup> Selected from the approved lists published on the Religious Studies website ([http://www.humanities.uci.edu/religious\\_studies/](http://www.humanities.uci.edu/religious_studies/)). One relevant lower-division course may be substituted for an upper-division course, with prior approval.

**Studying Abroad:** Students are encouraged to study abroad and may be able to satisfy a significant portion of their requirements abroad. Courses taken abroad must be approved by the Director of Religious Studies in order to be applied toward major requirements.

**Residence Requirement for the Major:** A minimum of five upper-division courses required for the major must be completed successfully at UCI.

Majoring in Religious Studies is an excellent preparation for living in a multicultural society and for a variety of careers in counseling, teaching, commerce, writing, government, the arts, and professional religious leadership. The major's emphasis on broad understanding, critical thinking skills, and clear written expression provides an effective springboard for graduate study in the humanities and social science or professional schools in medicine, law, or business.

The UCI Division of Career Pathways provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See the UCI D (<http://career.uci.edu/>) Division of Career Pathways website (<http://career.uci.edu/>) for additional information.

## Religious Studies, Minor

The curriculum of our major and minor seeks to provide understanding and knowledge of the religious experience in society through relevant study in the Schools of Humanities, Social Sciences, Social Ecology, and the Arts. It employs a wide variety of approaches and methods in order to comprehend in the broadest sense the role of religion and its relationship to other significant human factors. Note that our faculty encourages students to take at least some of the courses for the major or minor at universities abroad, either through the University of California's Education Abroad Program, or independently.

### Requirements for the Minor

A. Complete:

REL STD 5A	World Religions I
REL STD 5B	World Religions II
REL STD 5C	Religious Dialogue
REL STD 110 or REL STD 110W	Thinking about Religion: Theories and Methodologies

B. Four upper-division electives selected from the three categories under B in the B.A. in Religious Studies, including at least one course from both categories 1 and 2. Two of the four courses must be outside of the student's major. One relevant lower-division course may be substituted for an upper-division course, with prior approval.

**Residence Requirement for the Minor:** Four upper-division courses required for the minor must be completed successfully at UCI. Two of the four may be taken through the UC Education Abroad Program, provided course content is approved by the Director of the Religious Studies program.

# School of Law

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## L. Song Richardson, Dean

General Information

<http://www.law.uci.edu/>

[law@uci.edu](mailto:law@uci.edu)

The University of California, Irvine, School of Law offers the Juris Doctor (J.D.) degree through an innovative curriculum that includes in-depth study of legal doctrine, emphasizes experiential learning and clinical experience, and provides the professional training in lawyering skills necessary for the practice of law at the highest level of the profession. A hallmark of the School is that every student is required to have a clinical experience or equivalent in order to graduate.

The University of California, Irvine, School of Law offers the Master of Laws (LL.M.) degree program. The LL.M. program offers a first-rate legal education to lawyers, judges, government officials and others wishing to become educated about the legal system and practice of law in the United States. We offer a general LL.M. program that can be tailored to each individual's interests, thus uniquely equipping students with the knowledge and skills to excel in today's global legal community, whatever their personal and professional goals may be.

Notably, the School of Law also participates in the UC Irvine Program in Law and Graduate Studies, a concurrent degree program that enables qualified students to pursue a doctoral or master's degree in a cognate field at the same time they are pursuing their law degree. Several current students, for example, are pursuing concurrent J.D./Ph.D. degrees, J.D./M.A. degrees, or J.D./M.B.A. degrees.

The School of Law builds on UC Irvine's existing strengths in emerging technology, social policy, international business, environmental science and policy, health care, and other fields to produce leaders in law, government, and business for the 21st century. UC Irvine Law graduates are encouraged to pursue careers in public service, including non-governmental organizations and philanthropic agencies. The School works aggressively to place students on their chosen career path whether that be with a private law firm, public interest or legal services office, government agency, and/or in a judicial clerkship. A wide array of employers from both the public and private sectors come to interview students on campus for summer positions and externships.

UC Irvine School of Law is fully accredited by the American Bar Association. It seeks to enroll outstanding students who reflect a wide diversity of life experiences. Further information about admission requirements, application deadlines, tuition and fees, and curriculum is updated regularly on the School of Law website (<http://www.law.uci.edu/>).

In addition, concurrent degree study (J.D./Ph.D. and J.D./Master's) is available under the auspices of UC Irvine's Program in Law and Graduate Studies, which is described later in the School of Law section.

- Law (J.D.)
- Master of Laws (LL.M.)

### On This Page:

- First-Year Curriculum
- Upper-Level Courses
  - General Courses
  - Business Law
  - Colloquium
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  - Family Law
  - Intellectual Property
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  - Perspective Courses
  - Procedural Courses
  - Public Law
  - Real Estate Law
  - Skills Courses
  - Tax Law
  - Clinical/Externships

## First-Year Curriculum

UCI School of Law has an innovative curriculum designed to prepare students for the practice of law at the highest levels of the profession. Traditional areas of legal doctrine are covered in the first year, but in a novel way that focuses on training students in five methods of legal analysis: statutory, common law, procedural, constitutional, and international. The course on Statutory Analysis, for example, uses criminal law as the vehicle for teaching students to read and interpret statutes.

One of UCI's signature first-year courses, Legal Profession, exposes students to the economics, sociology, and psychology of a legal career. The course also emphasizes professional ethics. Panels of attorneys from a wide range of practice areas speak to students throughout the year about ethical dilemmas they confront as well as their work and careers.

Throughout both the first-year and upper-level curriculum there is great emphasis on incorporating skills training into traditional classes. The first-year Legal Skills class teaches fact investigation, interviewing, legal writing and analysis, extensive legal research, negotiation and oral advocacy. In addition, all first-year students are assigned a lawyer mentor and are required to spend a specified number of hours observing that lawyer at work.

UCI has an active pro bono program in which students engage in volunteer legal work on behalf of underserved populations as early as their first year.

All first-year students enroll in the courses below. Additional information is available at the School of Law Curriculum website (<http://www.law.uci.edu/academics/curriculum.html>).

**Common Law Analysis: Contracts (4).** This course will focus primarily on the common law of contracts to teach this method of analysis, in which the law is derived from judicial decisions rather than statutes or the Constitution.

**Statutory Analysis (3).** This course will use criminal law as a basis for teaching students the methods employed in all areas of law for analyzing statutes.

**Procedural Analysis (4).** This course will use civil procedure as the foundation for teaching students about areas of law in which there are procedural rules, and how analysis and arguments are made in such contexts.

**Lawyering Skills I (3).** This course, which will be part of both semesters, will focus on teaching skills that all lawyers use, such as fact investigation, interviewing, legal writing and analysis, legal research, negotiation and oral advocacy.

**Legal Profession I (2).** This course, which will be part of both semesters, is designed to prepare students to chart rewarding and responsible careers in law. Drawing from various disciplines, including economics, history, sociology, and psychology, we will teach students about the variety of practice settings in which lawyers work and the professional opportunities and challenges of each.

**Common Law Analysis: Torts (4).** This course will use torts as a way of further examining the common law, and how lawyers reason and develop arguments in this area.

**Constitutional Analysis (4).** This course will teach students basic areas of constitutional law such as separation of powers, federalism, and individual liberties. It will focus on how constitutional arguments are made, and how courts and lawyers analyze constitutional issues.

**International Legal Analysis (3).** This course will introduce students to international law and the ways that analyses in this area are similar to and different from analysis in other areas of law.

**Lawyering Skills II (3).** In the spring semester of this two-semester course, all students will gain experience in a legal clinic setting, where they will conduct intake interviews of actual clients at one or more legal services organization such as: The Learning Rights Center of Los Angeles, the Legal Aid Foundation of Los Angeles, the Legal Aid Society of Orange County, the Public Law Center, the United States Marines Corp Base at Camp Pendleton, and the UCI Consumer Protection Clinic.

**Legal Profession II (2).** Continuation of fall semester course.

**Legal Research (1).** This course prepares students to take on varied and challenging research assignments typically encountered at school and in the workplace.

## Upper-Level Courses

Below is an overview of the upper-level courses taught at UC Irvine School of Law. Not every course will be offered each year, and additional courses not listed may be offered. Additional information is available at School of Law Curriculum website (<http://www.law.uci.edu/academics/curriculum.html>). Course descriptions, content, and requirements are subject to change.

### General Courses

Administrative Law  
Business Associations  
Constitutional Law: First Amendment  
Criminal Procedure

Evidence  
Federal Courts  
Federal Criminal Law  
Federal Income Taxation  
Property  
Remedies  
The Federal Judge

### **Business Law**

Accounting and Finance for Lawyers  
Advanced Legal Writing: Business Drafting  
Antitrust  
Antitrust Law & IP Rights  
Bankruptcy Law  
Business and Economics of Law Firm Practice  
Business and Regulation of Fund Investors  
Business Torts  
Commercial Transactions  
Corporate Finance  
Insurance Law and Policy  
Investment Management Regulation  
Law and Theory Relating to the 2008 Financial Crisis  
Mergers and Acquisitions  
Organizations, Operations, and Tax Aspects of Public Charities and Private Foundations  
Public Companies  
Representing Business Clients  
SEC Enforcement Process  
Secured Credit  
Securities Regulation  
Statistics for Lawyers

### **Colloquium**

Writing for Publication in the Law Review  
Advanced Writing for Publication in the Law Review

### **Criminal Law**

Advanced Criminal Law, Practice, & Procedure  
Memory & The Law  
Documents and Artifacts in Socio-Legal Research  
Topics in White Collar Crime

### **Employment Law**

Employment Discrimination Law  
Employment Law  
Labor Law

### **Entertainment Law**

Entertainment Law  
Sports Law

### **Family Law**

Children and the Law  
Community Property  
Family Law  
Gifts, Wills, and Trusts  
Advocating for Vulnerable Children: From Foster Care to Juvenile Justice

### **Intellectual Property**

Copyright Law  
Digital Copyright Law  
Cross-Border Trade in IP  
Intellectual Property Law

Patent Law  
Technical Protection of Author's Rights  
Trademark and Unfair Competition Law

**International and Comparative Law**

China Law  
Comparative Law  
International Business Transactions  
International Contracts  
International Environmental Law  
International Human Rights Law  
International Trade Law  
Islamic Law  
Japanese Law  
Jewish Law  
Korean Law

**Law and Medicine**

Biomedical Ethics  
Drug Discovery, Development & Commercialization  
Health Care Law  
Reproductive Technologies

**Perspective Courses**

American Legal History  
Cause Lawyering  
Spanish for Lawyers  
Conflict of Laws  
Critical Race Theory  
Feminist Jurisprudence and the Law  
Human Rights & Protest in 20th and 21st Century China  
Jurisprudence  
Law and Economics  
Law and Literature  
Law and Social Movements  
Race and the Law  
Sexual Orientation and the Law

**Procedural Courses**

Arbitration  
Civil Rights Litigation  
Complex Litigation  
Conflicts of Law  
Dispute Resolution  
Negotiations and Mediation

**Public Law**

Animal Law  
Civil Rights Law  
Education Law  
Election Law  
Federal Public Land and Natural Resources Law  
Race and the Law  
Environmental Law  
Immigration Law  
Land Use and Development Control Law  
Legislation  
Local Government Law  
Organizations, Operations and Tax Aspects of Public Charities and Private Foundations  
Media Law  
National Security Law  
Natural Resources Law

Poverty Law  
Regulatory Design and Innovation  
White Collar Crime

### **Real Estate Law**

Land Use Law  
Real Estate Transactions

### **Skills Courses**

Advanced Legal Research  
Advanced Legal Writing  
Global Justice Summit  
Appellate Litigation  
Appellate Advocacy  
Negotiations  
Spanish for Lawyers  
Trial Advocacy

### **Tax Law**

Basic Tax  
Corporate Tax  
Estate and Gift Taxation  
Partnership & LLC Taxation  
Taxation of Business Enterprises

### **Clinical/Externships**

Appellate Litigation Clinic  
Advanced Community & Economic Development Clinic  
Advanced Environmental Law Clinic  
Advanced International Human Rights Clinic  
Advanced Immigrant Rights Clinic  
Advanced Consumer Protection Clinic  
Advanced Domestic Violence Clinic  
Advanced International Justice Clinic  
Civil Rights Litigation Clinic  
Community & Economic Development Clinic  
Consumer Protection Clinic  
Domestic Violence Clinic  
Environmental Law Clinic  
Fair Employment & Housing Clinic  
Immigrant Rights Clinic  
Intellectual Property, Arts & Technology Clinic  
International Human Rights Clinic  
International Justice Clinic  
Reproductive Justice Clinic  
Veterans Clinic  
Externships

## **Program in Law and Graduate Studies (J.D./Ph.D.; J.D./Master's)**

**Shauhin Talesh, Director**

949-824-9214

<http://www.law.uci.edu/academics/interdisciplinary-studies/concurrent-degrees.html>

stalesh@law.uci.edu (ctomlins@law.uci.edu)

Highly-qualified students interested in combining the study of law with graduate research and/or professional qualifications in cognate disciplines are invited to undertake concurrent degree study under the auspices of UC Irvine's Program in Law and Graduate Studies (PLGS). Students in this program pursue a coordinated curriculum leading to a J.D. degree from the School of Law in conjunction with a Master's or Ph.D. degree from any of the graduate professional or research degree programs at UCI that have been approved for this concurrent degree program. The objective of the program is to promote interdisciplinary study of law while also enabling students to obtain both a J.D. and a graduate degree in less time than would be required to acquire both degrees separately. The normative time for completion of the program is four years for J.D./Master's combinations and seven years for



J.D./Ph.D. combinations. Additional information is available from the PLGS Program Director's Office, 949-824-4158, or by email to [plgs@law.uci.edu](mailto:plgs@law.uci.edu). A full description of the program, with links to all relevant application information, can be found at the School of Law Concurrent Degree Program website (<http://www.law.uci.edu/academics/interdisciplinary-studies/concurrent-degrees.html>).

UC Irvine's PLGS program is well suited to students interested in professional or academic careers focused on the interdisciplinary or multidisciplinary study of law and legal institutions, policy analysis, and/or applied research in law-related fields (for example, criminal justice and criminology, urban planning and environmental issues, discrimination, human rights, urban planning, environmental protection, and intellectual property). UC Irvine is nationally known for its graduate programs in such fields as Criminology, Law and Society; Psychology and Social Behavior; Anthropology; Management and Business; Literature; History; Performing Arts; and others.

Applicants must submit separate applications for admission to the School of Law and to the graduate program of their choice. Once admitted for study into both components of their program, concurrent degree students will work with the PLGS director and the director of their graduate program to develop a program of study that will permit efficient pursuit of both degrees. Ordinarily, students will commence their studies in their chosen graduate program and begin their first year of law instruction after one or more years of graduate program study. Upon completion of the first year of law instruction, students will pursue a coordinated curriculum of upper-level law study and graduate program study and research. Concurrent degree students' law enrollments will include a required "Graduate Legal Studies" colloquium and a 3-unit "Interdisciplinary Perspectives on Law" course or its equivalent. Concurrent degree students will be eligible for financial support through their chosen graduate program while pursuing graduate degree studies, and through the law school while pursuing law studies.

## Required Colloquium

**University Studies 296 Graduate Legal Studies (.3).** Monthly faculty/student colloquium to present and discuss socio-legal related research/issues. Course convened by Law School faculty with other faculty participation. Open to graduate students and Law students; required for PLGS students enrolled in Law portion of degree. Satisfactory/Unsatisfactory only. May be repeated for credit as topics vary.

**Law 5655 Interdisciplinary Perspectives on Law.** This course is a reading and discussion seminar. Students will read a book each week. For the first class, students will read the book and come to class prepared to discuss it. For the second class each student will write a 750-word critique (analytic precis) of the book; discussion of the book will continue in that class. The seminar will be organized into four roughly equal segments. The first will present four quite distinct accounts of law—law as education, as ideology, as politics, and as organized activism. The second will consider several distinct scholarly perspectives on law—cultural, rhetorical, sociological. The third will examine applications of interdisciplinarity to legal studies—of property, recording media, citizenship, and emergency politics. The fourth will continue 'applications' and conclude the course by comparing two rather different studies of law and death.

## Faculty

Josh D. Blank, J.D. Harvard Law School, LL.M. New York University School of Law, *Professor of School of Law*

Dan L. Burk, J.D. Arizona State University, *UCI Chancellor's Professor of School of Law*

Alejandro E. Camacho, J.D., LL.M. Harvard University, Georgetown University, *Professor of School of Law; Political Science*

Elizabeth E. Cauffman, Ph.D. Temple University, *Professor of Psychological Science; Criminology, Law and Society; Education; School of Law* (adolescent development, mental health, juvenile justice, legal and social policy)

Simon A. Cole, Ph.D. Cornell University, *Professor of Criminology, Law and Society; History; School of Law* (science, technology, law, criminal justice)

Rachel E. Croskery-Roberts, J.D. University of Michigan, *Clinical Professor of Law of School of Law*

Joseph DiMento, Ph.D. University of Michigan, *Professor of School of Law; Criminology, Law and Society; Paul Merage School of Business; Urban Planning and Public Policy*

Victor Fleischer, J.D. Columbia Law School, *Professor of School of Law*

Bryant G. Garth, J.D. Stanford University, *Senior Associate Dean of Academic Affairs and Vice Dean and UCI Chancellor's Professor of School of Law*

Howard A. Gillman, Ph.D. University of California, Los Angeles, *Chancellor and Professor of Political Science; Criminology, Law and Society; History; School of Law*

Jonathan D. Glater, J.D. Yale University, *Professor of School of Law*

Michele B. Goodwin, J.D. Boston College, *Director, Center for Biotechnology and Global Health Policy and UCI's Chancellor's Professor of School of Law; Criminology, Law and Society; Gender and Sexuality Studies; Program in Public Health*

Michael R. Gottfredson, Ph.D. University at Albany, State University of New York, *Chancellor's Professor of Criminology, Law and Society; School of Law; Sociology* (criminology, juvenile delinquency, crime theory, public policy)

Kaaryn Gustafson, J.D., Ph.D. University of California, Berkeley, *Co-Director, Center on Law, Equality and Race (CLEar) and Professor of School of Law*

Sora Han, Ph.D. University of California, Santa Cruz, *Director of the Graduate Program in Culture and Theory and Associate Professor of Criminology, Law and Society; African American Studies; Culture and Theory; School of Law* (law and popular culture, critical race theory, philosophies of punishment, feminism and psychoanalysis)

Richard L. Hasen, J.D. University of California, Los Angeles, *UCI Chancellor's Professor of School of Law; Political Science*

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Paul L. Hoffman, J.D. New York University, *Adjunct Professor of School of Law*

D'lorah Hughes, J.D. Duke University School of Law, *Adjunct Professor of School of Law*

Linda Cohen Jennings, Ph.D. California Institute of Technology, *Professor of School of Law; Economics*

Dalie Jimenez, J.D. Harvard Law School, *Professor of School of Law*

David A. Kaye, J.D. University of California, Berkeley, *Clinical Professor of School of Law*

Sung Eun (Summer) Kim, J.D. Harvard University, *Assistant Professor of School of Law*

Christopher M. Klein, J.D. University of Chicago, *Lecturer of School of Law*

Anne Lai, J.D. New York University, *Assistant Clinical Professor of School of Law*

Stephen Lee, J.D. University of California, Berkeley, *Professor of School of Law; Asian American Studies*

Jack I. Lerner, J.D. Harvard University, *Clinical Professor of School of Law*

Christopher R. Leslie, J.D. University of California, Berkeley, *UCI Chancellor's Professor of School of Law*

Leah Litman, J.D. University of Michigan Law School, *Assistant Professor of School of Law*

Elizabeth F. Loftus, Ph.D. Stanford University, *UCI Distinguished Professor of Psychological Science; Cognitive Sciences; Criminology, Law and Society; School of Law* (cognitive psychology, human memory, psychology and law)

Mona Lynch, Ph.D. University of California, Santa Cruz, *Professor of Criminology, Law and Society; School of Law* (law and society, psychology and law, punishment and society, race and criminal justice)

Nicholas J. Marantz, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Urban Planning and Public Policy; School of Law*

Omri Marian, J.D., LL.M. University of Michigan Law School, *Assistant Professor of School of Law*

William M. Maurer, Ph.D. Stanford University, *Dean of the School of Social Sciences and Professor of Anthropology; Criminology, Law and Society; School of Law* (anthropology of law, globalization, Caribbean, anthropology of money and finance, gender and kinship)

Carrie Menkel-Meadow, J.D. University of Pennsylvania, *UCI Chancellor's Professor of Political Science; School of Law*

Alison Mikkor, J.D. New York University School of Law, *Assistant Professor of Lawyering Skills of School of Law*

David K. Min, J.D. Harvard University, *Assistant Professor of School of Law*

Alexandra Natapoff, J.D. Stanford Law School, *Professor of School of Law*

Katherine M. Porter, J.D. Harvard University, *Professor of School of Law*

R. Anthony Reese, J.D. Stanford University, *UCI Chancellor's Professor of School of Law*

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L. Song Richardson, J.D. Yale Law School, *Dean of the School of Law and Professor of School of Law; Asian American Studies*

Michael J. Robinson-Dorn, J.D. Cornell University, *Clinical Professor of School of Law*

Trilby Robinson-Dorn, J.D. Tulane University, *Associate Dean and Professor of School of Law*

Mark Rosenbaum, J.D. Harvard University, *Adjunct Professor of School of Law*

Ezra A. Ross, J.D. Harvard University, *Professor of School of Law*

Nicholas I. Scurich, Ph.D. University of Southern California, *Associate Professor of Psychological Science; Criminology, Law and Society; School of Law* (judgment and decision making, juridical proof, violence risk assessment)

Carroll S. Seron, Ph.D. New York University, *Professor Emerita of Criminology, Law and Society; School of Law* (sociology of law, sociology of professions, law and society, sociology of legal profession, methods and police misconduct)

Gregory Shaffer, J.D. Stanford University, *Director, Center of Globalization, Law and Society and UCI Chancellor's Professor of School of Law; Political Science*

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Jane K. Stoeber, J.D. Harvard University, *Clinical Professor of School of Law*

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William C. Thompson, Ph.D. Stanford University, *Professor Emeritus of Criminology, Law and Society; Psychological Science; School of Law* (psychology and law, criminal justice, forensic science, expert evidence, human judgment and decision making, use of social science in appellate litigation)

Beatrice Tice, J.D. Stanford University, *Associate Dean for LL.M. and International Student Programs and Professor of School of Law*

Katharine Tinto, J.D. New York University, *Assistant Clinical Professor of School of Law*

Grace Tonner, J.D. Loyola Marymount University, *Clinical Professor of Law of School of Law*

Kerry Vandell, Ph.D. Massachusetts Institute of Technology, *Professor Emeritus of Paul Merage School of Business; School of Law; Urban Planning and Public Policy*

Geoff Ward, Ph.D. University of Michigan, *Associate Professor of School of Law; School of Law*

Jeffrey N. Wasserstrom, Ph.D. University of California, Berkeley, *UCI Chancellor's Professor of History; School of Law* (modern China, protest, world history)

Henry Weinstein, J.D. University of California, Berkeley, *Professor of School of Law*

Christopher A. Whytock, J.D. Georgetown University, *Professor of School of Law; Political Science*

Jessica L. Wimer, J.D. Indiana University, *Associate Dean for the Law Library and Research Professor of School of Law*

## Law (J.D.)

Our faculty has developed a cutting-edge curriculum that ensures students receive an education that is comparable to or exceeds that found at any top 20 law school, and also that addresses the changing demands of the legal profession.

Our goal is to do the best job in the country of training students for the practice of law at the highest levels of the profession. Our innovative curriculum stresses hands-on, practical training, interdisciplinary studies and public service.

### Graduation Requirements

To earn the Juris Doctor, students must complete six semesters of study, earn 86 law semester credits, pass all required classes, complete the upper-level writing requirement, and have a minimum 2.5 (C+) grade point average.

**All students must complete at least 68 credits in regularly scheduled Law School classes.**

"Regularly scheduled Law School classes" include

- Law School courses and seminars, including courses cross-listed at the Law School but originating in another school or department at the University;
- Law School clinics and clinical placements approved by the Associate Dean for Clinical Education and Service Learning;
- Credits from another ABA-approved law school or from approved study in a foreign exchange program.

'Regularly scheduled Law School classes' do not include

- independent study work;
- non-law classes;
- research tutorials;
- externships (other than those deemed to meet the Law School's clinical requirement);
- designated advanced clinics (see Course Catalogue for designations).

No more than 8 units of *optional credit/no credit* course work will count toward the 86-unit degree requirement.

## First-Year Course Work Requirements

Students must pass all UCI Law School first-year courses, or their substantial equivalents, with grades of 1.0 (D) or higher. The Assistant Dean for Student Services will determine whether classes taken at another law school are sufficient for transfer students to meet the UCI Law first-year course work requirement. If not, the student will be notified which courses are needed to complete the requirement.

## Upper-Level Academic Requirements

### 1. Writing Requirement

Students must complete at least one course where they are required to produce a major writing project with frequent feedback from a faculty member. This might include seminars, independent studies, or other work, so long as it involves substantial original analysis and research, multiple drafts, and is certified by the faculty members as meeting this requirement.

- At the completion of the first-year lawyering skills course, students will have a meeting with their professor and receive advice on the type of writing assistance they need and approaches they should consider in meeting the upper-level writing requirement.
- Students are strongly encouraged to develop a portfolio over the course of law school that will include all of their major written work and other forms of presentation.

### 2. Clinical Requirement

All students are required to complete at least one semester of clinical education, either in a Law School clinic or at a clinical placement that is approved by the Associate Dean of Clinical Education and Service Learning. This shall involve a live client or other real-life practical experience, appropriately supervised and designed to encourage reflection by students on their experiences and on the values and responsibilities of the legal profession, and the development of one's ability to assess his or her performance and level of competence.

## Master of Laws (LL.M.)

<http://www.law.uci.edu/llm/>

The UC Irvine School of Law Master of Laws (LL.M.) degree program at the University of California, Irvine School of Law offers a first-rate legal education to lawyers, judges, government officials, and others wishing to become educated about the legal system and practice of law in the United States. We offer a general LL.M. program that can be tailored to each individual's interests, thus uniquely equipping students with the knowledge and skills to excel in today's global legal community, whatever their personal and professional goals may be.

The program in a one-year, full-time, 24-credit course of study in advanced legal topics, designed for lawyers trained outside of the United States. Students are required to take one course: Introduction to American Law. For the remainder of their courses, students select from a broad range of courses across the upper-level curriculum. Dedicated staff are available to assist students in planning their course of study and, if desired, ensuring that students coursework meets the eligibility requirements of the California, New York, or other state bars.

The UC Irvine School of Law faculty seek highly-qualified candidates, who have excelled in legal training and practice in their home jurisdictions. Applications are accepted on a rolling basis for fall or spring matriculation (spring matriculation is only available for the LL.M. in American Law; the Graduate Tax LL.M. program only matriculates students in the fall). In order to begin the application process, candidates must submit the following:

- Online application and application fee
- Official copies of academic records from an ABA-accredited U.S. law school or a foreign law school with equivalent standards
- Statement of purpose
- Resume
- Two letters of recommendation
- Official proof of English competency

## Language Requirements

Applicants whose first language is not English must take one of three tests for English competency:

Test of English as a Foreign Language (TOEFL) with a minimum score of 90 on the internet-based test.  
Pearson Test of English (PTE) with a minimum score of 63.  
International English Language Testing System (IELTS) with a minimum score of 6.0.

It is not necessary to take all three tests. Applications are only considered complete upon receipt of official examination results. This requirement is waived for applicants who have completed a higher degree program at an accredited U.S. institution. Photocopies of test reports will not be accepted.

## Course Requirements

### First semester:

Introduction to American Law

### Second semester:

Elective courses from J.D. and LL.M. curriculum.

For the remainder of their courses, students select from a broad range of course across the upper-level curriculum. Dedicated staff are available to assist students in planning their course of study and, if desired, ensuring that students' coursework meets the eligibility requirements of the California, New York, or other state bars.

## LL.M. Graduate Tax Program

LL.M. students have the option to complete a specialization in tax (<https://www.law.uci.edu/gradtax/curriculum/>), allowing them the opportunity to complete courses from a broad range of advanced tax courses across the upper-level curriculum.

The School of Law's tax faculty believes strongly that every LL.M. student in the Tax Specialization should possess the same foundational knowledge of core tax topics. The program requires all students to take the following core courses as a single cohort:

12 credits of mandatory course work (most offered in the fall semester):

1. Corporate Taxation – 4 credits (fall semester)
2. International Taxation – 4 credits (fall semester)
3. Partnership Taxation – 3 credits (spring semester)
4. Tax Practice and Procedure – 1 credit (fall semester)

12 credits of elective course work, at least four of which must satisfy the Practical Tax Skills (PTS) requirement.

Students who have completed their law degree outside the United States must also complete an intensive short course Introduction to United States Taxation (offered during the orientation week, before regular classes start) and Introduction to American Law.

# School of Medicine

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- School of Medicine Alumni Relations

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## Michael J. Stamos, M.D., Dean

240 Irvine Hall, 949-824-1046

Admissions and Outreach: 949-824-5388

<http://www.som.uci.edu/>

## School of Medicine Overview

The UCI School of Medicine became part of the University of California in 1965. Prior to this time it was known as the California College of Medicine which traces its roots to a private institution founded in 1896.

## Mission Statement

The mission of the University of California, Irvine, School of Medicine is to promote biomedical sciences and medicine in Orange County, California, and beyond, through excellence in research, patient care, education, and community service. This mission is achieved through programs of excellence in the following:

**Education:** The School of Medicine is committed to provide educational programs of the highest quality to medical and graduate students, residents, fellows, allied health, practicing physicians, and other healthcare professionals. Educational programs are offered along the continuum of medical education with programs in undergraduate, graduate, and continuing medical education. These programs emphasize the most current knowledge in the health sciences and reflect the changing practice of medicine. Further, the School of Medicine's educational programs are designed to stimulate life-long self-learning and critical inquiry and to exemplify those human values necessary to fulfill the professional commitments of a career in the health sciences.

**Research:** Excellence in research is an essential feature of the School of Medicine. Therefore, the School is committed to develop and maintain research programs in the health sciences which seek to advance basic scientific knowledge and the prevention, diagnosis, and treatment of human illness.

**Clinical Care:** Recognizing its responsibility to meet the educational needs of students and the diverse needs of the patient community, the School of Medicine is committed to programs of clinical excellence across the spectrum of patient care disciplines.

**Service to the Public:** As a publicly assisted institution, the School of Medicine is committed to serve the community as a vital resource of expertise and knowledge. The School further serves the public through the training of health professionals whose backgrounds reflect California's ethnic and cultural diversity and whose professional careers address California's healthcare needs.

## Degrees

Biomedical and Translational Science	M.S.
Biomedical Sciences <sup>1</sup>	M.S., Ph.D.
Genetic Counseling	M.S.
Medical Science	M.S.
Medicine	M.D.



- <sup>1</sup> The School of Medicine's basic medical science departments of Anatomy and Neurobiology, Biological Chemistry, Microbiology and Molecular Genetics, Pathology and Laboratory Medicine, and Physiology and Biophysics offer graduate instruction leading to the M.S. and Ph.D. degrees in Biomedical Sciences.

The School of Medicine also offers the Medical Scientist Training Program (M.D./Ph.D.), the Program in Medical Education for the Latino Community (PRIME-LC), Leadership Education to Advance Diversity-African, Black and Caribbean (LEAD-ABC), Health Education to Advance Leaders in Integrative Medicine (HEAL-IM), an M.D./M.B.A. program in cooperation with The Paul Merage School of Business, an M.D./M.P.H. program in cooperation with the Program in Public Health, medical residency and fellowship programs, and continuing medical education for physicians and other health care professionals.

## Vision Statement

The University of California, Irvine, School of Medicine will achieve preeminence through the creation, application, and dissemination of new knowledge in the biomedical sciences and medicine. This will be accomplished through international leadership in biomedical research, development of new therapies, delivery of state-of-the-art medical care, and innovative biomedical education.

## Health Sciences Complex

The Health Sciences Complex is a 121-acre site that houses UCI's medical school facilities. Twenty-nine acres have been developed to provide space for teaching, research, and patient care as well as offices for departmental administration.

The School's basic science instructional programs are located in modern, well-equipped, medical sciences buildings. These units provide space for first- and second-year classes, lecture halls (including the Dr. S. Jerome and Judith D. Tamkin Student Lecture Hall), offices and laboratories for various basic and clinical departments. Other buildings house the School's laboratories and administrative offices.

The Medical Education building symbolizes the University's ongoing commitment to high-quality medical education and innovation. The \$40-million, 65,000-square-foot building serves as the hub for nearly all non-hospital related educational activities for UCI medical students, and incorporates the latest technology to help prepare tomorrow's doctors for healthcare in the digital age. The School of Medicine Educational Affairs Office is located in the Medical Education building, as well as the innovative Program in Medical Education for the Latino Community (PRIME-LC), the Leadership Education to Advance Diversity - African, Black and Caribbean (LEAD-ABC) program, and the Health Education to Advance Leaders in Integrative Medicine (HEAL-IM) program.

The Medical Education building's Telemedicine Center includes a 60-seat interactive televideo auditorium where students watch UCI physicians provide expert care over the Internet to patients in rural or other remote locations. Located on the second floor, the Clinical Skills Center is a cutting-edge facility for teaching and assessment of clinical skills, communication, and professionalism. The Clinical Skills Center includes 17 fully equipped patient exam rooms, a central control room for exam administration and recording of all activities, and a computer software system that focuses on the capture, debriefing, and assessment of medical training. The building also features an advanced Medical Education Simulation Center, complete with a four-suite Simulation Lab that utilizes high-fidelity human patient simulators with physiologically accurate responses to stimuli to enhance learning and assess competency. The lab is equipped with a fully operational anesthesia suite, a trauma suite, and a general ward environment. The Simulation Lab has two debriefing rooms for immediate feedback on performance as well as a large central control room for all simulation activities.

In addition, the 40,000-square-foot Plumwood House is devoted to basic research in the fields of neurological disorders, diagnostic systems and reagents, and industrial bioreactors. In this facility, faculty from the Department of Biological Chemistry share laboratory space with corporate researchers.

Outpatient services are available on campus through the Louis A. and Helen C. Gottschalk Medical Plaza and the Beckman Laser Institute & Medical Clinic. Together these facilities capitalize upon the broad range of diagnostic and therapeutic programs of the School as well as the extensive clinical expertise of the faculty. Both primary care and specialty services are offered through these facilities, as well as special programs in diabetes, multiple sclerosis, Alzheimer's disease, and inflammatory bowel diseases. The medical plaza also houses UCI Corporate Health Services. Housing one of the world's leading programs in medical laser technology, the Beckman Laser Institute offers state-of-the-art treatment for cancer and dermatological conditions. The Institute specializes in the development and application of laser and other optical technologies for the diagnosis and treatment of disease.

For the latest in diagnostic healthcare for eye diseases, the Gavin Herbert Eye Institute, which serves as home to the UCI School of Medicine Department of Ophthalmology, provides state-of-the-art services including computerized refraction analysis, glaucoma diagnosis, and ultrasound analysis of eye disorders.

## Biomedical Research Center

UCI's Biomedical Research Center (BRC) is a landmark public-private collaboration between UCI and businesses involved in biomedical, biotechnological, and healthcare services. The Center enables UCI researchers and participating companies to work alongside one another, combining basic science, clinical study, and product development to find new approaches to the diagnosis and treatment of disease. The William J. Gillespie Neuroscience Research Facility, the first of several BRC buildings, is the home of a core group of prominent scientists investigating the causes and cures for neurological disorders, including Alzheimer's disease, Parkinson's disease, schizophrenia, and spinal cord injury. The second building is the Robert R. Sprague Family Foundation Hall, where scientists work to reveal the role of genetics in cancer treatment and prevention. The third building, the Dottie and George Hewitt Research Hall, is home to a state-of-the-art General Clinical Research Center and internationally recognized

investigators studying infectious diseases, molecular medicine, immunology, and complementary and alternative medicine. The Sue and Bill Gross Stem Cell Research Center is the fourth building in UCI's Biomedical Research Center. Opened in 2010, this state-of-the-art research and clinical building fosters a multi-pronged approach to neurodegenerative repair and basic stem cell biology by supporting basic research, regenerative medicine, and drug-development programs.

## Chao Family Comprehensive Cancer Center

The Chao Family Comprehensive Cancer Center is the only National Cancer Institute (NCI)-designated comprehensive cancer center in Orange County and one of only 49 such centers in the country. With this designation, NCI recognizes UCI's excellence in providing world-class patient care and innovative research as part of "the backbone of NCI's programs for studying and controlling cancer." The Cancer Center is headquartered at the UCI Medical Center in Orange and also operates out of Sprague Hall on the UCI campus in Irvine. The 58,000-square-foot Chao Family Comprehensive Cancer Center in Orange provides an ideal setting for the practice of all the basic and clinical subspecialties involved in oncology care, including the application of the latest techniques for the diagnosis and management of patients with cancer. The 53,000-square-foot Sprague Hall in Irvine serves as the UCI hub for multidisciplinary basic and translational cancer research, housing faculty laboratories and specialized core research support facilities. Overall, more than 200 physicians and scientists, drawn from over 32 academic departments across six schools at UCI (Medicine, Biological Sciences, Physical Sciences, Information and Computer Sciences, Engineering, and Business), work together to understand the biological mechanisms underpinning cancer and to translate these discoveries into new therapies for the diagnosis, treatment and prevention of cancer of all types and degrees of severity.

## University of California, Irvine Health

UCI Health is comprised of a devoted team of nationally regarded physicians and nurses, researchers and clinicians, educators and students united by a single calling — to improve the lives of the people in our community and beyond. As the only academic health system in Orange County, this multifaceted organization is dedicated to the discovery of new medical frontiers, to the teaching of future healers and to the delivery of the finest evidence-based care. UCI Medical Center features a 417-bed acute care hospital providing tertiary and quaternary care, ambulatory and specialty medical clinics, behavioral health, and rehabilitation. It is the primary teaching hospital for the UCI School of Medicine.

- UCI School of Medicine (<http://www.som.uci.edu>), one of the top U.S. medical schools for research, is where our groundbreaking research and treatment advances are imparted to the rising practitioners of tomorrow.
- UCI Medical Center (<http://www.ucirvinehealth.org/locations/orange/uc-irvine-medical-center/>) has been rated among the nation's best hospitals by (<http://www.ucirvinehealth.org/news/2014/07/2014-americas-best-hospitals/>) *U.S. News & World Report* for 19 consecutive years. It is also ranked among the top 50 U.S. medical centers in gynecology, gastroenterology & GI surgery, and geriatrics care.
- The Chao Family Comprehensive Cancer Center (<http://www.ucirvinehealth.org/medical-services/cancer-center/>) is one of only 51 in the nation — and the only one in Orange County — designated for excellence by the National Cancer Institute.
- UCI Medical Center is Orange County's only Level I adult and Level II pediatric trauma center, which means trauma and critical care physicians are fully equipped to treat life-threatening injuries 24 hours a day, seven days a week.
- The Comprehensive Stroke & Cerebrovascular Center is the first in Orange County to be certified as a Comprehensive Stroke Center by the nation's preeminent health care standard-setting organization.
- Numerous health providers throughout Orange County apply the most advanced medical knowledge — for diabetes, neuromuscular disease, women's health, and more.
- This union of discovery, teaching and healing has enabled UCI Health to pioneer new therapies and techniques that have been adopted by institutions across the nation.

More information is available at the UCI Health website (<http://www.ucirvinehealth.org>).

## UCI Family Health Center - Santa Ana and Anaheim Locations

The UCI Family Health Centers are designated as Federally Qualified Health Centers (UCI FQHC). The UCI FQHC Board of Directors is made up of community members and patients, who in collaboration with UCI Health, deliver primary care services to the under-served communities in Orange County. This collaboration is very unique, and although there are other FQHCs in the country with academic affiliations, the UCI FQHC and UCI Health have a co-applicant agreement that is recognized by the Health Resources and Services Administration (an agency of the U.S. Department of Health and Human Services).

UCI FQHC is the oldest FQHC in Orange County. It provides care to all patients regardless of their ability to pay. The vast majority of patients served at the UCI FQHC are Medi-Cal patients and predominantly monolingual Spanish speakers. The core services delivered at these locations are primary care - Adult, Pediatric, and Women's health. The Departments of Family Medicine, Pediatrics, Obstetrics and Gynecology, and the Sue and Bill Gross School of Nursing provide these services.

UCI FQHC serves as a training ground for both residents and medical students which gives learners a unique opportunity to manage complex medical cases while addressing the social determinants of health. In addition, the health centers offer an array of other services.

Behavioral Health is offered by Licensed Clinical Social Workers to address the social stressors affecting our patients and providing counseling for psychological and substance use disorders. Patients can also access our onsite Oral Health services that provide care for all ages and complements the medical care delivered. There are unique pharmacy services offered at the Santa Ana location. These services not only include medication dispensing



but also medication reconciliation and diabetes care management visits performed by our pharmacist. Our pregnant patients can access the various services listed above as well as specific Perinatal Education offered through our Comprehensive Perinatal Service Program (CPSP) staff.

Once a month, both health centers provide a mobile food pantry in collaboration with Second Harvest Food Bank. Patients are able to obtain fresh fruits and vegetables to improve their healthy eating habits. In addition, patients can see our certified dietitian for further counseling and monitoring of weight and eating habits. Our dietitian sees all patients including children and pregnant patients. Other collaborations have led to unique Group Medical Visits (GMV) that are offered at both locations. These GMVs provide a unique environment where patients come together to address a specific health issue they share in common, such as diabetes. The facilitators and providers work cohesively to help GMV patients to better understand their medical conditions and promote healthy lifestyle changes.

The uniqueness of having the UCI FQHC collaborate with UCI Health allows all learners to experience a comprehensive approach in dealing with healthcare. This setting takes place in an environment where the vast majority of patients are underserved and would likely not get this level of care elsewhere.

## Affiliated Hospitals and Clinics

Additional major teaching and research programs of the School of Medicine are conducted at the Veterans Affairs Long Beach Healthcare System, Children's Hospital of Orange County (CHOC), Long Beach Memorial Medical Center, and Miller Children's Hospital (Long Beach). Other academic programs are conducted in affiliation with Kaiser Foundation Hospital (Anaheim, Bellflower, Irvine, and Riverside), Children's Hospital of Los Angeles, Western Medical Center (Tustin/Santa Ana), and St. Jude's Hospital (Fullerton).

## School of Medicine Alumni Relations

The UCI School of Medicine is the oldest, continually operating medical school in the Los Angeles/Orange County area. It began as in 1896 as the Pacific College of Osteopathy (PSO) and some years later became the College of Osteopathic Physicians and Surgeons. It then evolved into the California College of Medicine in 1962 and subsequently joined the UC system in 1965. Alumni Relations provides programs and services for nearly 5,000 alumni of the School as well as for students. From financial support to Honor's Night awards, mentorship to reunions, Alumni Relations seeks to provide a cornerstone from which students and alumni can benefit from their relationships to one another and in so doing, strengthen the School of Medicine.

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- Office of Medical Education
- Office of Student Support
- Financial Aid
- Curricular Affairs
- Division of Educational Technology
- Continuing Medical Education
- Graduate Medical Education

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## Office of Medical Education

**Khanh-Van Le-Bucklin, M.D., Vice Dean for Medical Education:** 949-824-8405

**Julie Youm, Ph.D., Assistant Dean for Education Compliance and Quality:** 949-824-3913

**Shaun Langer, Chief Administrative Officer:** 949-824-1567

The Vice Dean for Medical Education, in cooperation with the Academic Senate faculty, is responsible for the administrative oversight of the educational program leading to the M.D. degree, postgraduate residency and fellowship programs, and continuing medical education programs provided for practicing physicians and allied health personnel. Housed within the Office of Medical Education are the divisions/offices of Admissions, Curricular Affairs, Student Support, Education Compliance and Quality, Educational Technology, Graduate Medical Education and Continuing Medical Education. The Office of Medical Education provides services for the M.D. program, which include curriculum development, implementation, management, and evaluation. Medical Education also offers student support services, which include academic advising, learning skills counseling, psychological/wellness counseling, career advising, financial aid, and student records. Additional student services are coordinated by Medical Education through general University offices, which include housing, student health, and disability services.

## Office of Student Support

**Megan Boysen Osborn M.D., Associate Dean, Students:** mbo@uci.edu (%20mbo@uci.edu)

**Kyle Parades, M.D., Assistant Dean, Student Affairs:** paredesk@uci.edu

**Ursula Worsham, Ed.D., Executive Director of Student Support:** uworsham@uci.edu (%20uworsham@uci.edu)

**Nancy Guirguis, Ed.D., Director of Student Affairs:** nancy.guirguis@uci.edu

**Ashley Selva-Rodriguez, Ed.D., Learning Skills Specialist:** aselvaro@uci.edu

**Tina Allee, M.D., School of Medicine Psychiatrist:** DrAllee@TMShealthandwellness.com

**Anju Hurria, M.D., Director, School of Medicine Wellness:** ahurria@uci.edu

The mission of the Office of Student Support is to create an environment within the School of Medicine community that fosters student wellbeing attainment of the School of Medicine educational objectives. This is accomplished through ensuring that student participation in the educational program occurs in a manner consistent with School of Medicine policies and regulations, and through the provision of support services that facilitate optimal student participation in the educational program. To accomplish the educational assurance mission, the Office of Student Support disseminates information regarding academic policies and regulations, provides administrative and executive support for the faculty Committee on Promotions and Honors, and facilitates the institutional recognition of student achievement through the conduct of various School of Medicine events. To accomplish the educational support mission, the Office of Student Support provides academic, personal, psychological, career, and financial counseling; academic skills assessment and learning resources support, student wellness programs, student facilities support, initiatives to enhance the learning environment, and support for a variety of student organizations and informal activities.

## Financial Aid

**Luis Medina, Director:** 949-824-6476

**May Chan, Counselor:** 949-824-6476

The UCI School of Medicine Financial Aid Office provides financial assistance and financial counseling services to entering and continuing medical students. The office secures, manages, and provides funds in the form of scholarships, grants, and loans to assist in meeting students' educational expenses. The office coordinates financial aid application materials; tracks documents needed to complete an application; reviews and evaluates information provided by applicants; awards financial aid programs; and conducts research to determine basic educational expense budgets. It also provides students with information on policies and procedures, cost of attendance, and eligibility criteria. In providing counseling services, the office advises students, reviews their individual circumstances, and provides financial assistance within financial aid program guidelines. It presents financial aid workshops for prospective and enrolled students to enhance their knowledge about financial aid programs and the application process, provides financial literacy and debt management counseling, and conducts entrance and exit interviews.

## Curricular Affairs

**Warren Wiechmann, M.D., M.B.A., Associate Dean of Curricular Affairs - Clinical Sciences:** 949-824-8358

**Jeffrey Suchard, M.D., Associate Dean of Curricular Affairs - Basic Sciences:** 949-824-4610

**Terri Dean, Director:** 949-824-4609

This office provides support related to curricular issues for the School of Medicine, departments, faculty, and students; initiates curriculum review and innovation to meet the challenges of contemporary medical education; establishes and reviews the objectives of the School of Medicine and ensures individual courses are teaching to meet the objectives; serves as facilitators of new programs and curriculum and supports working committees during curriculum development; facilitates and monitors curriculum integration; and maintains records on course materials and grading policies. This office is responsible for curriculum documentation for review by the Curriculum and Educational Policies committee; the collection of course evaluations by students; maintaining accurate information on core and elective curriculum; and assessing the success of the current programs.

## Division of Educational Technology

**Warren Wiechmann, M.D., Associate Dean of Educational Technology:** 949-824-3837

**Julie Youm, Ph.D., Director:** 949-824-3913

The Division of Educational Technology is dedicated to enhancing the medical education experience through innovation and the promotion of new technologies, including iPads, simulation, and ultrasound. The division provides quality technology support and media services for School of Medicine faculty, students, and staff, and collaborates within the Office of Medical Education to effectively integrate technology into the medical school curriculum.

## Continuing Medical Education

**Ellen Seaback, CMP, CAE, CHCP, Executive Director:** 949-824-1150

The Office of Continuing Medical Education provides educational activities to physicians and other health care professionals to reinforce basic medical knowledge, improve competency, enhance performance-in-practice, and improve patient safety and outcomes of patient care. Additionally, these activities impart practical, evidence-based updated information on clinical practice and health care delivery; introduce new ideas, skills, and technologies; and disseminate pertinent research findings. The program encompasses a broad and comprehensive range of topics based on identified gaps in the learning needs of the communities served. As an academic center of excellence that includes the UCI Medical Center, emphasis is placed on the identification of areas for improvement through the system's Patient Safety and Quality Improvement Department. UCI School of Medicine is accredited by the ACCME with commendation.

## Graduate Medical Education

**Deena Shin McRae, M.D., Associate Dean of Graduate Medical Education:** 714-456-3526

**Matthew Dolich, M.D., Assistant Dean of Graduate Medical Education:** 714-456-3526

**Courtney Strayer, Director:** 714-456-3526

The UCI School of Medicine attracts top students from prestigious medical schools and talented residents from reputable training programs nationwide, offering 63 ACGME-accredited residency and fellowship training programs with approximately 700 positions. UCI Medical Center, Tibor Rubin Veterans Affairs Medical Center, Children's Hospital of Orange County, Long Beach Memorial Medical Center and Miller Children's Hospital are the integrated training sites for the graduate medical education programs.

Residents and fellows in all programs rotate to UCI Medical Center. Residents in anesthesiology, emergency medicine, dermatology, diagnostic radiology, interventional radiology, internal medicine, subspecialties of medicine, neurology, ophthalmology, pathology, surgery, physical medicine and rehabilitation, radiation oncology, family medicine, orthopaedics, otolaryngology, plastic surgery, and urology also rotate to the Tibor Rubin Veterans Affairs Medical Center in Long Beach. Residents in medicine, medicine sub-specialties, anesthesiology, radiation oncology, obstetrics and gynecology, pathology, pediatrics, physical medicine and rehabilitation, plastic surgery, and surgery also rotate to the Long Beach Memorial Hospital Medical Center/ Miller Children's Hospital. UCI also has an established affiliation with the Children's Hospital of Orange County (CHOC), which is a major training site for the combined program in pediatrics and other specialties. Other affiliations such as Kaiser Permanente, Orange County Global Medical Center, St. Jude's Hospital, and Children's Hospital Los Angeles offer additional training in specialized fields.

Inquiries about specific programs should be directed to the Program Director as listed in the *Directory of Residency Training Programs*, published each year by the American Medical Association.

All ACGME-accredited residency and fellowship programs meet the formal standards of the Accreditation Council for Graduate Medical Education and the appropriate specialty boards. The University of California, Irvine (UCI) adheres to the Health Professions Educational Assistance Act of 1976, P.L. 94-484, Section 709, regarding shared-schedule residency training positions.

## The M.D. Program

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## Admissions

**University of California, Irvine**  
**School of Medicine**  
**Office of Admissions**  
**Medical Education Building**  
**Irvine, CA 92697-4089**  
**949-824-5388 or 800-UCI-5388**  
<http://www.meded.uci.edu/admissions/>

The UCI School of Medicine is a member of the American Medical College Application Service (AMCAS). All students who seek entrance to the UCI School of Medicine must complete the American Medical Colleges Application Services (AMCAS (<http://www.aamc.org/students/amcas/start.htm>)) application. Applications must be submitted between June 1 and November 1 of the year preceding anticipated admission.

Additional information for the following programs is included below:

- Medical Scientist Training Program (MSTP, M.D./Ph.D.)
- M.D./M.B.A., M.D./M.P.H.
- Health Education to Advance Leaders in Integrative Medicine (HEAL-IM)
- Leadership Education to Advance Diversity- African, Black and Caribbean (LEAD-ABC)
- Program in Medical Education for the Latino Community (PRIME-LC)

## Selection Factors

The UCI School of Medicine seeks to admit students who are highly qualified to be trained in the practice of medicine and whose backgrounds, talents, and experiences contribute to a diverse student body. The Admissions Committee carefully reviews all applicants whose academic record and MCAT scores indicate that they will be able to handle the rigorous medical school curriculum. In addition to scholastic achievement, applicants are evaluated on their extent and level of research involvement, exposure and involvement in a health care setting, and community service. Dedication, reliability, altruism, and leadership as well as interpersonal communication skills are attributes that are given high regard when considering applicants for a position in the class. Careful consideration is given to applicants from disadvantaged backgrounds and those that have demonstrated the potential to work with the medically under-served, in particular the Latino population in California.

After receipt of the AMCAS application, applicants may be invited to complete a secondary application and will be required to submit a nonrefundable application fee of \$120. Upon further review by the Admissions Committee, approximately 600 applicants will be invited to interview. Applicants are interviewed by both faculty and current medical students. Regional interviews are not available.

## Requirements for Admission

Students can be considered for admission to the School of Medicine if they meet the following requirements:

1. All applicants must complete the American Medical Colleges Application Service (AMCAS) application (<https://www.aamc.org/students/applying/amcas/>) between June 1 - November 1, of the application year. Applicants must have a minimum of three years (90 semester units) of undergraduate coursework at an accredited U.S. college or university at the time the application is submitted. All course work must be verified by AMCAS before an applicant can be advanced to the admissions process. For purposes of evaluation, letter or numerical grades are preferred for course work, particularly for the required subjects listed below. All prerequisite courses listed as "in progress" on the AMCAS application and UCI School of Medicine Secondary Application must be successfully completed by July 15 of the matriculation year. Failure to meet the requirements or falsification of information are grounds for rejection or dismissal.
2. Applicants must complete the following college course requirements prior to matriculation:
 

Subject	Requirement	Comments
Biology	1.5 Years: 3 semesters or 5 quarters.	Must include one upper-division Biology course.
Chemistry	2 Years: 4 semesters or 6 quarters.	Must include biochemistry, inorganic and organic chemistry courses.
Physics	1 Year: 2 semesters or 3 quarters.	
3. Applicants are strongly encouraged to have completed their basic science requirements at the time they submit their application. No specific major is required, however, demonstrated ability in the sciences is of great importance. In addition, applicants are advised to take advantage of the intellectual maturation afforded by a well-rounded liberal arts education. English, the humanities, and the social and behavioral sciences are considered particularly important. The following courses are also recommended but not required: molecular biology, cell biology, genetics, vertebrate embryology, psychology, biostatistics, calculus, English composition, and Spanish.
4. Medical College Admissions Test (MCAT) (<https://www.aamc.org/students/applying/mcat/>) must have been taken within the three years preceding June 1 of the application year and no later than September 30 of the application year.
5. Three to six current letters are suggested. We recommend that at least two of the letters be from senior professors who can evaluate your academic abilities. If you have been involved in research, clinical, community service, or other significant extracurricular activities, it is recommended that you submit a letter from your mentor, supervisor or advisor. The Admissions Committee will only be reviewing letters of recommendation from those applicants who received a secondary application.
6. A criminal background check is conducted on all accepted applicants.
7. All students matriculating to the UCI School of Medicine must be able to meet the Technical Standards available at the School of Medicine Admissions website (<http://www.meded.uci.edu/admissions/>).

## Outreach

Outreach efforts coordinated by the Office of Diversity and Inclusion housed in the School of Medicine are designed to introduce students to the medical profession during their high school and undergraduate education. An additional goal of this office is to create pathways of access to students with an interest in health careers through community outreach and engagement, hosting students on our campus for the annual Open Medical School event, and summer programming designed to introduce pre-medical students to the realities of medical training and the preparation desired. The UCI School of Medicine is committed to creating a health workforce that reflects and is responsive to the diverse communities we serve by recruiting students from socioeconomically disadvantaged groups with a desire to serve in the medically underserved communities in California.

## Medical Student Advisor System

The School of Medicine provides a comprehensive academic advising and assistance program that spans the full duration of the students' educational program.

### Academic and Career Advisors

**Megan Boysen Osborn, M.D., Associate Dean, Students:** mbo@uci.edu (%20mbo@uci.edu)

**Kyle Parades, M.D., Assistant Dean, Student Affairs:** paredesk@uci.edu (paredesk@uci.edu%C2%A0%C2%A0)

**Cristobal Barrios, M.D., Assistant Dean, Admissions:** cbarrios@uci.edu

**Nancy Guirguis, Ed.D., Director, Student Affairs:** nancy.guirguis@uci.edu (%20nancy.guirguis@uci.edu)

**Ashley Selva-Rodriguez, Ed.D., Learning Skills Specialist:** aselvaro@uci.edu (%20aselvaro@uci.edu)

Student academic performance is monitored on a monthly basis by the Educational Support Committee. The committee develops specific action plans for each student experiencing academic difficulty. All students are also assigned a faculty Career Advisor beginning early in their first year.

A four-year Career Advising Curriculum has been developed for all medical students. During the new student orientation, the Assistant Dean of Student Affairs leads a "Career Perspectives" workshop, which provides an overview of the career curriculum and introduces the AAMC Careers in Medicine program to the students. Monthly specialty workshops are provided to the first and second year classes during lunch at the Irvine campus and a two-year rotating schedule of specialties has been developed. Similarly, workshops are given at the Medical Center in Orange for the third year students. The assigned Career Advisor provides academic support as well as career counseling support while the student is enrolled in the school of medicine. Assigned Career Advisors provide guidance on factors such as elective selection and career path requirements. Students also have access to a group of faculty from various departments who have agreed to provide specialty-specific academic advice in their disciplines (Specialty Mentors).

In addition to the Career Advisors and Specialty Mentors, the students have access to services provided through the Learning Skills Specialist. Students can seek one-on-one counseling from the Learning Skills specialist or attend workshops that have been created to improve study skills and time management.

### Peer Review and Peer Counseling Program

**Megan Boysen Osborn, M.D., Associate Dean, Students:** mbo (%20mbo@uci.edu)@uci.edu (%20jtoohy@uci.edu)

**Anju Hurria, M.D., M.P.H., Director, SOM Wellness:** ahurria@uci.edu (%20ahurria@uci.edu)

The School of Medicine has an informal peer review process, aimed at early detection and assistance for medical students who are experiencing difficulty such as professional conduct problems, suspected impairment, violation of the honor code, or violation of any University policy, regulation, or rule. The Peer Review Committee is comprised of two representatives from each class, the student body co-presidents, and two advisory faculty members. The committee operates within guidelines set jointly by the School of Medicine administration and the student body. Cases involving serious professional misconduct are referred to the Dean's Office. The Promotions and Honor Committee conducts hearings and may impose sanctions or provide assistance to the student.

## Master of Science in Medical Science (M.S.)

The Master of Science in Medical Science is designed to prepare the next generation of leaders and researchers in health care. After obtaining a strong foundation in the medical sciences, some students may decide that they no longer wish to pursue the M.D. degree. The M.S. in Medical Science provides an innovative degree for students who wish to pursue careers in health care, but realize that direct patient care may not be the best fit for them.

## Medical Scientist Training Program (M.D./Ph.D.)

**Alan Goldin, M.D., Ph.D., Director:** 949-824-5334

Exceptionally well-qualified students interested in careers in academic medicine, and with demonstrated research accomplishments, may be considered for admission to the Medical Scientist Training Program (MSTP). Students in this program pursue a combined curriculum for an M.D. from the School of Medicine and a Ph.D. from any of the graduate programs at UCI for which they qualify. The normative time for completion of the program is eight years, and students holding either degree prior to admission are not eligible for MSTP. The maximum time for completion of the program is 10 years. Additional information is available from the MSTP Administrator's Office, 949-824-5264; mstp@uci.edu; or visit the Medical Scientist Training Program website ([www.mstp.uci.edu](http://www.mstp.uci.edu)).

Applicants for the Medical Scientist Training Program are required to answer supplementary program-specific questions on the secondary application (through the School of Medicine Office of Admissions). Students accepted into the program have the option of pursuing graduate study in any of the graduate programs at UCI for which they qualify. Although a specific graduate department need not be chosen at the time of admission, students are expected to have selected a field for their graduate studies. Financial support in the form of a fellowship, which includes a stipend as well as tuition and fees, is provided. Applicants not accepted into MSTP may be considered separately for admission to the School of Medicine.

## M.D./M.B.A. Program

**Kyle Paredes, M.D., M.B.A., Program Director:** 949-824-5932



The M.D./M.B.A. program requires five or six years for completion. It is aimed at individuals who are exceptional in ability and motivation and who seek a career as physicians with major responsibility for administration and management in health care organizations and institutions. Students in this program pursue a combined curriculum for an M.D. from the School of Medicine and an M.B.A. from The Paul Merage School of Business.

Students must be currently enrolled in the M.D. program in order to apply to the combined M.D./M.B.A. program. During their second year of medical school, interested students submit an application to The Paul Merage School of Business Admissions Committee, after review by the School of Medicine. Final acceptance to the program is granted by The Paul Merage School of Business, and M.B.A. course work begins following completion of the student's third year of medical school. Students should be aware that enrollment in the M.D. program does not guarantee acceptance into the M.B.A. program.

The MCAT, along with the completion of three years of medical school training in good standing and passage of USMLE Step 1, currently serve as a waiver for the GMAT entrance examination usually required for application to the M.B.A. program.

## **M.D./M.P.H. Program**

**Bharath Charkravarthy, M.D., M.P.H., Director**

The M.D./M.P.H. program requires five years for completion. It is aimed at individuals who are seeking a career as physicians concerned about making a significant difference in community disease prevention. Students in this program pursue a combined curriculum for an M.D. degree from the School of Medicine and an M.P.H. degree from the Program in Public Health.

Students must be currently enrolled in the M.D. program in order to apply to the dual M.D./M.P.H. program. During their second or third year of medical school, interested students submit both the Application for Graduate Admission and the School of Public Health Application Service (SOPHAS) application in order to be considered for admission. Final acceptance to the program is granted by the Program in Public Health, and M.P.H. coursework begins following the student's third year of medical school. Students should be aware that enrollment in the M.D. program does not guarantee acceptance into the M.P.H. program.

The MCAT, along with the completion of three years of medical school training in good standing, currently serve as a waiver for the GRE entrance examination usually required for application to the M.P.H. program. The total number of units required to graduate from each program separately are satisfied in the M.D./M.P.H. program.

Contact the M.D./M.P.H. Student Affairs Officer at 949-824-7095 for more information.

## **Health Education to Advance Leaders in Integrative Medicine (HEAL-IM)**

**David Kilgore, M.D., FAAFP, Director:** [dkilgore@uci.edu](mailto:dkilgore@uci.edu)

HEAL-IM is designed to provide a future generation of physicians with additional training and skills in the tools and philosophies of integrative medicine. The longitudinal curriculum supports the study of the practice of evidence-based, compassionate, whole-person care to benefit the treatment of patients and families, our community and healthcare as a whole, setting the stage for future professional study and practice. Medical students in the HEAL-IM program may also choose additional elective time completing certified integrative medicine training (in acupuncture, osteopathic manipulation therapy, medical hypnosis and culinary medicine) or spend an optional fifth year pursuing a master's degree supporting the effective implementation of future integrative medicine practices.

Applicants to the UCI School of Medicine are eligible to apply upon acceptance. The program is committed to offering a partial scholarship towards tuition and fees for the senior year for students in good standing in the program, as well as funding towards fees for an Integrative certificate program or a masters year. The program will also cover the tuition and lodging fees for the summer LEAPS into IM program, as well as attendance at the Scripps Evidence-Based Natural Supplements conference in San Diego during MS2 and MS4 years.

Learn more about the HEAL-IM Program at <https://www.meded.uci.edu/curricular-affairs/heal-im.asp>.

## **Leadership Education to Advance Diversity-African, Black, and Caribbean (LEAD-ABC)**

**Carol Major, M.D., Director:** [SOMdiversity@hs.uci.edu](mailto:SOMdiversity@hs.uci.edu)

The LEAD-ABC mission-based program is intended to develop physician leaders to address the health care needs of the African, Black, and Caribbean communities. Students in the program will receive in-depth training on the unique health care concerns in these communities. The program offers an optional year to obtain a master's degree in an area that will advance their ability to effect change in delivery of health care for these communities.

Applicants to the UCI School of Medicine are eligible to apply once they are accepted into the School of Medicine. The program selects two students per entering class who will receive tuition and fees for the four years of medical school as well as an optional fifth year for completion of a master's program.

Learn more about the LEAD-ABC Program at <https://www.meded.uci.edu/curricular-affairs/lead-abc.asp>.

## **Program in Medical Education for the Latino Community (PRIME-LC)**

**Charles Vega, M.D., Director:** 949-824-7136

The Program in Medical Education for the Latino Community (PRIME-LC) responds to the increasing demand for physician-leaders who are culturally and linguistically competent to address the health care delivery, research, and policy needs of underserved Latino communities in California. Students in PRIME-LC complete additional value-added curriculum in addition to their medical training in order to reach their goals of leading communities, and they also complete a Master's degree program of their choice. The first residency positions in any UC PRIME opened in the UCI Family Medicine program in 2010.

To be considered for PRIME-LC, students should have experience in working in disadvantaged communities, particularly Latino communities. At least conversational Spanish is required as well. The most important factor in PRIME-LC Admissions is the long-term commitment to being a physician-leader for Latino communities.

The PRIME-LC supplemental application is part of the UCI School of Medicine secondary application and must be completed to be considered for acceptance. Applicants selected for faculty and student interviews are required to undertake a third interview in Spanish to evaluate conversational skills and commitment to service. All interested applicants, including those who are not currently California residents, are encouraged to complete the PRIME-LC application. All PRIME-LC students receive a substantial financial award in their fifth year of training. Applicants not accepted into PRIME-LC may be considered separately for admission to the regular School of Medicine M.D. program. For more information contact 949-824-7136; [primelc@uci.edu](mailto:primelc@uci.edu); or visit the PRIME-LC website (<http://www.meded.uci.edu/curricular-affairs/prime-lc.asp>).

## The M.D. Curriculum

The UCI medical curriculum continues to meet the changing needs of medical education within all four years of instruction. Indeed, the School of Medicine faculty views curriculum development as a continual process and feels that medical education and teaching innovations must be encouraged and supported. The curriculum is designed to encourage medical students to become participants in their education process, to be active rather than passive learners, to become lifelong learners, and to use cooperative and team-learning principles.

UCI is dedicated to the nurturing of humanistic, caring physicians with top-notch clinical expertise and skills. The School strives for this through a curriculum that is not only anchored in the science of medicine but also provides meaningful experiences in the humanistic dimensions of medicine. In this context, the faculty endeavors to provide students with experiences in areas such as communication and empathy, ethics and professionalism, diversity awareness, and cultural sensitivity and medical humanities. The faculty also feels that the curriculum should strive to integrate basic and clinical sciences by bringing substantial clinical material into the early phases of medical education.

The School has achieved vertical integration of the curriculum with the development of a series of "Clinical Foundations" courses. The courses are longitudinal multidisciplinary experiences broadly designed to prepare students for their future careers in medicine through the application of experiential and self-directed learning principles. First- and second-year students begin to prepare for their clerkships through clinical exposures featuring standardized patients and clinical shadowing experiences. These courses also utilize small group learning sessions to reinforce core concepts of patient-physician interactions and introductory clinical reasoning skill development. During the Clinical Foundations course in the third and fourth years, students explore many of the crucial issues first presented during the introductory courses. During this segment greater emphasis is placed on advanced skill acquisition and more mature professional role development.

To satisfy the requirement for the M.D. degree, each medical student must successfully complete the full curriculum. Students must also pass both Step 1 and Step 2 of the United States Medical Licensing Examination (USMLE) and successfully pass a Clinical Performance Examination (CPX) prior to graduation.

An ongoing academic monitoring program is coordinated by the Office of Student Support, which identifies students early who might be experiencing academic difficulty and provides them with resources to successfully complete their course work. Faculty advisors are assigned to students during their first and second years. Students have advisory sessions with M.D. faculty prior to the scheduling of their fourth-year course work. A Learning Resources Program is available to provide tutorial assistance and study skills training.

## Curricular Policies

The Curriculum and Education Policy (CEP) Committee is a committee of the Academic Senate that oversees the curriculum and governs policies pertaining to the curriculum. The CEP reviews and sets the standards of achievement for courses, clerkships, and the curriculum as a whole, and their bylaws dictate graduation requirements. The Committee on Promotions and Honors (P&H) is a standing committee of the faculty and enforces the standards of achievement and curricular policies set by the CEP Committee. P&H monitors the progress of all students throughout their educational experience.

A listing of the curricular policies, as well as information regarding registration, rules and regulations, grading procedures, and requirements for academic advancement, are contained in the School of Medicine Handbook (<https://ucisom.instructure.com/courses/106/>), which is available at the School of Medicine Office of the Medical Education website (<http://www.meded.uci.edu/>).

### First and Second Years:

#### Basic Science and Pre-clinical Course Work

##### First Year

Clinical Foundations I

Anatomy and Embryology

Behavioral Science and Ethics 1  
 Histology  
 Immunology  
 Medical Biochemistry and Molecular Biology  
 Medical Genetics  
 Neuroscience  
 Patient-Centered 1 Clerkship  
 Physiology/Pathophysiology

### **Second Year**

Clinical Foundations II  
 Behavioral Science and Ethics II  
 Pathology  
 Medical Microbiology  
 Medical Pharmacology  
 Patient-Centered 2 Clerkship

### **Third and Fourth Years<sup>1</sup>:**

#### **Clinical Science Course Work**

##### **Third Year**

Clinical Foundations III  
 General Surgery Clerkship  
 Family Medicine Clerkship  
 Inpatient Medicine Clerkship  
 Neuroscience Clerkship  
 Obstetrics and Gynecology Clerkship  
 Pediatrics Clerkship  
 Psychiatry Clerkship  
 Radiology Clerkship

##### **Fourth Year**

Clinical Foundations IV  
 Emergency Medicine  
 Intensive Care Unit  
 Senior Subinternship  
 Electives

<sup>1</sup> The sequence of third and fourth years varies.

## **Curricular Descriptions**

### **First-Year Curriculum**

#### **Clinical Foundations I**

Clinical Foundations I, first of the four-part Clinical Foundations series, serves as the introductory clinical medicine course for first-year medical students. Participating students learn core skills in physician-patient communication, medical interviewing, physical examination, and health promotion. The course is horizontally integrated with the basic science curriculum. The series includes a variety of small and large group sessions facilitated by our Dean's Scholars clinical faculty. Students complete multiple medical interviews, physical examinations, and patient write-ups for which they receive feedback designed to improve proficiency. (*Med Ed 554A-B-C*)

#### **Gross Anatomy and Embryology**

The structure of the human body is taught in Gross Anatomy and Embryology. Emphasis is placed on normal structure as it relates to function, with consideration of abnormal structures that may be revealed in a clinical setting. Anatomy is taught through a regional approach, with an emphasis on laboratory dissections and demonstrations, augmented by lectures, radiographic films, discussions, and clinical correlate material. The course includes a detailed consideration of the embryologic aspects of human development. (*Anatomy 500A-B*)



### **Behavioral Science & Medical Ethics I**

This clinically oriented course will cover foundation topics in behavioral science and medical ethics, and will introduce clinically relevant social issues such as dealing with domestic violence as it presents clinically, treating minority or under-served populations and cultural competence. (*Psych 505A*)

### **Histology**

Histology is designed to provide students with knowledge of the major features of the structural organization of cells, tissues and organs, and how that organization is related to function. Emphasis is placed on normal structure and function, with consideration of abnormalities in clinical cases. (*Anatomy 503A-B*)

### **Immunology**

Immunology covers the cellular and molecular basis of immune responsiveness and the roles of the immune system in both health and disease. The material is presented in lectures and clinical correlates. (*Mic Bio 544*)

### **Medical Biochemistry and Molecular Biology**

This course covers the following topics from a biomedical perspective: protein and nucleic acid biochemistry, carbohydrates, lipids, amino acids, purines and pyrimidines, genome structure, molecular mechanisms of development, and signal transduction. (*Biochem 523*)

### **Medical Genetics**

Medical Genetics reviews the basic principles of human genetics related to disease. Assessment of patterns of genetic risk, screening for genetic diseases, and cytogenetics and biochemical diagnosis are presented. Utilization of the human gene map and DNA sequence information for molecular genetic diagnosis are discussed. Students are introduced to the use of genetic databases and bioinformatics. Approaches to treatment of genetic diseases are presented. Legal, ethical, and social aspects of diagnosis and management of genetic disease are discussed. (*Peds 511*)

### **Neuroscience**

The objective of this course is to provide students with the fundamental concepts, vocabulary, and learning strategies to attain a level of proficiency in basic integrative neurosciences so that they will develop an understanding in the clinical neurosciences throughout their careers as physicians. The course is integrative in the sense that the underlying knowledge of molecular, cellular, physiological, developmental, and neuroanatomical organization of the nervous system is brought together in each lecture block with clinical themes and examples in lectures, and which is further reinforced by clinical correlates given by clinicians. The course emphasizes knowledge of the nervous system using lessons from clinical neuroanatomy, systems neurosciences, and regional and developmental neuroanatomy. (*Anatomy 502A*)

### **Patient-Centered 1 (PACE-1) Clerkship**

This course is designed to introduce clinical skills to students and integrate basic science training through early exposure to the clinical setting. Training will be accomplished with weekly clinic sessions with a specific preceptor, with reflection sessions to reinforce clinical lessons. Students will be expected to achieve learning objectives in patient care, professionalism, interpersonal and communication skills, and medical knowledge. (*Med Ed 557*)

### **Physiology/Pathophysiology**

This course consists of lectures, clinical correlates, hands-on workshops, and small group discussions, covering the classical concepts of medical physiology. Specific topics include hemostasis, blood, neurophysiology, cardiovascular, respiratory, renal, gastrointestinal, endocrine, exercise, temperature regulation, and sexual physiology. (*Physio 543A-B*)

### **Second-Year Curriculum**

#### **Clinical Foundations II**

Clinical Foundations II, second of the Clinical Foundations series, builds second-year medical students' clinical skills. Students learn advanced skills in history-taking, physical diagnosis, and clinical reasoning. Clinical didactics sessions synthesize learning in the clinical and basic sciences. The course is comprised mostly of small-group sessions facilitated by our Dean's Scholars clinical faculty. With these faculty, students work on focused, guided practice of clinical skills that integrates basic science course work. (*Med Ed 555A-B*)

### **Behavioral Science & Medical Ethics II**

This clinically oriented course will cover foundational topics in behavioral science and medical ethics, and will introduce clinically relevant social issues such as dealing with domestic violence as it presents clinically, treating minority or underserved populations and cultural competence. (*Psych 505B*)

### **General and Systemic Pathology**

This course introduces second-year medical students to the basic pathogenesis, pathophysiology, and consequences of disease processes. It also introduces students to the proper use of the clinical laboratory for the diagnosis and management of these diseases. After an introduction to general types of disease processes and principles of laboratory medicine, disease processes are studied further in the context of specific organ systems. (*Path 598A-B*)

**Medical Microbiology**

This course covers the biology of infectious agents, including viruses, bacteria, fungi, and parasites, to provide the foundation in microbiology for the subsequent study of infectious diseases. Lectures, small group sessions with clinicians, and laboratory sessions are used to teach the molecular bases of microbial pathogenesis, diagnostic testing, antimicrobial therapy, and prevention strategies. (*Mic Bio 507A-B*)

**Medical Pharmacology**

This course covers the various classes of drugs that are used in medicine, particularly those used in specific or symptomatic treatment of disease states. Drugs of abuse are also covered. Emphasis is on the mechanisms of action of drugs at the organ and system level and on their use in medicine. The course includes lectures that illustrate pharmacologic principles, supplemented by small group problem-solving sessions. (*Med Ed 517A-B*)

**Patient-Centered 2 (PACE-2) Clerkship**

This course continues the processes of PACE-1 to build students' clinical skills and create a bridge between the basic and clinical sciences. Training will be accomplished at weekly clinic sessions with a specific preceptor, and during reflection sessions to reinforce clinical lessons. Students will be expected to achieve learning objectives in patient care, professionalism, interpersonal and communication skills, practice-based learning and improvement, and medical knowledge. (*Med Ed 558 A-B*)

**Third-Year Curriculum****Clinical Foundations III**

Clinical Foundations III, held at the beginning and Mid way through the third year, provides further preparation for third-year clinical rotations. Additionally, intersessions are planned during the third year to provide integration of clinical material across longitudinal topics that cross several disciplines. This preparation includes, but is not limited to clinical IT training with access to Electronic Medical Records, obtaining privileges at all of the primary clinical sites, discussions on team care, leadership, professionalism, management of assault behavior training, infection prevention, and basic life support. (*Med Ed 550*)

**General Surgery Clerkship**

The General Surgery clerkship provides students, as members of the surgical team, with an opportunity to study surgical patients in outpatient and hospital settings. Students acquire surgical knowledge, as well as develop skills in taking surgical histories and conducting physical examinations. Emphasis is placed on the clinical evaluation, pathogenesis, diagnosis, and treatment of surgical diseases. (*Med Ed 526*)

**Family Medicine Clerkship**

During the Family Medicine clerkship students are matched with a family physician. Students are assigned to a UCI-affiliated clinic where the principles of family medicine and primary care are taught. Emphasis is placed upon exposing students to the most common health care problems seen in family medicine. Students are exposed to the principles of community health and epidemiology, as practically applied in an ambulatory care setting. Students develop an awareness of the current health care delivery environment, including issues such as health care costs and the lifestyle of a family physician. Special tracks are available for interested students in geriatrics, integrative medicine, and under-served care. Special teaching sessions on family centered maternity care, health maintenance and nutrition, and musculoskeletal joint exams are part of the experience. A curriculum in ophthalmology is also part of the clerkship. (*Med Ed 597*)

**Internal Medicine Clerkship**

The Internal Medicine Clerkship occurs in a highly structured clinical environment in-patient setting. Students gradually assume responsibility for the care of patients, thereby enhancing their clinical, diagnostic, and procedural skills. Clinical vignettes and bedside teaching serve to round out the experience. (*Med Ed 527B*)

**Neuroscience Clerkship**

The Neuroscience clinical clerkship emphasizes the development of skills in taking a neurological history, performing a neurological examination, formulating a differential diagnosis, and proposing a course of management for neurological disorders. Students have the option of further training in Neurosurgery or pediatric sub-specialty rotations. (*Med Ed 532*)

**Obstetrics and Gynecology Clerkship**

During the Obstetrics and Gynecology clinical clerkship, students are given the opportunity to observe and handle problems in the obstetrical and gynecologic wards, outpatient clinic, labor and delivery suite, and in the operating room. (*Med Ed 524*)

**Pediatrics Clerkship**

The Pediatrics clerkship serves as an introduction to general pediatrics. Students rotate on the pediatric inpatient service, pediatric ambulatory settings, and the newborn nursery. During the clerkship, students develop their knowledge and skills in conducting age-appropriate patient histories and physical examinations and developing differential diagnoses and management plans. (*Med Ed 528*)

### Psychiatry Clerkship

The Psychiatry clerkship provides an opportunity for hands-on experience in the process of recognizing, diagnosing, and treating mental illness using the latest neuropharmacological advances, as well as more traditional psychotherapeutic approaches. Each student participates fully in patient care, clinical teaching, and conferences. (*Med Ed 529*)

### Radiology Clerkship

The Radiology clerkship offers an introduction to clinical imaging. Emphasis is given to correlate clinical findings and use the imaging modalities for problem-solving and diagnosis and treatment, including an understanding of risk/cost/benefit ration involved in daily clinical practices. (*Med Ed 533*)

### Fourth-Year Curriculum

#### Clinical Foundations IV

This is a two-week required course that all fourth-year students take during the final quarter in medical school in preparation for residency training. Intersessions are also planned during the fourth year to help prepare students further for residency. The course includes a resuscitation boot camp and provides an opportunity to obtain an ACLS certification. (*Med Ed 535*)

### Emergency Medicine

This two-week clinical clerkship introduces students to principles of acute care medicine while caring for acutely ill and injured patients. Students have the opportunity to evaluate patients, expand their directed history and physical exam skills, create a broad differential diagnosis, and formulate effective testing and treatment strategies. Active participation in patient care through refinement of procedural skills is largely emphasized and encouraged. (*Med Ed 547*)

### Intensive Care Unit Selective

This is a four-week clinical clerkship offered at one of several UC Irvine affiliated sites. ICU is offered in medicine, surgery, neurology, and pediatrics. Students function as interns, becoming integral members of the ICU team, and serve as primary caregivers under supervision. (*Med Ed 605B, 630K, 633M, 640E, 660S or 685U*)

### Senior Acting Internship Selective

Students spend four weeks as acting interns during which time they carry the full ward responsibility of an intern on one-half the number of patients usually carried by an intern. The acting internship is designed to improve clinical competence and to prepare the students for the challenges and demands of the internship. Students may choose between acting internships in family medicine, medicine, pediatrics, or surgery. (*Med Ed 536, 537, 538, 539, or 625Q*)

### Electives

Depending upon their particular interests, needs, and goals, students may take a variety of elective courses during the third and fourth years at UC Irvine Health facilities, VA Long Beach Healthcare System, Children's Hospital of Orange County, Long Beach Miller Children's Hospital, or Long Beach Memorial. Students may also take their fourth-year elective course work at other approved institutions.

A listing of elective courses and descriptions can be found online here (<http://www.meded.uci.edu/curricular-affairs/course-catalog.asp>).

**All questions regarding the curriculum, electives, or matters of records should be directed to:**

**University of California, Irvine  
School of Medicine  
Office of Medical Education  
Medical Education Building  
Irvine, CA 92697-4089**

General information/records: 949-824-5283; Scheduling: 714-456-8462; Curriculum: 949-824-4609.

## Master of Science and Doctor of Philosophy offered by the School of Medicine

The School of Medicine offers graduate study in a wide variety of fields in both basic science and clinical departments, leading to Master of Science and Doctor of Philosophy degrees. Each department or program has a graduate advisor whom students may consult for additional details about the individual programs. Most training takes place within one of the departments, although full facilities and curricular offerings are available to all graduate students in all departments of the School of Medicine. Interdisciplinary study and research are encouraged. The normative time to degree is two years for the master's degree, and five years for the doctoral degree. A master's degree is not a prerequisite for the Ph.D. degree.

The departments evaluate applications for admission based on research experience, letters of recommendation, Graduate Record Examination scores where required by the individual program, grades, and other relevant qualifications of the applicant. Candidates for graduate admission are urged to consult the particular department or program whose faculty and expertise best fit their interests and background.

Students plan their academic program in consultation with the graduate advisor or a faculty committee. Faculty advisors may be changed to meet the needs and interests of the student. Students are encouraged to consult with faculty members with regard to their research and academic interests.

Application information may be obtained by contacting the individual graduate programs or:

**University of California, Irvine**

**Graduate Division**

**120 Aldrich Hall**

**Irvine, CA 92697-4611**

**949-824-6761**

<http://www.grad.uci.edu> (<http://www.grad.uci.edu/>)

- Biomedical and Translational Science, M.S.
- Biomedical Sciences, Ph.D.
- Genetic Counseling, M.S.

## Residency & Fellowship Programs

The School of Medicine and its affiliated hospitals offer approximately 700 residency and fellowship positions in 63 accredited programs, covering almost all areas of medicine. Training levels range from first-year residencies through seventh-year-level subspecialty fellowships. Inquiries about specific programs should be directed to the Program Director as listed in the *Directory of Residency Training Programs*, published each year by the American Medical Association.

All ACGME-accredited residency and fellowship programs meet the formal standards of the Accreditation Council for Graduate Medical Education and the appropriate specialty boards. The University of California, Irvine (UCI) adheres to the Health Professions Educational Assistance Act of 1976, P.L. 94-484, Section 709, regarding shared-schedule residency training positions.

Residents and fellows in all programs rotate to the UCI Medical Center. Trainees in dermatology, diagnostic radiology, medicine, neurology, ophthalmology, pathology, surgery, physical medicine and rehabilitation, radiation oncology, family medicine, subspecialties of medicine, orthopaedics, otolaryngology, plastic surgery, and urology also rotate to the Tibor Rubin Veterans Affairs Medical Center in Long Beach. Residents in medicine, medicine sub-specialties, anesthesiology, radiation oncology, obstetrics and gynecology, pathology, pediatrics, physical medicine and rehabilitation, plastic surgery, and surgery also rotate to the Long Beach Memorial Hospital Medical Center/Miller Children's Hospital. UCI also has an established affiliation with the Children's Hospital of Orange County (CHOC), which is a major training site for the combined program in pediatrics and other specialties. Residents and fellows may also spend periods of time at other affiliated hospitals and clinics.

### Anesthesiology

The Anesthesiology Residency Program is an ACGME-accredited, four-year categorical program. The program is dedicated to providing an exceptional educational experience to develop the next generation of board-certified physician anesthesiologists and leaders in the field. The innovative 4U Didactic Program includes Point-of-Care Ultrasound (POCUS) training, high-fidelity simulations, hands-on workshops, problem-based learning discussions, wellness series, practice management, and professional development. The PGY-1 and CA-1 (PGY-2) years cover the fundamentals of anesthesiology and perioperative medicine to provide a solid foundation on which to build advanced and subspecialty clinical knowledge and skills during the CA-2 (PGY-3) and CA-3 (PGY-4) years. Residents gain broad and diverse clinical experience through rotations at UCI Medical Center, Children's Hospital of Los Angeles (CHLA), Long Beach Memorial Medical Center, Kaiser Permanente Los Angeles, Veterans Affairs Long Beach Healthcare System, and Children's Hospital of Orange County (CHOC). Residents also have the opportunity for participation in medical missions, in partnership with faculty, through the Global Outreach Initiative.

### Anesthesiology - Pain Medicine

The Pain Medicine Fellowship is an intensive one-year ACGME-accredited multidisciplinary training program. The comprehensive training includes pain assessment, treatment, and management, covering both inpatient and outpatient care, including both adult and pediatric pain medicine, with a special focus on advanced interventional techniques. The fellowship includes hands-on training in interventional neuraxial interventions, neuromodulation techniques, intrathecal drug delivery systems, and peripheral nerve blocks, among others procedures. Fellows work closely with specialists in anesthesiology, physical medicine and rehabilitation, neuroradiology, palliative care, neurology, primary care, and psychiatry to gain a comprehensive understanding of pain management. The program includes a strong didactic curriculum and participation in scholarly activities is strongly encouraged. Fellows get exposure in practice management and business administration. For candidates with an interest in pain related research, the UCI Center for Pain Wellness has a strong complement of basic and translational researchers with active laboratories in pain related to spinal cord injury and mechanisms of chronic pain.

### Anesthesiology - Critical Care

The fellowship in Anesthesiology Critical Care Medicine (ACCM) is designed to provide fellows with the opportunity to fulfill the American Board of Anesthesiology subspecialty requirements for certification in anesthesiology critical care medicine (ACCM). This 12-month ACGME accredited fellowship commences after successful completion of residency in Anesthesiology. The ACCM fellow takes an active role in all aspects of the profession and practice of Critical Care Medicine including didactic teaching, presenting, and conducting rounds. In addition, the ACCM fellow is required to actively

participating in research projects and other scholarly activities. The major focus and uniqueness of the ACCM Fellowship is to train the fellow in bedside echocardiography and ultrasonography. In addition, the ACCM fellow will have the opportunity to participate in the cutting edge research in minimally invasive and non-invasive hemodynamic monitorings to predict fluid responsiveness and to guide goal-directed therapy for fluid resuscitation.

### **Dermatology**

The Department of Dermatology offers a three-year accredited residency which has 15 residents, five for each of three postgraduate years (PGY-2 to PGY-4). Residents rotate through clinics and consultation services at UCI and the Veteran Affairs Long Beach Healthcare System, as well as at affiliate locations at Children's Hospital of Orange County, and receive extensive training in medical and surgical dermatology. Residents rotate through specialty clinics which see patients with immunobullous disease, pigmentary disorders, vascular birthmarks, pediatric disorders, hair disorders, and melanoma. Additionally, residents receive training specific for the care of immunosuppressed patients and those with a history of solid organ transplant. Residents receive extensive training in Mohs surgery, laser techniques, excisional surgery, performance of flaps and grafts, and administration of cosmetic agents. Residents are also active in research and present at local, national, and international meetings.

### **Dermatologic Surgery**

The Department of Dermatology offers a one-year subspecialty fellowship with one fellow who rotates through clinics at UCI and Kaiser Permanente. The fellow receives extensive training in the study, diagnosis, and surgical treatment of disease of the skin and adjacent mucous membranes, cutaneous appendages, hair, nails, and subcutaneous tissue. Dermatologic Surgery is broadly categorized into the following three areas: cutaneous oncologic surgery, cutaneous reconstructive surgery, and cutaneous aesthetic surgery.

### **Emergency Medicine**

The Emergency Medicine residency was established in 1988 and has full accreditation by the Residency Review Committee. The program has 27 residents, nine for each of three postgraduate years. The UCI Medical Center Emergency Department is a high-acuity, Level I Trauma Center, treating over 55,000 patients annually. Twenty board-certified emergency medicine faculty provide 24-hour patient care and supervision of residents and medical students. The Department of Emergency Medicine is active in disaster preparedness and response, emergency uses of ultrasound, public affairs, community service, and research in the areas of prehospital care, educational technology, trauma, health policy, and infectious disease, among others.

### **Emergency Medicine - Clinical Informatics**

The School of Medicine offers a two-year ACGME-accredited Clinical Informatics fellowship program, which prepares the applicant for board certification in Clinical Informatics. By design, this fellowship is multidisciplinary with collaboration by faculty in multiple medical specialties, Donald Bren School of Information and Computer Science, Institute for Clinical and Translational Science (ICTS), Children's Hospital Orange County (CHOC), and Information Services. The fellowship goal is to create leaders in the field of Clinical Informatics with a strong background in the fundamentals of information technology, change management and process improvement. With this education, the fellow will develop the skillset needed to assess workflow needs, recommend process and technical solutions for a given challenge, and implement information technology tools to facilitate the proposed solution. The program's educational experiences will consist of rotations, didactic sessions, an independent longitudinal research project, mentorship, and ongoing practice in the fellow's primary board specialty. Additionally, all fellows are required to conduct a longitudinal research project – chosen by the fellow and with a physician faculty member acting as mentor – during the second year of their fellowship. They will select a research question to address based upon their own career objectives and any challenges discovered during their first year rotations. Resources to support fellow projects will be available from the Donald Bren School of Information and Computer Sciences (boasting advanced educational facilities with smart classrooms, a multitude of learning studios, simulation labs, and group study/conference rooms), UCI's extensive onsite and online libraries (Science Library and Grunigen Medical Library), and various product specific resources from UCI's catalog of technology solution vendor partners.

### **Family Medicine**

The Family Medicine Residency Program strives to train excellent clinicians who provide the best patient-centered compassionate medical care to our most vulnerable and underserved communities. The residency is a fully accredited program with both faculty and residents who practice out of the only academic federally qualified health center in the entire state of California. The residency incorporates technology and innovation in a unique community-academic hybrid educational setting that provides a rich and intensive clinical training environment. Residents obtain exceptional clinical skills while promoting community engagement, patient advocacy and the practice of socially responsible and culturally appropriate care. The program aims to graduate physician leaders dedicated to medically underserved communities.

### **Family Medicine - Geriatric Medicine**

The Geriatric Medicine Fellowship is a comprehensive and challenging one-year advanced training program that prepares physicians to deliver compassionate, informed care to a diverse aging population. The clinical opportunities allow Geriatric Fellows to explore both the depth and breadth of geriatric medicine through longitudinal primary care experiences and rotations in a variety of subspecialty clinical settings. The heart of the Fellowship is at UCI Medical Center's SeniorHealth Center in Orange, where Fellows have their continuity and consultation clinics. Here, Fellows work with a continuity attending on a weekly basis, learning the art and medicine of geriatric ambulatory care. Some of the subspecialty rotations at UCI include a memory disorders clinic, subacute care, neurology, dermatology, cardiology, rheumatology and more. At Tibor Rubin Veterans Affairs Medical Center in Long Beach, Fellows participate in the Geriatric Evaluation Management (GEM) clinic, an interdisciplinary program which assesses the medical and psychosocial status of frail older patients. The goal is to optimize each military veteran's health, function and ability to live with the greatest degree of independence possible. The VA offers inpatient and outpatient geropsychiatry, a Parkinson's clinic, memory and movement disorders, palliative care,



aging with disabilities and physical medicine and rehabilitation. The program is also affiliated with skilled nursing facilities, as well as the country's first Elder Abuse Forensic Center. The program offer electives in integrative medicine, community resources, or additional experiences in any of the above rotations.

### **Family Medicine - Sports Medicine**

The Primary Care Sports Medicine Fellowship at UCI is a one-year program housed within the Department of Family Medicine, with all rotations at UCI. The primary goal of the program is to train Fellows who are knowledgeable in musculoskeletal medicine as well as in medical conditions in athletes, so as to develop primary care physicians into more comprehensive, self-sufficient doctors. Fellows will work regularly in primary care and orthopedic sports medicine clinics as well as have rotational experiences in foot/ankle orthopedics, hand surgery, physical medicine and rehabilitation, MSK radiology, physical therapy and nutrition. Fellows will have regular training room coverage with UCI Athletics and work in event coverage in the community. Graduates will be well-prepared for the CAQ examination in Sports Medicine and will be ready to practice in a variety of clinical settings after graduation.

### **Internal Medicine**

The Internal Medicine Residency Program is a traditional three-year training program and also sponsors a one-year preliminary medicine program in addition the ABIM certified research pathway. The program focuses on core educational skills of the internist and offers training to ensure our residents have access to a broad array of career options including hospitalist medicine, primary care, and subspecialty training. Residents rotate through UCI Medical Center, the Veterans Affairs Long Beach Healthcare System, and Long Beach Memorial Medical Center. Core program faculty have a special interest in academic internal medicine and education. Subspecialty fellowships are offered in basic and clinical allergy/immunology, cardiology, endocrinology and metabolic diseases, gastroenterology, geriatrics, hematology/oncology, infectious disease, nephrology, palliative care, pulmonary/critical care, and rheumatology.

### **Internal Medicine - Allergy & Immunology**

The Allergy & Immunology Fellowship Program is a two-year accredited program. It offers training for fellows at the postgraduate PGY-4 to PGY-5 levels. The Fellowship training involves clinical training at the UCI Medical Center and Veterans Affairs Long Beach Healthcare System as well as rotations in affiliates at Children's Hospital of Los Angeles, and Breath Mobile at Children's Hospital Orange County. Electives in subspecialty training in Rheumatology, ENT Larynx, ENT Sinus, Sinus Radiology, General Dermatology, Dermatology patch testing, Dermatopath, Pulmonary function testing, Ophthalmology and research opportunities are available.

### **Internal Medicine - Cardiology**

The three-year teaching program provided by the ACGME-approved Cardiovascular Disease fellowship program is comprised of 18 general cardiology trainees. These fellows rotate through three institutions: UCI Medical Center, Long Beach Veterans Administration Hospital, and Long Beach Memorial Medical Center, which provides additional training and experience in various cardiology subspecialties. UCI's program in cardiovascular disease adheres to training standards according to ACGME core competencies. Cardiovascular Disease program is dedicated to teaching using didactic lectures/conferences four to five times a week by visiting cardiology physicians, faculty or fellows on recent developments in catheterization methods, electrophysiology, ECG case studies, nuclear cardiology, cardiac CT and MRI, Echocardiography, and other subspecialty topics. The fellows also take part in weekly outpatient clinics offering direct interaction between fellows with faculty members. All cardiology fellows have six-months of protected research time during their three-year fellowship. During training, many fellows will achieve advanced competencies. Many of the UCI fellows pass the nuclear cardiology and echocardiography board exams during the training period. At the end of their training, fellows function as independent and competent consultants, with level II certification in core areas of cardiology.

### **Internal Medicine - Interventional Cardiology**

The Interventional Cardiology Fellowship is a one-year ACGME-approved program designed to train fellows in the use of percutaneous interventional techniques for the management of coronary, peripheral vascular and structural heart/valvular heart disease. The training includes didactic conferences, weekly case conferences, and individual fellow and faculty clinical patient reviews (pre- and post-procedure) to discuss risk, benefit, results, treatment strategies, and complications. Fellow experience is very individualized with one-on-one faculty interactions for each procedure. Trainees also assist in teaching general cardiology fellows, medicine residents, and other student groups. The fellowship functions as an integral component of the subspecialty residency in cardiology and the categorical residency program in internal medicine. During the year of interventional training, fellows are expected to master the techniques involved in coronary intervention, while developing perspective on procedural risk and benefit, patient selection, and clinical decision-making in cardiovascular patient care. At the end of the year, fellows should function as independent operators during interventional procedures. The program adheres to the tenets outlined in the ACC COCATS guidelines document and the AHA statement on clinical competency in interventional cardiology. Fellows share their time at the UCI Medical Center, Long Beach Memorial Medical Center, and the Long Beach Veterans Administration Hospital.

### **Internal Medicine - Endocrinology**

The fellowship program in Endocrinology, Diabetes and Metabolism prepares physicians for clinical and academic practice in endocrinology. The principal training sites are the UCI Medical Center and the Long Beach VA Medical Center, and additional training is provided at the Children's Hospital of Orange County (CHOC). The fellows are exposed to a broad spectrum of patients, males and females, both in in- and out-patient settings. The patients represent a broad range of ages, spanning from pediatric to endocrine cases associated with aging. The program emphasizes the

comprehension of molecular and cellular approaches to determining the pathogenesis and diagnoses of endocrine diseases. This is a two-year accredited program, but additional years of research training can be arranged for physicians interested in academic endocrinology.

### **Internal Medicine - Gastroenterology**

The gastroenterology fellowship training program is a three-year training program. The program focuses on core skills of the gastroenterologist including endoscopy, inpatient consultations, outpatient consultations, and chronic care of GI and liver conditions. Research training is a component of the training program with an emphasis on clinical research. The program offers training to ensure residents have access to a broad array of career options including community private practice, group practice and academic medicine. Trainees rotate through UCI Medical Center and the Veterans Affairs Long Beach Healthcare System. Core program faculty have a special interest in academic gastroenterology, endoscopy, inflammatory bowel disease, high-risk colon cancer, GI motility, and education.

### **Internal Medicine - Hematology Oncology**

The Division of Hematology/Oncology offers a rigorous three-year accredited fellowship program that emphasizes intensive theoretical training and a broad spectrum of clinical experience with the goal of preparing highly skilled hematologists and oncologists for careers in both clinical and academic medicine. The division's fellowship is conducted in concert with UCI's prestigious Chao Family Comprehensive Cancer Center, one of 48 U.S. comprehensive cancer centers designated for excellence by the National Cancer Institute. The multidisciplinary cancer center at UCI Medical Center is supported by more than 100 UCI faculty members from five schools and 23 departments. The division's faculty members serve patients with hematologic and oncologic disorders at the medical center, which has been ranked among the top 50 U.S. hospitals by *U.S. News & World Report*, and at the Veterans Affairs Long Beach Healthcare System. Throughout fellowship hematology/oncology fellows function as primary longitudinal caregivers to a panel of patients and serve as consultants directing the management of large numbers of patients under the supervision and guidance of faculty physicians. The fellowship program is designed to educate and support future clinical investigators who plan to dedicate their professional careers to clinical or laboratory research in hematology and oncology. The three-year combined hem/onc program is approved by the Accreditation Council for Graduate Medical Education (ACGME) and is recognized by the American Board of Internal Medicine (ABIM).

### **Internal Medicine - Hospice and Palliative Medicine**

The Palliative Medicine Fellowship is a one-year, accredited program. The fellows spend the clinical training year at multiple sites including Hoag Memorial Hospital, community hospices, Long Beach Veterans Affairs Medical Center, and Miller Children's Hospital at Long Beach Memorial Medical Center. The training includes inpatient palliative medicine consultation, outpatient palliative care clinic, an inpatient hospice unit, community hospice, pediatric hospice and palliative care, and long-term care. Examples of available electives include interventional pain management, pediatric pain management, long-term acute care, administrative medicine, and neurocritical care.

### **Internal Medicine - Infectious Disease**

The Division of Infectious Diseases offers a two-year fellowship which is accredited by the ACGME. The Fellowship offers a wide range of experiences including inpatient consultations, outpatient clinics, research, clinical microbiology, antibiotic stewardship and infection control and prevention. The two main teaching hospitals are the UCI Medical Center and the Veterans Affairs Long Beach Healthcare System. The patient population is ethnically and socioeconomically diverse and fellows manage a wide variety of disease processes. Fellows who demonstrate an early interest in research may consider a third research year of fellowship. This well-established program began in 1971 and has graduated many successful clinicians and academicians over the past 45+ years.

### **Internal Medicine - Nephrology**

The Division of Nephrology and Hypertension is committed to providing exemplary care for patients with a variety of kidney diseases. The program has earned UCI Medical Center recognition by *U.S. News & World Report* as one of the nation's top 50 hospitals for nephrology services. The program is heavily engaged in cutting-edge research and education, and lead in kidney disease research nationally and internationally in several arenas. The two-year ACGME-approved fellowship program offers fellows, residents, and medical students valuable experience in treating patients with a broad range of renal diseases and extensive didactic core lectures, grand rounds, seminars, and journal clubs. Research experience is an integral part of the educational program. Fellows are given protected time to pursue research projects under the guidance of dedicated faculty, and many research opportunities are available for interested students and residents.

### **Internal Medicine - Occupational Medicine**

The Occupational Medicine Residency Program is based in the Division of Occupational and Environmental Medicine in the Department of Medicine. It is intended for physicians who are seeking certification by the American Board of Preventive Medicine in the field of Occupational Medicine. A prerequisite to participation is a minimum of one year of postgraduate clinical training in an accredited United States or Canadian primary care program. The program generally expects entering residents to have completed a three-year primary care residency or the equivalent. The objective of the program is to train physicians to be specialists and leaders in the fields of occupational and environmental medicine. During the two-year program, residents are provided academic foundation in occupational medicine, industrial hygiene, environmental toxicology, and epidemiology. As part of this program, residents complete a Master of Science degree program in Environmental Health Sciences and complete a research thesis as part of the residency program. The program also includes extensive didactic and clinical training and field experience in occupational health and safety, interdisciplinary seminars, and a journal club in environmental and occupational medicine. Upon completion of training, the resident is qualified to enter the specialty

practice of occupational medicine as a consultant or in an occupational medicine specialty practice, workplace setting, government agency, or academic institution.

### **Internal Medicine - Pulmonary and Critical Care**

The Pulmonary Diseases and Critical Care Medicine Fellowship is a fully accredited three-year program designed to train clinicians to deliver high-quality, skilled care to patients. The highly competitive program, run by leading interventional pulmonologists, provides selected fellows with clinical research career opportunities in academic pulmonary and critical care. In addition to assuring competency and proficiency in medical care, the program's goal is to help fellows achieve independence and confidence in all clinical, academic, and educational endeavors.

### **Internal Medicine - Rheumatology**

The Division of Rheumatology offers a highly competitive, two-year fellowship program that provides extensive clinical training in rheumatic and musculoskeletal disorders. The program's focus is to train fellows to be clinically excellent regardless of what their future career path may be. The program is accredited for six fellows by the Accreditation Council for Graduate Medical Education (ACGME) and is based at two sites: the UCI Medical Center, Orange County's only academic medical center, and the Long Beach Veterans Administrative Hospital. Fellows see a diverse and complex patient population with frequent presentations of Lupus, Myositis and Vasculitis at the University and Gout, Osteoarthritis, Rheumatoid Arthritis, Psoriatic Arthritis at the VA. All fellows are exposed to Musculoskeletal Ultrasound, and the majority of fellows have completed the Ultrasound certification course by the American College of Rheumatology.

### **Neurological Surgery**

The Residency Program in Neurosurgery is a rigorous training program designed to develop academic neurosurgeons. There are ample opportunities for both clinical and basic research within the Department and in collaboration with other laboratories or departments at UCI. Applicants are expected to have a strong academic record with a strong commitment to neurosurgery. The program participates in the NRMP match program to select two candidates every other year and one candidate the years in between. Exact order of clinical rotations may vary slightly subject to the trainee's interest in neurosurgery subspecialty; however, the rotation generally proceeds as follows: the PGY-1 year consists of thirteen (13), four (4) week blocks. There are six (6) blocks of neurosurgery rotation, one (1) block of ENT rotation, one (1) block of neurology rotation, one (1) block of ACS/trauma rotation, one (1) block of elective rotation (Neuropathology and Neuroradiology), and three (3) blocks of neurocritical care rotation; PGY-2 is one year of training at UCI Medical Center assigned to neurosurgery service; PGY-3 is a nine-month rotation at UCI Medical Center, followed by a three-month elective (Interventional Radiology or Spine) at UCI Medical Center; PGY-4 is a three-month rotation at Children's Hospital of Orange County (CHOC), a three-month rotation at Tibor Rubin Veterans Affairs Medical Center, a two-month of stereotactic radiosurgery and four-month of elective rotation at UCI Medical Center; PGY-5 has an option of either a research year or a 12-month subspecialty training (i.e. enrolled fellowship); PGY-6 is a three to six-month elective rotation (Endovascular, Spine, Pediatrics), a three-month rotation at Tibor Rubin Veterans Affairs Medical Center and last three months starts the chief resident year; PGY-7 is the chief resident year and will be at UCI Medical Center with last three months of elective rotation.

### **Neurology**

Neurology residency training focuses on the development of strong clinical skills to competently evaluate and treat the large number of disorders that afflict the nervous system. During three years of training at UCI, residents have the opportunity to see a wide variety of neurological conditions and receive progressively more responsibility. The program provides a rich, intellectually stimulating environment in which to learn. UCI Neurology faculty all have broad experience caring for neurological disorders and have special expertise in different neurological disciplines. Residents have opportunities to work in many different subspecialty areas with the faculty. The neurology residency program is big enough to provide a rich environment to learn about neurological disorders, yet remains small enough for residents to work closely with each faculty member. Residents are encouraged to learn at every opportunity: from patients, peers, the faculty, and visiting experts. There are many formats in which to learn, from bedside discussions, tutorials, to specially prepared lectures. To further stimulate intellectual growth, residents are actively encouraged to pursue research in any topic of their choosing, with the guidance of the faculty.

### **Neurology - Clinical Neurophysiology**

The one-year fellowship program in Clinical Neurophysiology is accredited by the Accreditation Council of Graduate Medical Education (ACGME). The program is a joint fellowship with CHOC (Children's Hospital of Orange County). Primary emphasis is on adult routine and inpatient video EEG, as well as electro-corticography and functional brain mapping. Fellows also spend two months rotating at CHOC, gaining experience in pediatric epilepsy and EEG. Two elective months are available, which may be used to obtain experience in electromyography (EMG) or intraoperative monitoring. Clinical research opportunities are available.

### **Neurology - Neuromuscular**

The Fellowship provides comprehensive training in neuromuscular disorders, including the diagnosis and clinical management of inherited and acquired neuromuscular disorders (general neuromuscular diseases, neuropathy, muscular dystrophies, ALS and myasthenia gravis), training in electrodiagnostic medicine (EMG, single fiber EMG, quantitative sensory testing and autonomic testing), as well as nerve and muscle biopsy analysis. Given the number of patients seen in the center and weekly half-day teaching sessions in place (didactic neuromuscular lectures, review of interesting EMG cases from the week, and muscle/nerve pathology), the fellowship provides a great opportunity for well-versed education and training in Neuromuscular medicine.

### **Neurology - Vascular Neurology**



The Vascular Neurology Fellowship program offers two one-year training positions for graduates of adult neurology residency program. The fellowship strives toward training excellent stroke clinicians capable of delivering high-quality care to patients with vascular neurologic disorders in diverse patient population. The training is primarily based at the new state-of-the-art UCI Medical Center Douglas Hospital, the site of UCI Certified Comprehensive Stroke Center, the first in Orange County, CA and one of the first in the nation. The hospital has 24/7/365 advanced multimodal neuroimaging and neuro-interventional capabilities, a dedicated 12-bed Neuroscience ICU, a Neuroscience stepdown unit, and over 600 stroke admissions a year. We have six board-certified fellowship-trained Vascular Neurology Faculty, five board-certified Neuro-intensivists, and five Endovascular or Cerebrovascular Surgeons. The fellowship consists of clinical rotations on the inpatient stroke service, outpatient stroke clinic as well as electives and protected research time. Beside UCI Medical Center serving as the main site for the training, UCI main campus also provides additional opportunities resource with further potential electives based on the trainee's interests and career goals. This ACGME-accredited program fulfills the requirements necessary for vascular neurology board eligibility. While fulfilling ACGME criteria, the faculty make a concerted effort to tailor the fellowship congruent with the individual interest and career goals of the trainees, particularly research mentorship being available to those who wish to explore clinical or basic science research. The program participates in the Electronic Residency Application Service (ERAS) and the National Resident Matching Program (NRMP) for recruitment and matriculation of applicants.

### **Obstetrics & Gynecology**

The four-year program provides a solid foundation in Obstetrics and Gynecology with emphasis in the reproductive pathophysiology in the many different areas of women's health care. Based on this foundation, training continues with progressive resident responsibility for operative and medical management and surgical techniques. While predominantly clinical in scope, the program is strongly flavored by academic and research exposure. Training is provided in general obstetrics and gynecology with rotations in the subspecialties of Maternal-Fetal Medicine, Gynecologic Oncology, Female Pelvic Medicine and Reconstructive Surgery, Minimally Invasive Surgery, Family Planning and Reproductive Endocrinology, and Infertility. There are seven resident positions available each year in this four-year training program.

### **Obstetrics & Gynecology - Female Pelvic Medicine & Reconstructive Surgery (FPMRS)**

The Female Pelvic Medicine and Reconstructive Surgery (FPMRS) Fellowship in the Division of Urogynecology in the Department of Obstetrics and Gynecology is accredited by the Accreditation Council for Graduate Medical Education (ACGME). This is a three year fellowship program with training taking place at UCI and two affiliate sites. Fellows rotate with Colorectal Surgery and Urology. Post baccalaureate courses and a Masters Degree in clinical research are offered. Fellows are given opportunities to participate in clinical, translational and basic science research. Surgical training focuses on vaginal, laproscopic, and robotic approaches to pelvic organ prolapse and incontinence, sacral nerve modulation, fistula repair, and office procedures. Global health outreach is encouraged.

### **Obstetrics & Gynecology - Gynecologic Oncology**

The Gynecologic Oncology Fellowship Training Program in the Department of Obstetrics & Gynecology is a four-year program designed to produce clinician-scientists with expertise in the surgical and oncologic management of gynecologic cancers. Additional areas of focus are on clinical trials, drug development, translational research, and population statistics. The Fellowship is in its 43rd year and has been funded by a NIH T32 grant for the past 25 years. The fellowship experience includes 18 dedicated months of translational research during which time trainees develop a thesis in either the Department of Molecular Biology & Biochemistry in the School of Biological Sciences or in the Department of Epidemiology. The remaining 30 months are dedicated to graduated responsibility in clinical training at three diverse training sites the Center for Cancer Prevention and Treatment at St. Joseph's Hospital in Orange, the Todd Cancer Institute at Long Beach Memorial Medical Center, and Douglas Hospital at the UCI Medical Center. Fellows receive extensive training in cytoreductive surgery, radical surgery, minimally invasive surgery, and restorative surgery. They are also immersed in the scheduling of chemotherapy, targeted therapy, and radiation therapy planning, often as co-investigators on NRG Oncology and industry-sponsored clinical trials. Enrichment activities include integrated experiences in palliative care, critical care, pathology, and cancer genetics. Fellows are also encouraged to establish and pursue early career interests, and assistance and support are given for academic retention. Many graduates of this program currently hold leadership positions in major academic centers throughout the country and abroad. The Fellowship is accredited by the Accreditation Council for Graduate Medical Education (ACGME).

### **Obstetrics & Gynecology - Maternal Fetal Medicine**

UCI offers a three-year fellowship in Maternal Fetal Medicine, accredited by the Accreditation Council for Graduate Medical Education (ACGME). The program provides a well-rounded curriculum that balances clinical experiences, teaching opportunities, and academic and scientific activities. The program offers variety and depth due to the diversity of the two major training sites—UCI Medical Center and Long Beach Memorial Medical Center. The care of high-risk pregnancy seen through the two hospitals represents a cross-section of racial, cultural, and socioeconomic groups from a local population of more than 2.5 million. These two sites represent a broad-spectrum of perinatal practice and offer excellent opportunities to learn and teach. Clinical and basic science research conducted by the faculty in the section gives the fellow the ability to gain skills in scientific investigation. The program's superb physical environment, extraordinary clinical services, and varied research interests permit the faculty to carry out the mission of preparing fellows for a career in clinical or academic MFM.

### **Ophthalmology**

The Ophthalmology residency program at the UCI Gavin Herbert Eye Institute is four years in duration (PGY1 year is largely with internal medicine with 12 weeks of ophthalmology) and provides extensive clinical, surgical, and research training experiences. The education includes a robust weekly didactic curriculum. Trainees are exposed to a broad spectrum of disease with high volume surgical experience in the full range of ophthalmology

subspecialties. Residents rotate in cornea and refractive surgery, vitreoretinal surgery, oculoplastic and orbital surgery, glaucoma, pediatric ophthalmology and strabismus, ophthalmic pathology, uveitis, and neuro-ophthalmology, in addition to comprehensive ophthalmology. Trainees are exposed to diverse patient populations at various sites including Long Beach Veterans Affairs, UCI Medical Center, and the Gavin Herbert Eye Institute, a 70,000 square foot facility dedicated to ophthalmic patient care, surgery, and education. For more information, please visit <http://ghei.uci.edu>.

### **Orthopaedic Surgery**

The Department of Orthopaedic Surgery offers a five-year ACGME accredited residency program and currently accepts four residents each year. The program is designed to provide intense exposure, experience, and education in the subspecialties of orthopaedics: trauma/fracture care, reconstructive/joint replacement surgery, sports medicine, pediatric orthopaedics, as well as spine, foot and ankle, shoulder, and hand surgery. Exposure to non-operative and rehabilitative orthopaedic care is also provided. The program is structured for maximum resident participation with an emphasis on mentorship, didactic teaching, and supervised graduated autonomy in both the outpatient and the surgical setting. Clinical and basic science research opportunities are available, and resident participation in these academic endeavors are an integral component of the residency. The program's primary site, UCI Medical Center, is the only Level I academic medical center in Orange County, serving over 3 million residents. Other sites include the Veterans Affairs Healthcare System in Long Beach, Long Beach Memorial Medical Center, and Miller's Children's Hospital. Following completion of the orthopaedic residency program, residents are prepared to sit for the American Board of Orthopaedic Surgery certification exams and proceed to a subspecialty fellowship or enter into orthopaedic practice.

### **Orthopaedic Surgery - Hand Surgery**

The Hand Surgery Fellowship provides comprehensive training not only in hand surgery, but also in upper extremity surgery and microsurgery. The one-year ACGME accredited fellowship is based at the UCI Medical Center, Veterans Affairs Healthcare System in Long, and Children's Hospital of Orange County. The two fellows rotate with multiple fellowship-trained hand surgeons from both the Department of Orthopaedic Surgery and the Department of Plastic and Reconstructive Surgery. These rotations provide a very high volume of acute trauma and post-traumatic reconstruction of the entire upper extremity, including the hand, wrist, elbow, and shoulder; in addition to a diverse spectrum of nerve problems, brachial plexus, congenital anomalies, arthritis, and arthroscopy. Fellows gain extensive experience not only in replantation, but also in elective microsurgical reconstruction including toe-to-hand transfers, limb salvage for malignant tumors and soft-tissue coverage, and bony reconstruction of both the upper and lower extremities. Fellows receive one-on-one supervision in the operating room and outpatient clinics, but can also develop their own independent responsibility allowing them to supervise orthopaedic surgery and plastic surgery residents rotating on a combined Hand Service. There is a weekly didactic teaching conference, a monthly journal club, anatomical dissections in a fresh frozen cadaver facility, and an introductory microsurgical course. One day per week is reserved for research and basic science projects can be facilitated in laboratories focusing on biomechanics of the upper extremity and molecular biology of peripheral nerve injury.

### **Otolaryngology - Head and Neck Surgery**

The Department of Otolaryngology—Head and Neck Surgery offers a five-year residency program providing comprehensive training in otolaryngology and prepares trainees to sit for the American Board of Otolaryngology Examinations. The five-year program provides a breadth of training in general and pediatric otolaryngology, head and neck surgery, otological surgery, rhinology (including endoscopic sinus and skull base surgery), laryngology, sleep medicine and facial plastic and reconstructive surgery as well as dedicated research time. Residents receive an extensive clinical experience at UCI Medical Center, Children's Hospital of Orange County, Veterans Affairs Long Beach Healthcare System, and Kaiser Foundation Hospital-Anaheim and Irvine. Acceptance is through application and successful matching through the National Residency Matching Program. The program follows requirements set by the Accreditation Council for Graduate Medical Education.

### **Pathology - Cytopathology**

The Department of Pathology offers a one-year accredited Cytopathology Fellowship Program. The Program is designed to provide comprehensive training in diagnostic cytology including fine needle aspiration biopsy with surgical pathology and clinical correlation. Training will be provided in both gynecologic and non-gynecologic materials including performance and interpretation of fine needle aspiration biopsies. Fellows are also responsible for the weekly cytology conference, a research project, the cytopathology review courses and workshops given by the University of California, Irvine. In addition to cytopathology responsibilities, fellows will review all surgical-pathology cases of gynecologic oncology subspecialty and present them at weekly multidisciplinary tumor boards. They are exposed to research opportunities that are available in cytopathology, immunocytochemistry, and flow cytometry/image analysis.

### **Pathology - Hematopathology**

The Department of Pathology offers a one-year accredited Fellowship position in Hematopathology. The program is designed to provide comprehensive training in diagnostic hematopathology and laboratory hematology including morphologic evaluation of peripheral blood smears, body fluids, bone marrow, lymph nodes and other tissue, performance of bone marrow procedure, interpretation of laboratory hematology, coagulation, flow cytometry, immunohistochemistry, chromosomal and molecular cytogenetics and molecular diagnostics. The fellow is trained and serves as the primary consultant for the hematology laboratory mainly in UCI Medical Center with approximately 1,400,000 hematology and coagulation tests per year and 1,600 hematopathology cases including bone marrow, flow cytometry, lymph nodes, other tissue and referral/consultation cases. The fellow is also provided with the learning opportunities at Children's Hospital of Orange County for pediatric hematopathology and NeoGenomics laboratories for cytogenetics and molecular diagnostics. The fellow participates with faculty mentors to gain experience in laboratory management, teaching medical students, residents and fellows, and developing and conducting scholarly and research activities in the broad field of hematopathology.

## Pediatrics

The Pediatric Residency Program emphasizes the interrelationship of patient care, didactic teaching, and research in the training of the pediatric resident physician. The focus is on the total care of the child from birth through young adulthood. A strong clinical and educational foundation is provided through experiences in a broad spectrum of disease and/or injury as well as training in biosocial pediatrics, preventive health care, and community resources. The program offers variety and depth due to the diversity of the Department's major teaching hospitals—Children's Hospital of Orange County, Miller Children's Hospital (located at Long Beach Memorial Medical Center), and UCI Medical Center. The faculty at these institutions provides a comprehensive teaching program in general pediatrics and cover the full range of pediatric subspecialties. The care of children seen through the three hospitals represents a cross-section of racial, cultural, and socioeconomic groups from a local population of more than 2.5 million. Thus, pediatric residents are exposed to a wide range of problems presented in settings ranging from intensive care to supervised office-based practice.

### Pediatric Child Neurology

The Child Neurology program offers a traditional three-year training program for pediatric residents who have completed two or three years of pediatric training, or have participated in the specialized child neurology research track as per the training guidelines of the ABPN. The program offers a clinically-focused curriculum with extensive didactic and bedside teaching. As per ACGME requirements, residents have 12 months of adult neurology training, 12 months of clinical child neurology, and approximately 12 months of elective rotations. Residents complete the majority of their training at the UCI Medical Center and Children's Hospital of Orange County as well as rotations at various locations including outpatient subspecialty clinics, Center for Autism and Neurodevelopmental Disabilities, and Miller Children's Hospital in Long Beach. Faculty are all board certified in child neurology and many of the faculty have subspecialty training and board certification in specialties such as epilepsy, clinical neurophysiology, sleep medicine, and neurodevelopmental disabilities. In addition to clinical emphasis, residents have the opportunity for exposure to areas of active clinical research, including epilepsy, concussion, neuromuscular disorders, and sleep.

### Pediatric Critical Care Medicine

The Pediatric Critical Care Medicine fellowship program is a three-year ACGME accredited fellowship based at the Children's Hospital of Orange County (CHOC). The fellowship program prepares highly skilled Pediatric Intensivists for careers in both clinical and academic medicine. CHOC has a long history of training excellent Pediatric Critical Care fellows, and with a 30-bed Pediatric Intensive Care Unit (PICU) ([https://urldefense.com/v3/\\_\\_https://www.choc.org/programs-services/pediatric-intensive-care-unit/\\_\\_;!!OLgoXmg!ANxn7Gpul7wD35MU7Xa1LRrRBRgo0gErVo2AKdh37MROuJhJVbUJ3YUnqlogittag\\$/](https://urldefense.com/v3/__https://www.choc.org/programs-services/pediatric-intensive-care-unit/__;!!OLgoXmg!ANxn7Gpul7wD35MU7Xa1LRrRBRgo0gErVo2AKdh37MROuJhJVbUJ3YUnqlogittag$/)) and a 12-bed Cardiovascular Intensive Care Unit (CVICU) ([https://urldefense.com/v3/\\_\\_https://www.choc.org/heart/cardiovascular-intensive-care-unit/\\_\\_;!!OLgoXmg!ANxn7Gpul7wD35MU7Xa1LRrRBRgo0gErVo2AKdh37MROuJhJVbUJ3YUnqmrQJctTQ\\$/](https://urldefense.com/v3/__https://www.choc.org/heart/cardiovascular-intensive-care-unit/__;!!OLgoXmg!ANxn7Gpul7wD35MU7Xa1LRrRBRgo0gErVo2AKdh37MROuJhJVbUJ3YUnqmrQJctTQ$/)) that jointly has over 2,000 admissions per year, CHOC provides Pediatric Critical Care fellows with a broad range of clinical exposure. For more information about the fellowship program, visit <https://www.choc.org/careers/residency-training-programs/choc-pediatric-critical-care-medicine-fellowship-program/> ([https://urldefense.com/v3/\\_\\_https://www.choc.org/careers/residency-training-programs/choc-pediatric-critical-care-medicine-fellowship-program/\\_\\_;!!OLgoXmg!ANxn7Gpul7wD35MU7Xa1LRrRBRgo0gErVo2AKdh37MROuJhJVbUJ3YUnqmaKBUBow\\$/](https://urldefense.com/v3/__https://www.choc.org/careers/residency-training-programs/choc-pediatric-critical-care-medicine-fellowship-program/__;!!OLgoXmg!ANxn7Gpul7wD35MU7Xa1LRrRBRgo0gErVo2AKdh37MROuJhJVbUJ3YUnqmaKBUBow$/)).

### Pediatric Endocrinology

The UCI/CHOC Pediatric Endocrinology Fellowship Program offers a three-year training program in a fully accredited, university-based fellowship program. CHOC Children's is a community-based hospital in the heart of Southern California (Orange, California) and serves as the main clinical teaching site. CHOC Children's is a free-standing children's hospital that has national recognition for providing patients with first-class care in state-of-the-art facilities. CHOC is an extensive healthcare system featuring the main hospital in Orange and a referral place for specialty care from at least 14 primary care health centers, community clinics, and mobile health vans. UCI/CHOC also provides top-notch medical education to students, pediatrics residents and other fellowships.

The endocrine and diabetes program aims to prepare fellows for careers as leaders in clinical or academic medicine through a superior academic and professional atmosphere. The program includes a year of largely clinical training in a high-volume inpatient and outpatient setting, followed by two years of basic science, clinical or translational research. The program is designed to meet the ACGME requirements for fellowship training, so fellows may be successful and eligible for board certification. The program aims to provide the fellow with:

- Structured one-on-one mentoring to help guide their chosen career path
- Opportunities for conducting and presenting research (basic science, translational, clinical and educational) as well as quality improvement projects
- Promoting a collaborative culture and ensuring protection to the fellow to ensure wellness and minimize "burnout" amidst creating resilience
- Experience to provide patient-centered, evidence-based, high quality and innovative care to patients and their families

For more information, visit <https://www.choc.org/careers/residency-training-programs/uci-choc-pediatric-endocrinology-fellowship-program/>.

### Pediatric - Medical Genetics and Genomics

UCI offers two ACGME-accredited Medical Genetics and Genomics clinical training programs:

- A two-year categorical Clinical Genetics/Genomics program that requires prior satisfactory completion of 24 months of ACGME-accredited residency training in a specialty other than Medical Genetics. After successful completion of the Genetics program, trainees can apply for active candidacy to take the American Board of Medical Genetics and Genomics (ABMG) examinations.

- A four-year combined Pediatrics/Clinical Genetics/Genomics residency that can be entered after completion of medical school and that devotes 24 core months to Pediatrics, 18 core months to Clinical Genetics, and 6 months applicable to both specialties. The first year is spent in pediatrics in direct patient care experiences, the next 30 months alternate between Pediatrics and Medical Genetics for periods of 6 months each, and the last 6 months comprise an individualized study curriculum applicable to both specialties and/or research. After successful completion of the combined program, trainees can apply for active candidacy to take both the Pediatrics and the Medical Genetics and Genomics board examinations.

In each of the programs, the Clinical Genetics and Genomics curriculum comprises a minimum of 18 months of broad-based, clinically-oriented medical genetics activities, including inpatient consultations; outpatient prenatal, pediatric, adult, cancer genetics, metabolic genetics, and specialty clinics, and clinical laboratory rotations in cytogenetics and molecular cytogenetics, molecular genetics, and metabolic genetics. The curriculum also includes didactic courses (basic concepts, cytogenetics and molecular cytogenetics, quantitative genetics, genetic screening, human teratology, clinical and prenatal genetics, clinical biochemical genetics, clinical molecular genetics and bioinformatics, hereditary cancer risk counseling, ethical issues in human genetics, genetic counseling, and research methods), weekly clinical teaching and patient followup conferences, and journal club. The combined program also includes additional extensive clinical and didactic curricula in Pediatrics. Training occurs in three large teaching hospitals: UCI Medical Center, Children's Hospital of Orange County, and Miller Children's Hospital/Long Beach Memorial Medical Center. Both the categorical and the combined programs include research time and, to a large extent, an individualized curriculum.

The Clinical Genetics and Genomics training programs include exceptional evaluation and management opportunities with a culturally, socioeconomically, and medically diverse patient population and extensive individual teaching interactions with faculty. Clinical and basic science research conducted by faculty provides trainees with opportunities to develop skills and gain experience in scientific investigation.

### **Pediatric Hematology Oncology**

The Pediatric Hematology Oncology fellowship program is a three-year ACGME accredited fellowship based at Children's Hospital of Orange County.

The fellowship program prepares highly skilled pediatric hematologists and oncologists for careers in both clinical and academic medicine. The fellowship program is designed to educate and support future clinical investigators who plan to dedicate their professional careers to clinical or laboratory research in hematology and oncology.

### **Pediatric Infectious Diseases**

The Pediatric Infectious Diseases Fellowship Program is supported by UCI and CHOC Children's. Applications are accepted for qualified candidates through ERAS. The three-year training program includes approximately 14 months of clinical training and 20 months of research experience. The first year is primarily clinical and primarily based at CHOC. The inpatient ID service is divided into two services, the inpatient ward service and the ICU/Hematology-Oncology service. Fellows rotate on eight 4-week blocks during the first year on these teams. Each service generally sees 12-20 patients daily. Three 4-week blocks are devoted to research in the first year to allow fellows to explore possible research topics and select a research mentor. Research mentors are available through both CHOC and UCI and opportunities for lab research are strengthened by the research excellence of the infectious diseases team from UCI. During the first year of training, fellows will also do one 4-week rotation in adult ID medicine at the UCI Medical Center, an invaluable experience exposing them to the differences, intricacies and overlap of infectious diseases in the adult vs pediatric setting. During each of second and third year, fellows spend nine 4-week blocks on research, with three 4-week blocks on the inpatient services. Fellows participate in a 2-week rotation at the Orange County Health Care Agency to train in epidemiology of infectious diseases, obtain exposure to lab techniques and diagnostics tests available through the health department, and learn about outbreak investigation and mitigation. Throughout the three years, fellows will rotate through the Pediatric Infectious Disease, Immunodeficiency and HIV/KIDS clinics at CHOC. At the successful completion of this program, candidates will be able to sit for their boards in Pediatric Infectious Diseases.

### **Pediatric Neonatal-Perinatal Medicine**

UCI offers a three-year fellowship in Neonatal-Perinatal Medicine, accredited by the Accreditation Council for Graduate Medical Education (ACGME). The program provides a well-rounded curriculum that balances between clinical experiences, teaching opportunities, and academic and scientific activities. The program offers variety and depth due to the diversity of the two major training sites—UCI Medical Center and Long Beach Memorial Medical Center/Miller Children's Hospital. The care of newborns seen through the two hospitals represents a cross-section of racial, cultural, and socioeconomic groups from a local population of more than 2.5 million. These two sites represent a broad-spectrum of neonatal practice and offer excellent opportunities to learn and teach. Clinical and basic science research conducted by the faculty in the section gives the fellow the ability to gain skills in scientific investigation. The program's superb physical environment, extraordinary clinical services, and varied research interests permit the faculty to carry out the mission of preparing neonatal fellows for a career in clinical or academic neonatology. In addition, the program collaborates clinically and through research with a superb fellowship training in Maternal-Fetal Medicine that is also based at the two institutions. The Neonatal-Perinatal Medicine Fellowship training consists of 14 months of direct patient care responsibilities, 19 months of research training, and three months of vacation.

### **Pediatric Pulmonology**

UCI partners with Miller Children's Hospital in offering one of the few pediatric pulmonology fellowship training programs in California. The program has been in existence for more than 26 years and has attracted outstanding candidates from the United States and internationally. The pulmonary fellowship offers tailored, innovative research projects for fellows, as well as a thorough and comprehensive program in pediatric and pulmonary medicine. The program offers a special track program for candidates interested in pursuing a career in academic pediatrics. This candidate will have a research focus in exercise physiology in children and will be eligible for a Masters in Clinical Science at UCI. The research interests of fellows include such topics as air



pollution and asthma in children, immunological aspects of lung disease, exercise and the impact of immunity, and growth factor in children. Research is conducted at the Translational Pulmonary & Immunology Research Center in Long Beach. The six faculty members of the pediatric pulmonology program are supported by private, federal, and NIH grants.

### **Physical Medicine & Rehabilitation**

The Department of Physical Medicine & Rehabilitation (PM&R) offers a three-year residency program for applicants who have completed a 12-month ACGME accredited internship. The residency program's focus is on the diagnosis and comprehensive treatment and care of patients of all ages with functional impairments due to conditions such as musculoskeletal disorders, neurological disorders, trauma, amputation, and congenital abnormalities. Residents rotate at the UCI Medical Center, the Tibor Rubin VA Medical Center and Long Beach Memorial Medical Center. PM&R Residents are involved in research and medical student teaching.

### **Physical Medicine & Rehabilitation - Spinal Cord Injury**

The Spinal Cord Injury Medicine Fellowship is a one-year accredited program. The fellow rotates through three teaching institutions: Tibor Rubin VA Medical Center, Rancho Los Amigos National Rehabilitation Center, and UCI Medical Center. The Spinal Cord Injury Center at the Tibor Rubin VA Medical Center is the largest SCI Center in the nation within the Veterans Healthcare System with 77 bed capacity. Inpatient units treat complex medical/surgical cases, which include ventilator-dependent spinal cord injuries. Outpatient services include general and focused primary care for geriatric patients and SCI patients with diabetes. There are specialty clinics, such as surgical care (urology and plastic surgery), upper extremity restoration (tendon transfers), annual evaluations, shoulder clinic, wheelchair clinics and driver's training. Rancho Los Amigos National Rehabilitation Center (RLANRC) is a world renowned rehabilitation hospital with unique learning opportunities including spasticity, post-polio, and orthopedic rehabilitation clinics. In addition, RLANRC provides experiences in pediatric spinal cord disorders in acute, subacute, and rehabilitation settings, care of spinal bifida patients and an opportunity to learn about problems associated with transition from childhood to adulthood in persons with SCI. UCIMC is a level 1 trauma center which offers the SCI fellow the opportunity to understand the multidisciplinary approach for the acute management of traumatic spinal cord injury. The fellow will learn the clinical pathway guidelines for the critical care management of acute traumatic spinal cord injury and to understand the role of the physiatrist consult in the care of the acute spinal cord injured patient. In addition to the academic and clinical work, our fellows are expected to participate in performance improvement projects, shadow the chief/program director to various hospital-wide administrative meetings and actively participate in teaching of other trainees and colleagues.

### **Plastic Surgery**

The Department of Plastic Surgery has a fully integrated residency program. The program currently accepts three residents for a six-year educational training experience in Plastic Surgery. The goals and objectives of this program are to educate plastic surgeons who are analytical and scholarly in their approach to surgical problem solving, broadly experienced in all fields of the specialty, safe in their application of judgment and technique, and ultimately self-educating in a lifelong continuing medical education process. The goals and teaching philosophy are based on the graduate school model, which emphasizes analytic problem solving, scholarly use of the knowledge base and scientific resources of the field, development of judgment skills, and identification of educational tools that produce the ability to self-direct one's lifelong professional education in a scholarly manner. At the successful completion of this program, candidates will be able to sit for their boards in Plastic Surgery.

### **Psychiatry**

The Psychiatry Residency Training Program is a four-year program that fosters academic excellence and broad clinical experience in general psychiatry in a balanced, evidence based and patient-centered manner. Residents receive extensive supervised training in psychopharmacology and various modalities of psychotherapy. The core curriculum includes weekly didactic seminars and supervised clinical experiences in the following areas: adult inpatient and outpatient psychiatry, psychodynamic psychotherapy, child and adolescent psychiatry, geriatric neuropsychiatry, primary care, neurology, emergency psychiatry, consultation and liaison psychiatry, forensic psychiatry, and addiction psychiatry. Our training program, including weekly didactics, emphasizes the importance of using a 'biopsychosocial' and individualized approach to patient care. Psychopharmacologic, psychotherapeutic and integrated psychiatric care (e.g. collaborative care or telepsychiatry) is presented in a way which underscores the importance of becoming expert in all of these areas upon graduation from the program. Opportunities for research abound with expert faculty available to provide guidance. Throughout their training, by treating a highly diverse patient population, residents acquire competency in culturally-sensitive psychiatric assessment and treatment, as well as with different systems-based practices. The program is based at the UCI Medical Center and includes three inpatient units, a partial hospitalization program, an expanding outpatient clinic and a new sleep center, among other sites. The flexible curriculum and supportive faculty allow residents to pursue elective interests in research, teaching, and administrative psychiatry, ensuring attainment of the residents' career goals.

### **Psychiatry - Child Psychiatry**

The Child & Adolescent Psychiatry Fellowship Training Program is a two-year program that builds on the training already completed in a General Psychiatry Residency. It provides subspecialty training in how to specifically evaluate and treat individuals younger than 18 years old by accounting for this population's unique characteristics. Fellows are able to complement their developing knowledge base and clinical decision-making skills with a compassionate, humanistic approach. Our program emphasizes training in biological, psychological, and social modalities, as we strongly believe that a multidisciplinary approach is vital to providing excellent psychiatric care to children, adolescents and their families. Clinical experiences have been developed to provide exposure to the wide variety of psychiatric diagnoses and issues facing children and adolescents, as well as prepare our fellows for the diverse populations they may encounter post-graduation. Training opportunities include: acute inpatient treatment, partial hospitalization, consult-

liaison service, emergency psychiatry, trauma-focused therapy clinic for victims of child abuse, school consultation at UCI's Child Development Center, and juvenile forensic rotations.

### **Radiation Oncology**

The Residency Training Program in Radiation Oncology is designed to prepare suitably qualified individuals for academic and clinical practice careers in Radiation Oncology. Candidates enter a four-year program which encompasses clinical service, didactic teaching, and integrated research experience. Beyond exposure to a variety of conventional and precision-oriented external beam treatment technologies such as IMRT (Intensity-Modulated Radiation Therapy), SRS (Stereotactic Radiosurgery), and SBRT (Stereotactic Body Radiation Therapy), opportunities exist for training in interstitial and intracavitary brachytherapy using special applicators. Clinical applications based on fundamental principles in Radiation Physics and Biology are emphasized, while trainees attain competence in implementing multidisciplinary cancer care based on sound judgment of evidence-based medicine. The program includes rotations at three participating hospitals: UCI Medical Center, Veterans Affairs Long Beach Healthcare System, and UCSD/Rady Children's Hospital for pediatrics rotation.

### **Radiological Sciences - Diagnostic Radiology**

The Department of Radiological Sciences offers a four-year residency training program in diagnostic radiology, including all aspects of medical imaging. Resident training is conducted primarily at the UCI Medical Center and the Veterans Affairs Long Beach Healthcare System (LBVA), supplemented by rotations in Pediatric Radiology at CHOC Children's. The LBVA is an integral component of resident education. Exceptional faculty, quality didactic conferences, and a community-based patient population at the VA strengthen resident education and broaden residents' clinical exposure. The program offers a required dedicated research rotation in addition to elective time that can be used for research. Nearly all residents have published journal articles, co-authored book chapters, and/or presented at national and local society meetings. As a whole, the program is resident-centered and offers an exceptionally well-rounded training experience designed to prepare residents for careers in either academic radiology or private practice.

### **Radiological Sciences - Interventional Radiology (Independent)**

The Department of Radiological Sciences offers a two-year residency training program in interventional radiology through an independent program. Completion of an accredited diagnostic radiology residency program is required for entry into the independent program. Both ESIR and non-ESIR candidates are welcomed. Graduates will be eligible for dual board certification in IR/DR. The well-rounded training experience is designed to prepare residents for careers in either academic radiology or private practice. Residents participate in the entire gamut of modern interventional radiology care with an emphasis on pre- and post-procedure management and clinic patient evaluations. Participation in ongoing research projects, publications, and submission to regional and national meetings is highly encouraged and supported.

### **Radiological Sciences - Interventional Radiology (Integrated)**

The Department of Radiological Sciences offers a five-year ACGME-approved residency-training program in interventional radiology through an integrated program. The first three years focus on diagnostic radiology and the last two years focus on interventional radiology. Graduates will be eligible for dual board certification in IR and DR. Resident training is conducted primarily at the UCI Medical Center and the Veterans Affairs Long Beach Healthcare System, supplemented by rotations in Pediatric Radiology at CHOC Children's. As a whole, the program is resident-centered and offers an exceptionally well-rounded training experience designed to prepare residents for careers in either academic radiology or private practice.

### **Radiological Sciences - Neuroradiology**

A one-year ACGME-approved fellowship is offered in Diagnostic Neuroradiology. The fellow will spend 10 months of the 12-month fellowship in training and experience in the interpretation of studies of brain, spine, and head and neck disorders. A dedicated month of Pediatric Neuroradiology is included in the training program, typically on assignment to Loma Linda University Medical Center. Additional time will be spent in Interventional Neuroradiology with experience and training in both diagnostic and therapeutic vascular studies, as well as time spent on relevant nuclear medicine techniques. Participation in the ongoing research projects and publications of the section is encouraged.

### **Surgery - General Surgery**

The General Surgery program places strong emphasis on provision of excellent clinical care, establishing new horizons in minimally invasive surgery, education of residents and medical students in all aspects of surgery, and high-level surgical research. The program trains and prepares some of the finest surgeons in the country for the rigors of academic or private practice as well as subsequent fellowship training. The general surgery residency program's integrated and affiliated training sites include rotations in surgical oncology, cardiothoracic, vascular, gastrointestinal, colorectal, hepatobiliary, general surgery, surgical critical care, pediatric surgery, emergency general surgery, and trauma/acute care surgery. UCI's faculty and volunteer faculty, as well as that of affiliate institutions, are committed to teaching and provide residents with a variety of resources and opportunities to engage their surgical knowledge. Surgical residents perform clinical rotations at the UCI Medical Center, the Veterans Affairs Long Beach Hospital, Long Beach Memorial Medical Center, Mission Hospital and Children's Hospital of Orange County. Residents interested in research will find a broad range of resources and mentors. While not required, research during residency imbues critical skills and exposes the resident to the an additional dimension of academic surgery. Options for one or two years of dedicated research outside of the clinical track are available. Fully accredited by the ACGME, UCI's General Surgery Residency Program emphasizes the surgeon of the future in its curriculum—providing world class surgical care while minimizing the footprint left behind. The program practices and abides by the motto coined by former chair, David Hoyt, M.D., FACS, "When you see one of us, you see all of us." Resident applications are accepted entirely through ERAS and determined via the NRMP process. All candidates interested in pursuing

a general surgery residency will have completed medical school prior to residency's June start, and have applied through ERAS with a complete application.

### **Surgery - Colon & Rectal Surgery**

The Colon and Rectal Surgery Residency Program is a one-year accredited fellowship program available for residents who have previously completed General Surgery training. Fellowship interviews are held during the autumn of the year prior to the anticipated August start date. The Colon and Rectal Surgery fellowship program participates in the NRMP match program. Presently, the fellow spends the entire year on the UCI Medical Center campus rotating with the five colon and rectal surgeons who practice there. In addition, the fellow works with Gastroenterology attending physicians during the year regarding additional endoscopy training. Fellows participate in weekly conferences that include selected educational topics, quality improvement, journal club, and multidisciplinary conference regarding complex cancer and inflammatory bowel disease management. In addition, travel to meetings is supported for a selected research project during the year. The fellow will undergo extensive training in diseases of the colon, rectum, pelvic floor and anus. Advanced surgical training will include inflammatory bowel disease, colon and rectal cancer, diverticulitis, laparoscopy and robotic surgery, anorectal surgery, pelvic floor disease management, and endoscopy. All candidates interested in pursuing a Colorectal Fellowship must be board certified/eligible graduates from an ACGME-approved surgical residency.

### **Surgical Critical Care**

The Surgical Critical Care Fellowship is a one-year ACGME-accredited program with an opportunity for an optional non-accredited second year. As a surgical critical care fellow, experience will be gained working at UCI Medical Center in the Division of Trauma, Burns, Surgical Critical Care and Acute Care Surgery. UCI has both an ACS-verified Level I Trauma Center with approximately 4500 trauma activations per year and an ACS/ABA-verified regional Burn Center with over 225 admissions per year. There are over 6,000 ICU admissions per year, and fellows gain experience with core rotations in the SICU and elective experiences in the Neuro ICU, Burn ICU, Cardiovascular ICU, Pediatric ICU, and Medicine ICU. Extensive exposure to trauma resuscitation, operative management, emergency general surgery, and bedside ICU procedures is provided. Didactics include weekly core critical care lectures, case conferences, hands-on point of care ultrasound course, and Scientific American Surgical Critical Care program. Fellows attend a variety of educational courses sponsored by the American College of Surgeons including: Advanced Surgical Skills Exposure in Trauma (ASSET), Advanced Trauma Life Support (ATLS), and Disaster Management and Emergency Preparedness (DMEP). The optional second year is individually tailored to the needs of the fellow, and may include advanced experiences in trauma surgery, acute care surgery, quality and safety, and research. Applications to the Surgical Critical Care program are accepted through SAFAS. Applicants must be board-certified/eligible graduates from an ACGME-accredited surgical residency program.

### **Urology - Urological Surgery**

The Department of Urology Residency Program is a five-year training program with three residents per year. The PGY 1 (internship) consists of six months of urology rotations and six months of non-urologic rotations including core general surgery rotations. The PGY 2-5 years provide training in all aspects of adult and pediatric urologic diseases. The residents receive extensive training in open and endoscopic procedures, laparoscopy and other minimally invasive techniques, urologic pathology, uro-radiology, and management of non-operative urologic conditions. The program's training hospitals include UCI Medical Center, Veterans Affairs Long Beach Healthcare System, Long Beach Memorial Medical Center, and Children's Hospital of Orange County. The Department of Urology encourages and supports both clinical and basic science research.

### **Urology - Pediatric**

The Pediatric Urology Fellowship program, is an ACGME accredited program, leading to qualification for the American Board of Urology's Subspecialty Certification in Pediatric Urology. This is a two-year fellowship, centered at the Children's Hospital of Orange County (CHOC), and UCI. Four Pediatric Urologists, faculty in the Department of Urology, oversee a full clinical program in which trainees are guided through all aspects of Pediatric Urology. One year is fully clinical, and a second year is split between clinical and research activities. Research projects may make full use of the robotic and surgical simulation and animal facilities at UCI. Collaborative meetings are regularly held within the Urology Department, in which the Fellows are encouraged to present materials and participate. In addition, regular meetings at CHOC, include Radiology, Nephrology, Endocrinology Rounds, DSD Rounds, and scheduled Didactics. There are opportunities for international travel for volunteer missions. The entry to the Fellowship requires the completion of a recognized Urology residency, and the application is coordinated by the Society of Pediatric Urology matching program.

## **Anesthesiology**

The Anesthesiology Residency Program is an ACGME-accredited, four-year categorical program. Our program is dedicated to providing an exceptional educational experience to develop the next generation of board-certified physician anesthesiologists and leaders in our field.

Our innovative 4U Didactic Program includes Point-of-Care Ultrasound (POCUS) training, high-fidelity simulations, hands-on workshops, problem-based learning discussions, wellness series, practice management, and professional development. The PGY-1 and CA-1 (PGY-2) years cover the fundamentals of anesthesiology and perioperative medicine to provide a solid foundation on which to build advanced and subspecialty clinical knowledge and skills during the CA-2 (PGY-3) and CA-3 (PGY-4) years. Residents gain broad and diverse clinical experience through rotations at UCI Medical Center, Children's Hospital of Los Angeles (CHLA), Long Beach Memorial Medical Center, Kaiser Permanente Los Angeles, Veterans Affairs Long Beach Healthcare System, and Children's Hospital of Orange County (CHOC). Residents also have the opportunity for participation in medical missions, in partnership with faculty, through our Global Outreach Initiative.

## Dermatology

The Department of Dermatology offers a three-year accredited residency which has 15 residents, five for each of three postgraduate years. Residents rotate through clinics at UCI and the Veteran Affairs Long Beach Healthcare System and receive extensive training in medical and surgical dermatology. Residents rotate through specialty clinics which see patients with immunobullous disease, pigmentary disorders, vascular birthmarks, pediatric disorders, hair disorders, and melanoma. Residents receive extensive training in Mohs surgery, laser techniques, excisional surgery, performance of flaps and grafts, and administration of cosmetic agents. Residents are also active in research and present at local, national, and international meetings.

## Emergency Medicine

The Emergency Medicine residency was established in 1988 and has full accreditation by the Residency Review Committee. The program has 24 residents, eight for each of three postgraduate years. The UCI Medical Center Emergency Department is a high-acuity, Level I Trauma Center, treating over 50,000 patients annually. Nineteen board-certified emergency medicine faculty provide 24-hour patient care and supervision of residents and medical students. The Department of Emergency Medicine is active in disaster preparedness and response, emergency uses of ultrasound, public affairs, community service, and research in the areas of prehospital care, educational technology, trauma, health policy, and infectious disease, among others.

## Family Medicine

The University of California, Irvine Family Medicine Residency Program strives to train excellent clinicians who provide the best patient-centered compassionate medical care to our most vulnerable and underserved communities. The residency is a fully accredited program with both faculty and residents who practice out of the only academic federally qualified health center in the entire state of California. The residency incorporates technology and innovation in a unique community-academic hybrid educational setting that provides a rich and intensive clinical training environment. Residents obtain exceptional clinical skills while promoting community engagement, patient advocacy and the practice of socially responsible and culturally appropriate care. We aim to graduate physician leaders dedicated to medically underserved communities.

## Geriatrics

The Geriatric Medicine Fellowship is a comprehensive and challenging one-year advanced training program that prepares physicians to deliver compassionate, informed care to a diverse aging population. The clinical opportunities allow geriatric fellows to explore both the depth and breadth of geriatric medicine through longitudinal primary care experiences and rotations in a variety of sub specialty clinical settings.

The heart of the fellowship is in UCI's SeniorHealth Center, where fellows have their continuity and consultation clinics. Here, fellows work with a continuity attending on a weekly basis, learning the art and medicine of geriatric ambulatory care. Some of the subspecialty rotations at UCI include a memory disorders clinic, subacute care, neurology, dermatology, cardiology, rheumatology, and more.

At the Veterans Administration Center in Long Beach, fellows participate in the Geriatric Evaluation Management (GEM) clinic, an interdisciplinary program which assesses the medical and psychosocial status of frail older patients. The goal is to optimize each military veteran's health, function, and ability to live with the greatest degree of independence possible. The VA offers inpatient and outpatient geropsychiatry, a Parkinson's clinic, memory and movement disorders, palliative care, aging with disabilities, and physical medicine and rehabilitation.

Our program is also affiliated with skilled nursing facilities, as well as the country's first Elder Abuse Forensic Center. We offer electives in integrative medicine, community resources, or additional experiences in any of the above rotations.

## Internal Medicine

The internal medicine residency program is a traditional three-year training program and also sponsors a one-year preliminary medicine program in addition the ABIM certified research pathway. The program focuses on core educational skills of the internist and offers training to ensure our residents have access to a broad array of career options including hospitalist medicine, primary care, and subspecialty training. Residents rotate through UCI Medical Center, the Veterans Affairs Long Beach Healthcare System, and Long Beach Memorial Medical Center. Core program faculty have a special interest in academic internal medicine and education. Subspecialty fellowships are offered in basic and clinical allergy/immunology, cardiology, endocrinology and metabolic diseases, gastroenterology, geriatrics, hematology/oncology, infectious disease, nephrology, palliative care, pulmonary/critical care, and rheumatology.

## Medical Genetics and Genomics

UCI offers three Medical Genetics and Genomics training programs:

1. A two-year categorical Clinical Genetics/Genomics residency that requires prior satisfactory completion of 24 months of ACGME-accredited residency training in a specialty other than Medical Genetics. After successful completion of the Genetics program, trainees can apply for active candidacy to take the American Board of Medical Genetics and Genomics (ABMG) examinations.
2. A four-year combined Pediatrics/Clinical Genetics/Genomics residency that can be entered after completion of medical school and that devotes 24 core months to Pediatrics, 18 core months to Clinical Genetics, and 6 months applicable to both specialties. The first year is spent in pediatrics in direct patient care experiences, the next 30 months alternate between Pediatrics and Medical Genetics for periods of 3 to 6 months each, and the last 6 months comprise either an individualized curriculum applicable to both specialties or research. After successful completion of the combined program, trainees can apply for active candidacy to take both the Pediatrics and the Medical Genetics and Genomics board examinations.



3. A four-year combined Maternal-Fetal Medicine/Clinical Genetics/Genomics training program that requires prior satisfactory completion of 4 years of ACGME-accredited training in Obstetrics and Gynecology. After successful completion of the combined program, trainees can apply for active candidacy to take both the Maternal-Fetal Medicine and the Medical Genetics and Genomics board examinations.

In each of the three programs, the Clinical Genetics and Genomics curriculum comprises a minimum of 18 months of broad-based, clinically-oriented medical genetics activities, including inpatient consultations, outpatient prenatal, pediatric, adult, cancer genetics, metabolic genetics, and specialty clinics, and clinical laboratory rotations in cytogenetics and molecular cytogenetics, molecular genetics, and metabolic genetics. The curriculum also includes didactic courses (basic concepts, cytogenetics and molecular cytogenetics, genetic epidemiology, clinical and prenatal genetics, clinical biochemical genetics, clinical molecular genetics and bioinformatics, cancer genetics, ethics, genetic counseling, and research methods), weekly clinical teaching and patient followup conferences, and journal club. The two combined programs include additional extensive clinical and didactic curricula in Pediatrics and Maternal-Fetal Medicine, respectively. Training occurs in three teaching hospitals: UCI Medical Center, Children's Hospital of Orange County, and Miller Children's Hospital/Long Beach Memorial Medical Center. Maternal-Fetal Medicine also utilizes St. Joseph Medical Center and Long Beach Memorial Women's Hospital.

The Clinical Genetics and Genomics training programs include exceptional evaluation and management opportunities with a diverse patient population and extensive individual teaching interactions with faculty. Clinical and basic science research conducted by faculty provides trainees with opportunities to develop skills and gain experience in scientific investigation.

## Neonatal-Perinatal Medicine

UCI offers a three-year fellowship in Neonatal-Perinatal Medicine, accredited by the Accreditation Council for Graduate Medical Education (ACGME). The program provides a well-rounded curriculum that balances between clinical experiences, teaching opportunities, and academic and scientific activities. The program offers variety and depth due to the diversity of the two major training sites—UCI Medical Center and Long Beach Memorial Medical Center/Miller Children's Hospital. The care of newborns seen through the two hospitals represents a cross-section of racial, cultural, and socioeconomic groups from a local population of more than 2.5 million. These two sites represent a broad-spectrum of neonatal practice and offer excellent opportunities to learn and teach. Clinical and basic science research conducted by the faculty in the section gives the fellow the ability to gain skills in scientific investigation. The program's superb physical environment, extraordinary clinical services, and varied research interests permit the faculty to carry out the mission of preparing neonatal fellows for a career in clinical or academic neonatology. In addition, the program collaborates clinically and through research with a superb fellowship training in Maternal-Fetal Medicine that is also based at the two institutions. The Neonatal-Perinatal Medicine Fellowship training consists of 14 months of direct patient care responsibilities, 19 months of research training, and three months of vacation.

## Neurology

Neurology residency training focuses on the development of strong clinical skills to competently evaluate and treat the large number of disorders that afflict the nervous system. During three years of training at UCI, residents have the opportunity to see a wide variety of neurological conditions and receive progressively more responsibility. The program provides a rich, intellectually stimulating environment in which to learn. UCI Neurology faculty all have broad experience caring for neurological disorders and have special expertise in different neurological disciplines. Residents have opportunities to work in many different subspecialty areas with the faculty. The neurology residency program is big enough to provide a rich environment to learn about neurological disorders, yet remains small enough for residents to work closely with each faculty member. Residents are encouraged to learn at every opportunity: from patients, peers, the faculty, and visiting experts. There are many formats in which to learn, from bedside discussions, tutorials, to specially prepared lectures. To further stimulate intellectual growth, residents are actively encouraged to pursue research in any topic of their choosing, with the guidance of the faculty.

## Neurosurgery

The UCI Residency Program in Neurosurgery is a rigorous training program designed to develop academic neurosurgeons. There are ample opportunities for both clinical and basic research within the Department and in collaboration with other laboratories or departments at UCI. Applicants are expected to have a strong academic record with a strong commitment to neurosurgery. The program participates in the NRMP match program to select two candidates every other year and one candidate the years in between. Exact order of clinical rotations may vary slightly subject to the trainee's interest in neurosurgery subspecialty; however, the rotation generally proceeds as follows: the PGY-1 year consists of thirteen (13), four (4) week blocks. There are six (6) blocks of neurosurgery rotation, one (1) block of ENT rotation, one (1) block of neurology rotation, one (1) block of ACS/trauma rotation, one (1) block of elective rotation (Neuropathology and Neuroradiology), and three (3) blocks of neurocritical care rotation; PGY-2 is one year of training at UCI Medical Center assigned to neurosurgery service; PGY-3 is a nine-month rotation at UCI Medical Center, followed by a three-month elective (Interventional Radiology or Spine) at UCI Medical Center; PGY-4 is a three-month rotation at Children's Hospital of Orange County (CHOC), a three-month rotation at Tibor Rubin Veterans Affairs Medical Center, a two-month of stereotactic radiosurgery and four-month of elective rotation at UCI Medical Center; PGY-5 has an option of either a research year or a 12-month subspecialty training (i.e. enfolded fellowship); PGY-6 is a three to six-month elective rotation (Endovascular, Spine, Pediatrics), a three months rotation at Tibor Rubin Veterans Affairs Medical Center and last three months starts the chief resident year; PGY-7 is the chief resident year and will be at UCI Medical Center with last three months of elective rotation.

## Obstetrics and Gynecology

This four-year program provides a solid foundation in Obstetrics and Gynecology with emphasis in the reproductive pathophysiology in the many different areas of women's health care. Based on this foundation, training continues with progressive resident responsibility for operative and medical management and surgical techniques. While predominantly clinical in scope, the program is strongly flavored by academic and research exposure.

Training is provided in general obstetrics and gynecology with rotations in the subspecialties of Maternal-Fetal Medicine, Gynecologic Oncology, Female Pelvic Medicine and Reconstructive Surgery, Minimally Invasive Surgery, Family Planning and Reproductive Endocrinology, and Infertility. There are seven resident positions available each year in this four-year training program. For more information, visit <https://www.obgyn.uci.edu/obgyn-residency.asp>.

## Ophthalmology

The Ophthalmology Residency Program at UCI's Gavin Herbert Eye Institute is three years in duration and provides extensive clinical and surgical training experiences. The education includes a robust weekly didactic curriculum. Trainees are exposed to a broad spectrum of ophthalmic disease management with high volume surgical experience in the full range of ophthalmology subspecialties. Residents rotate in cornea and refractive surgery, vitreoretinal surgery, oculoplastic and orbital surgery, glaucoma, pediatric ophthalmology and strabismus, ophthalmic pathology, uveitis, and neuro-ophthalmology, in addition to comprehensive ophthalmology. Trainees are exposed to diverse patient populations at various sites including Long Beach Veterans Affairs, and UCI Medical Center, as well as Gavin Herbert Eye Institute, a 70,000 square foot facility dedicated to ophthalmic patient care, surgery, and education.

## Orthopaedic Surgery

The Department of Orthopaedic Surgery at the University of California, Irvine offers a five-year ACGME accredited residency program and currently accepts four residents each year. The program is designed to provide intense exposure, experience, and education in the subspecialties of orthopaedics: trauma/fracture care, reconstructive/joint replacement surgery, sports medicine, pediatric orthopaedics, as well as spine, foot and ankle, shoulder, and hand surgery. Exposure to non-operative and rehabilitative orthopaedic care is also provided. The program is structured for maximum resident participation with an emphasis on mentorship, didactic teaching, and supervised graduated autonomy in both the outpatient and the surgical setting. Clinical and basic science research opportunities are available, and resident participation in these academic endeavors are an integral component of the residency. The program's primary site, UCI Medical Center, is the only Level I Academic medical center in Orange County, serving over 3 million residents. Other sites include the Veterans Affairs Healthcare System in Long Beach, Long Beach Memorial Medical Center, and Miller's Children's Hospital. Following completion of the orthopaedic residency program, residents are prepared to sit for the American Board of Orthopaedic Surgery certification exams and proceed to a subspecialty fellowship or enter into orthopaedic practice.

## Otolaryngology—Head and Neck Surgery

The Department of Otolaryngology—Head and Neck Surgery offers a five-year residency program providing comprehensive training in otolaryngology and prepares trainees to sit for the American Board of Otolaryngology Examinations. The five-year program provides a breadth of training in general and pediatric otolaryngology, head and neck surgery, otological surgery, rhinology (including endoscopic sinus and skull base surgery), laryngology, and facial plastic and reconstructive surgery. Residents receive an extensive clinical experience at UCI Medical Center, Children's Hospital of Orange County, Veterans Affairs Long Beach Healthcare System, and Kaiser Foundation Hospital-Anaheim and Irvine. Acceptance is through application and successful matching through the National Residency Matching Program. The program follows requirements set by the Accreditation Council for Graduate Medical Education.

## Pain Medicine Fellowship

The Pain Medicine Fellowship at UCI Health is an intensive one-year ACGME-accredited multidisciplinary training program. The comprehensive training includes pain assessment, treatment, and management, covering both inpatient and outpatient care, including both adult and pediatric pain medicine, with a special focus on advanced interventional techniques. The fellowship includes hands-on training in interventional neuraxial interventions, neuromodulation techniques, intrathecal drug delivery systems, and peripheral nerve blocks, among others procedures. Fellows work closely with specialists in anesthesiology, physical medicine and rehabilitation, neuroradiology, palliative care, neurology, primary care, and psychiatry to gain a comprehensive understanding of pain management.

The program includes a strong didactic curriculum and participation in scholarly activities is strongly encouraged. Fellows get exposure in practice management and business administration.

For candidates with an interest in pain related research, the UCI Center for Pain Wellness has a strong complement of basic and translational researchers with active laboratories in pain related to spinal cord injury and mechanisms of chronic pain.

## Pediatrics

The Pediatric Residency Program emphasizes the interrelationship of patient care, didactic teaching, and research in the training of the pediatric resident physician. The focus is on the total care of the child from birth through young adulthood. A strong clinical and educational foundation is provided through experiences in a broad spectrum of disease and/or injury as well as training in biosocial pediatrics, preventive health care, and community resources.

The program offers variety and depth due to the diversity of the Department's major teaching hospitals—Children's Hospital of Orange County, Miller Children's Hospital (located at Long Beach Memorial Medical Center), and UCI Medical Center. The faculty at these institutions provides a comprehensive teaching program in general pediatrics and cover the full range of pediatric subspecialties. The care of children seen through the three hospitals represents a cross-section of racial, cultural, and socioeconomic groups from a local population of more than 2.5 million. Thus, pediatric residents are exposed to a wide range of problems presented in settings ranging from intensive care to supervised office-based practice.

## Physical Medicine and Rehabilitation

The Department of Physical Medicine and Rehabilitation offers a three-year residency for applicants who have completed a 12-month ACGME accredited internship. The residency program focus is on the diagnosis and comprehensive treatment and care of patients with musculoskeletal, neurological problems or cardiopulmonary disabilities, from newborns to the elderly. Residents rotate at the UCI Medical Center, the Veterans Affairs Long Beach Healthcare System, Long Beach Memorial Hospital, and St. Jude Hospital. PM&R Residents are involved in research and medical student teaching.

## Plastic Surgery

The Department of Plastic Surgery at the University of California, Irvine has a fully integrated residency program. The program currently accepts three residents for a six-year educational training experience in Plastic Surgery. The goals and objectives of this program are to educate plastic surgeons who are analytical and scholarly in their approach to surgical problem solving, broadly experienced in all fields of the specialty, safe in their application of judgment and technique, and ultimately self-educating in a lifelong continuing medical education process. The goals and teaching philosophy are based on the graduate school model, which emphasizes analytic problem solving, scholarly use of the knowledge base and scientific resources of the field, development of judgment skills, and identification of educational tools that produce the ability to self-direct one's lifelong professional education in a scholarly manner. At the successful completion of this program, candidates will be able to sit for their boards in Plastic Surgery.

## Preventive Medicine - Occupational Medicine

The Occupational Medicine Residency Program is based in the Division of Occupational and Environmental Medicine, Department of Medicine. It is intended for physicians who are seeking certification by the American Board of Preventive Medicine in the field of Occupational Medicine. A prerequisite to participation is a minimum of one year of postgraduate clinical training in an accredited United States or Canadian primary care program. The program generally expects entering residents to have completed a three-year primary care residency or the equivalent. The objective of the program is to train physicians to be specialists and leaders in the fields of occupational and environmental medicine. During the two year program, residents are provided academic foundation in occupational medicine, industrial hygiene, environmental toxicology, and epidemiology. As part of this program, residents complete a Master of Science degree program in Environmental Health Sciences and complete a research thesis as part of the residency program. The program also includes extensive didactic and clinical training and field experience in occupational health and safety, interdisciplinary seminars, and a journal club in environmental and occupational medicine. Upon completion of training, the resident is qualified to enter the specialty practice of occupational medicine as a consultant or in an occupational medicine specialty practice, workplace setting, government agency, or academic institution.

## Psychiatry

The Psychiatry Residency Training Program is a four-year program that fosters academic excellence and broad clinical experience in general psychiatry in a balanced, evidence based and patient-centered manner. Residents receive extensive supervised training in psychopharmacology and various modalities of psychotherapy. The core curriculum includes weekly didactic seminars and supervised clinical experiences in the following areas: adult inpatient and outpatient psychiatry, psychodynamic psychotherapy, child and adolescent psychiatry, geriatric neuropsychiatry, primary care, neurology, emergency psychiatry, consultation and liaison psychiatry, forensic psychiatry, and addiction psychiatry. Our training program, including weekly didactics, emphasizes the importance of using a 'biopsychosocial' and individualized approach to patient care. Psychopharmacologic, psychotherapeutic and integrated psychiatric care (e.g. collaborative care or telepsychiatry) is presented in a way which underscores the importance of becoming expert in all of these areas upon graduation from the program. Opportunities for research abound with expert faculty available to provide guidance. Throughout their training, by treating a highly diverse patient population, residents acquire competency in culturally-sensitive psychiatric assessment and treatment, as well as with different systems-based practices. The program is based at the UCI Medical Center and includes three inpatient units, a partial hospitalization program, an expanding outpatient clinic and a new sleep center, among other sites. The flexible curriculum and supportive faculty allow residents to pursue elective interests in research, teaching, and administrative psychiatry, ensuring attainment of the residents' career goals.

## Radiology, Diagnostic

The Department of Radiological Sciences has an ACGME-approved four-year residency program in diagnostic radiology based at the UCI Medical Center and integrated with the Veterans Affairs Long Beach Healthcare System. There are also month-long Pediatric Radiology rotations at Children's Hospital of Orange County. The objectives of the program are (1) to train competent radiologists with a solid background in all modalities of imaging and interventional procedures, (2) to provide a conducive atmosphere and to encourage opportunities for residents to participate in translational and basic science research as well as patient care quality improvement and healthcare economics, and (3) to provide elective periods in which residents have the opportunity to increase their clinical radiology expertise or to work on research projects during their residency training. The residency program includes sub-specialized training in interventional, cardiothoracic, abdominal, pediatric, musculoskeletal radiology, as well as breast imaging, neuroradiology, and molecular imaging. Residents are exposed to a variety of modalities including radiography, fluoroscopy, computed tomography (CT), magnetic resonance imaging (MRI), ultrasonography, mammography, nuclear medicine, and molecular imaging. All residents participate in scholarly activities and are encouraged to complete at least one research project during the program. The program provides a month-long research block; residents are required to complete at least one scholarly project during residency. Candidates are accepted for six positions at the PGY-2 level for the four-year program. Fellowships are available for an additional year in specialized areas following the successful completion of the residency. The newest technologies in the field of radiological sciences are available at UCI Medical Center and affiliated institutions. The program sponsors a four-week course in radiology-pathology correlation training, as well as training in radiology physics.

## Radiation Oncology

The Residency Training Program in Radiation Oncology is designed to prepare suitably qualified individuals for academic and clinical practice careers in Radiation Oncology. Candidates enter a four-year program which encompasses clinical service, didactic teaching, and integrated research experience. Beyond exposure to a variety of conventional and precision-oriented external beam treatment technologies such as IMRT (Intensity-Modulated Radiation Therapy), SRS (Stereotactic Radiosurgery), and SBRT (Stereotactic Body Radiation Therapy), opportunities exist for training in interstitial and intracavitary brachytherapy using special applicators. Clinical applications based on fundamental principles in Radiation Physics and Biology are emphasized, while trainees attain competence in implementing multidisciplinary cancer care based on sound judgment of evidence-based medicine. The program includes rotations at three participating hospitals: UCI Medical Center, Veterans Affairs Long Beach Healthcare System, and Long Beach Memorial Medical Center.

## Surgery

The University of California, Irvine General Surgery program places strong emphasis on provision of excellent clinical care, establishing new horizons in minimally invasive surgery, education of residents and medical students in all aspects of surgery, and high-level surgical research. Our program trains and prepares some of the finest young surgeons in the country for the rigors of academic or private practice as well as subsequent fellowship training.

Our general surgery residency program's integrated and affiliated training sites include rotations in surgical oncology, cardiothoracic, vascular, gastrointestinal, colorectal, hepatobiliary, general surgery, surgical critical care, pediatric surgery, emergency general surgery, and trauma/acute care surgery. UCI's faculty and volunteer faculty, as well as that of our affiliate institutions, are committed to teaching and provide residents with a variety of resources and opportunities to engage their surgical knowledge. Surgical residents perform clinical rotations at our UCI Medical Center, the Veteran's Affairs - Long Beach Hospital, Long Beach Memorial Medical Center, Mission Hospital and Children's Hospital of Orange County.

Residents interested in research will find a broad range of resources and mentors. While not required, research during residency imbues critical skills and exposes the resident to the an additional dimension of academic surgery. Options for one or two years of dedicated research outside of the clinical track are available.

Fully accredited by the ACGME, UCI's General Surgery Residency Program emphasizes the surgeon of the future in its curriculum—providing world class surgical care while minimizing the footprint we leave behind. We practice and abide by the motto coined by our former chair, David Hoyt, M.D., FACS, "When you see one of us, you see all of us."

Resident applications are accepted entirely through ERAS and determined via the NRMP process. All candidates interested in pursuing a general surgery residency will have completed medical school prior to residency's June start, and have applied through ERAS with a complete application.

## Urology

The Department of Urology Residency Program is a five-year training program that includes a one-year internship in the Department of Surgery and four years of Urology training. The residency program provides training in all aspects of adult and pediatric urologic diseases. The residents receive extensive training in open and endoscopic procedures, laparoscopy and other minimally invasive techniques, urologic pathology, uro-radiology, and management of non-operative urologic conditions. The program's training hospitals include UCI Medical Center, Veterans Affairs Long Beach Healthcare System, Long Beach Memorial Medical Center, and Children's Hospital of Orange County. The Urology Department encourages and supports both clinical and basic science research.

## Faculty

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Veendamali Subramanian, Ph.D. University of Madras, *Assistant Adjunct Professor of Medicine*

Jeffrey R. Suchard, M.D. University of California, Los Angeles, *Associate Dean of Basic Science Education and Professor of Emergency Medicine*

Gabriel R. Sudario, M.D. University of California, San Francisco, *Health Sciences Clinical Instructor of Emergency Medicine*



Coral Sun, M.D. University of Florida, *Health Sciences Associate Clinical Professor of Anesthesiology and Perioperative Care*

Laxmi A. Suthar, M.D. Oregon Health & Science University, *Health Sciences Assistant Clinical Professor of Medicine*

Shuichi Suzuki, M.D. Kitasato University, *Associate Professor of Neurological Surgery; Neurology*

Morgan L. Swank, M.D. Creighton University, *Health Sciences Clinical Instructor of Obstetrics and Gynecology*

James M. Swanson, Ph.D. Ohio State University, *Professor Emeritus of Pediatrics*

Bindu Swaroop, M.D. St. George's University, *Health Sciences Assistant Clinical Professor of Medicine*

Yona Tadir, M.D. Tel Aviv University, *Adjunct Professor of Surgery*

Ronald Takemoto, M.D. University of Southern California, *Health Sciences Clinical Professor of Physical Medicine and Rehabilitation*

Steven Tam, M.D. University of California, San Diego, *Health Sciences Assistant Clinical Professor of Medicine*

Ming Tan, M.D. Johns Hopkins University, *Professor of Microbiology and Molecular Genetics; Medicine*

Siu W. Tang, M.D. University of Hong Kong, *Senate Emeritus of Psychiatry and Human Behavior*

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Dawn T. Tanner, M.D. Creighton University, *Health Sciences Clinical Instructor of Radiological Sciences*

Jeremiah Tao, M.D. University of South Carolina, *Health Sciences Associate Clinical Professor of Ophthalmology*

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Sharief K. Taraman, M.D. Wayne State University, *Health Sciences Clinical Professor of Pediatrics*

Andrzej S. Tarnawski, M.D. University Medical School, *Professor of Medicine*

Candice E. Taylor, M.D. University of Southern California School of Medicine, *Health Sciences Assistant Clinical Professor of Pediatrics*

Jamshid Tehranzadeh, M.D. Pahlavi University, *Professor Emeritus of Radiological Sciences*

Krishnansu S. Tewari, M.D. University of California, Irvine, *Professor of Obstetrics and Gynecology*

Gaby T. Thai, M.D. Tufts University, *Health Sciences Professor of Neurology*

Leslie M. Thompson, Ph.D. University of California, Irvine, *Chancellor's Professor and Donald Bren Professor of Psychiatry and Human Behavior; Biological Chemistry; Neurobiology and Behavior*

Lauri D. Thrupp, M.D. University of Washington, *Professor Emeritus of Medicine*

Jeremiah G. Tilles, M.D. Harvard University, *Professor Emeritus of Medicine*

Pornchai Tirakitsoontorn, M.D. University of California, San Diego, *Health Sciences Associate Clinical Professor of Pediatrics*

Jerome S. Tobis, M.D. Chicago Medical School, *Professor Emeritus of Physical Medicine and Rehabilitation*

Francesco Tombola, Ph.D. University of Padua, *Associate Professor of Physiology and Biophysics*

Corey Tong, M.D. Robert Wood Johnson Medical School, *Health Sciences Clinical Instructor of Anesthesiology and Perioperative Care*

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Nojan Toomari, M.D. Western University of Health Sciences, *Health Sciences Clinical Instructor of Surgery*

Simin Torabzadeh, Ph.D. Universidad Central del Este, *Health Sciences Professor of Medicine*

Jason D. Toranto, M.D. University of Michigan, *Health Sciences Assistant Clinical Professor of Surgery*

Lillibeth Torno, M.D. University of Santo Tomas, *Health Sciences Associate Clinical Professor of Pediatrics*

Minodora Totoiu, M.D. University of Medicine and Pharmacy of Targu-Mures, *Health Sciences Clinical Professor of Pediatrics*

Paul E. Touchette, Ed.D. Harvard University, *Recall Non-Senate Academic of Pediatrics*

Anne E. Tournay, MBBS University College London, *Health Sciences Associate Clinical Professor of Pediatrics*

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Hien T. Tran, M.D. Harvard University, *Health Sciences Clinical Professor of Dermatology*

Huy T. Tran, M.D. Western University of Health Sciences, *Health Sciences Professor of Family Medicine*

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Shermeen B. Vakharia, M.D. Aga Khan University, *Health Sciences Clinical Professor of Anesthesiology and Perioperative Care*

Theodorus G. Van Erp, Ph.D. Utrecht University, *Assistant Professor in Residence of Psychiatry and Human Behavior*

Richard A. Van Etten, M.D., Ph.D. Stanford University, *Director, Chao Family Comprehensive Cancer Center; Chao Family Endowed Director's Chair in Cancer Research and Treatment and Senior Associate Dean and Associate Vice Chancellor for Cancer and Professor of Medicine; Biological Chemistry*

Nicolaas-John Van Nieuwenhuysen, MBBS, *Health Sciences Clinical Professor of Psychiatry and Human Behavior*

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Fan-Gang Zeng, Ph.D. Syracuse University, *Director of Hearing Research and Professor of Otolaryngology; Anatomy and Neurobiology; Biomedical Engineering; Cognitive Sciences*

Weian Zhao, Ph.D. McMaster University, *Associate Professor of Pharmaceutical Sciences; Biological Chemistry; Biomedical Engineering; Materials Science and Engineering* (stem cell therapy, diagnostics, biosensors, immunotherapy, single-cell analysis)

Xiaolin Zi, Ph.D. Shanghai University, *Associate Professor of Urology; Pharmaceutical Sciences*

Mary L. Zupanc, M.D. University of California, Los Angeles, *Health Sciences Clinical Professor of Pediatrics*

## Anatomy and Neurobiology

**Christine M. Gall, Department Chair**

**David C. Lyon, Department Vice Chair**

**Brian J. Cummings, Departmental Graduate Advisor**

Med Sci 1, B240

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Research programs in the Department of Anatomy and Neurobiology in the School of Medicine focus on the neurosciences. Faculty interests range across broad areas of basic and clinical neuroscience research, including cellular and molecular neurobiology, cellular mechanisms of development, ion channel electrophysiology, functional synaptic plasticity, mechanisms of learning and memory, experimental neuroanatomy, structure and function of sensory and motor systems, and response to injury and regeneration. Students performing graduate work in the Department are encouraged to become proficient in multiple areas of study using interdisciplinary techniques.

The Department offers graduate training under the auspices of the School of Medicine in conjunction with the Interdepartmental Neuroscience Program (INP) and the Medical Scientist Training Program (MSTP). Students are eligible to enter the Departmental program after meeting the specific requirements of the INP gateway curriculum or by direct application to the Department. The Departmental program leads to a Ph.D. degree in Biomedical Sciences, awarded after successful completion of all requirements.

In concert with other departments, a combined neuroscience core curriculum has been developed which includes offerings in systems neurobiology, neurophysiology, and cellular, molecular, and developmental neurobiology that may be taken as complete or partial fulfillment of the requirements of the INP. Students admitted into the INP who subsequently select a research advisor in the Department will begin to follow the departmental requirements for their Ph.D. at the beginning of their second year; whereas MSTP students, in addition to following departmental requirements for the Ph.D., will be considered as a first-year student and are required to take at least one INP course. Students may take additional elective courses at their own option, but they are required to attend departmental seminars, to participate in the Journal Club and an annual "Grad Day" symposium, and to make presentations to Progress in Neuroscience sessions when invited. The research topic for a student's dissertation is chosen by the student in close consultation with their research advisor. Students are expected to advance to candidacy by the end of the third year by presenting progress on their own research and providing a proposal for their dissertation research. The normative time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

## Faculty

Aileen J. Anderson, Ph.D. University of California, Irvine, *Director of the Sue and Bill Gross Stem Cell Research Center and Professor of Physical Medicine and Rehabilitation; Anatomy and Neurobiology*

Tallie Z. Baram, M.D., Ph.D. University of Miami, *Weizmann Institute of Science and Danette 'Dee Dee' Shepard Chair in Neurological Studies and Distinguished Professor of Pediatrics; Anatomy and Neurobiology; Neurology; Physiology and Biophysics*

Anne L. Calof, Ph.D. University of California, San Francisco, *Professor of Anatomy and Neurobiology; Developmental and Cell Biology*

Lulu Y. Chen, Ph.D. University of California, Irvine, *Assistant Professor of Anatomy and Neurobiology*

Brian J. Cummings, Ph.D. University of California, Irvine, *Associate Dean of Faculty Development - Senate and Professor of Physical Medicine and Rehabilitation; Anatomy and Neurobiology*

Mark J. Fisher, M.D. University of Cincinnati, *Professor of Neurology; Anatomy and Neurobiology; Political Science*

Lisa Flanagan-Monuki, Ph.D. University of California, San Diego, *Associate Professor of Neurology; Anatomy and Neurobiology; Biomedical Engineering*

Christine M. Gall, Ph.D. University of California, Irvine, *Department Chair and Distinguished Professor of Anatomy and Neurobiology; Neurobiology and Behavior*

Alan L. Goldin, M.D. Ph.D. University of Michigan, *Professor of Microbiology and Molecular Genetics; Anatomy and Neurobiology; Physiology and Biophysics*

Robert F. Hunt, Ph.D. University of Kentucky, *Assistant Professor of Anatomy and Neurobiology*

Kei Igarashi, Ph.D. University of Tokyo, *Assistant Professor of Anatomy and Neurobiology*

Kwang M. Jung, Ph.D. Chung-Ang University, *Associate Adjunct Professor of Anatomy and Neurobiology*

Gary S. Lynch, Ph.D. Princeton University, *Professor of Psychiatry and Human Behavior; Anatomy and Neurobiology*

David C. Lyon, Ph.D. Vanderbilt University, *Department Vice Chair and Associate Professor of Anatomy and Neurobiology; Cognitive Sciences*

Diane K. O'Dowd, Ph.D. University of California, San Diego, *Professor of Developmental and Cell Biology; Anatomy and Neurobiology* (regulation of activity in developing and adult nervous systems)

Andre Obenaus, Ph.D. University of British Columbia, *Professor in Residence of Pediatrics; Anatomy and Neurobiology*

Daniele Piomelli, Ph.D. Columbia University, *Louise Turner Arnold Chair in the Neurosciences and Distinguished Professor of Anatomy and Neurobiology; Biological Chemistry; Pharmaceutical Sciences*

David J. Reinkensmeyer, Ph.D. University of California, Berkeley, *Professor of Anatomy and Neurobiology; Biomedical Engineering; Mechanical and Aerospace Engineering; Physical Medicine and Rehabilitation*

Steven S. Schreiber, M.D. Albany Medical College, *Professor in Residence of Neurology; Anatomy and Neurobiology; Psychiatry and Human Behavior*

Magdalene J. Seiler, Ph.D. University of Munich, *Associate Professor in Residence of Anatomy and Neurobiology; Physical Medicine and Rehabilitation*

Oswald Steward, Ph.D. University of California, Irvine, *Director, Reeve-Irvine Research Center and Reeve-Irvine Chair in Spinal Cord Injury Research and Distinguished Professor of Anatomy and Neurobiology; Neurobiology and Behavior*

John H. Weiss, M.D., Ph.D. Stanford University, *Professor of Neurology; Anatomy and Neurobiology*

Jamie Wikenheiser, Ph.D. Case Western Reserve University, *Associate Adjunct Professor of Anatomy and Neurobiology*

Xiangmin Xu, Ph.D. Vanderbilt University, *Professor of Anatomy and Neurobiology; Biomedical Engineering; Computer Science*

Fan-Gang Zeng, Ph.D. Syracuse University, *Director of Hearing Research and Professor of Otolaryngology; Anatomy and Neurobiology; Biomedical Engineering; Cognitive Sciences*

## Courses

### **ANATOMY 200. Research in Anatomy. 2-12 Units.**

Individual research supervised by a particular faculty member.

Repeatability: May be repeated for credit unlimited times.

### **ANATOMY 200R. Research in Anatomy and Neurobiology for First-Year Students. 2-12 Units.**

Independent research within the laboratories of graduate training faculty in the Department of Anatomy and Neurobiology for first-year Ph.D. students.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

### **ANATOMY 201. Human Gross Anatomy. 8 Units.**

Study and dissection of the human body, including muscular, skeletal, nervous, and cardiovascular systems. Emphasis on both normal and abnormal structure and function.

Restriction: Graduate students only.

### **ANATOMY 202B. Human Neuroscience. 4 Units.**

Study of the human nervous system at the systems level including the physiology and anatomy of sensory, motor, and integrative functions.

Prerequisite: ANATOMY 202A

**ANATOMY 203A. Human Microscopic Anatomy. 3 Units.**

Lecture and laboratory course on human microscopic anatomy. Emphasis is on functional implications of structure of cells and tissues.

Restriction: Graduate students only.

**ANATOMY 203B. Human Microscopic Anatomy. 3 Units.**

Lecture and laboratory course on human microscopic anatomy. Emphasis is on functional implications of structure of cells and tissues.

Prerequisite: ANATOMY 203A

Restriction: Graduate students only.

**ANATOMY 206. Tutorial in Anatomy. 3 Units.**

Series of tutorials on advanced topics in anatomy.

Repeatability: May be repeated for credit unlimited times.

**ANATOMY 210A. Systems Neuroscience. 5 Units.**

Study of the mammalian nervous system at the systems level. Anatomy and physiology of sensory, motor, and integrative functions.

Repeatability: May be taken for credit 2 times.

Same as NEURBIO 208.

Restriction: Graduate students only. Neurobiology and Behavior Majors only.

**ANATOMY 215. Epilepsy as a Window to Mechanisms of Neuronal Plasticity. 4 Units.**

Understanding the mechanisms of brain disorders provides novel insights into the normal function of neurons and circuits. Discusses approaches to studying mechanisms of brain function ranging from imaging, the use of models and others to study epilepsy.

Grading Option: Satisfactory/unsatisfactory only.

**ANATOMY 227A. Current Topics in Neuroscience. 1-4 Units.**

Focuses on critical reading, presentation, and discussion of current literature in neuroscience research.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ANATOMY 227B. Current Topics in Neuroscience. 1-4 Units.**

Focuses on critical reading, presentation, and discussion of current literature in neuroscience research.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ANATOMY 227C. Current Topics in Neuroscience. 1-4 Units.**

Focuses on critical reading, presentation, and discussion of current literature in neuroscience research.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ANATOMY 230. Topics in Translational Neuroscience. 2-4 Units.**

One-hour seminar presentation by participating faculty or guest lecturer and open to the science community, followed by one-hour student discussion of the lecture topic or related topic. Students are responsible for presentations and readings.

Repeatability: May be taken for credit 2 times as topics vary.

Restriction: Graduate students only. Interdepartmental Neuroscience Majors have first consideration for enrollment.

**ANATOMY 230A. Molecular, Cellular, & Developmental Neurobiology. 4 Units.**

Molecular aspects of the structure and function of neurons and glia including neurotransmission, synaptic modulation, and channels. Neural development at the cellular and molecular level including neurogenesis, pattern formation, trophic factors, axonal growth, and synaptic rearrangement.

Restriction: Graduate students only.

**ANATOMY 292A. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**ANATOMY 292B. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**ANATOMY 292C. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Biological Chemistry

**Peter Kaiser, Department Chair**

**Kyoko Yokomori, Departmental Graduate Advisor**

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The Department of Biological Chemistry provides advanced training to individuals who are interested in understanding the fine regulation of the biological processes, structural basis of the regulation, and the identification of targets for disease managements. Faculty research interests are diverse with emphases on several areas of basic and translational research: epigenetic regulation of gene expression; circadian rhythm and metabolism; chromatin structure and function; DNA repair and DNA damage responses; telomerase and telomere regulation; ubiquitin regulation in metabolism and cell cycle; signal transduction and transcription regulation in development and disease manifestation; molecular mechanisms of stem cell regulation and tumorigenesis; genomic and bioinformatics. Students are trained and exposed to technical expertise in all facets of current biological sciences. Established core research facilities are available in which students have access to a microarray and high-throughput sequencing core facility, electron microscopy, atomic force microscopy, confocal imaging center, mass spectroscopy, flow cytometry, transgenic core laboratories, biopolymer sequencing and synthesis laboratories, and other resources.

The Department offers training to graduate students under the auspices of the School of Medicine and in conjunction with the gateway program in Cellular and Molecular Biosciences (CMB) as well as the Mathematical, Computational, and Systems Biology (MCSB) program. Students are eligible to enter the Department program after meeting the specific requirements of the CMB gateway curriculum or by direct application to the Department. The Department program leads to the M.S. or Ph.D. in Biomedical Sciences, awarded after successful completion of all requirements. Students admitted into the combined program who select a research advisor in the Department begin thesis research in the second year. Students are required to attend and participate in the departmental research seminars. In addition, students are required to complete two advanced-level graduate courses subsequent to entering the Department's Ph.D. concentration. In the third year, students take the advancement-to-candidacy examination for the Ph.D. by presenting and defending a proposal for specific dissertation research. The normative time for completion of the Ph.D. is five years; students who make exceptional progress on their thesis projects are encouraged to complete the Ph.D. sooner. The maximum time permitted is seven years.

## Faculty

Bogi Andersen, M.D. University of Iceland, *Professor of Medicine; Biological Chemistry*

Pierre F. Baldi, Ph.D. California Institute of Technology, *Director of the Institute for Genomics and Bioinformatics and Distinguished Professor of Computer Science; Biological Chemistry; Biomedical Engineering; Developmental and Cell Biology; Mathematics* (artificial intelligence and machine learning, biomedical informatics, databases and data mining, environmental informatics, statistics and statistical theory)

Rémi Buisson, Ph.D. Université Laval, *Assistant Professor of Biological Chemistry; Pharmaceutical Sciences*

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Kai Kessenbrock, Ph.D. Ludwig Maximilian University of Munich, *Assistant Professor of Biological Chemistry*

Eva Y. Lee, Ph.D. University of California, Berkeley, *UCI Chancellor's Professor Emerita of Biological Chemistry*

Wen-Hwa Lee, Ph.D. University of California, Berkeley, *Professor Emeritus of Biological Chemistry*

Ellis Levin, M.D. Thomas Jefferson University, Jefferson Medical College, *Professor in Residence of Medicine; Biological Chemistry*

Wei Li, Ph.D. Institute of Biophysics, Chinese Academy of Sciences, *Endowed Chair and Professor of Biological Chemistry*

Haoping Liu, Ph.D. Cornell University, *Professor of Biological Chemistry*

Selma Masri, Ph.D. Beckman Research Institute of the City of Hope, *Assistant Professor of Biological Chemistry*

Frank L. Meyskens, M.D. University of California, San Francisco, *Daniel G. Aldrich, Jr. Endowed Chair and Professor of Medicine; Biological Chemistry; Program in Public Health*

Seyed Ali Mortazavi, Ph.D. California Institute of Technology, *Professor of Developmental and Cell Biology; Biological Chemistry* (functional genomics to study transcriptional regulation in development)

Trina Norden-Krichmar, Ph.D. University of California, San Diego, *Assistant Professor of Epidemiology; Biological Chemistry; Computer Science; Pharmaceutical Sciences*

Nicholas R. Pannunzio, Ph.D. Beckman Research Institute of City of Hope, *Assistant Professor of Medicine; Biological Chemistry*

Daniele Piomelli, Ph.D. Columbia University, *Louise Turner Arnold Chair in the Neurosciences and Distinguished Professor of Anatomy and Neurobiology; Biological Chemistry; Pharmaceutical Sciences*

Feng Qiao, Ph.D. University of California, Los Angeles, *Associate Professor of Biological Chemistry*

Suzanne B. Sandmeyer, Ph.D. University of Washington, *Grace Beekhuis Bell Chair in Biological Chemistry and Professor of Biological Chemistry; Microbiology and Molecular Genetics*

Paolo Sassone-Corsi, Ph.D. University of Naples Federico II, *Donald Bren Professor and Distinguished Professor of Biological Chemistry; Microbiology and Molecular Genetics; Pharmaceutical Sciences*

Marcus M. Seldin, Ph.D. Johns Hopkins University, *Assistant Professor of Biological Chemistry*

Robert E. Steele, Ph.D. Yale University, *Professor of Biological Chemistry*

Leslie M. Thompson, Ph.D. University of California, Irvine, *Chancellor's Professor and Donald Bren Professor of Psychiatry and Human Behavior; Biological Chemistry; Neurobiology and Behavior*

Richard A. Van Etten, M.D., Ph.D. Stanford University, *Director, Chao Family Comprehensive Cancer Center; Chao Family Endowed Director's Chair in Cancer Research and Treatment and Senior Associate Dean and Associate Vice Chancellor for Cancer and Professor of Medicine; Biological Chemistry*

Kyoko Yokomori, Ph.D. University of Tokyo, *Professor of Biological Chemistry*

Michael V. Zaragoza, M.D., Ph.D. Case Western Reserve University, *Associate Professor of Pediatrics; Biological Chemistry; Genetic Counseling*

Weian Zhao, Ph.D. McMaster University, *Associate Professor of Pharmaceutical Sciences; Biological Chemistry; Biomedical Engineering; Materials Science and Engineering* (stem cell therapy, diagnostics, biosensors, immunotherapy, single-cell analysis)

## Courses

### BIOCHEM 200A. Research in Biological Chemistry. 2-12 Units.

Individual research under the supervision of a professor.

Repeatability: Unlimited as topics vary.



**BIOCHEM 200B. Research in Biological Chemistry. 2-12 Units.**

Individual research under the supervision of a professor.

Repeatability: Unlimited as topics vary.

**BIOCHEM 200C. Research in Biological Chemistry. 2-12 Units.**

Individual research under the supervision of a professor.

Repeatability: Unlimited as topics vary.

**BIOCHEM 200R. Research in Biological Chemistry for First-Year Students. 2-12 Units.**

Independent research within the laboratories of graduate training faculty in the Department of Biological Chemistry for first-year Ph.D. students.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

**BIOCHEM 202A. Laboratory Seminar Series. 1 Unit.**

Study within a laboratory group including research and journal presentations.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

**BIOCHEM 202B. Laboratory Seminar Series. 1 Unit.**

Study within a laboratory group including research and journal presentations.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

**BIOCHEM 202C. Laboratory Seminar Series. 1 Unit.**

Study within a laboratory group including research and journal presentations.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

**BIOCHEM 207. Current Topics in Cancer Genomics. 4 Units.**

Literature-based discussion of molecular principles in genetics and functional genomics, with focus on cancer and stem cell biology.

Repeatability: May be taken for credit 2 times.

**BIOCHEM 210A. Medical Biochemistry and Molecular Biology. 12 Units.**

Covers the following topics from a biomedical perspective: protein and nucleic acid biochemistry, carbohydrates, lipids, amino acids, purines and pyrimidines, genome structure, molecular mechanisms of development, and signal transduction.

Restriction: Graduate students only.

**BIOCHEM 215. Mouse Developmental Genetics. 4 Units.**

Introduction to using the mouse in contemporary biomedical research. The biology and development of the laboratory mouse, methods for manipulation of the mouse genome and embryos, and examples of application of these methods to understand mammalian development and homeostasis.

Same as DEV BIO 207.

Restriction: Graduate students only.

**BIOCHEM 217. Human Evolution and Behavior. 4 Units.**

Covers theories and empirical research concerning the evolutionary origins of human behaviors and their variations. An interdisciplinary course emphasizing both evolutionary psychology (e.g., mating strategies, kinship, and parenting) and molecular evolution (i.e., evolution of genes for various behaviors).

Same as PSCI P271.

Restriction: Graduate students only.

**BIOCHEM 225. Epigenetics in Health and Disease . 4 Units.**

Focuses on the role of chromatin/nuclear structure organization (histone and DNA modification, chromatin remodeling, higher order chromatin structure and nuclear organization) on gene regulation, DNA replication and repair, relevant to development, metabolism, learning and memory, and human disease.

Prerequisite: MOL BIO 203 or MOL BIO 204 or NEURBIO 206

Same as NEURBIO 230.

Restriction: Graduate students only.

**BIOCHEM 240. New Breakthroughs in Basic and Translational Cancer Research. 4 Units.**

Highlights breakthroughs in molecular and cellular aspects of cancer biology and emerging therapeutic approaches. Emphasis on new discoveries of critical pathways/processes in cancer etiology, progression, and metastasis. Introduces strategies used in the discovery, design of biological and small molecules-based therapies.

Prerequisite: MOL BIO 204 or PHYSIO 252. A gene regulation course is also required.

Restriction: Graduate students only.

**BIOCHEM 291. Research Seminar. 2 Units.**

Student research-based colloquium covering current topics in gene organization and expression, cell cycle and differentiation, DNA repair, checkpoint control, and the physical, chemical, and biological properties of macromolecules. Students are encouraged to read critically and analyze recent literature.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**BIOCHEM 292A. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**BIOCHEM 292B. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**BIOCHEM 292C. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Biomedical and Translational Science, M.S.

**Sherrie H. Kaplan, Director**

100 Theory, Suite 110

949-824-7286

ttp@uci.edu

<http://www.som.uci.edu/graduate-studies/education/ms-bats.asp>

The aim of the M.S.-BATS program is to train students in the conduct of high-quality multidisciplinary clinical research to facilitate the rapid transformation of basic knowledge to clinical medicine. The program is designed for students from varying levels of training, including medical students, residents, fellows, physicians, nurses, and others who are interested in conducting clinical research to maximize interdisciplinary communication and understanding sufficient to carry out high-quality clinical research. The dual degree M.D./M.S.-BATS program is intended to integrate clinical research training skills with the medical school curriculum by allowing medical students to be enrolled in both degree programs concurrently. The program provides training in core competencies required to conduct clinical research including study design reflecting the breadth and complexity of clinical research applications, critical appraisal of multidisciplinary research literature, conduct and management of clinical research, medical statistics, research

ethics, and the leadership of multidisciplinary research teams. Students who successfully complete the program receive the M.S. degree in Biomedical and Translational Science. Medical students receive two separate degrees and diplomas: An M.S.-BATS degree and an M.D. degree from the School of Medicine at the completion of School of Medicine work. The M.S.-BATS can be conferred before completion of the M.D., or concurrently with the M.D. degree.

Faculty evaluate applicants to the program on the basis of grades, previous course work, letters of recommendation, and other relevant qualifications. All graduate students, including those from public health, nursing science, and pharmaceutical science are eligible to apply, but the program has a highly clinical focus and is specifically designed for those with a sufficient background in clinical sciences. Applicants should have successfully completed a B.S. or equivalent, and may be current medical students, residents, clinical fellows, faculty, or licensed physicians in the community.

The M.S.-BATS program will initially offer training in Evidence-Based Medicine/Clinical Research, which will focus on the conduct and interpretation of clinical research, synthesis of clinical literature, and the assessment and improvement of quality of healthcare. Additional fields of emphasis will be added, including Molecular Medicine, focusing on the molecular mechanisms and molecular physiology of human disease and Population Medicine, focusing on the application of epidemiologic research and research methods and findings to clinical practice.

The M.S.-BATS program is a two-year curriculum. First-year students are required to enroll in core courses including Introduction to Clinical Epidemiology, Introduction to Medical Statistics, Design and Analysis of Clinical Trials, and Ethics in Clinical Research. Additional required courses include Comparative Effectiveness Research; Health Politics and Policy; Measurement Science; Outcomes Research and Advanced Applied Methods; Disparities in Health and Health Care; Introduction to Medical Statistics II; and Quality, Efficiency, and Cost-effectiveness. Training during the second year emphasizes research and culminates in a written thesis. Throughout the program, students enroll in the BATS Seminar Series. By exception only, medical students and some students entering the program with advanced degrees, clinical research experience, or those who have previously completed the four core courses may be able to complete the program in less than two years.

The MS-BATS admissions committee will evaluate applicants to the program on the basis of grades, previous course work, letters of recommendation, and other relevant qualifications, such as years of experience working in a clinical setting. All graduate students, including those from public health, nursing science, and pharmaceutical science are eligible to apply, but the program has a highly clinical focus and is specifically designed for those with a sufficient background in clinical sciences. Applicants should have successfully completed a B.S. degree or equivalent, and may be current medical students, residents, clinical fellows, faculty, or licensed physicians in the community.

## Graduate Program in Biomedical And Translational Science

Faculty evaluate applicants to the program on the basis of grades, previous course work, letters of recommendation, and other relevant qualifications. All graduate students, including those from public health, nursing science, and pharmaceutical science are eligible to apply, but the program has a highly clinical focus and is specifically designed for those with a sufficient background in clinical sciences. Applicants should have successfully completed a B.S. degree or equivalent, and may be current medical students, residents, clinical fellows, faculty, or licensed physicians in the community.

The M.S.-BATS program will initially offer training in Evidence-Based Medicine/Clinical Research, which will focus on the conduct and interpretation of clinical research, synthesis of clinical literature, and the assessment and improvement of quality of healthcare. Additional fields of emphasis will be added, including Molecular Medicine, focusing on the molecular mechanisms and molecular physiology of human disease and Population Medicine, focusing on the application of epidemiologic research and research methods and findings to clinical practice.

The M.S.-BATS program is a two-year curriculum. First-year students are required to enroll in core courses including Introduction to Clinical Epidemiology, Introduction to Medical Statistics, Design and Analysis of Clinical Trials, and Ethics in Clinical Research. Additional required courses include, Comparative Effectiveness Research, Health Politics and Policy, Measurement Science, Outcomes Research and Advanced Applied Methods, Disparities in Health and Health Care, Introduction to Medical Statistics II, and Quality, Efficiency, and Cost-effectiveness. Training during the second year emphasizes research and culminates in a written thesis. Throughout the program, students enroll in the BATS Seminar Series. By exception only, medical students and some students entering the program with advanced degrees, clinical research experience, or those who have previously completed the four core courses may be able to complete the program in less than two years.

## Courses

### **BATS 209A. Introduction to Medical Statistics. 4 Units.**

Provides understanding of medical statistics for clinicians and clinical researchers to read and interpret literature.

### **BATS 209B. Introduction to Medical Statistics II. 4 Units.**

Provides sufficient understanding of medical statistics to read and interpret medical literature critically, identify appropriate statistics for basic research designs used in medicine, and discriminate between appropriate and inappropriate statistical applications for common research designs.

Prerequisite: BATS 209A

### **BATS 210A. Introduction to Clinical Epidemiology. 4 Units.**

Introduces principles and practice of clinical epidemiology and the population-based approach to health and disease.

Prerequisite: BATS 209A

**BATS 232. Design and Analysis of Clinical Trials. 4 Units.**

Presents history, organization and planning, rationale for methods, limits, and ethics in conducting clinical trials.

Prerequisite: BATS 209A or STAT 250

**BATS 245A. Comparative Effectiveness Research . 4 Units.**

Provides a comprehensive overview of comparative effectiveness research (CER) with in-depth methodologic clinical practice and policy/dissemination issues related to the conduct, interpretation, and clinical applications of CER.

**BATS 247. Measurement Science, Outcomes Research, and Advanced Applied Methods. 4 Units.**

Further the understanding of methodologic issues involved in the conducting of comparative effectiveness research (CER). Topics: risk adjustment, balancing observational study designs, use of outcomes from multiple data sources, innovations clinical trial designs, the conduct of meta-analysis, and psychometric methods.

**BATS 251. Quality Efficiency and Cost Effectiveness. 4 Units.**

Introduces the principles and practice of quality of care, patient safety, and patient experience research, along with major national and statewide policy and legislative initiatives related to quality of care and patient safety.

**BATS 253. Disparities in Health and Health Care. 4 Units.**

Reviews all aspects of culture that influence health status, development of public health policy, and management and practice of health care. Explores how race and ethnicity affect health and health care, including health care services and policies governing these services.

**BATS 255. Health Politics and Policy. 4 Units.**

Offers political and analytical insights into understanding U.S. health policymaking and developing strategies that influence health policy outcomes.

**BATS 280. Biomedical and Translational Science Seminar. 2 Units.**

Students present their current research or a topic of interest and are exposed to diverse projects in the biomedical and translational science arena.

Repeatability: May be repeated for credit unlimited times.

**BATS 295. Master's Thesis Research and Writing. 2-12 Units.**

Master's thesis research and writing with Biomedical and Translational Science faculty.

Repeatability: May be repeated for credit unlimited times.

**BATS 296. Ethics in Clinical Research. 4 Units.**

Covers major frameworks and concepts of ethics in public health research as well as human subject protection issues.

**BATS 299. Independent Directed Research. 2-12 Units.**

Independent research with Biomedical and Translational Science faculty.

Repeatability: May be repeated for credit unlimited times.

## Biomedical Sciences, Ph.D.

The UCI School of Medicine offers graduate study leading to a Ph.D. degree in Biomedical Sciences. Five participating basic science departments train students in biomedical research and critical inquiry with the goal of a research-based career in academia, biomedical technology and related fields.

Entry into the Ph.D. programs is primarily through the UCI Gateway Programs (CMB and INP). Direct admission is on a case-by-case basis. Students in the Medical Scientist Training Program (MSTP) may also elect to pursue their Ph.D. in Biomedical Sciences.

**About the UCI Gateway Programs:**

- Cellular & Molecular Biosciences (CMB) [cmb.uci.edu](http://cmb.uci.edu) (<https://cmb.uci.edu>)
- Interdepartmental Neuroscience Program (INP) <https://inp.uci.edu>

Among the first-year requirements, students supervised by a faculty advisor take coursework and identify labs for rotation with the intention of selecting a potential thesis advisor, and must pass a preliminary qualifying examination.

Application information is found on the ADMISSION tab and at <https://grad.uci.edu>.

**About the Medical Scientist Training Program (MSTP):**

The MSTP is an M.D./Ph.D. program that trains individuals who can understand and contribute to advances in research, and can also apply those advances to the field of medical care. Website information is found at <https://mstp.uci.edu/>. The program is administered by Joanne Wu at [joanne.wu@uci.edu](mailto:joanne.wu@uci.edu) and directed by Dr. Alan Goldin at [agoldin@uci.edu](mailto:agoldin@uci.edu).

**Departments Offering the Ph.D. in Biomedical Sciences:**

- Anatomy & Neurobiology
- Biological Chemistry
- Microbiology & Molecular Biology (Medical Microbiology)
- Pathology & Laboratory Medicine (Experimental Pathology)
- Physiology & Biophysics

Programs are administered by each department. The School of Medicine Office of Graduate Studies oversees and enhances student and program efforts. Questions may be directed to the Director of Graduate Studies, Leora Fellus at [lfellus@uci.edu](mailto:lfellus@uci.edu), or Associate Dean for Graduate and Postdoctoral Studies, Dr. Klemens Hertel, at [khertel@uci.edu](mailto:khertel@uci.edu).

**Admission Requirements and Application for Gateway Programs and Direct Admission:**

To apply via the CMB or INP Gateway Programs, carefully review program and admission requirements and deadlines.

- Interdepartmental Neuroscience Program (INP): <https://inp.uci.edu/admissions-and-application/>
- Cellular & Molecular Biosciences (CMB): <https://cmb.uci.edu/admissions/>

Consult each program and the UCI Graduate Division website for information and instructions:

- <https://www.grad.uci.edu/admissions/index.php> (<https://www.grad.uci.edu/admissions/>)
- <https://www.grad.uci.edu/admissions/applying-to-uci/index.php> (<https://www.grad.uci.edu/admissions/applying-to-uci/>)
- Online Application: <https://apply.grad.uci.edu/apply/>

**Admission Requirements and Application for the MSTP:**

Carefully review program, admission requirements and deadlines as well as qualifications and eligibility requirements for the M.D./Ph.D. program: <https://mstp.uci.edu/admissions/application-process/>.

Application for qualifying individuals is made through the American Medical College Application Service (AMCAS).

Questions about admission should be directed to program faculty and staff.

**Master of Science in Biomedical Sciences**

The Master of Science degree in Biomedical Sciences may be completed by submission of a research thesis (plan I) or by course-work and a comprehensive exam (plan II).

**Plan I: Thesis Plan.** The student is required to complete at least four didactic graduate courses (16 units) offered by the department, and elective course work with an additional 8 units of graduate or upper-division undergraduate course work. In addition, the student will typically take additional seminar courses during the graduate study. Students in the M.S. program may be employed as teaching assistants, but units earned through enrollment in University Teaching (399) may not be counted toward degree completion. The student engages in thesis research with a faculty thesis advisor, and will prepare and submit a dissertation to the thesis committee. The final examination is an oral presentation of the thesis to the committee. The normative time to degree is two years for the thesis M.S. degree.

**Plan II: Comprehensive Examination Plan.** The plan II M.S. degree is awarded based on completion of at least 36 units of course work and a satisfactory completion of a comprehensive exam. The student is required to complete at least 16 units (four courses) of didactic graduate course work offered by the department. In addition, the student will take up to 12 units of research. An additional 8 units or more of elective course work will be completed from other graduate courses offered by the department. A maximum of 4 units of upper-division undergraduate courses may be included in the program with the approval of the Associate Dean for Graduate Studies. Students in the M.S. program may be employed as teaching assistants, but units earned through enrollment in University Teaching (399) may not be counted toward degree completion. The comprehensive exam will be administered by a committee of at least three departmental faculty, and may include written and oral sections. The comprehensive exam format will include a research presentation and may include additional portions such as a research proposal, presentation of a project, or other components. The normative time to degree is one year for the M.S. degree by comprehensive exam.

**Doctor of Philosophy**

**Comprehensive Examination-First Year.** The student must pass comprehensive oral or written examinations at the discretion of the department. The examination is generally taken at the end of the first year of graduate study.

**Advancement to Candidacy.** The advancement to candidacy examination is taken before the end of the third year of graduate study. The student is expected to have identified an important and tractable dissertation research topic. A faculty committee for the advancement to candidacy examination is proposed by the faculty mentor in consultation with the student, and approved by the Department Graduate Advisor. A majority of the committee must hold primary or joint appointments in the student's department.

Once this examination is completed, the student is advanced to candidacy for the doctoral degree and is expected to complete the degree within three years. The student must submit a dissertation on this research and defend the thesis in an oral examination during the final year of graduate study. The normative time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Graduate-student status or consent of instructor is a prerequisite for all 200–299 courses.

- Anatomy and Neurobiology
- Biological Chemistry
- Experimental Pathology
- Microbiology and Molecular Genetics
- Physiology and Biophysics

## Experimental Pathology

**Edwin S. Monuki, Department Chair and Graduate Program Director**  
**Elizabeth Head, Departmental Graduate Advisor**

Medical Sciences I, Building D, Room D440  
 949-824-5367  
<http://www.pathology.uci.edu/>

The Department of Pathology and Laboratory Medicine offers a Ph.D. in Biomedical Sciences with a focus on Experimental Pathology. The graduate program emphasizes experimental approaches to better understand the molecular and cellular mechanisms of disease, particularly human disease. Principal areas of research investigated by faculty in Experimental Pathology include concentrating studies in microbial genomics, innate immunity, cellular stress, stem cell biology, developmental neurobiology, cancer, and neurodegenerative disease.

The Department of Pathology & Laboratory Medicine offers a graduate program in Experimental Pathology. Application to Experimental Pathology is generally through one of two 'gateway' programs, which offer multidisciplinary graduate training under the heading of Cellular and Molecular Biosciences (CMB) (<https://cmb.uci.edu>) or the Interdepartmental Neuroscience Program (INP) (<https://inp.uci.edu>). Members of the Pathology faculty participate in the CMB and INP programs.

The CMB and INP programs include a first-year curriculum and the opportunity to rotate through two or more research laboratories. For the CMB program, students select a specific area of interest from ten areas of academic study, one of which is Experimental Pathology. Experimental Pathology emphasizes experimental approaches to better understand the molecular and cellular mechanisms of disease, with a focus on human disease. After the first year in the CMB or INP program, students interested in Experimental Pathology will join the laboratories of faculty within the department or the laboratories of approved affiliated faculty.

Students should advance to candidacy by the end of their third year. The normative time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

## Faculty

Daniela A. Bota, M.D., Ph.D. Carol Davila University of Medicine and Pharmacy, *Chief Scientific Officer, Center for Clinical Research and Vice Dean for Clinical Research and Associate Professor of Neurology; Neurological Surgery; Pathology and Laboratory Medicine*

Jefferson Chan, M.D. Ph.D. University of California, San Francisco, *Professor of Pathology and Laboratory Medicine; Environmental Health Sciences*

Vishal S. Chandan, M.D. Maharashtra University of Health Sciences, *Health Sciences Clinical Professor of Pathology and Laboratory Medicine*

Peter Chang, M.D. Northwestern University, *Assistant Professor in Residence of Radiological Sciences; Computer Science; Pathology and Laboratory Medicine*

Daniel Chow, M.D. University of California, Los Angeles, *Assistant Professor in Residence of Radiological Sciences; Neurology; Pathology and Laboratory Medicine*

Bridgit O. Crews, Ph.D. University of California, Santa Barbara, *Health Sciences Assistant Clinical Professor of Pathology and Laboratory Medicine*

Maria G. Dacoste-Iyer, M.D. Topiwala National Medical College, *Health Sciences Clinical Professor of Pathology and Laboratory Medicine*

Luis M. De La Maza, M.D., Ph.D. University of Minnesota, *Professor of Pathology and Laboratory Medicine*

Suvarna Ajay Deshmukh-Rane, M.D. Bharti Vidyapeeth Medical College, *Health Sciences Assistant Clinical Professor of Pathology and Laboratory Medicine*

Robert A. Edwards, M.D., Ph.D. Baylor College of Medicine, *Associate Professor of Pathology and Laboratory Medicine*



Ted Farzaneh, M.D. Shaheed Beheshti University of Medical Sciences, *Health Sciences Assistant Clinical Professor of Pathology and Laboratory Medicine*

Min Han, M.D. Xi'an Jiaotong University, *Health Sciences Assistant Clinical Professor of Pathology and Laboratory Medicine*

Elizabeth Head, Ph.D. University of Toronto, *Vice Chair for Research and Professor of Pathology and Laboratory Medicine*

Maria Cristina Kenney, M.D., Ph.D. University of California, Los Angeles; University of Arizona, *Professor of Ophthalmology; Pathology and Laboratory Medicine*

Virginia E. Kimonis, M.D. University of Southampton, *Professor of Pediatrics; Environmental Health Sciences; Genetic Counseling; Pathology and Laboratory Medicine*

Dan Mercola, M.D., Ph.D. University of California, Los Angeles, *Professor of Pathology and Laboratory Medicine*

Edwin S. Monuki, M.D., Ph.D. University of California, San Diego, *Department Chair and Warren L. Bostick Chair in Pathology and Professor of Pathology and Laboratory Medicine; Developmental and Cell Biology*

Tahseen Mozaffar, MBBS Aga Kahn University, *Dr. Stanley van den Noort Endowed Chair and Interim Department Chair and Professor of Neurology; Pathology and Laboratory Medicine*

Ellena Peterson, Ph.D. Georgetown University, *Professor Emerita of Pathology and Laboratory Medicine*

Sherif Rezk, M.D. Alexandria University, *Professor of Pathology and Laboratory Medicine*

Beverly Wang, M.D. Jiangxi Medical College, *Professor of Pathology and Laboratory Medicine; Otolaryngology*

## Courses

### **PATH 200A. Research in Experimental Pathology. 2-12 Units.**

Independent research for the Ph.D. program within the laboratories of graduate training faculty in Experimental Pathology.

Corequisite: PATH 203A

Repeatability: Unlimited as topics vary.

### **PATH 200B. Research in Experimental Pathology. 2-12 Units.**

Independent research for the Ph.D. program within the laboratories of graduate training faculty in Experimental Pathology.

Corequisite: PATH 203B

Repeatability: Unlimited as topics vary.

### **PATH 200C. Research in Experimental Pathology. 2-12 Units.**

Independent research for the Ph.D. program within the laboratories of graduate training faculty in Experimental Pathology.

Corequisite: PATH 203C

Repeatability: Unlimited as topics vary.

### **PATH 200R. Research in Experimental Pathology for First-Year Students. 2-12 Units.**

Independent research within the laboratories of graduate training faculty in Experimental Pathology for first-year Ph.D. students.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

### **PATH 203A. Advanced Studies in Experimental Pathology. 1 Unit.**

A tutorial course for Ph.D. students in Experimental Pathology entailing attendance at Departmental seminars and critical reading of the scientific literature.

Corequisite: PATH 200A

Repeatability: May be repeated for credit unlimited times.



**PATH 203B. Advanced Studies in Experimental Pathology. 1 Unit.**

A tutorial course for Ph.D. students in Experimental Pathology entailing attendance at Departmental seminars and critical reading of the scientific literature.

Corequisite: PATH 200B

Repeatability: May be repeated for credit unlimited times.

**PATH 203C. Advanced Studies in Experimental Pathology. 1 Unit.**

A tutorial course for Ph.D. students in Experimental Pathology entailing attendance at Departmental seminars and critical reading of the scientific literature.

Corequisite: PATH 200C

Repeatability: May be repeated for credit unlimited times.

**PATH 204A. Experimental Pathology Research Seminar. 1 Unit.**

Seminar series for graduate students in Experimental Pathology. Students attend seminars and, beginning in their third year of graduate study, present one formal seminar on their graduate research.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PATH 204B. Experimental Pathology Research Seminar. 1 Unit.**

Seminar series for graduate students in Experimental Pathology. Students attend seminars and, beginning in their third year of graduate study, present one formal seminar on their graduate research.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PATH 204C. Experimental Pathology Research Seminar. 1 Unit.**

Seminar series for graduate students in Experimental Pathology. Students attend seminars and, beginning in their third year of graduate study, present one formal seminar on their graduate research.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PATH 221. Immunopathogenic Mechanisms of Disease. 3 Units.**

Examination of the mechanisms underlying disease states mediated by immune dysregulation. Topics include mechanisms of immune evasion by cancer, diseases mediated by cytokine dysregulation, role of the microbiome of the GI tract and other disease sites, and adoptive T-cell therapy.

Prerequisite: MMG 215

Same as MMG 221.

Restriction: Graduate students only.

**PATH 225. Molecular Mechanisms of Human Disease. 3 Units.**

Provides an overview of the molecular mechanisms of human diseases, including neurologic, hematologic, neoplastic, and infectious diseases. Students gain an understanding of these mechanisms, as well as models of human diseases.

Same as MMG 225.

**PATH 227. Experimental Pathology Journal Club. 1 Unit.**

Graduate-level course, which is open to all years, will involve the reading and discussion of papers, preferably written by the invited seminar speaker. Discussions will cover advanced topics in experimental pathology as related to an understanding of human disease.

Corequisite: PATH 204A and PATH 204B and PATH 204C

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PATH 292A. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PATH 292B. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PATH 292C. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PATH 299. Dissertation in Experimental Pathology. 1-12 Units.**

Provided for the preparation and completion of the dissertation required for the Ph.D. degree.

Repeatability: May be repeated for credit unlimited times.

## Genetic Counseling, M.S.

**Pamela Flodman, Graduate Program Director**

UCI Medical Center, City Tower, Suite 800

714-456-7570 / 714-456-5789

<http://www.pediatrics.uci.edu/gcprogram/>

The Division of Genetic and Genomic Medicine in the School of Medicine's Department of Pediatrics offers a Master of Science degree program in Genetic Counseling. The program is an intensive, full-time, two-year program, and consists of didactic coursework, supervised clinical experience, and the completion of a required research project (thesis). The goal of the program is to graduate students who have developed the practice-based skills and competency of an entry-level genetic counselor. In order to develop these professional skills, students gain practical experience in a variety of clinical settings (including prenatal, cancer, pediatrics, and adult clinics), under the supervision of faculty medical geneticists and genetic counselors. Many graduates of the program join academic or hospital-based genetics teams providing clinical services, teaching, and research. Others work for local, state, or federal genetics programs, for commercial genetics laboratories, in research studies, or in education. The graduate program is fully accredited by the Accreditation Council for Genetic Counseling.

Division faculty and staff are engaged in teaching, research, and patient service. Clinical activities center on diagnostic evaluation, management, genetic test interpretation, and genetic counseling for genetic disorders, including birth defects, developmentally disabling conditions, hereditary cancers, and adult onset conditions. Faculty research interests include clinical genomics; gene mapping and identification using molecular and quantitative methods; characterization and management of malformation and chromosomal syndromes; genetic variant identification and classification; counseling for late-onset genetic conditions including familial cancers and neurogenetic disorders; factors causing chromosome abnormalities, genomic disorders, and congenital malformations; cancer genetics and cytogenetics; biochemical genetics; psychosocial and cultural issues associated with genetic conditions, prenatal diagnosis, genetic screening, testing, and genetic services delivery; treatment of genetic disease; and ethical and public policy issues in genetics.

Recommended undergraduate preparation includes course work in the biological and behavioral sciences—particularly in genetics, biochemistry, molecular biology, cell biology, psychology, statistics, and human anatomy or embryology. Fluency in Spanish or a Southeast Asian language confers an advantage, but is not required. Extracurricular or employment experiences that provide evidence of the student's maturity, interpersonal skills, and promise as a genetic counselor figure prominently in the admissions decision. References should speak to these qualities as well as to the academic qualifications of the applicant. Experience providing crisis counseling is also recommended. The GRE General Test is required of all applicants (including those who have a previous graduate degree). Subject Test scores in any area will also be considered if they are available. Since there is no GRE code for the Department of Pediatrics, applicants should use the UCI institution code: R4859.

Applications are accepted for the fall quarter only and must be complete by January 15. Because of keen competition for places in the program, a two-stage admissions process is employed. Following initial review of applications by the faculty admissions committee, approximately one-quarter of applicants are invited for interviews, which are usually conducted during February through early April. If invited, it is greatly to the candidate's advantage to have an on-site interview, although in difficult circumstances it may be possible to arrange an out-of-town interview. Any candidate planning to be in the Southern California area in February through early April is encouraged to inquire in advance regarding the likelihood of an interview. Final selection from the interviewed candidates is accomplished by way of a Genetic Counseling Admissions Match program which has been established to place

applicants into programs based on a fair process that takes into account both the applicants' and programs' preferences (similar to the process of matching physicians to residency training programs). For further information about the match program, visit the GC Admissions Match website (<https://natmatch.com/gcadmissions/>). Six to eight students are usually admitted each year.

During the six to eight academic quarters of the program, students complete a sequence of core courses covering medical, quantitative, biochemical, molecular, and cancer genetics and genomics; teratology, embryology, and development; cytogenetics; counseling theory and application; research methods; ethical issues; and community resources. All courses are taught by Division faculty specifically for students in the program. Experiential professional training occurs concurrently with formal course work in a variety of clinics at the UCI Medical Center and affiliated facilities, in the prenatal diagnosis and cancer genetics programs, in cytogenetics and molecular genetics laboratories, and in various community agencies. Students participate in divisional and departmental professional and educational activities such as lectures, seminars, and journal club; rounds including in Pediatrics, Obstetrics, and Ethics; tumor boards; and various research, counseling, and patient management conferences throughout the program. While not required, some students choose to arrange optional clinical rotations at other academic, private, or commercial genetics units.

Degree requirements include a minimum of 87 quarter units, completion of a research thesis that should be publishable, and demonstration of appropriate professional skills in genetic counseling. The program director serves as faculty advisor to students. Teaching and supervision of professional experiential training are shared by all Division faculty and staff, who frequently review student progress. In the second year, development of professional skills can be individualized according to the trainee's needs and interests. Successful completion of the program (together with an assessment that the student has achieved the practice-based competency of an entry-level genetic counselor) fulfills the curricular and clinical training requirements for eligibility to sit for examination by the American Board of Genetic Counseling.

## Faculty

Maureen E. Bocian, M.D. University of Illinois, *Senate Emerita of Pediatrics; Genetic Counseling*

Jennifer N. Cech, Ph.D. University of Washington, *Health Sciences Assistant Clinical Professor of Pediatrics; Genetic Counseling*

Elizabeth C. Chao, M.D. University of California, Irvine, *Assistant Adjunct Professor of Pediatrics; Genetic Counseling*

Pamela L. Flodman, M.S. University of California, Irvine, *Adjunct Professor of Pediatrics; Genetic Counseling*

Kathryn Steinhaus French, M.S. University of Colorado Denver, *Health Sciences Clinical Professor of Pediatrics; Genetic Counseling*

Natalie M. Gallant, M.D. University of Southern California, *Health Sciences Associate Clinical Professor of Pediatrics; Genetic Counseling*

John Jay Gargus, M.D. Ph.D. Yale University, *Director of the Center for Autism Research and Translation and Professor Emeritus of Physiology and Biophysics; Genetic Counseling; Pediatrics*

June-Anne Gold, M.B.B.S., D.C.H., M.R.C.P. University of London, *Health Sciences Clinical Professor of Pediatrics; Genetic Counseling*

Virginia E. Kimonis, M.D. University of Southampton, *Professor of Pediatrics; Environmental Health Sciences; Genetic Counseling; Pathology and Laboratory Medicine*

Rebecca L. Leshay, M.S. University of North Carolina, *Health Sciences Assistant Clinical Professor of Pediatrics; Genetic Counseling*

Angela Myers, M.C.H., M.D. Stanford University, *Health Sciences Assistant Clinical Professor of Pediatrics; Genetic Counseling*

Deepika Nathan, M.S. Northwestern University, *Health Sciences Assistant Clinical Professor of Pediatrics; Genetic Counseling*

Leslie J. Raffel, M.D. Medical College of Pennsylvania, *Health Sciences Clinical Professor of Pediatrics; Genetic Counseling*

Kathryn E. Singh, M.P.H., M.S. University of California, Irvine, *Health Sciences Associate Clinical Professor of Pediatrics; Genetic Counseling*

Moyra Smith, M.D., Ph.D., M.F.A. University of Pretoria, *Professor Emerita of Pediatrics; Genetic Counseling*

M. Anne Spence, Ph.D. University of Hawaii at Manoa, *Professor Emerita of Pediatrics; Genetic Counseling*

Michael V. Zaragoza, M.D., Ph.D. Case Western Reserve University, *Associate Professor of Pediatrics; Biological Chemistry; Genetic Counseling*

## Courses

### **PED GEN 200A. Introduction to Medical Genetics and Cytogenetics. 4 Units.**

Covers current concepts regarding mitosis, meiosis, the cell cycle, and chromosome ultrastructure and function. Clinical disorders caused by chromosomal aneuploidy, duplication, and deletion, and principles of Mendelian, chromosomal, and multifactorial and nontraditional inheritance are presented and illustrated.

Restriction: Graduate students only.

**PED GEN 200B. Genetic Screening, Prenatal Development, and Human Teratology. 4 Units.**

Principles and techniques of prenatal, neonatal, and carrier screening. Infertility, pregnancy, and delivery. Normal and abnormal prenatal growth and development. Reproductive and fetal effects of drugs, radiation, infections, and other environmental factors.

Prerequisite: PED GEN 200A

Restriction: Medical students only. Genetic Counseling Majors only.

**PED GEN 200C. Human Genetic Disorders. 4 Units.**

Inheritance, diagnosis, natural history, management, and counseling considerations for commonly encountered genetic diseases, birth defects, and dysmorphic syndromes.

Prerequisite: PED GEN 200B

Restriction: Medical students only. Genetic Counseling Majors only.

**PED GEN 200D. Disorders due to Inborn Errors of Metabolism. 4 Units.**

Aspects of biochemistry and metabolism are reviewed with special emphasis on genetic abnormalities which lead to inborn errors of metabolism. Diagnostic procedures, heterozygote detection, treatment, counseling issues, and prenatal diagnosis are reviewed.

Prerequisite: PED GEN 200A

**PED GEN 200E. Molecular Genetics, Gene Mapping, and Genetic Linkage. 4 Units.**

Derivation of different types of DNA probes and DNA libraries, restriction endonuclease polymorphisms, assignment of genes to chromosomes, and genetic linkage. Emphasis on the use of recombinant DNA technologies and genetic analysis for diagnosis of human genetic disease.

Prerequisite: PED GEN 200A and PED GEN 200D

**PED GEN 200F. Quantitative Genetics. 2 Units.**

Quantitative aspects of human genetics, including population studies, segregation analysis, linkage, mapping, and genetic risk determination.

Prerequisite or corequisite: PED GEN 200A

Overlaps with PED GEN 200B.

**PED GEN 200G. Hereditary Cancer Counseling. 4 Units.**

Issues in genetic counseling for cancer. Cancer biology; genetic mechanisms and environmental influences in carcinogenesis; tumor pathology; cancer gene mapping; epidemiology. Features natural history, diagnosis, prevention, surveillance, and management of heredity cancers. Psychosocial, ethical, legal aspects of cancer risk assessment.

Prerequisite: PED GEN 200B

Restriction: Medical students only. Genetic Counseling Majors only.

**PED GEN 200H. Genetic Counselin Research Design. 4 Units.**

Quantitative and qualitative methods for genetic counseling research. Reference management; statistics: sample size, power, and data analysis; reliability and validity; surveys, questionnaires, interviews, focus groups; quality of life and genetic epidemiology research; designing a research protocol; IRB issues; grant writing.

**PED GEN 200L. Cytogenetics Laboratory. 4 Units.**

Practicum introducing methods of specimen collection, short-term lymphocyte and bone marrow culture, long-term fibroblast and amniocyte culture, harvesting and slide preparation, chromosome staining, microphotography, and darkroom techniques. Microscopic chromosome analysis, photographic karyotyping, and appropriate use of cytogenetic nomenclature are emphasized.

Restriction: Graduate students only.

**PED GEN 201A. Introduction to Genetic Counseling. 4 Units.**

Through directed readings, observing patient evaluations, role-playing, and conducting intake interviews, students are introduced to the process of diagnosis, management, and counseling for genetic disease. Psychosocial issues, interviewing techniques, pedigree construction, clinical photography, and various other skills are addressed.

Restriction: Medical students only. Genetic Counseling Majors only.

**PED GEN 201B. Clinical Rotation I. 4 Units.**

Provides extensive supervised experience in history taking, interviewing, and psychosocial assessment in the clinical genetics setting. Students independently perform telephone, office, and home-visit intake interviews, participate in counseling, and present cases at patient management conferences.

Restriction: Medical students only. Genetic Counseling Majors only.

**PED GEN 201C. Clinical Rotation II. 4 Units.**

Provides further supervised experience in genetic counseling, case management, clinic administration and organization, and the use of community resources. Emphasis is on sharpening counseling skills and on developing a professional identity and code of ethics.

Restriction: Medical students only. Genetic Counseling Majors only.

**PED GEN 201D. Prenatal Diagnosis Counseling. 4 Units.**

A practicum with extensive supervised experience in prenatal diagnosis counseling which provides the student with the opportunity to conduct genetic counseling sessions semi-independently and to further develop clinical skills.

Prerequisite: PED GEN 200A and PED GEN 200B and PED GEN 200C

Restriction: Medical students only. Genetic Counseling Majors only.

**PED GEN 202A. Counseling in Human Genetics: Theory and Methods. 3 Units.**

Theoretical approaches, counseling models and methods, and bio-psychosocial assessment strategies are examined in the context of genetic counseling. Contract-setting, working alliance, the use of self and evaluation methods. Beginning counseling and peer supervision skills are practiced in class.

Restriction: Medical students only. Genetic Counseling Majors only.

**PED GEN 202B. Community Resources. 1-2 Units.**

Lectures, guest speakers, and community visits acquaint genetic counselors with public and private health care and funding agencies, parent support and advocacy groups, and other resources to assist individuals and families confronted with genetic disorders, developmental disabilities, and birth defects.

Repeatability: May be taken for credit 2 times.

Restriction: Medical students only. Genetic Counseling Majors only.

**PED GEN 202C. Ethical Issues in Human Genetics. 1-2 Units.**

Explores major social, legal, and ethical issues in genetic counseling including those arising in genetic screening, prenatal diagnosis, informed consent, privacy and confidentiality, rights of the disabled, new genetic and reproductive technologies, treatment, and access to services.

Repeatability: May be taken for credit 2 times.

Restriction: Medical students only. Genetic Counseling Majors only.

**PED GEN 203A. Counseling in Human Genetics: Putting Thought to Practice. 4 Units.**

Builds upon the skills learned in previous courses emphasizing advanced counseling methods such as listening, empathy, and collaboration. The counselor's own self-awareness, ethical behaviors, and limits are explored. Individual, team, and group exercises are performed.

Prerequisite: PED GEN 202A

Restriction: Medical students only. Genetic Counseling Majors only.

**PED GEN 204A. Professional Skills Development. 4 Units.**

Hones and augments existing competencies in genetic counseling through ongoing clinical experiences. Develops skills using computers for genetics applications, provision of community and professional education, and clinic administration. Further experience in genetics laboratories or specialty clinics may be elected.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**PED GEN 204B. Professional Skills Development. 4 Units.**

Hones and augments existing competencies in genetic counseling through ongoing clinical experiences. Develops skills using computers for genetics applications, provision of community and professional education, and clinic administration. Further experience in genetics laboratories or specialty clinics may be elected.

Prerequisite: PED GEN 204A

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**PED GEN 204C. Professional Skills Development. 4 Units.**

Hones and augments existing competencies in genetic counseling through ongoing clinical experiences. Develops skills using computers for genetics applications, provision of community and professional education, and clinic administration. Further experience in genetics laboratories or specialty clinics may be elected.

Prerequisite: PED GEN 204B

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

**PED GEN 295. Master's Thesis and Research Writing. 4-8 Units.**

Under the supervision of one or more faculty members, the student designs and conducts a research project or completes a case report. A problem in the cytogenetics, biochemical, clinical, psychosocial, or behavioral areas of medical genetics may be investigated.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only.

## Microbiology and Molecular Genetics

**Rozanne M. Sandri-Goldin, Department Chair**

**Klemens J. Hertel, Department Vice Chair and Departmental Graduate Advisor**

Building B, Room 240, Medical Sciences I

949-824-7669

<http://www.microbiology.uci.edu/>

The Department of Microbiology and Molecular Genetics provides advanced training to individuals interested in the regulation of gene expression and the structural and functional properties of proteins encoded by these genes. The research in the Department covers a wide range of topics with special emphasis on bacterial gene expression and pathogenesis; viral gene expression and host interactions; vector-borne malaria and dengue fever transmission; nuclear-cytoplasmic transport and intracellular signaling; eukaryotic gene expression; mRNA splicing, and processing; cancer genetics and tumor suppressors; ion channel expression and function; genomics and bioinformatics.

The Department offers graduate study under the auspices of the School of Medicine and in conjunction with the program in Cellular and Molecular Biosciences (CMB) and the program in Mathematical and Computational Biology (MCB), which are described in the School of Biological Sciences section. Students are eligible to enter the Department program after meeting the specific requirements of the CMB gateway curriculum or by direct application to the Department. The Department program leads to the M.S. or Ph.D. degree in Biomedical Sciences, awarded after successful completion of all requirements. Students admitted into the CMB program who select a research advisor in the Department begin following the departmental requirements for the Ph.D. at the beginning of their second year.

Participation in the Department's seminar series and completion of at least one advanced topics course per year for three years are expected of all students. All students are required to convene a pre-advancement committee meeting at the end of their second year. In their third year, students take the advancement-to-candidacy examination for the Ph.D. degree by presenting and defending an original proposal for specific dissertation research. The normative time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

## Faculty

Alan G. Barbour, M.D. Tufts University, *Distinguished Professor of Microbiology and Molecular Genetics; Ecology and Evolutionary Biology; Medicine*

Emiliana Borrelli, Ph.D. University of Strasbourg, *Chancellor's Professor of Microbiology and Molecular Genetics; Pharmaceutical Sciences*

Michael J. Buchmeier, Ph.D. McMaster University, *Professor of Medicine; Microbiology and Molecular Genetics; Molecular Biology and Biochemistry*

Michael Demetriou, M.D. Ph.D. University of Toronto, *Professor of Neurology; Microbiology and Molecular Genetics*

Timothy L. Downing, Ph.D. University of California, Berkeley, *Assistant Professor of Biomedical Engineering; Microbiology and Molecular Genetics* (stem cells and tissue engineering, regenerative biology, cell programming, epigenomics, mechanobiology)

Alan L. Goldin, M.D. Ph.D. University of Michigan, *Professor of Microbiology and Molecular Genetics; Anatomy and Neurobiology; Physiology and Biophysics*

Sidney Golub, Ph.D. Temple University, *Edward A. Dickson Emeritus Professor and Professor Emeritus of Microbiology and Molecular Genetics*

Klemens J. Hertel, Ph.D. University of Colorado Boulder, *Associate Dean of Graduate and Postdoctoral Studies and Vice Chair and Professor of Microbiology and Molecular Genetics*

Anthony A. James, Ph.D. University of California, Irvine, *Distinguished Professor and Donald Bren Professor of Microbiology and Molecular Genetics; Molecular Biology and Biochemistry*

Michael McClelland, Ph.D. University of Georgia, *Professor of Microbiology and Molecular Genetics*

Ilhem Messaoudi Powers, Ph.D. Weill Cornell Graduate School of Medical Sciences, *Associate Professor of Molecular Biology and Biochemistry; Microbiology and Molecular Genetics*

Suzanne B. Sandmeyer, Ph.D. University of Washington, *Grace Beekhuis Bell Chair in Biological Chemistry and Professor of Biological Chemistry; Microbiology and Molecular Genetics*

Rozanne M. Sandri-Goldin, Ph.D. Johns Hopkins University, *Department Chair and Chancellor's Professor of Microbiology and Molecular Genetics*

Paolo Sassone-Corsi, Ph.D. University of Naples Federico II, *Donald Bren Professor and Distinguished Professor of Biological Chemistry; Microbiology and Molecular Genetics; Pharmaceutical Sciences*

Bert L. Semler, Ph.D. University of California, San Diego, *Distinguished Professor of Microbiology and Molecular Genetics*

Yongsheng Shi, Ph.D. Syracuse University, *Professor of Microbiology and Molecular Genetics*

Eric J. Stanbridge, Ph.D. Stanford University, *Professor Emeritus of Microbiology and Molecular Genetics*

Ming Tan, M.D. Johns Hopkins University, *Professor of Microbiology and Molecular Genetics; Medicine*

Marian L. Waterman, Ph.D. University of California, San Diego, *Professor of Microbiology and Molecular Genetics*

## Courses

### **M&MG 200A. Research in Microbiology and Molecular Genetics. 2-12 Units.**

Individual research supervised by a particular professor.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

### **M&MG 200B. Research in Microbiology and Molecular Genetics. 2-12 Units.**

Individual research supervised by a particular professor.

Prerequisite: M&MG 200A

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

### **M&MG 200C. Research in Microbiology and Molecular Genetics. 2-12 Units.**

Individual research supervised by a particular professor.

Prerequisite: M&MG 200B

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.



**M&MG 200R. Research in Microbiology and Molecular Genetics for First-Year Students. 2-12 Units.**

Independent research within the laboratories of graduate training faculty in the Department of Microbiology and Molecular Genetics for first-year Ph.D. students.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

**M&MG 201A. Research topics in Microbiology and Molecular Genetics. 1 Unit.**

Seminars presented by graduate students and faculty of the Department which explore research topics in specialized areas of microbiology and molecular genetics. Opportunity for students to gain experience in the organization, critical evaluation, and oral presentation of current research developments.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**M&MG 201B. Research topics in Microbiology and Molecular Genetics. 1 Unit.**

Seminars presented by graduate students and faculty of the Department which explore research topics in specialized areas of microbiology and molecular genetics. Opportunity for students to gain experience in the organization, critical evaluation, and oral presentation of current research developments.

Prerequisite: M&MG 201A

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**M&MG 201C. Research topics in Microbiology and Molecular Genetics. 1 Unit.**

Seminars presented by graduate students and faculty of the Department which explore research topics in specialized areas of microbiology and molecular genetics. Opportunity for students to gain experience in the organization, critical evaluation, and oral presentation of current research developments.

Prerequisite: M&MG 201B

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**M&MG 203A. Advanced Studies in Microbiology and Molecular Genetics. 1 Unit.**

Organized within each laboratory group, one to four hours. Advanced study in areas related to faculty research interests. Involves small group study based on readings, discussions, and guest speakers. May be conducted as journal clubs.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**M&MG 203B. Advanced Studies in Microbiology and Molecular Genetics. 1 Unit.**

Organized within each laboratory group, one to four hours. Advanced study in areas related to faculty research interests. Involves small group study based on readings, discussions, and guest speakers. May be conducted as journal clubs.

Prerequisite: M&MG 203B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**M&MG 203C. Advanced Studies in Microbiology and Molecular Genetics. 1 Unit.**

Organized within each laboratory group, one to four hours. Advanced study in areas related to faculty research interests. Involves small group study based on readings, discussions, and guest speakers. May be conducted as journal clubs.

Prerequisite: M&MG 203B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**M&MG 205A. Basic Immunology Core Lectures. 1 Unit.**

Basic concepts in human immunology including development of the immune system, innate immunity, immunoglobulin structure and genetics, antigen-antibody reactions, the major histocompatibility complex and antigen presentation, T cell and B cell development, initiation of the immune response, effector mechanisms.

Grading Option: Satisfactory/unsatisfactory only.

**M&MG 205B. Basic Immunology Core Lectures. 1 Unit.**

Basic concepts in human immunology including development of the immune system, innate immunity, immunoglobulin structure and genetics, antigen-antibody reactions, the major histocompatibility complex and antigen presentation, T cell and B cell development, initiation of the immune response, effector mechanisms.

Prerequisite: M&MG 205A

Grading Option: Satisfactory/unsatisfactory only.

**M&MG 205C. Basic Immunology Core Lectures. 1 Unit.**

Basic concepts in human immunology including development of the immune system, innate immunity, immunoglobulin structure and genetics, antigen-antibody reactions, the major histocompatibility complex and antigen presentation, T cell and B cell development, initiation of the immune response, effector mechanisms.

Prerequisite: M&MG 205C

Grading Option: Satisfactory/unsatisfactory only.

**M&MG 206. Regulation of Gene Expression. 4 Units.**

Aspects of gene expression including the organization of the eukaryotic nucleus in terms of protein-nucleic acid interaction (i.e., chromatin and chromosome structure); the enzymology and regulation of RNA transcription and pre-mRNA processing in eukaryotes; mechanisms of RNAi and translation.

**M&MG 210A. Medical Microbiology. 4-6 Units.**

Biology of microbial pathogens (viruses, bacteria, fungi, parasites) as foundation for subsequent study of infectious diseases. Topics: molecular basis of microbial pathogenesis; clinical presentation and epidemiology; diagnostic testing; antimicrobial therapy; prevention strategies. Format: lectures, laboratory, clinical cases, liveclasstech interactive questions.

**M&MG 210B. Medical Immunology. 6 Units.**

Cellular and molecular basis of immune response and roles of the immune system in both maintaining health and contributing to disease.

Prerequisite: M&MG 210A

Restriction: Medical students only.

**M&MG 215. Integrative Immunology. 4 Units.**

Lectures and student presentations of primary literature. The main goal is to achieve a basic understanding of the cellular and molecular basis of innate and adaptive immunity, and how immune function is coordinated at a systems level.

Same as MOL BIO 215.

**M&MG 216. Pathogenic Microbiology. 4 Units.**

Biochemical and genetic properties of infectious agents; identification and behavior of pathogens; activities of toxins; the chemotherapy, biochemistry, and genetics of drug resistance; and epidemiology of infectious diseases.

**M&MG 219. Medical Virology. 4 Units.**

Animal viruses as disease causing agents, including mechanisms of infection at both the cellular and organismic levels. Topics include comparative studies of different groups of viruses, viral transformation, and mechanisms of viral gene expression.

**M&MG 221. Immunopathogenic Mechanisms of Disease. 3 Units.**

Examination of the mechanisms underlying disease states mediated by immune dysregulation. Topics include mechanisms of immune evasion by cancer, diseases mediated by cytokine dysregulation, role of the microbiome of the GI tract and other disease sites, and adoptive T-cell therapy.

Prerequisite: M&MG 215

Same as PATH 221.

Restriction: Graduate students only.

**M&MG 222. Molecular Pathogenesis of Microbial Infections. 4 Units.**

Features lectures by faculty on the molecular aspects of microbial pathogenesis, highlighting both microbe and cellular functions. In addition to lectures, students review papers and discuss them. There will be two written exams, one on viruses and one on microbes.

**M&MG 225. Molecular Mechanisms of Human Disease. 3 Units.**

Provides an overview of the molecular mechanisms of human diseases, including neurologic, hematologic, neoplastic, and infectious diseases. Students gain an understanding of these mechanisms, as well as models of human diseases.

Same as PATH 225.

**M&MG 227. Immunology Journal Club. 2 Units.**

Advanced topics in immunology as related to an understanding of human disease.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**M&MG 230. Topics in Stem Cells. 2-4 Units.**

One-hour seminar presentation by participating faculty or guest lecturer and open to the science community, followed by one-hour discussion of the lecture topic or related topic. Students are responsible for presentations and readings.

**M&MG 240. M.D./PH.D. Tutorial. 1 Unit.**

Explores a variety of topics that impact careers of medical scientists (M.D./Ph.D students). Topics range from scientific, such as recent advances in particular research areas, to ethical problems brought on by increased technology and intervention in the disease process.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**M&MG 250. Responsible Conduct of Research. 2 Units.**

Each session includes a formal presentation by faculty/invited speaker followed by a discussion of case studies related to the topic under consideration.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**M&MG 270. Career Development. 2 Units.**

Topics include preparation of papers, grants and fellowships, scientific presentations, and curriculum vitae, and career opportunities.

Repeatability: May be repeated for credit unlimited times.

**M&MG 280. Tutorial in Microbiology and Molecular Genetics. 2 Units.**

Tutorial in Microbiology and Molecular Genetics. Presented by the department chair; relates current laboratory research to the literature.

Repeatability: May be repeated for credit unlimited times.

**M&MG 292A. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**M&MG 292B. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**M&MG 292C. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**M&MG 298. Independent Study. 1-12 Units.**

Provided for MSTP students to synthesize the basic science information learned during the basic science years of medical school and learn how to apply that knowledge toward graduate research directed at understanding the basis of human disease.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**M&MG 299. Dissertation—Microbiology and Molecular Genetics . 1-12 Units.**

Course provided for Ph.D. students to prepare and complete the dissertation required for a Ph.D. degree.

Repeatability: May be repeated for credit unlimited times.

## Physiology and Biophysics

**Michael D. Cahalan, Department Chair**

**Todd C. Holmes, Department Vice Chair**

**Francesco Tombola, Departmental Graduate Advisor**

Building D, Room D340, Medical Sciences I

949-824-5864

<http://www.physiology.uci.edu/>

The Department of Physiology and Biophysics offers research opportunities in molecular biophysics of membranes and proteins, ion channels and signal transduction, molecular and cell biology, structural biology, proteomics, physiological genomics, neuroscience, developmental neurobiology, stem cell biology, endocrinology, cardiac and exercise physiology, GI pathophysiology, immunology, cancer biology, and vision science.

The Department offers graduate study under the auspices of the School of Medicine and in conjunction with the graduate program in Cellular and Molecular Biosciences (CMB) and the Interdepartmental Neuroscience Program (INP), which are described in the School of Biological Sciences section. Students are eligible to enter the Department program after meeting the specific requirements of the CMB or INP gateway curriculum or by direct application to the Department. The Department program leads to an M.S. or Ph.D. in Biomedical Sciences, awarded after successful completion of all requirements. Students admitted through either gateway program who select a research advisor in the Department begin following the departmental requirements for the Ph.D. at the beginning of their second year.

The faculty conducts quarterly reviews of all continuing students to ensure that they maintain satisfactory progress within their particular academic program. Students participate in a literature review course designed to strengthen research techniques and presentation skills, and attend the monthly Department Colloquium. Students advance to candidacy during the third year; each student presents a seminar on their research projects in preparation for their Ph.D. dissertation. The candidacy committee examines the student's qualifications for the successful conduct of doctoral dissertation research. The students submit a written dissertation on an original research project and defend it in an oral final exam. The normative time for completion of the Ph.D. is five years. Students who make exceptional progress on their thesis projects are encouraged to complete the Ph.D. sooner. The maximum time permitted is seven years.

## Faculty

Geoffrey W. Abbott, Ph.D. University of London, *Senior Associate Dean for Academic Personnel and Vice Dean for Basic Science Research and Professor of Physiology and Biophysics; Physiology and Biophysics*

Tallie Z. Baram, M.D., Ph.D. University of Miami, *Weizmann Institute of Science and Danette 'Dee Dee' Shepard Chair in Neurological Studies and Distinguished Professor of Pediatrics; Anatomy and Neurobiology; Neurology; Physiology and Biophysics*

Kevin T. Beier, Ph.D. Harvard University, *Assistant Professor of Physiology and Biophysics; Pharmaceutical Sciences*

Amanda Burkhardt, Ph.D. University of California, Irvine, *Assistant Adjunct Professor of Physiology and Biophysics*

Michael D. Cahalan, Ph.D. University of Washington, *Department Chair and Distinguished Professor of Physiology and Biophysics*

David Huw Davies, Ph.D. University College London, *Assistant Adjunct Professor of Physiology and Biophysics*

Philip Felgner, Ph.D. Michigan State University, *Director of the Vaccine Research and Development Center and Professor in Residence of Physiology and Biophysics*

John Jay Gargus, M.D. Ph.D. Yale University, *Director of the Center for Autism Research and Translation and Professor Emeritus of Physiology and Biophysics; Genetic Counseling; Pediatrics*

Alan L. Goldin, M.D. Ph.D. University of Michigan, *Professor of Microbiology and Molecular Genetics; Anatomy and Neurobiology; Physiology and Biophysics*

Steven A.N. Goldstein, M.D., Ph.D. Harvard University, *Vice Chancellor for Health Affairs and Distinguished Professor of Physiology and Biophysics*

Milton Greenberg, Ph.D. University of California, Irvine, *Assistant Adjunct Professor of Physiology and Biophysics*

James E. Hall, Ph.D. University of California, Riverside, *Professor Emeritus of Physiology and Biophysics*

Todd C. Holmes, Ph.D. Massachusetts Institute of Technology, *Department Vice Chair and Professor of Physiology and Biophysics*

Naoto Hoshi, Ph.D. Kanazawa University, *Associate Professor of Pharmaceutical Sciences; Physiology and Biophysics*

Lan Huang, Ph.D. University of Florida, *Professor of Physiology and Biophysics; Biological Chemistry; Biomedical Engineering; Pharmaceutical Sciences*

Autumn S. Ivy, M.D., Ph.D. University of California, Irvine, *Assistant Professor of Pediatrics; Neurology; Physiology and Biophysics*

Rongsheng Jin, Ph.D. Columbia University, *Professor of Physiology and Biophysics*

Philip D. Kiser, Pharm.D. Ph.D. Case Western Reserve University, *Assistant Professor of Physiology and Biophysics; Ophthalmology*

Devon A. Lawson, Ph.D. University of California, Los Angeles, *Assistant Professor of Physiology and Biophysics*

Kenneth J. Longmuir, Ph.D. University of Oregon, *Professor Emeritus of Physiology and Biophysics*

Francesco Marangoni, Ph.D. Vita-Salute San Raffaele University, *Assistant Professor of Physiology and Biophysics*

Krzysztof Palczewski, Ph.D. Wroclaw University of Science and Technology, *Irving H. Leopold Chair of Ophthalmology and Professor of Ophthalmology; Physiology and Biophysics*

Mitradas M. Panicker, Ph.D. Carnegie-Mellon University, *Associate Adjunct Professor of Physiology and Biophysics*

Ian Parker, Ph.D. University College London, *Professor of Neurobiology and Behavior; Physiology and Biophysics*

Medha Pathak, Ph.D. University of California, Berkeley, *Assistant Professor of Physiology and Biophysics*

Eric Pearlman, Ph.D. University of Texas Health Sciences Center at San Antonio, *Director of the Institute for Immunology and Chancellor's Professor of Physiology and Biophysics; Ophthalmology*

Hamid M. Said, Pharm.D., Ph.D. Baghdad University, Aston University, *Distinguished Professor of Medicine; Physiology and Biophysics*

Dorota Skowronska-Krawczyk, Ph.D. University of Geneva, *Assistant Professor of Physiology and Biophysics*

Francesco Tombola, Ph.D. University of Padua, *Associate Professor of Physiology and Biophysics*

Nosratola D. Vaziri, M.D. University of Tehran, *Professor Emeritus of Medicine; Physiology and Biophysics*

S. Armando Villalta, Ph.D. University of California, Los Angeles, *Assistant Professor of Physiology and Biophysics; Neurology*

Ping H. Wang, M.D. Harvard University, *Professor of Medicine; Physiology and Biophysics*

Stephen H. White, Ph.D. University of Washington, *Professor Emeritus of Physiology and Biophysics*

Qin Yang, M.D. Ph.D. Nanjing University of Chinese Medicine, Osaka University, *Associate Professor of Medicine; Physiology and Biophysics*

## Courses

### **PHYSIO 200. Research in Physiology and Biophysics. 2-12 Units.**

Individual research directed toward doctoral dissertation and supervised by a particular professor.

Repeatability: May be repeated for credit unlimited times.

### **PHYSIO 200R. Research in Physiology and Biophysics for First-Year Students. 2-12 Units.**

Independent research within the laboratories of graduate training faculty in the Department of Physiology and Biophysics for first-year Ph.D. students.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

### **PHYSIO 201. Introduction to Physiology Research. 1-4 Units.**

Introduction to research in physiology and related sciences. Concentrates on techniques emphasized in the various laboratories of the Department of Physiology and Biophysics.

Repeatability: May be repeated for credit unlimited times.

### **PHYSIO 204. Concepts of Biophysics. 3 Units.**

Principles of crystallography; introduction to time-resolved absorption and fluorescence spectroscopy; the concepts of kinetic order and kinetic rate theory.

Restriction: Graduate students only.

### **PHYSIO 205. Electronics for Biologists. 4 Units.**

Basic principles of electricity; properties and use of discrete components and integrated circuits; circuit analysis and design. Intended for advanced students in the life sciences.

Same as NEURBIO 249.

### **PHYSIO 206A. Introduction to Medical Physiology. 5 Units.**

Vertebrate physiology with emphasis on humans and on the relationship between the function of normal tissues and the processes of disease. Fundamental principles of physiology and the interrelationships which control organ function.

Prerequisite: A biochemistry course.

Restriction: Graduate students only.

### **PHYSIO 206B. Introduction to Medical Physiology. 6 Units.**

Vertebrate physiology with emphasis on humans and on the relationship between the function of normal tissues and the processes of disease. Fundamental principles of physiology and the interrelationships which control organ function.

Prerequisite: PHYSIO 206A

Restriction: Graduate students only.

### **PHYSIO 212. Medical Immunology. 1.5 Unit.**

One of the cornerstones of the MS1 Molecular Basis of Medicine block. Includes temporal coordination of lecture material, regular course director meetings, and combined exams with PHYSIO 544: Medical Immunology.

Restriction: Graduate students only.

### **PHYSIO 215. Integrative Immunology . 4 Units.**

Provides an introduction to immunology, but focuses on providing in-depth analysis of selected topics within the broader field of immunology, including relevant research techniques, while improving critical thinking skills.

Restriction: Graduate students only.

### **PHYSIO 232. The Physiology of Ion Channels. 4 Units.**

Discusses how ion channels work (molecular/structural biophysics level) and what ion channels do in diverse cell types (cell physiology level).

Restriction: Graduate students only.

**PHYSIO 252. Introduction to Proteomics. 4 Units.**

Introduces students to concepts and methods of proteomics including protein identification, expression proteomics, and protein-protein interactions.

Repeatability: May be taken for credit 2 times.

**PHYSIO 272. Eye: Health and Disease. 3 Units.**

Introduces the anatomic and physiological basis of vertebrate vision and disease states in which the structure and function of the eye is disrupted with emphasis on current and developing research areas.

Restriction: Graduate students only.

**PHYSIO 290. Topics in Physiology. 3 Units.**

Contemporary research problems in physiology. Students review research articles in current literature and present ideas contained therein, focusing on groundbreaking discoveries and methodologies. Students present results of their own research and attend presentations given by other students and departmental researchers.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSIO 292A. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PHYSIO 292B. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PHYSIO 292C. Scientific Communication. 2 Units.**

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PHYSIO 299. Dissertation in Physiology and Biophysics. 2-12 Units.**

Preparation and completion of the dissertation required for the Ph.D.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.



# School of Physical Sciences

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## On This Page:

- Overview
- Degrees
- Honors

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### James S. Bullock, Dean

134 Rowland Hall

Undergraduate Counseling: 949-824-6507

<http://ps.uci.edu/stuaff> (<http://ps.uci.edu/>)

The School of Physical Sciences offers both professional training and general education in the Departments of Chemistry, Earth System Science, Mathematics, and Physics and Astronomy. The faculty, active in research and graduate education, are at the same time vitally concerned with undergraduate teaching. Curricula of the School are designed to meet the needs of a wide variety of students ranging from those with little technical background who seek insight into the activities and accomplishments of physical scientists to those seeking a comprehensive understanding that will prepare them for creative research in physical science.

Over the course of the past century and a half, physics, chemistry, and mathematics have evolved into interdependent but separate intellectual disciplines. This development is reflected in the departmental structure of the School of Physical Sciences. In the same period, these fundamental disciplines have moved into domains of abstraction unimagined by early scientists. This trend to abstraction with its concomitant increase in understanding of the physical universe provides the major challenge to the student of the physical sciences. Mathematics, physics, and chemistry, while providing the foundation of the technology that dominates contemporary civilization, underlie to an ever-increasing extent the new developments in the biological and social sciences. Earth system science is grounded in the traditional physical sciences while breaking new paths in the quantitative study of changes in the global environment.

## Honors

Criteria used by the School of Physical Sciences in selecting candidates for honors at graduation are as follows: Approximately 2 percent will be awarded *summa cum laude*, 4 percent *magna cum laude*, and 10 percent *cum laude*. Honors are awarded on the basis of a student's performance in research, cumulative grade point average, and performance in upper-division courses in the major. Students considered for honors at graduation must have completed 72 units in residence at the University of California. The student's cumulative record at the end of the final quarter is the basis for all decisions regarding honors at graduation. Other important factors are considered visit at **Honors Recognition**. The School of Physical Sciences also grants special honors to students who have distinguished themselves by their work in their major subject.

- Department of Chemistry
- Department of Earth System Science
- Department of Mathematics
- Department of Physics and Astronomy
- Applied Physics, B.S.
- Chemistry, B.S.
- Chemistry, Ph.D.
- Earth and Atmospheric Sciences, Minor
- Earth System Science, B.S.
- Earth System Science, Ph.D.
- Mathematics for Biology, Minor
- Mathematics, B.S.
- Mathematics, M.S.
- Mathematics, Minor
- Mathematics, Ph.D.
- Physics, B.S.
- Physics, Ph.D.

Each department offers courses that are of value to nonmajors and majors in the sciences. The programs for majors are designed to meet the needs of students planning careers in business, education, or industry; of students planning advanced professional study; and of students planning graduate work that continues their major interest. Students who wish to complete a coordinated set of courses beyond the introductory level in Mathematics and in Earth and Atmospheric Sciences may pursue minors in these areas. Students interested in mathematical and computational biology may complete the

Mathematics for Biology minor which prepares them for interdisciplinary graduate studies in this area. Introductory courses in chemistry, mathematics, and physics meet the needs of students majoring in the sciences, mathematics, and engineering and are also appropriate for students in other disciplines who seek a rigorous introduction to the physical sciences. In addition, a number of courses within the School have few or no prerequisites and are directed particularly toward students majoring in areas remote from the sciences.

## Planning a Program of Study

Students who choose a major in the School of Physical Sciences have a variety of academic advising and counseling resources available to them. In addition to faculty advisors, there is a Chief Academic Advisor in each department who is responsible for interpreting degree requirements, reviewing student petitions, and assisting with special advising problems. An academic advising and counseling staff, employed in the Associate Dean's Office, is available to serve a broad range of student advising needs. In consultation with their faculty advisor or an academic counselor, students should plan a course of study leading to a major in one of the departments of the School. In carrying out this major, students may often concentrate very heavily in a second department within the School or in some other school. Occasionally students choose to pursue a double major. Permission to do so may be sought by an online application submitted to the Office of the Associate Dean of Physical Sciences.

All initial courses of study for majors includes mathematics through calculus, and calculus is a prerequisite for much of the upper-division work in each major. A student interested in any of the physical sciences should continue mathematical training beyond these prerequisite courses. Furthermore, students interested in either physics or chemistry usually will include work in both of these subjects in their undergraduate careers.

Students in the physical sciences are urged to acquire a working knowledge of computer programming at an early stage of their University studies. This can be accomplished by taking one of the following:

CHEM 5	Scientific Mathematical and Computing Skills
EECS 10	Computational Methods in Electrical and Computer Engineering
EECS 12	Introduction to Programming
ENGRMAE 10	Introduction to Engineering Computations
I&C SCI 31	Introduction to Programming
MATH 9	Introduction to Programming for Numerical Analysis
PHYSICS 53	Introduction to Programming and Numerical Analysis

## Career Opportunities

Many of the School of Physical Sciences graduates continue their education beyond the Bachelor's degree level. Some pursue advanced academic degrees in preparation for careers in scientific or medical research, engineering, or postsecondary education. Other students will complete a secondary education credential in order to prepare for careers teaching high school mathematics and science. Some students enter professional school in areas such as medicine, dentistry, law, or business administration. Students who choose not to continue their studies beyond the baccalaureate level most frequently find employment in private business or industry. In addition to technical areas directly related to their major fields of study, students often enter careers in less obviously related fields such as computing, systems analysis, engineering, journalism, marketing, or sales.

The UCI Division of Career Pathways provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. Visit the Division of Career Pathways website (<http://career.uci.edu/>) for additional information.

## Preparation for Teaching Science and Mathematics

### Option 1: Earn a Bachelor's Degree, Education Concentration, and Teaching Credential

Physical Sciences students who are interested in pursuing a teaching career should consider the UCI Cal Teach Science and Mathematics Program. This program offers Chemistry, Earth System Science, Environmental Science, Mathematics, and Physics majors an option to earn their bachelor's degree concurrently with a California Preliminary Single Subject Teaching Credential. Individuals who hold this credential are authorized to teach science (chemistry, geosciences, or physics) or math in a middle school or high school.

Students complete the degree requirements for their selected major, the requirements for an optional education concentration offered by the same department, and any additional teacher credentialing course requirements that are not included in the major or the concentration. The following courses are required for the Preliminary Single Subject Teaching Credential:

EDUC 55	Knowing and Learning in Mathematics and Science
EDUC 109	Reading and Writing in Mathematics and Science
EDUC 143AW	Classroom Interactions I
EDUC 143BW	Classroom Interactions II
EDUC 148	Complex Pedagogical Design
EDUC 158	Student Teaching Mathematics and Science in Middle/High School (two quarters)

LPS 60	The Making of Modern Science (for chemistry, geosciences, and physics credential candidates only)
MATH 8	Explorations in Functions and Modeling (for mathematics credential candidates only)
PHY SCI 5	California Teach 1: Introduction to Science and Mathematics Teaching
PHY SCI 105	California Teach 2: Middle School Science and Mathematics Teaching
PHYSICS 193	Research Methods
or CHEM 193	Research Methods

Beyond course work, some additional requirements for teacher certification are described below.

With careful, early planning, it is possible for students to complete their bachelor's degree and teacher certification in four years. This is a more time-efficient and cost-effective route than the traditional five-year teacher preparation model, which usually involves a full academic year of teacher education courses and clinical teaching experience after completion of a bachelor's degree.

After the School of Physical Sciences verifies the completion of all requirements for the bachelor's degree and education concentration, students are awarded their degree from UC Irvine. The Preliminary Single Subject Teaching Credential is awarded by the California Commission on Teacher Credentialing (CTC) upon completion of a bachelor's degree and the state-approved UCI teacher education program, which combines course work, student teaching, and a teaching performance assessment. The UCI School of Education must verify completion of all requirements for the teaching credential and then recommend that the credential be awarded to a candidate by the CTC.

**Additional Requirements for Teacher Certification.** In addition to the required course work for a California Preliminary Single Subject Teaching Credential, the following additional requirements must be satisfied:

1. The School of Physical Sciences requires a *cumulative* GPA of 2.0 (C) to graduate with the bachelor's degree. However, students must earn a grade of C or better in each of the following courses in order to be recommended for the Preliminary Single Subject Credential: PHY SCI 105, EDUC 55, EDUC 143AW, EDUC 143BW, EDUC 148, and EDUC 158.
2. The following must be completed and verified prior to the start of student teaching in EDUC 158:
  - a. Pass the California Basic Education Skills Test (CBEST), a basic mathematics and literacy skills test. For more information, visit the CBEST exam website (<http://www.ctcexams.nesinc.com/>).
  - b. Pass the California Subject Exam for Teachers (CSET) in the discipline in which a candidate plans to earn a Preliminary Single Subject Credential (chemistry, geosciences, mathematics, or physics). Although secondary teachers are only required to pass the CSET exam in one discipline, those who pass the CSET exam in more than one disciplinary field (e.g., physics and mathematics) can be authorized to teach classes in each of those disciplines. For more information visit the CSET exam website (<http://www.ctcexams.nesinc.com/>). Mathematics majors have an option to waive the CSET exam by completing prescribed course work, referred to as a subject-matter preparation program (SMPP). More information is available at the School of Education's Mathematics SMPP website (<https://calteach.uci.edu/>).
  - c. Secondary school science teachers in California are expected to have a broad range of general science knowledge in addition to their discipline of specialization, because their Single Subject Teaching Credential in one of the sciences also authorizes them to teach classes in general or integrated science. The general science subtests of the CSET exam cover foundational topics in astronomy, geodynamics, Earth resources, ecology, genetics and evolution, molecular biology and biochemistry, cell and organismal biology, waves, forces and motion, electricity and magnetism, heat transfer and thermodynamics, and structure and properties of matter. Although students can prepare for the CSET exam's general science subtests through independent study, Physical Sciences students can also prepare themselves by taking lower-division courses that cover this content. Some suggested courses include BIO SCI 1A or BIO SCI 93 and BIO SCI 94; CHEM 1A-CHEM 1B-CHEM 1C; EARTHSS 1 and EARTHSS 7 and PHYSICS 20A.
  - d. Obtain a Certificate of Clearance from the State of California.
  - e. Obtain a TB test with negative results.
3. The following must be completed and verified before the School of Education is able to recommend an individual for the Preliminary Single Subject Credential:
  - a. Complete a college-level course or pass an examination on the U.S. Constitution. POL SCI 21A satisfies this requirement. Contact the UCI School of Education Student Affairs Office for information about the exam.
  - b. Obtain a CPR certificate in adult, child, or infant training.

**Declaring Intention to Complete the Concentration and Teacher Certification.** Prospective teachers who want to complete their degree and a teaching credential in four years are encouraged to start planning early by reviewing the sample programs for the major and the education concentration that they have selected, and to consult with an academic counselor. Interested students are encouraged to get started on the suggested first- and second-year credentialing course work, including PHY SCI 5 and PHY SCI 105, and can do so without officially declaring their intention to complete the concentration or the credential. However, students must declare their intention to complete the optional education concentration and their intention to earn the Preliminary Single Subject Teaching Credential by the end of their second year at the latest, and prior to enrolling in EDUC 55, which they would typically take in fall of their third year. Forms for declaring a selected education concentration and for declaring an intention to complete the teaching credential are available in the Cal Teach Science and Mathematics Resource and Advising Center (137 Bison Modular).

## Option 2: Earn a Bachelor's Degree and Education Concentration or Specialization

A second option for students interested in teaching science and mathematics is to earn a teaching credential in a post-baccalaureate teacher preparation program *after* completing their bachelor's degree. UCI and other universities offer such programs, which typically require one academic year of education course work and clinical teaching experience. The Departments of Chemistry, Mathematics, and Physics and Astronomy offer the concentration in Chemistry Education, the specialization in Mathematics for Education, and the concentration in Physics Education, respectively, which are well suited for undergraduates who plan to pursue a teaching credential after finishing their degree. These programs offer strong grounding in the fundamentals of one discipline, and at the same time, emphasize the breadth in natural sciences needed by secondary science teachers. Each department's curriculum includes introductory courses on effective methods of science and mathematics teaching and provides opportunities for practical fieldwork experiences in a secondary school classroom. Detailed requirements for each program are provided in the departmental sections.

## Special Programs

### Campuswide Honors Collegium

The Campuswide Honors Collegium is available to selected high-achieving students from all academic majors from their freshman through senior years. For more information contact the Campuswide Honors Collegium, 1200 Student Services II; 949-824-5461; [honors@uci.edu](mailto:honors@uci.edu); or visit the Campuswide Honors Collegium website (<http://honors.uci.edu/>).

### UC Education Abroad Program

Upper-division students have the opportunity to experience a different culture while making progress toward degree objectives through the University's Education Abroad Program (EAP). UCEAP is an overseas study program which operates in cooperation with host universities and colleges throughout the world. Visit the Study Abroad Center website (<http://www.cie.uci.edu/>) for additional information.

### Minor in Biomedical Engineering

The minor in Biomedical Engineering is an interdisciplinary curriculum that includes courses from the Schools of Engineering, Physical Sciences, and Biological Sciences. The minor is designed to provide a student in the physical sciences with the introductory skills needed in the quantitative biomedical arena. See The Henry Samueli School of Engineering section of the *Catalogue* for more information.

### Minor in Global Sustainability

The interdisciplinary minor in Global Sustainability trains students to understand the changes that need to be made in order for the human population to live in a sustainable relationship with the resources available on this planet. See Interdisciplinary Studies section of the *Catalogue* for more information.

### Physical Sciences Undergraduate Mentoring (PSUM) Program

The Physical Sciences Undergraduate Mentoring Program pairs juniors and seniors in the School of Physical Sciences with business and science professionals in a variety of areas, careers, and industries. Interested students should contact the Student Affairs office, the summer prior to their junior year. See the PSUM website (<https://ps.uci.edu/mentors/home/>) for more information.

## Faculty

Kevork N. Abazajian, Ph.D. University of California, San Diego, *Professor of Physics and Astronomy*

Takeo Akasaki, Ph.D. University of California, Los Angeles, *Professor Emeritus of Mathematics* (ring theory)

Jun F. Allard, Ph.D. University of British Columbia, *Associate Professor of Mathematics; Physics and Astronomy* (mathematical and computational biology)

Steven D. Allison, Ph.D. Stanford University, *Professor of Ecology and Evolutionary Biology; Earth System Science*

Ioan Andricioaei, Ph.D. Boston University, *Professor of Chemistry; Physics and Astronomy* (chemical biology, physical chemistry and chemical physics, theoretical and computational)

Ara Apkarian, Ph.D. Northwestern University, *UCI Distinguished Professor of Chemistry* (physical chemistry and chemical physics)

Ramesh D. Arasasingham, Ph.D. University of California, Davis, *Professor of Teaching of Chemistry* (chemical education and inorganic chemistry)

Shane Ardo, Ph.D. Johns Hopkins University, *Associate Professor of Chemistry; Chemical and Biomolecular Engineering; Materials Science and Engineering* (inorganic and organometallic, physical chemistry and chemical physics, polymer, materials, nanoscience)

Plamen Atanasov, Ph.D. Bulgarian Academy of Sciences, *UCI Chancellor's Professor of Chemical and Biomolecular Engineering; Chemistry; Materials Science and Engineering* (electrocatalysis and electrocatalysts for energy conversion processes; bio-electrocatalysis and energy harvesting systems)

Pierre F. Baldi, Ph.D. California Institute of Technology, *Director of the Institute for Genomics and Bioinformatics and Distinguished Professor of Computer Science; Biological Chemistry; Biomedical Engineering; Developmental and Cell Biology; Mathematics* (artificial intelligence and machine learning, biomedical informatics, databases and data mining, environmental informatics, statistics and statistical theory)

- Vladimir Baranovsky, Ph.D. University of Chicago, *Professor of Mathematics* (algebra and number theory)
- Aaron J. Barth, Ph.D. University of California, Berkeley, *Professor of Physics and Astronomy*
- Christopher P.J. Barty, Ph.D. Stanford University, *Distinguished Professor of Physics and Astronomy*
- Steven W. Barwick, Ph.D. University of California, Berkeley, *Professor of Physics and Astronomy*
- Gregory A. Benford, Ph.D. University of California, San Diego, *Professor Emeritus of Physics and Astronomy*
- Elizabeth Bess, Ph.D. University of Utah, *Assistant Professor of Chemistry* (chemical biology)
- Jianming Bian, Ph.D. Chinese Academy of Sciences, *Assistant Professor of Physics and Astronomy*
- Donald R. Blake, Ph.D. University of California, Irvine, *UCI Distinguished Professor of Chemistry* (analytical, atmospheric, environmental)
- Suzanne A. Blum, Ph.D. University of California, Berkeley, *Professor of Chemistry; Chemistry* (inorganic and organometallic, organic and synthetic, physical chemistry and chemical physics, polymer, materials, nanoscience)
- Andrew Borovik, Ph.D. University of North Carolina at Chapel Hill, *Professor of Chemistry* (chemical biology, inorganic and organometallic, organic and synthetic)
- Paulo Brando, Ph.D. University of Florida, *Assistant Professor of Physics and Astronomy*
- David A. Brant, Ph.D. University of Wisconsin-Madison, *Professor Emeritus of Chemistry* (biophysical)
- James S. Bullock, Ph.D. University of California, Santa Cruz, *Dean of the School of Physical Sciences and Professor of Physics and Astronomy*
- David A. Buote, Ph.D. Massachusetts Institute of Technology, *Professor of Physics and Astronomy*
- Kieron Burke, Ph.D. University of California, Santa Barbara, *Professor of Chemistry; Physics and Astronomy* (physical chemistry and chemical physics, theoretical and computational)
- Ann Marie Carlton, Ph.D. Rutgers University, *Associate Professor of Chemistry* (atmospheric and environmental, physical chemistry and chemical physics, theoretical and computational)
- David W. Casper, Ph.D. University of Michigan, *Associate Professor of Physics and Astronomy*
- A. Richard Chamberlin, Ph.D. University of California, San Diego, *Department Chair and Professor Emeritus of Pharmaceutical Sciences; Chemistry* (chemical biology, organic and synthetic)
- Gary A. Chanan, Ph.D. University of California, Berkeley, *Professor Emeritus of Physics and Astronomy*
- John Charles Chaput, Ph.D. University of California, Riverside, *Professor of Pharmaceutical Sciences; Chemistry; Molecular Biology and Biochemistry* (chemical and synthetic biology)
- Liu Chen, Ph.D. University of California, Berkeley, *Research Professor and Professor Emeritus of Physics and Astronomy*
- Long Chen, Ph.D. Pennsylvania State University, *Professor of Mathematics* (applied and computational mathematics)
- Mu-Chun Chen, Ph.D. University of Colorado Boulder, *Professor of Physics and Astronomy*
- Alexander L. Chernyshev, Ph.D. Russian Academy of Sciences, *Professor of Physics and Astronomy*
- Philip Collins, Ph.D. University of California, Berkeley, *Professor of Physics and Astronomy*
- Michael Cooper, Ph.D. University of California, Berkeley, *Professor of Physics and Astronomy*
- Asantha R. Cooray, Ph.D. University of Chicago, *Professor of Physics and Astronomy*
- Robert Corn, Ph.D. University of California, Berkeley, *UCI Distinguished Professor of Chemistry; Biomedical Engineering* (analytical, chemical biology, physical chemistry and chemical physics, polymer, materials, nanoscience)
- Michael C. Cranston, Ph.D. University of Minnesota, *Department Chair and Professor of Mathematics* (probability)
- Elizabeth D. Crook, Ph.D. University of California, Santa Cruz, *Assistant Professor of Teaching of Earth System Science*
- Claudia I. Czimczik, Ph.D. Max Planck Institute, *Associate Professor of Earth System Science*



Anthony V. Daly, M.F.A. University of California, Irvine, *Lecturer of Physical Sciences*

Christopher J. Davis, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Teaching of Mathematics* (algebra and number theory)

Kristen A. Davis, Ph.D. Stanford University, *Associate Professor of Civil and Environmental Engineering; Earth System Science* (coastal oceanography, fluid mechanics, turbulent flows)

Steven J. Davis, Ph.D. Stanford University, *Associate Professor of Earth System Science; Civil and Environmental Engineering*

Michael B. Dennin, Ph.D. University of California, Santa Barbara, *Professor of Physics and Astronomy*

Robert J. Doedens, Ph.D. University of Wisconsin-Madison, *Professor Emeritus of Chemistry* (inorganic and organometallic)

Franklin Dollar, Ph.D. University of Michigan, *Associate Professor of Physics and Astronomy* (applied physics)

Neil Donaldson, Ph.D. University of Bath, *Lecturer of Mathematics* (differential geometry)

Vy M. Dong, Ph.D. California Institute of Technology, *Professor of Chemistry* (organic and synthetic)

Ellen R. Druffel, Ph.D. University of California, San Diego, *Fred Kavli Chair in Earth System Science and Distinguished Professor of Earth System Science*

Igor E. Dzyaloshinskii, Ph.D. Moscow State University, *Professor Emeritus of Physics and Astronomy*

Kimberly D. Edwards, Ph.D. University of California, Irvine, *Department Vice Chair and Professor of Teaching of Chemistry* (general chemistry, chemical education)

Benis Egoh, Ph.D. Stellenbosch University, *Assistant Professor of Earth System Science*

Paul C. Eklof, Ph.D. Cornell University, *Professor Emeritus of Mathematics* (logic and algebra)

German A. Enciso Ruiz, Ph.D. Rutgers, the State University of New Jersey, *Professor of Mathematics; Developmental and Cell Biology* (applied and computational mathematics, mathematical and computational biology)

William J. Evans, Ph.D. University of California, Los Angeles, *UCI Distinguished Professor of Chemistry* (inorganic and organometallic)

Celia Faiola, Ph.D. Washington State University, *Assistant Professor of Ecology and Evolutionary Biology; Chemistry*

Jonathan L. Feng, Ph.D. Stanford University, *Professor of Physics and Astronomy*

Asaf Ferber, Ph.D. Tel Aviv University, *Assistant Professor of Mathematics* (combinatorics and probability)

Julie E. Ferguson, Ph.D. Oxford University, *Associate Professor of Teaching of Earth System Science*

Aleksandr Figotin, Ph.D. Tashkent University of Information Technologies, *Professor of Mathematics* (applied and computational mathematics, mathematical physics)

Sarah Finkeldei, Ph.D. RWTH Aachen University, *Assistant Professor of Chemistry; Materials Science and Engineering* (nuclear chemistry)

Mark Finkelstein, Ph.D. Stanford University, *Professor Emeritus of Mathematics; Center for Educational Partnerships* (analysis)

Barbara J. Finlayson-Pitts, Ph.D. University of California, Riverside, *Director of AirUCI and UCI Distinguished Professor of Chemistry* (analytical, atmospheric and environmental, physical chemistry and chemical physics)

Zachary Fisk, Ph.D. University of California, San Diego, *UCI Distinguished Professor Emeritus of Physics and Astronomy*

Matthew Foreman, Ph.D. University of California, Berkeley, *Distinguished Professor of Mathematics; Logic and Philosophy of Science* (ergodic theory and dynamical systems, logic and foundations)

Fillmore Freeman, Ph.D. Michigan State University, *Professor of Chemistry* (organic and synthetic, theoretical and computational)

Michael D. Fried, Ph.D. University of Michigan, *Professor Emeritus of Mathematics* (arithmetic geometry and complex variables)

Filipp Furche, Ph.D. University of Karlsruhe, *Professor of Chemistry* (physical chemistry and chemical physics, theoretical and computational)

Nien-Hui Ge, Ph.D. University of California, Berkeley, *Professor of Chemistry* (analytical, chemical biology, physical chemistry and chemical physics, polymer, materials, nanoscience)

Robert B. Gerber, Ph.D. Oxford University, *Professor Emeritus of Chemistry* (atmospheric and environmental, physical chemistry and chemical physics, theoretical and computational)

Isaac Goldbring, Ph.D. University of Illinois at Urbana-Champaign, *Associate Professor of Mathematics; Logic and Philosophy of Science* (logic and foundations)

Anton Gorodetski, Ph.D. Moscow State University, *Professor of Mathematics* (ergodic theory and dynamical systems)

Alon A. Gorodetsky, Ph.D. California Institute of Technology, *Associate Professor of Chemical and Biomolecular Engineering; Chemistry; Materials Science and Engineering* (cephalopods, adaptive materials, camouflage, bioelectronics)

Michael L. Goulden, Ph.D. Stanford University, *Professor of Earth System Science; Ecology and Evolutionary Biology*

Enrico Gratton, Ph.D. University of Rome, *Distinguished Professor of Biomedical Engineering; Developmental and Cell Biology; Physics and Astronomy* (design of new fluorescence instruments, protein dynamics, single molecule, fluorescence microscopy, photon migration in tissues)

Michael T. Green, Ph.D. University of Chicago, *Professor of Molecular Biology and Biochemistry; Chemistry* (chemical, biology, inorganic and organometallic, physical chemistry and chemical physics, theoretical and computational)

Steven P. Gross, Ph.D. University of Texas at Austin, *Professor of Developmental and Cell Biology; Physics and Astronomy* (force generation by molecular motors in living cells)

Zhibin Guan, Ph.D. University of North Carolina at Chapel Hill, *Professor of Chemistry; Biomedical Engineering; Chemical and Biomolecular Engineering; Materials Science and Engineering* (chemical biology, organic and synthetic, polymer, materials, nanoscience)

Alex Guenther, Ph.D. Washington State University, *Professor of Earth System Science*

Arnold Guerra, Ph.D. University of California, Irvine, *Lecturer of Physics and Astronomy*

Patrick Q. Guidotti, Ph.D. University of Zurich, *Professor of Mathematics* (analysis and partial differential equations, applied and computational mathematics)

Gultekin Gulsen, Ph.D. Bogazici University, *Associate Professor of Radiological Sciences; Biomedical Engineering; Physics and Astronomy*

Herbert W. Hamber, Ph.D. University of California, Santa Barbara, *Professor Emeritus of Physics and Astronomy*

Stephen Hanessian, Ph.D. Ohio State University, *Professor of Pharmaceutical Sciences; Chemistry* (organic chemistry, medicinal chemistry)

William W. Heidbrink, Ph.D. Princeton University, *Professor of Physics and Astronomy*

John C. Hemminger, Ph.D. Harvard University, *UCI Distinguished Professor of Chemistry* (analytical, atmospheric and environmental, physical chemistry and chemical physics, polymer, materials, nanoscience)

Alan F. Heyduk, Ph.D. Massachusetts Institute of Technology, *Department Vice Chair and Professor of Chemistry* (inorganic and organometallic)

Hamid Hezari, Ph.D. Johns Hopkins University, *Associate Professor of Mathematics* (analysis and partial differential equations)

Wilson Ho, Ph.D. University of Pennsylvania, *Donald Bren Professor and Professor of Physics and Astronomy; Chemistry*

Allon Hochbaum, Ph.D. University of California, Berkeley, *Associate Professor of Materials Science and Engineering; Chemical and Biomolecular Engineering; Chemistry* (nanoscale materials and hybrid bio-inorganic devices for applications in clean energy)

Amanda J. Holton, Ph.D. University of California, Irvine, *Associate Professor of Teaching of Chemistry* (chemistry, chemical education)

Herbert J. Hopster, Ph.D. Aachen University, *Professor Emeritus of Physics and Astronomy*

Kenneth B. Huber, Ph.D. University of California, Irvine, *Lecturer of Mathematics*

Paata Ivanisvili, Ph.D. Michigan State University, *Assistant Professor of Mathematics* (analysis, probability)

Kenneth C. Janda, Ph.D. Harvard University, *Professor Emeritus of Chemistry* (physical chemistry and chemical physics)

Elizabeth R. Jarvo, Ph.D. Boston College, *Professor of Chemistry* (inorganic and organometallic, organic and synthetic)

Luis A. Jauregui, Ph.D. Purdue University, *Assistant Professor of Physics and Astronomy*

Svetlana Jitomirskaya, Ph.D. Moscow State University, *Distinguished Professor of Mathematics* (mathematical physics)

Kathleen Johnson, Ph.D. University of California, Berkeley, *Associate Professor of Earth System Science*



- Nathan Kaplan, Ph.D. Harvard University, *Associate Professor of Mathematics* (algebra and number theory)
- Manoj Kaplinghat, Ph.D. Ohio State University, *Professor of Physics and Astronomy*
- Saewung Kim, Ph.D. Georgia Institute of Technology, *Associate Professor of Earth System Science*
- Susan M. King, Ph.D. Massachusetts Institute of Technology, *Professor of Teaching of Chemistry* (organic chemistry, chemical education)
- Anne A. Kirkby, Ph.D. California Institute of Technology, *Lecturer of Physics and Astronomy*
- David P. Kirkby, Ph.D. California Institute of Technology, *Professor of Physics and Astronomy*
- Abel Klein, Ph.D. Massachusetts Institute of Technology, *Distinguished Professor of Mathematics* (mathematical physics)
- Natalia Komarova, Ph.D. University of Arizona, *UCI Chancellor's Professor of Mathematics; Ecology and Evolutionary Biology* (applied and computational mathematics, mathematical and computational biology, mathematics of complex and social phenomena)
- Ilya N. Krivorotov, Ph.D. University of Minnesota, *Professor of Physics and Astronomy*
- Jason Russell Kronewetter, Ph.D. University of California, Irvine, *Lecturer of Mathematics*
- Katsiaryna Krupchyk, Ph.D. Belarusian State University, *Professor of Mathematics* (analysis and partial differential equations, inverse problems, and imaging)
- Andrew J. Lankford, Ph.D. Yale University, *Professor of Physics and Astronomy*
- Matthew Law, Ph.D. University of California, Berkeley, *Associate Professor of Chemistry; Chemical and Biomolecular Engineering; Materials Science and Engineering* (inorganic and organometallic, physical chemistry and chemical physics, polymer, materials, nanoscience)
- Jon M. Lawrence, Ph.D. University of Rochester, *Professor Emeritus of Physics and Astronomy*
- Rachel Lehman, Ph.D. University of California, Irvine, *Lecturer of Mathematics* (mathematics education and probability)
- Peter Li, Ph.D. University of California, Berkeley, *Chancellor's Professor Emeritus of Mathematics* (geometry and topology)
- Song-Ying Li, Ph.D. University of Pittsburgh, *Professor of Mathematics* (analysis and partial differential equations)
- Zhihong Lin, Ph.D. Princeton University, *Professor of Physics and Astronomy*
- Renee Link, Ph.D. University of California, Irvine, *Associate Professor of Teaching of Chemistry* (organic chemistry, chemical education)
- Chang C. Liu, Ph.D. Scripps Research Institute, *Assistant Professor of Biomedical Engineering; Chemistry; Molecular Biology and Biochemistry* (genetic engineering, directed evolution, synthetic biology, chemical biology)
- John S. Lowengrub, Ph.D. Courant Institute of Mathematical Sciences, *Chancellor's Professor of Mathematics; Biomedical Engineering* (applied and computational mathematics, mathematical and computational biology)
- Zhiqin Lu, Ph.D. Courant Institute of Mathematical Sciences, *Professor of Mathematics* (geometry and topology)
- Jeffrey Ludwig, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Teaching of Mathematics*
- Andrej Luptak, Ph.D. Yale University, *Professor of Pharmaceutical Sciences; Chemistry; Molecular Biology and Biochemistry* (chemical biology)
- Katherine Mackey, Ph.D. Stanford University, *Clare Booth Luce Assistant Professor of Earth System Science*
- Gudrun Magnusdottir, Ph.D. Colorado State University, *Professor of Earth System Science*
- Mark A. Mandelkern, Ph.D. University of California, Berkeley, *Research Professor and Professor Emeritus of Physics and Astronomy*
- Vladimir A. Mandelshtam, Ph.D. Russian Academy of Sciences, *Professor of Chemistry* (physical chemistry and chemical physics, theoretical and computational)
- Stephen Mang, Ph.D. University of California, Irvine, *Assistant Professor of Teaching of Chemistry* (chemical education, advanced laboratories)
- Alexei A. Maradudin, Ph.D. University of Bristol, *Professor Emeritus of Physics and Astronomy*
- Craig C. Martens, Ph.D. Cornell University, *Professor of Chemistry* (physical chemistry and chemical physics, polymer, materials, nanoscience, theoretical and computational)

Rachel Martin, Ph.D. Yale University, *Department Vice Chair and Professor of Chemistry; Molecular Biology and Biochemistry* (analytical, chemical biology, physical chemistry and chemical physics)

Adam Martiny, Ph.D. Technical University of Denmark, *Professor of Earth System Science; Ecology and Evolutionary Biology*

Roger D. McWilliams, Ph.D. Princeton University, *Associate Dean of the School of Physical Sciences and Professor of Physics and Astronomy*

George E. Miller, Ph.D. Oxford University, *Professor of Teaching Emeritus of Chemistry* (analytical and radioanalytical chemistry and chemical education)

Eric D. Mjolsness, Ph.D. California Institute of Technology, *Professor of Computer Science; Mathematics* (artificial intelligence and machine learning, biomedical informatics and computational biology, applied mathematics, mathematical biology, modeling languages)

David L. Mobley, Ph.D. University of California, Davis, *Vice Chair and Professor of Pharmaceutical Sciences; Chemistry* (chemical biology, physical chemistry and chemical physics, theoretical and computational)

William R. Molzon, Ph.D. University of Chicago, *Professor of Physics and Astronomy*

Connor Mooney, Ph.D. Columbia University, *Assistant Professor of Mathematics* (partial differential equations)

Jefferson Moore, Ph.D. Oregon State University, *Professor of Earth System Science*

Mathieu Morlighem, Ph.D. Ecole Centrale Paris, *Vice Chair and Associate Professor of Earth System Science*

Shaul Mukamel, Ph.D. Tel Aviv University, *UCI Distinguished Professor of Chemistry; Physics and Astronomy* (physical chemistry and chemical physics, polymer, materials, nanoscience, theoretical and computational)

Simona Murgia, Ph.D. Michigan State University, *Associate Professor of Physics and Astronomy*

Craig Murray, Ph.D. University of Edinburgh, *Associate Professor of Chemistry* (atmospheric and environmental, physical chemistry and chemical physics)

Riley D. Newman, Ph.D. University of California, Berkeley, *Professor Emeritus of Physics and Astronomy; Logic and Philosophy of Science; Physics and Astronomy*

Qing Nie, Ph.D. Ohio State University, *Director of the NSF-Simons Center for Multiscale Cell Fate Research and Chancellor's Professor of Mathematics; Biomedical Engineering* (applied and computational mathematics, mathematical and computational biology)

Sergey Nizkorodov, Ph.D. University of Basel, *Co-Director, AirUCI and Department Vice Chair and Professor of Chemistry* (analytical, atmospheric and environmental, physical chemistry and chemical physics)

James S. Nowick, Ph.D. Massachusetts Institute of Technology, *Professor of Chemistry; Pharmaceutical Sciences* (chemical biology, organic and synthetic, polymer, materials, nanoscience)

Juan Pedro Ochoa-Ricoux, Ph.D. California Institute of Technology, *Assistant Professor of Physics and Astronomy*

Larry E. Overman, Ph.D. University of Wisconsin-Madison, *UCI Distinguished Professor of Chemistry* (inorganic and organometallic, organic and synthetic)

Xiaoqing Pan, Ph.D. Saarlandes University, *Henry Samueli Endowed Chair and Director of Irvine Materials Research Institute (IMRI) and Professor of Materials Science and Engineering; Physics and Astronomy* (atomic-scale structure, properties and dynamic behaviors of advanced materials including thin films and nanostructures for memories, catalysts, and energy conversion and storage devices)

Alessandra Pantano, Ph.D. Princeton University, *Associate Professor of Teaching of Mathematics* (algebra and number theory)

William H. Parker, Ph.D. University of Pennsylvania, *Professor Emeritus of Physics and Astronomy*

Joseph Patterson, Ph.D. University of Warwick, *Assistant Professor of Chemistry; Materials Science and Engineering* (polymer, materials, nanoscience)

Roberto Pelayo, Ph.D. California Institute of Technology, *Assistant Professor of Teaching of Mathematics* (algebra and data science)

Reginald M. Penner, Ph.D. Texas A&M University, *UCI Chancellor's Professor of Chemistry* (analytical, physical chemistry and chemical physics, polymer, materials, nanoscience)

Eric Potma, Ph.D. University of Groningen, *Professor of Chemistry; Electrical Engineering and Computer Science* (analytical, chemical biology, physical chemistry and chemical physics)

Thomas L. Poulos, Ph.D. University of California, San Diego, *Distinguished Professor of Molecular Biology and Biochemistry; Chemistry; Pharmaceutical Sciences* (chemical biology)

Michael J. Prather, Ph.D. Yale University, *UCI Distinguished Professor of Earth System Science*

Jennifer A. Prescher, Ph.D. University of California, Berkeley, *Professor of Chemistry; Molecular Biology and Biochemistry; Pharmaceutical Sciences* (chemical biology, organic and synthetic)

Francois W. Primeau, Ph.D. Massachusetts Institute of Technology, *Professor of Earth System Science*

Michael S. Pritchard, Ph.D. University of California, San Diego, *Associate Professor of Earth System Science*

Sergey V. Pronin, Ph.D. University of Chicago, *Assistant Professor of Chemistry* (organic and synthetic chemistry)

Arvind Rajaraman, Ph.D. Stanford University, *Professor of Physics and Astronomy*

James T. Randerson, Ph.D. Stanford University, *UCI Chancellor's Professor of Earth System Science; Civil and Environmental Engineering; Ecology and Evolutionary Biology*

Michael Ratz, Ph.D. Technical University of Munich, *Professor of Physics and Astronomy*

David L. Rector, Ph.D. Massachusetts Institute of Technology, *Professor Emeritus of Mathematics* (algebraic topology and computer algebra)

William S. Reeburgh, Ph.D. Johns Hopkins University, *Professor Emeritus of Earth System Science*

Markus W. Ribbe, Ph.D. University of Bayreuth, *UCI Chancellor's Professor of Molecular Biology and Biochemistry; Chemistry* (chemical biology, inorganic and organometallic)

Eric Rignot, Ph.D. University of Southern California, *Department Chair and Donald Bren Professor of Earth System Science; Civil and Environmental Engineering*

Thorsten Ritz, Ph.D. University of Ulm, *Professor of Physics and Astronomy*

Paul M. Robertson, Ph.D. University of Texas at Austin, *Assistant Professor of Physics and Astronomy*

Judit Romhanyi, Ph.D. Budapest University of Technology and Economy, *Assistant Professor of Physics and Astronomy*

Karl Rubin, Ph.D. Harvard University, *Distinguished Professor Emeritus of Mathematics* (algebra and number theory)

Bernard Russo, Ph.D. University of California, Los Angeles, *Professor Emeritus of Mathematics* (functional analysis)

James E. Rutledge, Ph.D. University of Illinois at Chicago Circle, *Professor Emeritus of Physics and Astronomy*

Scott D. Rychnovsky, Ph.D. Columbia University, *UCI Distinguished Professor of Chemistry* (chemical biology, organic and synthetic)

Nathan Rynn, Ph.D. Stanford University, *Professor Emeritus of Physics and Astronomy*

Donald G. Saari, Ph.D. Purdue University, *UCI Distinguished Professor Emeritus of Economics; Logic and Philosophy of Science; Mathematics*

Eric S. Saltzman, Ph.D. University of Miami, *UCI Distinguished Professor of Earth System Science; Chemistry*

Javier D. Sanchez-Yamagishi, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Physics and Astronomy*

Martin Schechter, Ph.D. New York University, *Professor Emeritus of Mathematics* (analysis and partial differential equations, mathematical physics)

Stephen Scheinberg, Ph.D. Princeton University, *Professor Emeritus of Mathematics*

Richard M. Schoen, Ph.D. Stanford University, *UCI Excellence in Teaching Chair in Mathematics and Distinguished Professor of Mathematics* (differential geometry, partial differential equations, general relativity)

Jonas Schultz, Ph.D. Columbia University, *Professor Emeritus of Physics and Astronomy; Logic and Philosophy of Science*

A. J. Shaka, Ph.D. Oxford University, *Professor of Chemistry* (chemical biology, physical chemistry and chemical physics)

Kenneth J. Shea, Ph.D. Pennsylvania State University, *Distinguished Professor of Chemistry* (analytical, chemical biology, organic and synthetic, polymer, materials, nanoscience)

Aomawa Shields, Ph.D. University of Washington, *Assistant Professor of Physics and Astronomy*

Manabu Shiraiwa, Ph.D. Max Planck Institute for Chemistry, *Associate Professor of Chemistry* (atmospheric and environmental, chemical biology, physical chemistry and chemical physics, theoretical and computational)

Yuri Shirman, Ph.D. University of California, Santa Cruz, *Professor of Physics and Astronomy*

Alice Silverberg, Ph.D. Princeton University, *Distinguished Professor Emerita of Mathematics; Computer Science* (algebra and number theory)

Dennis J. Silverman, Ph.D. Stanford University, *Professor Emeritus of Physics and Astronomy*

Albert Siryaporn, Ph.D. University of Pennsylvania, *Assistant Professor of Physics and Astronomy; Molecular Biology and Biochemistry*

Zuzanna S. Siwy, Ph.D. Silesian University of Technology, *Professor of Physics and Astronomy; Biomedical Engineering; Chemistry*

Tammy Ann Smecker-Hane, Ph.D. Johns Hopkins University, *Associate Professor of Physics and Astronomy*

James N. Smith, Ph.D. California Institute of Technology, *Professor of Chemistry* (analytical, atmospheric and environmental, physical chemistry and chemical physics)

William H. Smoke, Ph.D. University of California, Berkeley, *Professor Emeritus of Mathematics* (homological algebra)

Henry W. Sobel, Ph.D. Case Western Reserve University, *Professor Emeritus of Physics and Astronomy*

Knut Solna, Ph.D. Stanford University, *Professor of Mathematics* (applied and computational mathematics, inverse problems and imaging, probability)

Soroosh Sorooshian, Ph.D. University of California, Los Angeles, *Director of the Center for Hydrometeorology and Remote Sensing (CHRS) and UCI Distinguished Professor of Civil and Environmental Engineering; Earth System Science* (hydrology, hydrometeorology and hydroclimate modeling, remote sensing, water sources management)

Robert Spitale, Ph.D. University of Rochester, *Director of the UCI Transcriptomics Core and Associate Professor of Pharmaceutical Sciences; Chemistry; Molecular Biology and Biochemistry* (chemistry, chemical biology, RNA biology)

Ronald J. Stern, Ph.D. University of California, Los Angeles, *Professor Emeritus of Mathematics* (geometry and topology)

Jeffrey D. Streets, Ph.D. Duke University, *Professor of Mathematics* (geometry and topology)

Min-Ying Su, Ph.D. University of California, Irvine, *Professor of Radiological Sciences; Physics and Astronomy*

Peter Taborek, Ph.D. California Institute of Technology, *Professor of Physics and Astronomy*

Agnes Taffard, Ph.D. University of Liverpool, *Professor of Physics and Astronomy*

Timothy Tait, Ph.D. Michigan State University, *Department Chair and Professor of Physics and Astronomy*

Fumiko Tajima, Ph.D. University of Tokyo, *Lecturer of Physics and Astronomy*

Toshiki Tajima, Ph.D. University of California, Irvine, *UCI Endowed Chair and Adjunct Professor of Physics and Astronomy*

Chuu-Lian Terng, Ph.D. Brandeis University, *Professor Emerita of Mathematics* (differential geometry and integrable systems)

Edriss S. Titi, Ph.D. Indiana University, *Professor Emeritus of Mathematics* (analysis and partial differential equations, applied and computational mathematics)

Douglas J. Tobias, Ph.D. Carnegie Mellon University, *Department Chair and Professor of Chemistry* (atmospheric and environmental, chemical biology, physical chemistry and chemical physics, theoretical and computational)

Virginia L. Trimble, Ph.D. California Institute of Technology, *Professor of Physics and Astronomy*

Susan E. Trumbore, Ph.D. Columbia University, *Professor of Earth System Science*

Shiou-Chuan (Sheryl) Tsai, Ph.D. University of California, Berkeley, *Professor of Molecular Biology and Biochemistry; Chemistry; Pharmaceutical Sciences*

Li Sheng Tseng, Ph.D. University of Chicago, *Associate Professor of Mathematics* (geometry and topology, mathematical physics)

Laura Tucker, Ph.D. University of California, San Diego, *Assistant Professor of Teaching of Physics and Astronomy*

Mark Vagins, Ph.D. Yale University, *Adjunct Professor of Physics and Astronomy*

Christopher Vanderwal, Ph.D. Scripps Research Institute, *Professor of Chemistry; Pharmaceutical Sciences* (organic and synthetic)

Gerard Vanhoven, Ph.D. Stanford University, *Professor Emeritus of Physics and Astronomy*

Isabella Velicogna, Ph.D. Università degli Studi di Trieste, *UCI Chancellor's Fellow and Professor of Earth System Science*

Roman Vershynin, Ph.D. University of Missouri-Columbia, *Professor of Mathematics* (probability, data science)

Jeffrey Viaclovsky, Ph.D. Princeton University, *Professor of Mathematics* (differential geometry, geometric analysis)

David Van Vranken, Ph.D. Stanford University, *Associate Dean of the School of Physical Sciences and Professor of Chemistry* (organic and synthetic)

Jasper A. Vrugt, Ph.D. University of Amsterdam, *Associate Professor of Civil and Environmental Engineering; Earth System Science* (examining how (eco)systems work, why theories deviate from data, how scientists diagnose change, as applied to biogeosciences, ecology, geomorphology, geophysics, hydrology, soils)

Richard F. Wallis, Ph.D. Catholic University of America, *Professor Emeritus of Physics and Astronomy*

Daqing Wan, Ph.D. University of Washington, *Professor of Mathematics* (algebra and number theory)

Frederic Yui-Ming Wan, Ph.D. Massachusetts Institute of Technology, *Professor Emeritus of Mathematics* (applied and computational mathematics, mathematical and computational biology)

Gregory A. Weiss, Ph.D. Harvard University, *Professor of Chemistry; Molecular Biology and Biochemistry; Pharmaceutical Sciences* (analytical, chemical biology, organic and synthetic, polymer, materials, nanoscience)

Frank J. Wessel, Ph.D. University of California, Irvine, *Project Scientist of Physics and Astronomy*

Robert W. West, Ph.D. University of Michigan, *Professor Emeritus of Mathematics* (algebraic topology)

Joel J. Westman, Ph.D. University of California, Los Angeles, *Professor Emeritus of Mathematics* (analysis)

Steven R. White, Ph.D. Cornell University, *Professor of Physics and Astronomy*

Daniel Whiteson, Ph.D. University of California, Berkeley, *Professor of Physics and Astronomy; Logic and Philosophy of Science*

Robert J. Whitley, Ph.D. New Mexico State University, *Professor Emeritus of Mathematics* (analysis)

Janet L. Williams, Ph.D. Brandeis University, *Professor Emerita of Mathematics* (probability and statistics)

Dominik Franz X. Wodarz, Ph.D. Oxford University, *Professor of Ecology and Evolutionary Biology; Mathematics*

Jesse Wolfson, Ph.D. Northwestern University, *Assistant Professor of Mathematics* (topology)

Ruqian Wu, Ph.D. Institute of Physics, Chinese Academy of Science, *Professor of Physics and Astronomy*

Jing Xia, Ph.D. Stanford University, *Professor of Physics and Astronomy*

Huolin Xin, Ph.D. Cornell University, *Assistant Professor of Physics and Astronomy; Materials Science and Engineering*

Jack Xin, Ph.D. New York University, *Chancellor's Professor of Mathematics* (applied and computational mathematics, mathematical and computational biology, probability)

Jenny Y. Yang, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Chemistry* (inorganic and organometallic, organic and synthetic, polymer, materials, nanoscience)

James J. Yeh, Ph.D. University of Minnesota, *Professor Emeritus of Mathematics* (analysis and partial differential equations, probability)

Clare C. Yu, Ph.D. Princeton University, *Professor of Physics and Astronomy*

Jin Yu, Ph.D. University of Illinois at Urbana-Champaign, *Assistant Professor of Physics and Astronomy*

Jin Yi Yu, Ph.D. University of Washington, *Vice Chair and Professor of Earth System Science*

Yifeng Yu, Ph.D. University of California, Berkeley, *Professor of Mathematics* (analysis and partial differential equations)

Martin Zeman, Ph.D. Humboldt University of Berlin, *Professor of Mathematics; Logic and Philosophy of Science* (logic and foundations)

Charles S. Zender, Ph.D. University of Colorado Boulder, *Professor of Earth System Science; Computer Science*

Xiangwen Zhang, Ph.D. McGill University, *Assistant Professor of Mathematics* (geometry and topology)



Hong-Kai Zhao, Ph.D. University of California, Los Angeles, *Chancellor's Professor of Mathematics; Computer Science* (applied and computational mathematics, inverse problems and imaging)

Weian Zheng, Ph.D. University of Strasbourg, *Professor Emeritus of Mathematics* (probability theory and financial engineering)

## Chemistry Courses

### **CHEM 1A. General Chemistry. 4 Units.**

General chemistry with applications to life sciences, physical sciences, and engineering. Atomic structure; general properties of the elements; covalent, ionic, and metallic bonding; mass relationships.

Prerequisite or corequisite: MATH 5A or MATH 2A or PHYS 7C or CHEM 1X or CHEM 1P or SAT Mathematics or ACT Mathematics or SAT Subject Chemistry or AP Chemistry or AP Calculus AB or AP Calculus BC. CHEM 1P with a grade of C- or better. SAT Mathematics with a minimum score of 600. ACT Mathematics with a minimum score of 27. SAT Subject Chemistry with a minimum score of 700. AP Chemistry with a minimum score of 3. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 3

Overlaps with CHEM H2A, ENGR 1A, CHEM M2A.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

(II and VA ).

### **CHEM 1B. General Chemistry. 4 Units.**

General chemistry with applications to life sciences, physical sciences, and engineering. Properties of gases, liquids, solids; intermolecular forces; changes of state; properties of solutions; stoichiometry; thermochemistry; and thermodynamics. Course may be offered online.

Prerequisite: CHEM 1A or ENGR 1A or CHEM H2A or AP Chemistry or CHEM M2A. CHEM 1A with a grade of C- or better. ENGR 1A with a grade of C- or better. CHEM H2A with a grade of C- or better. AP Chemistry with a minimum score of 4. CHEM M2A with a grade of C- or better

Overlaps with CHEM H2B.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

(II and Va ).

### **CHEM 1C. General Chemistry . 4 Units.**

General chemistry with applications to life sciences, physical sciences, and engineering. Equilibria, aqueous acid-base equilibria, solubility equilibria, oxidation reduction reactions, electrochemistry; kinetics; special topics.

Corequisite: CHEM 1LC

Prerequisite: CHEM 1B. CHEM 1B with a grade of C- or better

Overlaps with CHEM H2C.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

(II and VA ).

### **CHEM 1LA. General Chemistry Laboratory. 2 Units.**

Training and experience in basic laboratory techniques through experiments related to lecture topics in Chemistry 1A. Materials fee.

Corequisite: CHEM 1A

Overlaps with CHEM H2LA.

**CHEM 1LC. General Chemistry Laboratory. 3 Units.**

Training and experience in basic laboratory techniques. Chemical practice and principles illustrated through experiments related to lecture topics of CHEM 1A-B-C. Materials fee.

Corequisite: CHEM 1C

Prerequisite: CHEM 1B. CHEM 1B with a grade of C- or better

Overlaps with CHEM 1LE, CHEM H2LB, CHEM M2LB.

Restriction: Div of Undergraduate Education students have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Nursing Science Majors have first consideration for enrollment. Pharmaceutical Sciences Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment.

**CHEM 1LD. General Chemistry Laboratory. 3 Units.**

Training and experience in basic laboratory techniques. Chemical practice and principles illustrated through experiments related to lecture topics in CHEM 1A-B-C. Materials fee.

Prerequisite: (CHEM 1C and CHEM 1LC) or CHEM 1LE. CHEM 1C with a grade of C- or better. CHEM 1LC with a grade of C- or better. CHEM 1LE with a grade of C- or better

Overlaps with CHEM H2LB, CHEM M2LB.

Restriction: School of Biological Sciences students only. School of Physical Sciences students only. School of Engineering students only. Program in Nursing Science students only. Pharmaceutical Sciences Majors only. Public Health Sciences Majors only. No credit for CHEM M2LA if taken after CHEM 1LD. Undecided/Undeclared students also have first consideration for enrollment.

**CHEM 1LE. Accelerated General Chemistry Lab. 3 Units.**

Lecture and experiments covering chemical concepts for accelerated students who do not plan to take organic chemistry. Properties of gases, liquids, solutions, and solids; chemical equilibrium and chemical thermodynamics; atomic and molecular structure; chemical kinetics; electrochemistry. Materials fee.

Prerequisite or corequisite: CHEM 1A or ENGR 1A or AP Chemistry. AP Chemistry with a minimum score of 3

Overlaps with CHEM 1LC.

Restriction: School of Engineering students have first consideration for enrollment. Biomedical Computing Majors have first consideration for enrollment.

**CHEM 1P. Preparation for General Chemistry . 4 Units.**

Units of measurement, dimensional analysis, significant figures; elementary concepts of volume, mass, force, pressure, energy, density, temperature, heat, work; fundamentals of atomic and molecular structure; the mole concept, stoichiometry; properties of the states of matter; gas laws; solutions concentrations.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Biomedical Computing Majors have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

**CHEM 1X. General Chemistry Plus. 2 Units.**

Units of chemical measurements, dimensional analysis, significant figures; elementary physicochemical concepts; fundamentals of atomic and molecular structure; molar amounts and stoichiometry; properties of the states of matter; solutions concentrations.

Prerequisite: Students who meet the requirements for taking Chem 1A through their SAT, ACT, or AP test scores are not eligible for enrollment in Chem 1X. Specifically, the students must have ALL of the following advisory prerequisites (the inverse of the Chem 1A prerequisites): S02<600 (score below 600 on the SAT Mathematics Reasoning test) A02<27 (score below 27 on the ACT Mathematics test) Z43<700 (score below 700 on the SAT Chemistry subject exam) AP25<3 (score below 3 on the AP Chemistry exam) AP66<4 (score below 4 on the AP Calculus AB Exam) AP68<3 (score below 3 on the AP Calculus BC Exam) Students who meet Chem 1A eligibility through ALEKS-based training are permitted to enroll in Chem 1X. Chem 1X is open to interested BioEASE students.

Grading Option: Pass/no pass only.



**CHEM H2A. Honors General Chemistry. 4 Units.**

Covers the same material as CHEM 1A-CHEM 1B-CHEM M3C but in greater depth. Additional topics will also be included as time permits.

Corequisite: CHEM H2LA

Prerequisite: AP Chemistry or SAT Subject Chemistry. AP Chemistry with a minimum score of 4. SAT Subject Chemistry with a minimum score of 700

Overlaps with CHEM 1A.

Restriction: Campuswide Honors Collegium students only.

**(II and Va ).**

**CHEM H2B. Honors General Chemistry. 4 Units.**

Covers the same material as CHEM 1A-CHEM 1B-CHEM M3C but in greater depth. Additional topics are also included as time permits.

Corequisite: CHEM H2LB

Prerequisite: CHEM H2A and (CHEM H2LA or CHEM M2LA). CHEM H2A with a grade of C- or better. CHEM H2LA with a grade of C- or better. CHEM M2LA with a grade of C- or better

Overlaps with CHEM 1B.

Restriction: Campuswide Honors Collegium students only.

**(II and VA ).**

**CHEM H2C. Honors General Chemistry. 4 Units.**

Covers the same material as CHEM 1A-CHEM 1B-CHEM M3C but in greater depth. Additional topics are also included as time permits.

Prerequisite: CHEM H2B and (CHEM H2LB or CHEM M2LB). CHEM H2B with a grade of C- or better. CHEM H2LB with a grade of C- or better. CHEM M2LB with a grade of C- or better

Overlaps with CHEM 1C.

Restriction: Campuswide Honors Collegium students only.

**(II and VA ).**

**CHEM H2LA. Honors General Chemistry Laboratory. 3 Units.**

Training and experience in fundamental and analytical laboratory techniques through experiments related to lecture topics in CHEM H2A-CHEM H2B-CHEM H2C. Materials fee.

Corequisite: CHEM H2A

Prerequisite: AP Chemistry or SAT Subject Chemistry. AP Chemistry with a minimum score of 4. SAT Subject Chemistry with a minimum score of 700

Overlaps with CHEM M2LA.

Restriction: Campuswide Honors Collegium students only.

**CHEM H2LB. Honors General Chemistry Laboratory. 3 Units.**

Training and experience in fundamental and analytical laboratory techniques through experiments related to lecture topics in CHEM H2A-CHEM H2B-CHEM H2C. Materials fee.

Corequisite: CHEM H2B

Prerequisite: CHEM H2A and (CHEM H2LA or CHEM M2LA). CHEM H2A with a grade of B or better. CHEM H2LA with a grade of B or better. CHEM M2LA with a grade of B or better

Overlaps with CHEM M2LB.

Restriction: No credit for CHEM 1LC if taken after CHEM H2LB or CHEM M2LB.

**CHEM H2LC. Honors General Chemistry Laboratory. 3 Units.**

Training and experience in fundamental and analytical laboratory techniques through experiments related to lecture topics in CHEM H2A-CHEM H2B-CHEM H2C. Materials fee.

Corequisite: CHEM H2C

Prerequisite: CHEM H2B and (CHEM H2LB or CHEM M2LB). CHEM H2B with a grade of B or better. CHEM H2LB with a grade of B or better. CHEM M2LB with a grade of B or better

**CHEM M2A. Majors General Chemistry Lecture. 4 Units.**

Covers the same material as CHEM 1A but in greater depth. Additional topics are included as time permits.

Prerequisite or corequisite: MATH 5A or MATH 2A or PHYS 7C or CHEM 1X or CHEM 1P or SAT Mathematics or ACT Mathematics or SAT Subject Chemistry or AP Chemistry or AP Calculus AB or AP Calculus BC. CHEM 1P with a grade of C- or better. SAT Mathematics with a minimum score of 600. ACT Mathematics with a minimum score of 27. SAT Subject Chemistry with a minimum score of 700. AP Chemistry with a minimum score of 3. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 3. Placement via a passing score on the ALEKS placement exam is also accepted.

Overlaps with CHEM 1A, CHEM H2A, ENGR 1A.

Restriction: Chemistry Majors have first consideration for enrollment.

**(II and Va ).**

**CHEM M2B. Majors General Chemistry Lecture. 4 Units.**

Covers the same material as CHEM 1B but in greater depth. Additional topics will also be included as time permits.

Prerequisite: CHEM M2A and CHEM M2LA. CHEM M2A with a grade of C- or better. CHEM M2LA with a grade of C- or better

Overlaps with CHEM H2B, CHEM 1B.

Restriction: Chemistry Majors have first consideration for enrollment.

**(II and Va ).**

**CHEM M2C. Majors General Chemistry Lecture. 4 Units.**

Covers the same material as CHEM 1C but in greater depth. Additional topics are also included as time permits.

Prerequisite: CHEM M2B and CHEM M2LB. CHEM M2B with a grade of C- or better. CHEM M2LB with a grade of C- or better

Overlaps with CHEM 1C, CHEM H2C.

Restriction: Chemistry Majors have first consideration for enrollment.

**(II and Va ).**

**CHEM M2LA. Majors General Chemistry Laboratory. 3 Units.**

Training and experience in basic laboratory techniques through experiments related to lecture topics in CHEM 1A-CHEM 1B-CHEM M3C. Materials fee.

Prerequisite or corequisite: CHEM 1A or CHEM M2A or CHEM H2A. CHEM 1A with a grade of C- or better. CHEM M2A with a grade of C- or better. CHEM H2A with a grade of C- or better. High school chemistry.

Overlaps with CHEM H2LA, CHEM 1LD.

Restriction: Chemistry Majors only. No credit for CHEM M2LA if taken after CHEM 1LD.

**CHEM M2LB. Majors General Chemistry Laboratory. 3 Units.**

Training and experience in basic laboratory techniques through experiments related to lecture topics in CHEM 1A-CHEM 1B-CHEM M3C. Materials fee.

Prerequisite or corequisite: (CHEM 1B or CHEM H2B or CHEM M2B) and (CHEM M2A or CHEM H2A) and (CHEM M2LA or CHEM H2LA). CHEM M2A with a grade of C- or better. CHEM H2A with a grade of C- or better. CHEM M2LA with a grade of C- or better. CHEM H2LA with a grade of C- or better

Overlaps with CHEM H2LB.

Restriction: Chemistry Majors only. CHEM 1LC may not be taken for credit if taken after CHEM H2LB or CHEM M2LB.

**CHEM M3C. Majors Quantitative Analytical Chemistry. 4 Units.**

Topics include equilibria, aqueous acid-base equilibria, solubility equilibria, oxidation reduction reactions, electrochemistry, and kinetics with a special emphasis on the statistical treatment of data and analytical methods of chemical analysis.

Corequisite: CHEM M3LC

Prerequisite: (CHEM 1B or CHEM H2B or CHEM M2B) and (CHEM M2LB or CHEM H2LB). CHEM 1B with a grade of C- or better. CHEM H2B with a grade of C- or better. CHEM M2B with a grade of C- or better. CHEM M2LB with a grade of C- or better. CHEM H2LB with a grade of C- or better

Restriction: Chemistry Majors only.

**(II and VA ).**

**CHEM M3LC. Majors Quantitative Analytical Chemistry Laboratory. 4 Units.**

Foundational principles of analytical chemistry and experimental methods for quantitative analysis of real samples. Materials fee.

Prerequisite: (CHEM 1B or CHEM H2B or CHEM M2B) and (CHEM M2LB or CHEM H2LB). CHEM 1B with a grade of C- or better. CHEM H2B with a grade of C- or better. CHEM M2B with a grade of C- or better. CHEM M2LB with a grade of C- or better. CHEM H2LB with a grade of C- or better

Restriction: Chemistry Majors only.

**CHEM 5. Scientific Mathematical and Computing Skills. 4 Units.**

Introduces students to mathematical skills, including complex numbers, linear algebra, differential equations, multivariable calculus, infinite series, Fourier series, and integral transforms; and computing skills, including plotting, data analysis (statistics and curve fitting), linear algebra, symbolic mathematics, and spectral analysis.

Corequisite: (CHEM 1C or CHEM H2C or CHEM M3C) and MATH 2D.

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 11. New Chemistry Student Seminar. 1 Workload Unit.**

Seminar for students who recently joined the chemistry major. Addresses available tracks in the major, research opportunities in the chemistry department, careers in chemistry, and relevant programs and resources for students.

Grading Option: Workload Credit P/NP Only.

Restriction: Freshmen students, transfer students, and students who recently changed their major to Chemistry have first consideration for enrollment.

**CHEM 12. Chemistry Around Us. 4 Units.**

Addresses ways in which chemistry affects everyday life. Topics include pollution, global warming, water supply/demands, biodiesel fuels, foods we eat, natural/synthetic materials, common drugs, drug design. Learn and apply basic chemistry concepts. Use risk/benefit analysis for optimal solutions.

(II and Va ).

**CHEM 14. Sense and Sensibility in Science. 4 Units.**

Gives an overview of scientific methods and heuristics through group exercises and discussion. Discusses the benefits and limitations of applying rational scientific approaches to real-world examples from philosophy, cognitive and social psychology, game theory, economics, political science, law, and negotiation.

(II and V.A. ).

**CHEM H30A. Critical Analysis of Health Science Literature. 4 Units.**

Focuses on evaluation of scientific literature. Aspects of scientific inquiry include scientific method, scientific research design, statistical analysis, and publication processes. Addresses why scientific inquiry cannot be separated from sociocultural influences and concerns. Examples drawn from research on health-related issues.

Restriction: Campuswide Honors Collegium students only.

(II and Va. ).

**CHEM 51A. Organic Chemistry. 4 Units.**

Fundamental concepts relating to carbon compounds with emphasis on structural theory and the nature of chemical bonding, stereochemistry, reaction mechanisms, and stereoscopic, physical, and chemical properties of the principal classes of carbon compounds.

Prerequisite or corequisite: (CHEM 1C or CHEM H2C or CHEM M3C) and (CHEM 1LD or CHEM H2LB or CHEM M2LB). CHEM 1C with a grade of C- or better. CHEM H2C with a grade of C- or better. CHEM M3C with a grade of C- or better. CHEM 1LD with a grade of C- or better. CHEM H2LB with a grade of C- or better. CHEM M2LB with a grade of C- or better

Overlaps with CHEM H52A.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

**CHEM 51B. Organic Chemistry. 4 Units.**

Fundamental concepts relating to carbon compounds with emphasis on structural theory and the nature of chemical bonding, stereochemistry, reaction mechanisms, and stereoscopic, physical, and chemical properties of the principal classes of carbon compounds.

Prerequisite: CHEM 51A and (CHEM 1LD or CHEM M52LA or CHEM H52LA). CHEM 51A with a grade of C- or better. CHEM 1LD with a grade of C- or better. CHEM M52LA with a grade of C- or better. CHEM H52LA with a grade of C- or better

Overlaps with CHEM H52B.

Restriction: Undeclared Majors have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment.

**CHEM 51C. Organic Chemistry. 4 Units.**

Fundamental concepts relating to carbon compounds with emphasis on structural theory and the nature of chemical bonding, stereochemistry, reaction mechanisms, and stereoscopic, physical, and chemical properties of the principal classes of carbon compounds.

Prerequisite: CHEM 51B and (CHEM 51LB or CHEM M52LB or CHEM H52LB). CHEM 51B with a grade of C- or better. CHEM 51LB with a grade of C- or better. CHEM M52LB with a grade of C- or better. CHEM H52LB with a grade of C- or better

Overlaps with CHEM H52C.

Restriction: Undeclared Majors have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment.

**CHEM 51LB. Organic Chemistry Laboratory. 3 Units.**

Modern techniques of organic chemistry, using selected experiments to illustrate topics introduced in CHEM 51A-CHEM 51B-CHEM 51C. Materials fee.

Corequisite: CHEM 51B

Prerequisite: CHEM 51A and (CHEM 1LD or CHEM H2LB or CHEM M2LB). CHEM 51A with a grade of C- or better. CHEM 1LD with a grade of C- or better. CHEM H2LB with a grade of C- or better. CHEM M2LB with a grade of C- or better

Overlaps with CHEM H52LA, CHEM M52LA.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

**CHEM 51LC. Organic Chemistry Laboratory. 3 Units.**

Modern techniques of organic chemistry, using selected experiments to illustrate topics introduced in CHEM 51A-B-C. Materials fee.

Corequisite: CHEM 51C

Prerequisite: CHEM 51B and CHEM 51LB. CHEM 51B with a grade of C- or better. CHEM 51LB with a grade of C- or better

Overlaps with CHEM H52LB, CHEM M52LB.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

**CHEM 51LD. Organic Chemistry Laboratory. 3 Units.**

Modern techniques of organic chemistry using selected experiments to illustrate topics introduced in CHEM 51A-CHEM 51B-CHEM 51C. Materials fee.

Prerequisite: CHEM 51C and CHEM 51LC. CHEM 51C with a grade of C- or better. CHEM 51LC with a grade of C- or better

Overlaps with CHEM H52LC.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

**CHEM H52LA. Honors Organic Chemistry Laboratory. 3 Units.**

Fundamental techniques of modern experimental organic chemistry. Materials fee.

Corequisite: CHEM 51A

Prerequisite: (CHEM 1C or CHEM H2C or CHEM M3C) and (CHEM M2LB or CHEM H2LB or CHEM 1LD). CHEM 1C with a grade of C- or better.

CHEM H2C with a grade of C- or better. CHEM M3C with a grade of C- or better. CHEM M2LB with a grade of C- or better. CHEM H2LB with a grade of C- or better. CHEM 1LD with a grade of C- or better

Overlaps with CHEM 51LB, CHEM M52LA.

Restriction: Campuswide Honors Collegium students only.

**CHEM H52LB. Honors Organic Chemistry Laboratory. 3 Units.**

Fundamental techniques of modern experimental organic chemistry. Materials fee.

Corequisite: CHEM 51B

Prerequisite: CHEM 51A and CHEM H52LA. CHEM 51A with a grade of C- or better. CHEM H52LA with a grade of C- or better

Overlaps with CHEM M52LB, CHEM 51LC.

**CHEM H52LC. Honors Organic Chemistry Laboratory. 3 Units.**

Fundamental techniques of modern experimental organic chemistry. Materials fee.

Prerequisite: CHEM 51B and CHEM H52LB. CHEM 51B with a grade of C- or better. CHEM H52LB with a grade of C- or better

Overlaps with CHEM 51LD, CHEM M52LC.

**CHEM M52LA. Majors Organic Chemistry Laboratory. 3 Units.**

Modern techniques of organic chemistry, using selected experiments to illustrate topics introduced in CHEM 51A-B-C. Materials fee.

Corequisite: CHEM 51A

Prerequisite: (CHEM 1C or CHEM H2C or CHEM M3C) and (CHEM H2LB or CHEM M2LB or CHEM 1LD). CHEM 1C with a grade of C- or better.

CHEM H2C with a grade of C- or better. CHEM M3C with a grade of C- or better. CHEM H2LB with a grade of C- or better. CHEM M2LB with a grade of C- or better. CHEM 1LD with a grade of C- or better

Overlaps with CHEM H52LA, CHEM 51LB.

Restriction: Chemistry Majors only.

**CHEM M52LB. Majors Organic Chemistry Laboratory. 3 Units.**

Modern techniques of organic chemistry, using selected experiments to illustrate topics introduced in CHEM 51A-B-C. Materials fee.

Corequisite: CHEM 51B

Prerequisite: CHEM 51A and CHEM M52LA. CHEM 51A with a grade of C- or better. CHEM M52LA with a grade of C- or better

Overlaps with CHEM H52LB, CHEM 51LC.

Restriction: Chemistry Majors only.

**CHEM M52LC. Majors Organic Chemistry Laboratory. 3 Units.**

Modern techniques of organic chemistry, using selected experiments to illustrate topics introduced in CHEM 51A-B-C. Materials fee.

Corequisite: CHEM 51C

Prerequisite: CHEM 51B and CHEM M52LB. CHEM 51B with a grade of C- or better. CHEM M52LB with a grade of C- or better

Overlaps with CHEM H52LC, CHEM 51LD.

Restriction: Chemistry Majors only.

**CHEM H90. The Idiom and Practice of Science. 4 Units.**

A series of fundamental and applied problems in the chemical sciences are addressed. Topics may include the periodic table, electronic structure of atoms, chemical bonding, molecular structure, thermodynamics, and kinetics, with applications to energy and the environment, and/or biochemistry.

Restriction: Campuswide Honors Collegium students only.

(II, Va)

**CHEM 100S. Laboratory Safety for Chemists.**

Provide students with the fundamentals of safety involved in chemical laboratory work.

Prerequisite or corequisite: CHEM 51C

Grading Option: Pass/no pass only.

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 101W. Writing in Chemical Sciences. 4 Units.**

Students receive guidance on preparing research papers, proposals, reports, and other forms of scientific writing in chemistry-related fields, on effectively searching for and using chemical information, and on communicating data in poster and platform presentations.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Chemistry Majors have first consideration for enrollment.

(Ib)

**CHEM 107. Inorganic Chemistry. 4 Units.**

Introduction to modern inorganic chemistry. Principles of structure, bonding, and chemical reactivity with application to compounds of the main group and transition elements, including organometallic chemistry.

Prerequisite: CHEM 51C or CHEM H52C

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 107L. Inorganic Chemistry Laboratory. 3 Units.**

Modern techniques of inorganic and organometallic chemistry, including experience with glove box, Schlenk line, and vacuum line methods. Materials fee.

Prerequisite or corequisite: CHEM 107 and CHEM 100S

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 125. Advanced Organic Chemistry. 4 Units.**

Rapid-paced comprehensive treatment of organic chemistry. Focuses on molecular structure, reactivity, stability, scope and mechanisms of organic reactions. Topics include: structure and bonding; theoretical organic chemistry; acidity and basicity; reactive intermediates; pericyclic reactions; stereochemistry; organic synthesis; natural products; organic photochemistry.

Prerequisite: CHEM 51C

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 127. Inorganic Chemistry II. 4 Units.**

Advanced treatment of selected fundamental topics in inorganic chemistry, building on material presented in Chemistry 107. Molecular symmetry with applications to electronic structure and spectroscopy. Reaction kinetics and mechanisms; inorganic synthesis and catalysis; bioinorganic chemistry.

Prerequisite: CHEM 107

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 128. Introduction to Chemical Biology. 4 Units.**

Introduction to the basic principles of chemical biology: structures and reactivity; chemical mechanisms of enzyme catalysis; chemistry of signalling, biosynthesis, and metabolic pathways.

Corequisite: CHEM 128L

Prerequisite: (CHEM 51C or CHEM H52C)

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 128L. Introduction to Chemical Biology Laboratory Techniques. 3 Units.**

Introduction to the basic laboratory techniques of chemical biology: electrophoresis, plasmid preparation, PCR, protein expression, isolation, and kinetics. Materials fee.

Corequisite: CHEM 128

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 132A. Chemical Thermodynamics, Kinetics, and Dynamics. 4 Units.**

Energy, entropy, and the thermodynamic potentials. Chemical equilibrium. Chemical kinetics.

Prerequisite or corequisite: MATH 2D and (PHYS 7D or PHYS 7E) and (CHEM 5 or (MATH 3D and (EECS 10 or EECS 12 or MAE 10 or ICS 31)) )

Overlaps with CHEM 131C.

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 132B. Quantum Principles, Spectroscopy, and Bonding. 4 Units.**

Principles of quantum chemistry with applications to the elements of atomic structure, energy levels, and spectroscopy.

Prerequisite: (CHEM 132A or CEMS 45C) and (PHYS 7D or PHYS 7E). CHEM 132A with a grade of C- or better

Overlaps with CHEM 131A.

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 132C. Molecular Structure and Elementary Statistical Mechanics. 4 Units.**

Principles of quantum mechanics with applications to molecular spectroscopy and structure determination, and chemical bonding in simple molecules. Elements of statistical mechanics.

Prerequisite: CHEM 132B

Overlaps with CHEM 131B.

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 133. Nuclear and Radiochemistry. 4 Units.**

Advanced treatment of nuclear structure, nuclear reactions, and radioactive-decay processes. Introduction to nuclear activation analysis, isotope effects, radiation chemistry, hot-atom chemistry, nuclear age-dating methods, nuclear reactors, and nuclear power.

Prerequisite: (CHEM M3C or CHEM 1C or CHEM H2C) and MATH 2D

Same as CBE 176.

Overlaps with CHEM 170.

Restriction: Chemistry Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment.

Concurrent with CHEM 233 and CBE 276.

**CHEM 133L. Nuclear and Radiochemistry Laboratory. 3 Units.**

Practical aspects of production, separation, safe handling, detection, and measurement of radioactive isotopes. Experiments use the UCI nuclear reactor and emphasize uses of radioisotopes in chemistry, engineering, biology, and medicine. Materials fee.

Prerequisite or corequisite: CHEM 133

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 137. Computational Chemistry. 4 Units.**

Short introduction to programming languages and to representative algorithms employed in chemical research. Students have the opportunity to devise and employ their own codes and also to employ codes which are widely used in various fields of chemistry. Materials fee.

Corequisite: CHEM 132C

Prerequisite: CHEM 51C and (CHEM 131A or CHEM 132B)

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 138. Introduction to Computational Organic Chemistry. 4 Units.**

An introduction to the use of computational chemistry to investigate reaction mechanisms, to calculate structures, and to predict properties of molecules. Students have the opportunity to perform calculations employing computational methods which are widely used in various fields of chemistry. Materials fee.

Prerequisite: CHEM 51C

Restriction: Chemistry Majors have first consideration for enrollment.



**CHEM 141. Environmental Chemistry. 4 Units.**

Processes that control the fate of chemicals in the environment. Chemistry of the atmosphere, hydrosphere, and soils, especially as it pertains to pollutants.

Prerequisite: (CHEM 51C or CHEM H52C) and (MATH 2B or AP Calculus BC). AP Calculus BC with a minimum score of 4

**CHEM 145A. Gas-Phase Atmospheric Chemistry. 4 Units.**

Sources, chemistry, sinks, and measurements of key atmospheric gaseous species. Chemistry of photochemical oxidant formation, transformation of key inorganic and organic trace gases, and stratospheric ozone cycling. Applications of atmospheric chemistry models to control strategies.

Prerequisite: CHEM 132A and CHEM 132B and CHEM 132C

Concurrent with CHEM 245A.

**CHEM 145B. Multi-Phase Atmospheric Chemistry. 4 Units.**

Chemical and physical processes leading to the production, aging, and removal of atmospheric particles. Multi-phase processes involving gases, particles, water droplets, and environmental surfaces. Approaches for modeling these processes with applications to control strategies.

Prerequisite: CHEM 145A

Concurrent with CHEM 245B.

**CHEM 150. Computational Chemistry. 4 Units.**

Basic concepts, methods, and techniques in computational chemistry: density functional and wavefunction theory, molecular property calculations, analysis tools, potential energy surfaces, vibrational effects, molecular dynamics simulations.

Prerequisite or corequisite: MATH 3A and (CHEM 132A or PHYS 113A)

Restriction: Chemistry Majors have first consideration for enrollment.

Concurrent with CHEM 250.

**CHEM 150L. Computational Chemistry Laboratory. 4 Units.**

Introduction to the practice of modern computational chemistry through a series of advanced computational experiments.

Prerequisite: CHEM 150 and (CHEM 5 or PHYS 50 or EECS 12)

Restriction: Chemistry Majors have first consideration for enrollment.

Concurrent with CHEM 250L.

**CHEM 152. Advanced Analytical Chemistry. 5 Units.**

In-depth treatment of modern instrumental methods for quantitative analysis of real samples and basic principles of instrument design. Laboratory experiments using spectroscopic, chromatographic, mass spectrometric, and other instrumental methods. Materials fee.

Prerequisite: (CHEM 1C or CHEM M3C or CHEM H2C) and (CHEM M3LC or CHEM H2LC)

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 153. Physical Chemistry Laboratory. 4 Units.**

Introduction to the modern experimental approaches and software tools used in spectroscopy, kinetics, electrochemistry, and other physical chemistry experiments. Basics of interfacing with instruments using LabView. Materials fee.

Corequisite: CHEM 132C

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 156. Advanced Laboratory in Chemistry and Synthesis of Materials. 4 Units.**

Modern synthesis and characterization of organic and inorganic materials including polymers, nanomaterials, and biomaterials. State-of-the-art characterization techniques include gel permeation chromatography, dynamic light scattering, thermal analysis, mechanical analysis, electron and scanning probe microscopy, X-ray diffraction, and porosimetry. Materials fee.

Prerequisite: (CHEM 51C or CHEM H52C) and (CHEM 51LC or CHEM H52LC or CHEM M52LC) and (CHEM 131A or CHEM 132B or PHMS 171)

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 160. Organic Synthesis Laboratory. 4 Units.**

Modern experimental techniques in organic synthesis including experience with thin-layer chromatography, liquid chromatography, and gas chromatography. Modern methods of structure elucidation including FT NMR are employed in the characterization of products. Materials fee.

Prerequisite or corequisite: CHEM 51C and CHEM 100S and (CHEM 51LC or CHEM H52LC or CHEM M52LC)

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 170. Radioisotope Techniques. 4 Units.**

Basic theory and practice of production, separation, safe handling, counting, applications of radioactive isotopes with emphasis on applications in chemistry, biology, and medicine. Materials fee.

Prerequisite: (CHEM 1C or CHEM M3C or CHEM H2C) and (CHEM 1LC or CHEM M3LC or CHEM H2LC)

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 177. Medicinal Chemistry. 4 Units.**

An introduction of the basics of drug activity and mechanisms. Strategies used to identify lead compounds such as natural product chemistry, combinatorial chemistry, molecular modeling, and high-throughput screening. Relationship of molecular structure to pharmacological activity.

Prerequisite: CHEM 51A and CHEM 51B and CHEM 51C and (BIOL 98 or CHEM 128)

Same as PHMS 177.

Restriction: Pharmaceutical Sciences Majors have first consideration for enrollment.

**CHEM 177L. Medicinal Chemistry Laboratory. 3 Units.**

An introduction of the basics of drug activity and mechanisms. Strategies used to identify lead compounds such as natural product chemistry, combinatorial chemistry, molecular modeling, and high-throughput screening. Relationship of molecular structure to pharmacological activity. Materials fee.

Corequisite: PHRMSCI 177 or CHEM 177.

Prerequisite: CHEM 51A and CHEM 51B and CHEM 51C and BIOL 100 and (BIOL 98 or CHEM 128)

Same as PHMS 177L.

Restriction: Pharmaceutical Sciences Majors have first consideration for enrollment.

**(Ib)****CHEM 180. Undergraduate Research. 4 Units.**

Research for credit arranged with a faculty member to sponsor and supervise work. Student time commitment of 10 to 15 hours per week is expected, and a written research report is required at the end of each quarter.

Prerequisite or corequisite: CHEM 100S

Repeatability: May be repeated for credit unlimited times.

**CHEM 180W. Senior Thesis in Chemistry. 4 Units.**

Students receive guidance on preparing research papers, proposals, reports, and other forms of scientific writing in chemistry-related fields; on effectively searching for and using chemical information; and on communicating data in poster and platform presentations.

Prerequisite: CHEM 180 or CHEM 199 or PHYS 195 or ESS 199 or CEMS 199 or CEE 199 or MAE 199 or BIOL 199 or PUBH 199. CHEM 180 with a grade of A or better. CHEM 199 with a grade of A or better. PHYS 195 with a grade of A or better. ESS 199 with a grade of A or better. CEMS 199 with a grade of A or better. CEE 199 with a grade of A or better. MAE 199 with a grade of A or better. BIOL 199 with a grade of A or better. PUBH 199 with a grade of A or better. Consent of the instructor is also accepted. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Chemistry Majors have first consideration for enrollment.

**(Ib)****CHEM H180A. Honors Research in Chemistry. 4 Units.**

Undergraduate honors research in Chemistry. A student time commitment of 10-15 hours per week is required.

Restriction: Chemistry Honors students only. Campuswide Honors Collegium students only.

**CHEM H180B. Honors Research in Chemistry. 4 Units.**

Undergraduate honors research in Chemistry. A student time commitment of 10-15 hours per week is required.

Prerequisite: CHEM H180A

Restriction: Campuswide Honors Collegium students only.

**CHEM H180C. Honors Research in Chemistry. 4 Units.**

Undergraduate honors research in Chemistry. A student time commitment of 10-15 hours per week is required.

Prerequisite: CHEM H180B

Restriction: Chemistry Honors students only. Chemistry majors participating in the Campuswide Honors Program students only.

**CHEM H181W. Honors Seminar in Chemistry. 2 Units.**

Students will receive guidance in the preparation of oral and written research presentations. A written thesis will be prepared and a formal research seminar will be presented.

Corequisite: CHEM H180C

Prerequisite: CHEM H180A and CHEM H180B. Satisfactory completion of the Lower-Division Writing requirement.

**(Ib)**

**CHEM 191. Chemistry Outreach Program. 2 Units.**

Involves intensive participation in the UCI Chemistry Outreach Program, which performs Chemistry demonstrations at local high schools.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 6 times.

**CHEM 192. Tutoring in Chemistry. 2 Units.**

Enrollment limited to participants in the Chemistry Peer Tutoring Program.

Repeatability: May be taken for credit 9 times.

Restriction: The first eight may be taken for a letter grade. The remaining ten units must be taken Pass/Not Pass only. NOTE: No more than eight units may be counted toward the 180 units required for graduation. Satisfies no degree requirement other than contribution to the 180-unit total.

**CHEM 193. Research Methods. 4 Units.**

Explores tools of inquiry for developing and implementing science research projects. Students undertake independent projects requiring data collection, analysis, and modeling, and the organization and presentation of results. Additional topics include ethical issues and role of scientific literature.

Prerequisite: BIOL 14 or PS 5

Same as BIOL 108, PHYS 193.

**CHEM 197. Professional Internship. .5-4 Units.**

Internship program that provides students with opportunity to develop professional skills necessary for competitive placement in their chosen chemical-inspired industry. Students gain new and field-specific skills outside the classroom while participating in a supervised internship.

Prerequisite: Enrollment requires completion of an application form. Student selection is made by a selection committee.

Repeatability: May be taken for credit for 13 units.

Restriction: Upper-division students only. Chemistry Majors only.

**CHEM 199. Independent Study in Chemistry. 1-4 Units.**

Independent research with Chemistry faculty. Student time commitment of three to four hours per week per unit is expected, and a written report on the independent study is required at the end of each quarter of enrollment.

Repeatability: Unlimited as topics vary.

**CHEM 200. Conduct of Research . 2 Units.**

Introduces new graduate students to ethical conduct of scientific research, mentoring, and current research in the Department of chemistry.

Repeatability: May be taken for credit 2 times.

**CHEM 201. Organic Reaction Mechanisms I. 4 Units.**

Advanced treatment of basic mechanistic principles of modern organic chemistry. Topics include molecular orbital theory, orbital symmetry control of organic reactions, aromaticity, carbonium ion chemistry, free radical chemistry, the chemistry of carbenes and carbanions, photochemistry, electrophilic substitutions, aromatic chemistry.

Prerequisite: CHEM 132A and CHEM 132B and CHEM 132C

**CHEM 202. Organic Reaction Mechanisms II. 4 Units.**

Topics include more in-depth treatment of mechanistic concepts, kinetics, conformational analysis, computational methods, stereoelectronics, and both solution and enzymatic catalysis.

Prerequisite: CHEM 201

**CHEM 203. Organic Spectroscopy. 4 Units.**

Modern methods used in structure determination of organic molecules. Topics include mass spectrometry; ultraviolet, chiroptical, infrared, and nuclear magnetic resonance spectroscopy.

Prerequisite: (CHEM 51A and CHEM 51B and CHEM 51C) or (CHEM H52A and CHEM H52B and CHEM H52C)

Restriction: Graduate students only.

**CHEM 204. Organic Synthesis I. 4 Units.**

Fundamentals of modern synthetic organic chemistry is developed. Major emphasis is on carbon-carbon bond forming methodology. Topics include carbonyl annulations, cycloadditions, sigmatropic rearrangements, and organometallic methods.

**CHEM 205. Organic Synthesis II. 4 Units.**

Fundamentals of modern synthetic organic chemistry will be developed. Major emphasis this quarter is on natural product total synthesis and retrosynthetic (antithetic) analysis.

Prerequisite: CHEM 204

**CHEM 206. Advanced Data Acquisition and Analysis. 4-6 Units.**

Introduces students to a variety of practical laboratory techniques, including lock-in, boxcar, coincidence counting, noise filtering, PID control, properties of common transducers, computer interfacing to instruments, vacuum technology, laboratory safety, basic mechanical design, and shop skills. Materials fee.

Same as PHYS 206.

Concurrent with PHYS 106.

**CHEM 207. Applied Physical Chemistry. 4 Units.**

Introduction to fundamental concepts in molecular structure and reactivity: theory of bonding, valence and molecular orbitals; structure and reactivity in inorganic chemistry; elements in molecular group theory; nomenclature in organic chemistry; and survey of macromolecules.

Same as PHYS 207.

**CHEM 208. Math Methods. 4 Units.**

Applications of mathematics to physical and chemical problems. Calculus of special functions, complex variables and vectors; linear vector spaces and eigenvalue problems. Differential equations.

Same as PHYS 208.

**CHEM 213. Chemical Kinetics. 4 Units.**

Surveys gas phase and organic reaction mechanisms and their relationship to kinetic rate laws; treats the basic theory of elementary reaction rates. A brief presentation of modern cross-sectional kinetics is included.

Prerequisite: CHEM 132A and CHEM 132B and CHEM 132C

**CHEM 215. Inorganic Chemistry I. 4 Units.**

Principles of modern inorganic chemistry with applications to chemical systems of current interest. Inorganic phenomena are organized into general patterns which rationalize observed structures, stabilities, and physical properties.

Prerequisite: CHEM 107 and CHEM 132A and CHEM 132B and CHEM 132C

Restriction: Graduate students only.

**CHEM 216. Organometallic Chemistry. 4 Units.**

Synthesis and reactivity of organometallic complexes with an emphasis on mechanisms. Topics include bonding and fluxional properties; metal-carbon single and multiple bonds; metal  $\pi$ -complexes. Applications to homogenous catalysis and organic synthesis are incorporated throughout the course.

Prerequisite: CHEM 107 or CHEM 215

**CHEM 217. Physical Inorganic Chemistry. 4 Units.**

General principles of the spectroscopy and magnetism of inorganic compounds. Characterization of inorganic complexes by infrared, near-infrared, visible, ultraviolet, NMR, EPR, EXAFS, and Mossbauer spectroscopies. Some necessary group theory developed.

Prerequisite: CHEM 215

**CHEM 218. Metallobiochemistry . 4 Units.**

A review of the biochemistry of metallic elements emphasizing: methods for studying metals in biological systems; the chemical basis for nature's exploitation of specific elements; structures of active sites; mechanisms; solid-state structures and devices; metals in medicine.

Prerequisite or corequisite: CHEM 131C or CHEM 132C

Same as MBB 248.

**CHEM 219. Chemical and Structural Biology. 4 Units.**

A survey of the organic chemistry underlying biological function. Introduction to chemical genetics, receptor-ligand interactions, small molecule agonists and antagonists, combinatorial synthesis, high throughput assays, molecular evolution, protein and small molecule design.

Restriction: Graduate students only.

**CHEM 221A. Fundamentals of Molecular Biophysics. 4 Units.**

An overview of the principles and concepts in molecular biophysics. Topics covered include energy and entropy in biology, non-equilibrium reaction kinetics, random walks and molecular diffusion, molecular forces in biology.

Prerequisite: Undergraduate courses in physical chemistry and biochemistry.

Repeatability: May be taken for credit 3 times.

**CHEM 223. Biological Macromolecules. 4 Units.**

Introduction to nucleic acid and protein structure, dynamics, and function. Topics include analytical methods, molecular evolution, folding, and catalysis.

Same as PHMS 223.

**CHEM 224. Molecular and Cellular Biophotonics. 4 Units.**

Principles underlying the application of photonic technologies to biomolecular and cellular systems. Sample technologies Optical Tweezers, Linear and Nonlinear Optical Microscopy and Fluorescence Lifetime and Correlation Methods, and their use to investigate emergent problems in Molecular, Cellular, and Developmental Biology.

Same as BME 224.

Restriction: Graduate students only.

**CHEM 225. Polymer Chemistry: Synthesis and Characterization of Polymers. 4 Units.**

Structure of synthetic and natural polymers. Survey of modern polymer synthetic methods. Molecular weight and molecular weight distribution. Chain conformation and stereochemistry. Introduction to polymer characterization, chain models, and solution behavior.

Prerequisite: Undergraduate courses in organic and physical chemistry.

**CHEM 228. Electromagnetism. 4 Units.**

Maxwell's equations, electrodynamics, electromagnetic waves and radiation, wave propagation in media, interference and quantum optics, coherent and incoherent radiation, with practical applications in interferometry, lasers, waveguides, and optical instrumentation.

Same as PHYS 228.

**CHEM 229A. Computational Methods. 4 Units.**

Mathematical and numerical analysis using Mathematica and C programming, as applied to problems in physical science.

Same as PHYS 229A.

Concurrent with PHYS 100.

**CHEM 230. Classical Mechanics and Electromagnetic Theory. 4 Units.**

Fundamentals of classical mechanics and electromagnetic theory are developed with specific application to molecular systems. Newtonian, Lagrangian, and Hamiltonian mechanics are developed. Boundary value problems in electrostatics are investigated. Multipole expansion and macroscopic media are discussed from a molecular viewpoint.

Prerequisite: CHEM 132A and CHEM 132B and CHEM 132C

**CHEM 231A. Fundamentals of Quantum Mechanics. 4 Units.**

The postulates of quantum mechanics are discussed and applied to a variety of model problems.

Prerequisite: CHEM 131A and CHEM 131B and CHEM 131C

**CHEM 231B. Applications of Quantum Mechanics. 4 Units.**

Approximate methods for solving atomic and molecular structure problems are developed, and the application of quantum mechanics to spectroscopy is introduced.

Prerequisite: CHEM 231A

**CHEM 231C. Molecular Spectroscopy. 4 Units.**

Theory and techniques of spectroscopy as used for the study of molecular and condensed phase properties. Coherent time domain spectroscopies are covered.

Prerequisite: CHEM 231B

**CHEM 232A. Thermodynamics and Introduction to Statistical Mechanics. 4 Units.**

A detailed discussion from an advanced point of view of the principles of classical thermodynamics. The fundamentals of statistical mechanics. Topics include an introduction to ensemble theory, Boltzmann statistics, classical statistical mechanics, and the statistical mechanics of ideal gas systems.

Prerequisite: CHEM 131A and CHEM 131B and CHEM 131C

**CHEM 232B. Advanced Topics in Statistical Mechanics. 4 Units.**

Continued discussion of the principles of statistical mechanics. Applications to topics of chemical interest including imperfect gases, liquids, solutions, and crystals. Modern techniques such as the use of autocorrelation function methods.

Prerequisite: CHEM 232A

**CHEM 232C. Non-Equilibrium Statistical Mechanics. 4 Units.**

Phenomenology of material processes, including: kinetic theories of transport and continuum, linear response theory, critical phenomena of phase transition, self-assembly, and nucleation.

**CHEM 233. Nuclear and Radiochemistry. 4 Units.**

Advanced treatment of nuclear structure, nuclear reactions, and radioactive-decay processes. Introduction to nuclear activation analysis, isotope effects, radiation chemistry, hot-atom chemistry, nuclear age-dating methods, nuclear reactors, and nuclear power.

Same as CBE 276.

Restriction: Graduate students only.

Concurrent with CHEM 133 and CBE 176.

**CHEM 237. Mathematical Methods in Chemistry. 4 Units.**

Survey of essential math methods in chemistry. Topics may include series and limits, complex analysis, Fourier and Laplace transforms, linear algebra and operators (theory and algorithms), differential equations, and probability concepts for stochastic processes.

**CHEM 241. Current Issues Related to Air Quality, Climate, and Energy. 4 Units.**

Current issues related to the atmosphere, climate, and air quality in the context of energy conversion and sustainability. Topics include transportation systems; building design; impacts on humans and ecosystems; modeling and meteorology; economics; and application to public policies.

Prerequisite: MAE 261 or CHEM 245 or ESS 240

Same as MAE 260.

Restriction: Graduate students only.

**CHEM 242A. Physical and Geometrical Optics. 4 Units.**

Focuses on the practical aspects of optics and optical engineering, starting at the fundamentals. Topics include geometrical optics, ray tracing, polarization optics, interferometers, and diffractive optics.

Restriction: Graduate students only.

Concurrent with PHYS 134A.

**CHEM 243. Advanced Instrumental Analysis. 4 Units.**

Theory and applications of modern advanced instrumental methods of analysis. Includes data acquisition, storage, retrieval, and analysis; Fourier transform methods; vacuum technologies; magnetic sector; quadrupole and ion trap mass spectrometry; surface science spectroscopic methods; lasers and optics.

Prerequisite: CHEM 152 and CHEM 132C. CHEM 152 with a grade of B or better. CHEM 132C with a grade of B or better

**CHEM 244. Detection and Measurement of Radiation. 4 Units.**

Basic principles of detection and measurement of ionizing radiation; both theory and practical aspects of measurement techniques for alpha, beta, gamma, and neutron radiation, properties of different detector materials, electronics and data treatments, and analysis.

Prerequisite: CHEM 233 or CBE 276

Same as CBE 277.

Restriction: Graduate students only.

**CHEM 245A. Gas-Phase Atmospheric Chemistry. 4 Units.**

Sources, chemistry, sinks, and measurements of key atmospheric gaseous species. Chemistry of photochemical oxidant formation, transformation of key inorganic and organic trace gases, and stratospheric ozone cycling. Applications of atmospheric chemistry models to control strategies.

Prerequisite: CHEM 132A and CHEM 132B and CHEM 132C

Concurrent with CHEM 145A.

**CHEM 245B. Multi-Phase Atmospheric Chemistry. 4 Units.**

Chemical and physical processes leading to the production, aging, and removal of atmospheric particles. Multi-phase processes involving gases, particles, water droplets, and environmental surfaces. Approaches for modeling these processes with applications to control strategies.

Prerequisite: CHEM 245A

Concurrent with CHEM 145B.

**CHEM 245C. Special Topics in Atmospheric Chemistry. 4 Units.**

The subjects covered vary from year to year.

Prerequisite: CHEM 245B

Repeatability: Unlimited as topics vary.

**CHEM 246. Separations and Chromatography. 4 Units.**

Introduction to modern separation techniques such as gas chromatography, high-performance liquid chromatography, supercritical fluid chromatography, capillary electrophoresis, and field flow fractionation. Applications of these separation strategies are discussed.

**CHEM 247. Current Problems in Analytical Chemistry. 4 Units.**

Surveys current research challenges in analytical chemistry. Topics include electrochemistry, chromatography, spectroscopy, and mass spectrometry.

**CHEM 248. Electrochemistry. 4 Units.**

Fundamentals of electrochemistry including thermodynamics and the electrochemical potential, charge transfer kinetics, and mass transfer. Methods based on controlled potential and controlled current are described; the effects of slow heterogeneous kinetics and the perturbation caused by homogeneous chemistry are discussed.

**CHEM 249. Analytical Spectroscopy. 4 Units.**

Advanced treatment of spectroscopic techniques and instrumentation. Atomic and molecular absorption, emission, and scattering processes and their application to quantitative chemical analysis are outlined. Puts different spectroscopic techniques in perspective and demonstrates most appropriate applications to analytical problems.



**CHEM 250. Computational Chemistry. 4 Units.**

Basic concepts, methods, and techniques in computational chemistry: density functional and wavefunction theory, molecular property calculations, analysis tools, potential energy surfaces, vibrational effects, molecular dynamics simulations.

Restriction: Graduate students only.

Concurrent with CHEM 150.

**CHEM 250L. Computational Chemistry Laboratory. 4 Units.**

Introduction to the practice of modern computational chemistry through a series of advanced computational experiments.

Prerequisite: CHEM 250

Restriction: Graduate students only.

Concurrent with CHEM 150L.

**CHEM 251. Special Topics in Organic Chemistry. 1-4 Units.**

Advanced topics in organic chemistry.

Repeatability: Unlimited as topics vary.

**CHEM 252. Special Topics in Physical Chemistry. 1-4 Units.**

Advanced topics in physical chemistry. Materials fee.

Repeatability: Unlimited as topics vary.

**CHEM 253. Special Topics in Inorganic Chemistry. 4 Units.**

Advanced topics in inorganic chemistry.

Prerequisite: CHEM 215

Repeatability: Unlimited as topics vary.

**CHEM 254. Special Topics in Computational and Theoretical Chemistry. 4 Units.**

Subjects covered vary from year to year.

Repeatability: Unlimited as topics vary.

**CHEM 263. Materials Chemistry . 4 Units.**

An introduction to crystalline solids, descriptive crystal chemistry, solid-state synthesis and characterization techniques, x-ray and electron diffraction, phase diagrams, electronic band structure of extended solids, semi conductors, and nanoscale inorganic materials.

**CHEM 266. Current Topics in Chemical, Applied, and Materials Physics. 1 Unit.**

The subjects covered vary from year to year. Connection between fundamental principles and implementations in practice in science, industry, and technology.

Repeatability: May be repeated for credit unlimited times.

Same as PHYS 266.

**CHEM 267. Photochemistry. 4 Units.**

Photochemical and photovoltaic processes in molecules and semiconductors; quantum mechanics; statistical thermodynamics; kinetics; and experimental techniques relevant to photon absorption and emission; photochemical charge separation, recombination, and transport of electrons and ions; and interfacial redox chemistry.

Restriction: Seniors only. Graduate students only.

**CHEM 268. NMR Spectroscopy . 4 Units.**

Students learn the theoretical basis of solid-state or solution NMR (alternate times), including the basics of pulse sequence design. Extensive literature reading is required.

Prerequisite: CHEM 231A

Repeatability: May be taken for credit 2 times.

**CHEM 273. Technical Communication Skills. 2 Units.**

Development of effective communication skills, oral and written presentations, through examples and practice.

Grading Option: Satisfactory/unsatisfactory only.

Same as PHYS 273.

**CHEM 280. Research. 2-12 Units.**

Supervised original research toward the preparation of a Ph.D dissertation or M.S. thesis.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CHEM 290. Seminar. 1 Unit.**

Weekly seminars and discussions on general and varied topics of current interest in chemistry.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CHEM 291. Research Seminar. 4 Units.**

Detailed discussion of research problems of current interest in the Department. Format, content, and frequency of the course are variable.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**CHEM 292. Graduate Symposium. 2 Units.**

Students present public seminars on literature-based research topics in contemporary chemistry. Topics to be chosen by student and approved by instructor.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**CHEM 299. Independent Study. 1-4 Units.**

Independent research with Chemistry faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CHEM 399. University Teaching. 1-4 Units.**

Required of and limited to Teaching Assistants.

Repeatability: May be repeated for credit unlimited times.

## **Earth System Science Courses**

**EARTHSS 1. Introduction to Earth System Science. 4 Units.**

Covers the origin and evolution of the Earth, its atmosphere, and oceans, from the perspective of biogeochemical cycles, energy use, and human impacts on the Earth system.

(II and VA ).

**EARTHSS 3. Oceanography. 4 Units.**

Examines circulation of the world oceans and ocean chemistry as it relates to river, hydrothermal vent, and atmospheric inputs. Geological features, the wide variety of biological organisms, and global climate changes, such as greenhouse warming, are also studied.

(II, Va)

**EARTHSS 5. The Atmosphere. 4 Units.**

The composition and circulation of the atmosphere with a focus on explaining the fundamentals of weather and climate. Topics include solar and terrestrial radiation, clouds, and weather patterns.

(II and VA ).

**EARTHSS 7. Physical Geology. 4 Units.**

Introduction to Earth materials and processes. Topics include rocks and minerals, plate tectonics, volcanoes, earthquakes, Earth surface processes, Earth resources, geologic time, and Earth history. Laboratory work involves hands-on study of geologic materials, maps, and exercises pertaining to geologic processes. Materials fee.

(II and VA ).

**EARTHSS 15. Introduction to Global Climate Change. 4 Units.**

Introduction of scientific, technological, environmental, economic, and social aspects underlying the threat and understanding of global climate change. Human and natural drivers of climate. Impacts of climate on natural, managed, and human systems, including their vulnerability and ability to adapt.

(II and (VA or VIII) ).

**EARTHSS 17. Hurricanes, Tsunamis, and Other Catastrophes. 4 Units.**

Introduction to the basic science and state of predictability of various natural catastrophic events including earthquakes, volcanic eruptions, tsunamis, landslides, floods, hurricanes, fires, and asteroid impacts and their interactions and implications with human society in the U.S. and globally.

Overlaps with PUBHLTH 90.

(II and (VA or VIII) ).

**EARTHSS 19. Introduction to Modeling the Earth System. 4 Units.**

Simulate the Earth's system using computer models. Covers the interaction of the air, land, and ocean, and explores how changes to one part of the environment affect the complete Earth system. Utilizes technological tools to understand scientific principles.

(II, Vb)

**EARTHSS 21. On Thin Ice: Climate Change and the Cryosphere. 4 Units.**

Introduction of the basic science that governs the cryosphere and its interaction with the climate system. Covers some of the significant economic, sociological, and political consequences of the recent melting of the cryosphere driven by anthropogenic climate change.

(II and (VA or VIII) ).

**EARTHSS 23. Air Pollution: From Urban Smog to Global Change . 4 Units.**

Air pollution occurs on regional to global scales. A wide range of air pollution sources and physical, chemical, and meteorological sciences behind air pollution are introduced. The consequences of air pollution to our society are also discussed.

(II and (VA or VIII) ).

**EARTHSS 27. The Sustainable Ocean. 4 Units.**

An introduction to sustainability as it relates to marine resources and conservation. Topics include the scientific basis of our understanding of marine ecosystems, and the political, social, and cultural principles that govern resource protection.

(II and VIII ).

**EARTHSS H30B. Environmental Issues Affecting the Sustainability of Societies I. 4 Units.**

Focuses on several environmental challenges facing the world today, and explores the problem, possible solutions, and their scientific, technical, and social constraints. Models for systems, their assumptions, predictive uncertainty, and interpretation, play a large role.

Prerequisite: CHEM H30A. CHEM H30A with a grade of C or better

Overlaps with EARTHSS 15.

Restriction: Campuswide Honors Collegium students only.

(II and Vb ).

**EARTHSS H30C. Environmental Issues Affecting the Sustainability of Societies II. 4 Units.**

Focuses on how we can use Earth's resources, e.g., food and water, in a more sustainable way, exploring their scientific, technical, and social constraints.

Prerequisite: EARTHSS H30B. EARTHSS H30B with a grade of C or better

Restriction: Campuswide Honors Collegium students only.

(III)

**EARTHSS 40A. Earth System Chemistry. 4 Units.**

To understand the cycling of matter on Earth, we need to learn about the chemistry of elements and molecules in the environment. Introduces students to the understanding of how chemical principles apply in context to their everyday lives.

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment.

(II and VA ).

**EARTHSS 40B. Earth System Biology. 4 Units.**

Earth System Science is a highly interdisciplinary field that requires knowledge of various components of the Earth as a system, including the biosphere. Students are introduced to several fundamental principles of biology, from the smallest cells to the largest ecosystems.

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment.

(II)

**EARTHSS 40C. Earth System Physics. 4 Units.**

Covers the fundamental physical forces and laws that affect the Earth system, such as electromagnetic radiation and energy transfer, atmospheric and ocean dynamics. Also covers aspects of physics related to environmental issues, such as electricity generation and transmission.

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment.

(II and VA ).

**EARTHSS 45. New Student Seminar. 1 Unit.**

Weekly meetings led by faculty, current students, and staff, to provide information on the Department of Earth System Science, campus resources, and special programs and opportunities. Designed for students who recently joined the Earth System Science and Environmental Science majors.

Grading Option: Pass/no pass only.

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment. New students only (freshman, transfer, and change of major).

**EARTHSS 51. Land Interactions. 4 Units.**

The role of terrestrial processes in the Earth system. Provides an introduction to ecosystem processes that regulate the cycling of energy, water, carbon, and nutrients. Analysis of the impact of human activities. Materials fee.

Corequisite: CHEM 1C

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 53. Ocean Biogeochemistry. 4 Units.**

Overview of oceanography for those interested in Earth System Science. Focus is on physical, chemical, and biological processes that drive biogeochemical cycling in the oceans. Coastal systems are also reviewed, with an emphasis on California waters.

Prerequisite: CHEM 1C

Restriction: Earth System Science Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment.

**EARTHSS 55. Earth's Atmosphere. 4 Units.**

Composition, physics, and circulation of Earth's atmosphere with an emphasis on explaining the role of atmospheric processes in shaping the climate system. Topics include atmospheric composition, the global energy balance, radiative transfer and climate, atmospheric circulation, and climate sensitivity.

Prerequisite or corequisite: (MATH 2B or MATH 5B) and (PHYSICS 3B or PHYSICS 7C)

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 70A. Sustainable Energy Systems. 4 Units.**

Addresses how modern energy services can be provided sustainably and the challenges and barriers that must be overcome. Major environmental issues are discussed, such as climate change, air pollution, and resource demands.

Prerequisite or corequisite: EARTHSS 40C or PHYSICS 3C or PHYSICS 7E

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 70B. Sustainable Food and Water Systems. 4 Units.**

Explores the biophysical underpinnings of food production, the history of agricultural development, and a range of environmental issues facing agricultural systems, including water management, climate change, and land use.

Prerequisite or corequisite: EARTHSS 40B or (BIO SCI 93 and BIO SCI 94)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 100. Special Topics in Earth System Science. 1-4 Units.**

Devoted to current topics in the field of Earth System Science. Topics addressed vary each quarter.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Repeatability: May be taken for credit for 12 units as topics vary.

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 101. Paleoclimatology. 4 Units.**

Explores past changes in Earth's climate. Topics include tools and techniques used to reconstruct past climate from natural archives; records and mechanisms of past climate changes throughout Earth history; and lessons learned from the paleo-record for prediction of future climate.

Prerequisite: EARTHSS 51 and EARTHSS 53 and EARTHSS 55

Restriction: Earth System Science Majors have first consideration for enrollment.

Concurrent with EARTHSS 201.

**EARTHSS 112. Global Climate Change and Impacts. 4 Units.**

Observations over the 20th century show extensive changes in atmospheric composition, climate and weather, and biological systems that have paralleled industrial growth. Evidence of globally driven changes in these biogeochemical systems is studied, including projected impacts over the 21st century.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 114. Earth System Science Laboratory and Field Methods. 4 Units.**

Introduction to methods used to measure exchange of gases and energy between the atmosphere and terrestrial ecosystems. Laboratories include data acquisition and isotopic and chromatographic analysis. Field measurements at UCI's Marsh Reserve include microclimate, hydrology, trace-gas exchange, and plant growth. Materials fee.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 115. Aquatic Field Methods. 4 Units.**

Students design sampling plans, conduct field research techniques, and carry out data analyses that are relevant to aquatic field research. Aquatic field sites covered in the course include marine, estuarine, and fluvial systems. Materials fee.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 116. Introduction to Environmental Data Science. 4 Units.**

Analysis and interpretation of geophysical data, including functional fitting, probability density functions, and multidimensional time-series methods, with applications in atmospheric, oceanic, and biogeochemical sciences.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 118. Analysis, Modeling, and Visualization of Multidimensional Environmental Data. 4 Units.**

Students learn programming and numerical methods in Python with applications in Earth System Science and ecology. Topics include regression, uncertainty and significance, the development of simple box models, and the visualization of multi-dimensional climate and satellite datasets.

Prerequisite: I&C SCI 31 or EARTHSS 116

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 122. Atmospheric Dynamics. 4 Units.**

Fluid dynamical processes that determine the large-scale flow of the atmosphere and ocean. Most important are interactions between the density stratification and the Coriolis force associated with Earth's rotation. Topics include circulation, vorticity, planetary waves, and their role in climate.

Prerequisite: EARTHSS 55 and (PHYSICS 7C or PHYSICS 3B)

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 124. Weather Analysis. 4 Units.**

Provides an overview of weather systems in midlatitudes and tropics. The fundamental dynamics possible for these weather systems are described. Elementary weather analysis and forecasting techniques are introduced.

Prerequisite: EARTHSS 55

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 130. Physical Oceanography. 4 Units.**

Physical processes that determine the distribution of water properties such as salt and temperature. Fluid-dynamical underpinnings of physical oceanography. Wave motions. The wind-driven and thermohaline circulation. Similarities and differences between ocean and atmosphere dynamics.

Prerequisite: (PHYSICS 7C or PHYSICS 3B) and EARTHSS 53

Restriction: Earth System Science Majors have first consideration for enrollment.

**EARTHSS 132. Terrestrial Hydrology. 4 Units.**

Comprehensive treatment of modern conceptual and methodological approaches to hydrological science. Combines qualitative understanding of hydrological processes with quantitative representation, approaches to measurement, and treatment of uncertainty. Components of the hydrological cycle and their linkages within the coupled Earth system.

Prerequisite: (EARTHSS 51 and EARTHSS 55) or (EARTHSS 40C and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 133. Soil: It's the Good Dirt. 4 Units.**

An introduction to the critical role soils play in sustaining land ecosystems and humans. Covers how soils form and how human actions contribute to the pollution and loss but also the health and productivity of soils.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors only. Environmental Science Majors only. Earth System Science Majors only.

**EARTHSS 134. Fundamentals of GIS for Environmental Science. 4 Units.**

Introduction to Geographic Information Systems (GIS). Topics include fundamentals of cartography, creating/editing GIS data, linking spatial and tabular data, georeferencing, map projections, geospatial analysis, spatial statistics, and the development of GIS models. Examples from hydrology, ecology, and geology.

Prerequisite: (EARTHSS 51 and EARTHSS 53) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 138. Satellite Remote Sensing for Earth System Science. 4 Units.**

Satellite remote sensing data are increasingly used to study the Earth system. Provides an overview of the principles behind remote sensing, and the types of satellite data available for study of the oceans, land, and atmosphere.

Prerequisite: (EARTHSS 51 and EARTHSS 53) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 140. Advanced Geology. 4 Units.**

Introduces students to the geological processes which have formed and continue to shape the Earth. Topics include geological time, minerals and the rock cycle, plate tectonics and associated geological hazards, earth resources, and earth surface processes. Materials fee.

Prerequisite: EARTHSS 51 or EARTHSS 70B

Overlaps with EARTHSS 7.

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 142. Atmospheric Chemistry. 4 Units.**

Chemistry of the troposphere and stratosphere. Topics include processes controlling the lifetime and reaction pathways of chemicals in the atmosphere, the role of the atmosphere in biogeochemical cycles, and interactions between atmospheric chemistry and the physical climate system.

Prerequisite: (CHEM 1C or CHEM H2C or CHEM M3C) and (PHYSICS 3C or PHYSICS 7E) and (MATH 2B or MATH 5B or AP Calculus BC). AP Calculus BC with a minimum score of 4

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 144. Marine Geochemistry and Biogeochemistry. 4 Units.**

Processes controlling the major and minor element composition of seawater and element distributions in the ocean. Gas exchange, carbon dioxide system, stable isotopes, radionuclides as tracers and chronometers, particle fluxes, organic geochemistry, sediment geochemistry, global cycles of biogeochemically important elements.

Prerequisite: EARTHSS 53 or CHEM 51C

Restriction: School of Physical Sciences students have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 146. Consequences of Air Pollution. 4 Units.**

From public health to the global climate system, this course explores the impacts of air pollution from the beginning of human history to current and emerging issues. Scientific concepts behind air pollution and solutions are discussed.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 40C and EARTHSS 70A)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.



**EARTHSS 148. Marine Ecosystems and Global Change. 4 Units.**

Presents an overview of marine ecosystem structure, diversity, and processes in the context of global change, including the impacts of climate warming, ocean acidification, marine fisheries, and anthropogenic additions of nutrients and pollutants.

Prerequisite: EARTHSS 53 or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

Concurrent with EARTHSS 248.

**EARTHSS 154. Ecosystem Services. 4 Units.**

Covers what ecosystem services are, how to classify them, what the impacts of land degradation are on ecosystem services, how to quantify and value them, and the importance of mainstreaming ecosystem services in decision-making.

Prerequisite: (EARTHSS 70A and EARTHSS 70B) or (EARTHSS 51 and EARTHSS 53 and EARTHSS 55)

Same as BIO SCI E146.

**EARTHSS 156. The Future of Forests. 4 Units.**

Introduces students to the determinants of global forest distribution; ecosystem services associated with forest functioning; threats to forests resulting from climate and land-use change; and, opportunities for conserving natural forests in the near future.

Prerequisite: (EARTHSS 70A and EARTHSS 70B) or (EARTHSS 51 and EARTHSS 53 and EARTHSS 55)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 158. Research Methods for Sustainable Systems Analysis. 4 Units.**

Develops students' analytical skills that are necessary to engage and assess the sustainability of coupled human and natural systems and effectively communicate their findings.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B). Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment. Global Sustainability Minors have first consideration for enrollment.

**EARTHSS 162. The Impact of Climate Change on California's Landscape. 4 Units.**

Overview of anticipated impacts of climate change on California's landscape. Includes projections of future climate; anticipated impacts on ecology, hydrology, wildfire, coastal environment, and agriculture; and efforts to reduce greenhouse gas emissions or adapt to climate change through land management.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 164. Ecosystem Ecology. 4 Units.**

A mechanistic perspective on ecosystem processes. Covers ecosystem development, element cycling, and interactions with plants and microbes. The role of ecosystems in environmental change is also addressed.

Prerequisite: BIO SCI E106 or EARTHSS 51 or EARTHSS 60A or CHEM 51C

Same as BIO SCI E118.

Restriction: Earth System Science Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Ecology and Evolutionary Biol Majors have first consideration for enrollment.

Concurrent with EARTHSS 264.

**EARTHSS 168. Physiological Plant Ecology. 4 Units.**

An examination of the interactions between plants and their environment. Emphasis on the underlying physiological mechanisms of plant function, adaptations and responses to stress, and the basis of the distribution of plants and plant assemblages across the landscape.

Prerequisite: EARTHSS 51 or BIO SCI 94 or (EARTHSS 60A and EARTHSS 60C)

Same as BIO SCI E127.

Restriction: Biological Sciences Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 171. Microbial Biogeochemistry. 4 Units.**

Develops an understanding of microorganisms in the context of their environment, environmental impact, and role in the global cycles of C,N,P, etc. Focuses on tools used to evaluate microbial diversity and function, and applications of microbial ecology.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors only. Environmental Science Majors only. Earth System Science Majors only.

**EARTHSS 176W. Marine Conservation, Policy, and Society. 4 Units.**

Conservation of marine ecosystems is important yet challenging due to competing physical, ecological, social, and regulatory issues. Students explore the principles of marine conservation, the scientific basics of marine ecosystems, and political and social processes involved with resource protection.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B). Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

(Ib)

**EARTHSS 177W. Documenting and Understanding Earth System Change. 4 Units.**

Students select a time series of key environmental interest as the focus for their writing. They become familiar with common writing practices for the Earth Sciences, and exercise their ability to use the scientific method to produce reports.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B). Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Environmental Science and Policy Majors only. Environmental Science Majors only. Earth System Science Majors only.

(Ib)

**EARTHSS 179. Climate Solutions. 4 Units.**

Focuses on carbon neutrality and climate stability, addressing.

Same as ENGRMAE 119, UPPP 111.

Restriction: Upper-division students only.

**EARTHSS 190A. Senior Seminar on Global Sustainability I. 2 Units.**

Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum is also required. Seminar utilized to analyze forum presentations. Prepare bibliography.

Same as BIO SCI 191A, SOCECOL 186A.

Restriction: Seniors only. Global Sustainability Minors have first consideration for enrollment.

**EARTHSS 190B. Senior Seminar on Global Sustainability II. 2 Units.**

Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum is also required. Seminar utilized to analyze forum presentations. Prepare research proposal.

Prerequisite: BIO SCI 191A or SOCECOL 186A or EARTHSS 190A

Same as BIO SCI 191B, SOCECOL 186B.

Restriction: Seniors only.

**EARTHSS 190CW. Writing/Senior Seminar on Global Sustainability III. 4 Units.**

Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum also is required. Seminar utilized to analyze Forum presentations and to prepare senior research paper. Prepare/write research paper under direction of faculty member.

Prerequisite: BIO SCI 191B or EARTHSS 190B or SOCECOL 186B. BIO SCI 191B or EARTHSS 190B or SOCECOL 186B. Satisfactory completion of the Lower-Division Writing requirement.

Same as BIO SCI 191CW, SOCECOL 186CW.

Restriction: Seniors only.

**(Ib)**

**EARTHSS 191. Introduction to Research in Earth System Science. 1 Unit.**

Weekly presentations by Earth System Science faculty describing ongoing research in their laboratories. Students are introduced to the range of research topics and methods in Earth System Science and to the research opportunities available within the Department.

Prerequisite: (EARTHSS 60A and EARTHSS 60B) or (EARTHSS 51 and EARTHSS 53)

Grading Option: Pass/no pass only.

Restriction: Earth & Atmospheric Sciences Minors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 192. Careers in Earth System Science. 1 Unit.**

A weekly seminar course designed to help students transition to post-graduation career paths. Topics include designing effective resumes, applying to graduate school, and seeking employment. Also includes presentations by faculty, business, and government leaders describing potential environmental science career trajectories.

Grading Option: Pass/no pass only.

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 197. Independent Study in Earth System Science. .5-4 Units.**

Field study, educational outreach, or other independent projects under faculty direction. Interested students should arrange with an ESS faculty member to supervise and support an independent study project. A written summary is required at the end of each quarter.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 12 units.

**EARTHSS 198W. Senior Thesis in Earth System Science. 4 Units.**

Students receive guidance on the effective oral and written communication of research results. Students prepare and present a seminar, a poster, and a written thesis describing their research in Earth System Science.

Prerequisite: Two quarters of EARTHSS 199. Satisfactory completion of the Lower-Division Writing requirement.

Overlaps with EARTHSS H198.

**(Ib)**

**EARTHSS H198. Honors Thesis in Earth System Science. 4 Units.**

Students receive guidance on effective written and oral communication of research results. Students prepare and present a seminar, poster, and written thesis describing their honors research in Earth System Science. Submission of the thesis and successful completion of this course will also satisfy the UCI upper-division writing requirement.

Prerequisite: ESS 199A and ESS 199B

Restriction: Consent of instructor to enroll and Prerequisite required

**(Ib)**

**EARTHSS 199. Undergraduate Research. 1-4 Units.**

For undergraduates with majors in science or engineering. Interested students should arrange with an ESS faculty member to supervise and support a research project. A written summary is required at the end of each quarter.

Repeatability: May be taken for credit for 12 units.

**EARTHSS H199A. Honors Research in Earth System Science. 4 Units.**

Undergraduate honors research in Earth System Science. A student commitment of 10-15 hours a week is expected, and a written report is required at the end of the quarter.

Restriction: Earth System Science Honors students only. Campuswide Honors Collegium students only.

**EARTHSS H199B. Honors Research in Earth System Science. 4 Units.**

Undergraduate honors research in Earth System Science. A student commitment of 10-15 hours a week is expected, and a written report is required at the end of the quarter.

Restriction: Earth System Science Honors students only. Campuswide Honors Collegium students only.

**EARTHSS H199C. Honors Research in Earth System Science. 4 Units.**

Undergraduate honors research in Earth System Science. A student commitment of 10-15 hours a week is expected, and a written report is required at the end of the quarter.

Restriction: Earth System Science Honors students only. Campuswide Honors Collegium students only.

**EARTHSS 200. Global Physical Climatology. 4 Units.**

A descriptive overview of Earth's climate system and energy budget. Large-scale circulations, key physical processes, and climate sensitivity of the atmosphere, ocean, land surface, and cryosphere.

Restriction: Graduate students only.

**EARTHSS 201. Paleoclimatology . 4 Units.**

Explores past changes in Earth's climate. Topics include tools and techniques used to reconstruct past climate from natural archives; records and mechanisms of past climate changes throughout Earth history; and lessons learned from the paleo-record for predication of future climate.

Restriction: Graduate students only.

Concurrent with EARTHSS 101.

**EARTHSS 202. Climate Change. 4 Units.**

Explores past, present, and projected changes in Earth's climate. Topics include paleoclimate records and mechanisms of natural climate variability at a range of timescales (orbital to seasonal); General Circulation Models; and IPCC observations and projections of future climate change.

Restriction: Graduate students only.

**EARTHSS 204. Humans in the Earth System. 4 Units.**

Focuses on the human systems of energy and food production which have the greatest effects on the Earth system. Assess the physical mechanisms and feedbacks of human-nature interactions and consider approaches of mitigation, interventions, and adaptation.

Restriction: Graduate students only. Earth System Science Majors only.

**EARTHSS 212. Geoscience Modeling and Data Analysis. 4 Units.**

Computer-based course. Fundamental statistical techniques needed to analyze Earth system data and models. Basic numerical techniques to solve Earth system models. Focuses on linear and non-linear ordinary differential equations, as well as simple partial differential equations.

Restriction: Graduate students only.

**EARTHSS 215. Cryosphere. 4 Units.**

A global perspective of the major components of the cryosphere. Includes current extent and trends, mass balance, energetics, and physical processes. Quantitative assessment of current state, in situ and remote observations, and interactions with climate.

Restriction: Graduate students only.

**EARTHSS 224. Ocean Processes. 4 Units.**

Introduction to the physics, chemistry, and biology of the oceans. Offers a mechanistic perspective of the structure and functioning of marine ecosystems, nutrient cycles, and role of ecosystem dynamics in local and global biogeochemistry.

Restriction: Graduate students only.

**EARTHSS 225. Marine Biogeochemistry. 4 Units.**

Overview of ocean biology and biogeochemistry, with a focus on lower trophic levels and the roles of biota in the marine biogeochemical cycles of key elements.

Restriction: Doctor of Philosophy Degree students have first consideration for enrollment. Graduate students only. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 226. Land Surface Processes. 4 Units.**

A mechanistic perspective of the structure and functioning of terrestrial ecosystems. Includes processes such as nutrient cycling, biogeochemical cycling, mass balance, energetics, terrestrial hydrology, and water cycle.

Restriction: Graduate students only.

**EARTHSS 228. Geophysical Fluid Dynamics. 4 Units.**

Introduces fluid dynamical processes that determine the large-scale flow of the atmosphere and ocean, with particular emphasis on the interactions between the stable density stratification and the Coriolis force associated with Earth's rotation.

Restriction: Graduate students only.

**EARTHSS 230. Physical Oceanography. 4 Units.**

Physical processes that determine the distribution of water properties such as salt and temperature. Fluid-dynamical underpinnings of physical oceanography. Wave motions. The wind-driven and thermohaline circulation. Similarities and differences between ocean and atmosphere dynamics.

Prerequisite: MATH 2D and PHYSICS 7A and PHYSICS 7B and PHYSICS 7E

Restriction: Graduate students only.

**EARTHSS 238. Satellite Remote Sensing for Earth System Science. 4 Units.**

Satellite remote sensing data are increasingly used to study the Earth system. Provides an overview of the principles behind remote sensing, and the types of satellite data available for study of the oceans, land, and atmosphere.

**EARTHSS 240. Atmospheric Chemistry and Physics. 4 Units.**

Examines the physical/chemical processes which determine the structure and composition of Earth's atmosphere and its role in the climate system.

Restriction: Graduate students only.

**EARTHSS 242. Advanced Atmospheric Chemistry. 4 Units.**

Chemistry of the troposphere and stratosphere. Topics include: processes controlling the lifetime and reaction pathways of chemicals in the atmosphere, the role of the atmosphere in biogeochemical cycles, and interactions between atmospheric chemistry and the physical climate system.

Restriction: Graduate students only.

**EARTHSS 244. Introduction to Atmospheric Dynamics. 4 Units.**

Covers fundamentals of atmospheric dynamics including thermodynamics, quasi-geostrophy, the weak-temperature gradient of the tropics, and the turbulent boundary layer.

Restriction: Graduate students only.

**EARTHSS 248. Marine Ecosystems and Global Change. 4 Units.**

Presents an overview of marine ecosystem structure, diversity, and processes in the context of global change, including the impacts of climate warming, ocean acidification, marine fisheries, and anthropogenic additions of nutrients and pollutants.

Prerequisite: EARTHSS 224

Restriction: Graduate students only.

Concurrent with EARTHSS 148.

**EARTHSS 252. Environmental Isotope Geochemistry. 4 Units.**

Covers the fundamentals of stable, radioactive, and radiogenic isotope variability in the Earth System. Focuses on theory, measurement techniques, biogeochemistry, hydrology, ecology, and climate related applications.

Restriction: Graduate students only.

Concurrent with EARTHSS 152.

**EARTHSS 256. Paleoclimatology and Paleoceanography. 4 Units.**

Explores past changes in Earth's climate. Topics include tools and techniques used to reconstruct past climate from natural archives; records and mechanisms of past climate changes throughout Earth history; and lessons learned from the paleo-record for prediction of future climate.

Restriction: Graduate students only.

**EARTHSS 264. Ecosystem Ecology . 4 Units.**

A mechanistic perspective on ecosystem processes. Covers ecosystem development, element cycling, and interactions with plants and microbes. The role of ecosystems in environmental change is also addressed.

Prerequisite: CHEM 51C

Concurrent with EARTHSS 164 and BIO SCI E118.

**EARTHSS 266. Global Biogeochemical Cycles. 4 Units.**

Global biogeochemical cycling of the elements. Topics include global cycling of carbon, nitrogen, oxygen, and sulfur; impact of human activities on biogeochemical processes.

Restriction: Graduate students only.

**EARTHSS 280A. Special Topics in Earth System Science. 1-4 Units.**

Each quarter is devoted to current topics in the field of Earth System Science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**EARTHSS 280B. Special Topics in Earth System Science. 1-4 Units.**

Each quarter is devoted to current topics in the field of Earth System Science. Topics addressed vary each quarter.

Prerequisite: EARTHSS 280A

Repeatability: Unlimited as topics vary.

**EARTHSS 280C. Special Topics in Earth System Science. 1-4 Units.**

Each quarter is devoted to current topics in the field of Earth System Science. Topics addressed vary each quarter.

Prerequisite: EARTHSS 280B

Repeatability: Unlimited as topics vary.

**EARTHSS 282C. Special Topics in Climate. 1-4 Units.**

Each quarter is devoted to in-depth analysis of an important and rapidly developing area in the field of climate dynamics. Topics addressed vary each quarter.

Prerequisite: EARTHSS 282B

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EARTHSS 286A. Special Topics in Biogeochemistry. 1-4 Units.**

Each quarter is devoted to in-depth analysis of a subarea in biogeochemistry which is undergoing rapid development. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EARTHSS 286B. Special Topics in Biogeochemistry. 1-4 Units.**

Each quarter is devoted to in-depth analysis of a subarea in biogeochemistry which is undergoing rapid development. Topics addressed vary each quarter.

Prerequisite: EARTHSS 286A

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EARTHSS 286C. Special Topics in Biogeochemistry. 1-4 Units.**

Each quarter is devoted to in-depth analysis of a subarea in biogeochemistry which is undergoing rapid development. Topics addressed vary each quarter.

Prerequisite: EARTHSS 286B

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EARTHSS 288C. Special Topics in Ecosystems. 1-4 Units.**

Each quarter is devoted to current topics relating to Ecosystems. Topics addressed vary each quarter.

Prerequisite: EARTHSS 288B

Repeatability: Unlimited as topics vary.

**EARTHSS 290. Seminar. 1 Unit.**

Weekly seminars and discussions on topics of general and current interest in Earth System Science. Topics addressed vary each quarter.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EARTHSS 298. Practicum in Earth System Science. 4 Units.**

Designed to introduce first-year graduate students to research. Students explore research opportunities and develop a proposal for a summer research project under the direction of a faculty mentor.

Restriction: Graduate students only.

**EARTHSS 299. Research. 2-12 Units.**

Supervised original research in areas of Earth System Science.

Repeatability: May be repeated for credit unlimited times.

**EARTHSS 399. University Teaching. 1-4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Mathematics Courses

**MATH 1A. Pre-Calculus. 4 Workload Units.**

Basic equations and inequalities, linear and quadratic functions, and systems of simultaneous equations.

Grading Option: Workload Credit Letter Grade with P/NP.

**MATH 1B. Pre-Calculus. 4 Units.**

Preparation for calculus and other mathematics courses. Exponentials, logarithms, trigonometry, polynomials, and rational functions. Satisfies no requirements other than contribution to the 180 units required for graduation.

Prerequisite: MATH 1A. Placement into MATH 1B via the Calculus Placement exam, or a score of 450 or higher on the Mathematics section of the SAT Reasoning Test.

Restriction: MATH 1B may not be taken for credit if taken after MATH 2A.



**MATH 2A. Single-Variable Calculus. 4 Units.**

Introduction to derivatives, calculation of derivatives of algebraic and trigonometric functions; applications including curve sketching, related rates, and optimization. Exponential and logarithm functions.

Prerequisite: MATH 1B or AP Calculus AB or SAT Mathematics or ACT Mathematics. MATH 1B with a grade of C or better. AP Calculus AB with a minimum score of 3. SAT Mathematics with a minimum score of 650. ACT Mathematics with a minimum score of 29. Placement via the Calculus Placement exam (fee required) is also accepted.

Overlaps with MATH 5A.

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment.

**(Vb)**

**MATH 2B. Single-Variable Calculus. 4 Units.**

Definite integrals; the fundamental theorem of calculus. Applications of integration including finding areas and volumes. Techniques of integration. Infinite sequences and series.

Prerequisite: MATH 2A or MATH 5A or AP Calculus AB or AP Calculus BC. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 3

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment.

**(Vb)**

**MATH 2D. Multivariable Calculus. 4 Units.**

Differential and integral calculus of real-valued functions of several real variables, including applications. Polar coordinates.

Prerequisite: MATH 2B or MATH 5B or AP Calculus BC. AP Calculus BC with a minimum score of 4

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

**(Vb)**

**MATH 2E. Multivariable Calculus. 4 Units.**

The differential and integral calculus of vector-valued functions. Implicit and inverse function theorems. Line and surface integrals, divergence and curl, theorems of Greens, Gauss, and Stokes.

Prerequisite: MATH 2D or MATH H2D

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment.

**MATH H2D. Honors Multivariable Calculus. 4 Units.**

Differential and integral calculus of real-valued functions of several real variables, including applications. Polar coordinates. Covers the same material as MATH 2D-E, but with a greater emphasis on the theoretical structure of the subject matter.

Prerequisite: MATH 2B or MATH 5B or (AP Calculus BC and (MATH H3A) or (MATH 3A and MATH 13)). MATH 2B with a grade of A or better. MATH 5B with a grade of A or better. AP Calculus BC with a minimum score of 5. MATH H3A with a grade of B- or better. MATH 3A with a grade of A or better. MATH 13 with a grade of A or better

Overlaps with MATH 2D.

**(Vb)**

**MATH H2E. Honors Multivariable Calculus. 4 Units.**

Differential and integral calculus of real-valued functions of several real variables, including applications. Polar coordinates. Covers the same material as MATH 2D-E, but with a greater emphasis on the theoretical structure of the subject matter.

Prerequisite: MATH H2D. MATH H2D with a grade of B- or better

Overlaps with MATH 2E.

**MATH 3A. Introduction to Linear Algebra. 4 Units.**

Systems of linear equations, matrix operations, determinants, eigenvalues and eigenvectors, vector spaces, subspaces, and dimension.

Prerequisite: MATH 2B or MATH 5B or AP Calculus BC. AP Calculus BC with a minimum score of 4

Overlaps with ICS 6N.

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

**(Vb)**

**MATH 3D. Elementary Differential Equations. 4 Units.**

Linear differential equations, variation of parameters, constant coefficient cookbook, systems of equations, Laplace transforms, series solutions.

Prerequisite: (MATH 3A or MATH H3A) and (MATH 2D or MATH H2D) and (MATH 2B or AP Calculus BC). AP Calculus BC with a minimum score of 4

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment.

**MATH H3A. Honors Introduction to Linear Algebra. 4 Units.**

Systems of linear equations, matrix operations, determinants, eigenvalues, eigenvectors, vector spaces, subspaces, and dimension.

Prerequisite: MATH 2B or MATH 5B or AP Calculus BC. MATH 2B with a grade of A or better. MATH 5B with a grade of A or better. AP Calculus BC with a minimum score of 5

Overlaps with MATH 3A, ICS 6N.

Restriction: School of Physical Sciences students only. School of Engineering students only. Mathematics Majors only. Undeclared Majors only.

**MATH 5A. Calculus for Life Sciences. 4 Units.**

Differential calculus with applications to life sciences. Exponential, logarithmic, and trigonometric functions. Limits, differentiation techniques, optimization and difference equations.

Prerequisite: MATH 1B or AP Calculus AB or SAT Mathematics or ACT Mathematics. MATH 1B with a grade of C or better. AP Calculus AB with a minimum score of 3. SAT Mathematics with a minimum score of 650. ACT Mathematics with a minimum score of 29. Placement via the Calculus Placement exam (fee required) is also accepted.

Overlaps with MATH 2A.

Restriction: School of Biological Sciences students have first consideration for enrollment.

**(Vb)**

**MATH 5B. Calculus for Life Sciences. 4 Units.**

Integral calculus and multivariable calculus with applications to life sciences. Integration techniques, applications of the integral, phase plane methods and basic modeling, basic multivariable methods.

Prerequisite: MATH 5A or MATH 2A or AP Calculus AB or AP Calculus BC. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 3

Restriction: School of Biological Sciences students have first consideration for enrollment. Cannot be taken for credit after MATH 2B.

**(Vb)**

**MATH 7A. Single-Variable Calculus I. 4 Units.**

Introduction to derivatives, calculation of derivatives of algebraic and trigonometric functions; applications including curve sketching, related rates, and optimization. Exponential and logarithm functions.

Prerequisite: MATH 1B or AP Calculus AB or SAT Mathematics or ACT Mathematics. MATH 1B with a grade of C or better. AP Calculus AB with a minimum score of 3. SAT Mathematics with a minimum score of 650. ACT Mathematics with a minimum score of 29. Placement via the Calculus Placement exam (fee required) is also accepted.

Overlaps with MATH 2A, MATH 5A.

Restriction: Mathematics Majors only.

**(Vb)**

**MATH 7B. Single-Variable Calculus II. 4 Units.**

Definite integrals; the fundamental theorem of calculus. Applications of integration including finding areas and volumes. Techniques of integration. Infinite sequences and series.

Prerequisite: MATH 2A or MATH 5A or AP Calculus AB or AP Calculus BC or MATH 7A. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 3

Overlaps with MATH 2B, MATH 5B.

Restriction: Mathematics Majors only.

**(Vb)**

**MATH 8. Explorations in Functions and Modeling. 4 Units.**

Explorations of applications and connections in topics in algebra, geometry, calculus, and statistics for future secondary math educators. Emphasis on nonstandard modeling problems.

Prerequisite or corequisite: MATH 2A or AP Calculus AB or AP Calculus BC. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 3

**MATH 9. Introduction to Programming for Numerical Analysis. 4 Units.**

Introduction to computers and programming using Matlab and Mathematica. Representation of numbers and precision, input/output, functions, custom data types, testing/debugging, reading exceptions, plotting data, numerical differentiation, basics of algorithms. Analysis of random processes using computer simulations.

Prerequisite: MATH 2A

Restriction: Mathematics Majors have first consideration for enrollment.

**(II and Vb ).**

**MATH 10. Introduction to Programming for Data Science. 4 Units.**

Intro to algorithms in data science using Python and R. Basic concepts of Python, store, access, and manipulate data in lists; functions, methods, and packages; NumPy, Numerical stability, and accuracy. Gradient descent and Newton's method. Basics of R Programming.

Prerequisite or corequisite: (MATH 2D or MATH H2D) and (MATH 3A or MATH H3A) and MATH 9

Restriction: Mathematics Majors have first consideration for enrollment.

**(II and VB ).**

**MATH 13. Introduction to Abstract Mathematics. 4 Units.**

Introduction to formal definition and rigorous proof writing in mathematics. Topics include basic logic, set theory, equivalence relations, and various proof techniques such as direct, induction, contradiction, contrapositive, and exhaustion.

Prerequisite: MATH 2A or ICS 6D

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 105A. Numerical Analysis I. 4 Units.**

Introduction to the theory and practice of numerical computation with an emphasis on solving equations. Solving transcendental equations; linear systems, Gaussian elimination, QR factorization, iterative methods, eigenvalue computation, power method.

Corequisite: MATH 105LA

Prerequisite: MATH 3A or MATH H3A. Familiarity with computer programming is required.

Overlaps with MAE 185.

**MATH 105B. Numerical Analysis II. 4 Units.**

Introduction to the theory and practice of numerical computation with an emphasis on topics from calculus and approximation theory. Lagrange interpolation; Gaussian quadrature; Fourier series and transforms; Methods from data science including least squares and L1 regression.

Corequisite: MATH 105LB

Prerequisite: MATH 105A

**MATH 105LA. Numerical Analysis Laboratory. 1 Unit.**

Provides practical experience to complement the theory developed in Mathematics 105A.

Corequisite: MATH 105A

**MATH 105LB. Numerical Analysis Laboratory. 1 Unit.**

Provides practical experience to complement the theory developed in Mathematics 105B.

Corequisite: MATH 105B

**MATH 107. Numerical Differential Equations. 4 Units.**

Theory and applications of numerical methods to initial and boundary-value problems for ordinary and partial differential equations.

Corequisite: MATH 107L

Prerequisite: MATH 3D and MATH 105A and MATH 105B

**MATH 107L. Numerical Differential Equations Laboratory. 1 Unit.**

Provides practical experience to complement the theory developed in Mathematics 107.

Corequisite: MATH 107

**MATH 110A. Optimization I. 4 Units.**

Introduction to optimization, linear search method, trust region method, Newton method, linear programming, linear, and non-linear least square methods.

Prerequisite or corequisite: (MATH 2D or MATH H2D) and (MATH 3A or MATH H3A) and MATH 10 and MATH 121A and MATH 121B

**MATH 110B. Optimization II. 4 Units.**

The simplex method, interior point method, penalty barrier method, primal dual method, augmented Lagrangian method, and stochastic gradient method.

Prerequisite: MATH 110A. MATH 110A with a grade of C or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 112A. Introduction to Partial Differential Equations and Applications. 4 Units.**

Introduction to ordinary and partial differential equations and their applications in engineering and science. Basic methods for classical PDEs (potential, heat, and wave equations). Classification of PDEs, separation of variables and series expansions, special functions, eigenvalue problems.

Prerequisite: (MATH 2E or MATH H2E) and MATH 3D

**MATH 112B. Introduction to Partial Differential Equations and Applications. 4 Units.**

Introduction to partial differential equations and their applications in engineering and science. Basic methods for classical PDEs (potential, heat, and wave equations). Green functions and integral representations, method of characteristics.

Prerequisite: MATH 112A

**MATH 112C. Introduction to Partial Differential Equations and Applications. 4 Units.**

Nonhomogeneous problems and Green's functions, Sturm-Liouville theory, general Fourier expansions, applications of partial differential equations in different areas of science.

Prerequisite: MATH 112B

**MATH 113A. Mathematical Modeling in Biology. 4 Units.**

Discrete mathematical and statistical models; difference equations, population dynamics, Markov chains, and statistical models in biology.

Prerequisite: MATH 2B or MATH 5B

**MATH 113B. Mathematical Modeling in Biology. 4 Units.**

Linear algebra; differential equations models; dynamical systems; stability; hysteresis; phase plane analysis; applications to cell biology, viral dynamics, and infectious diseases.

Prerequisite: MATH 2B or AP Calculus BC or MATH 5B. AP Calculus BC with a minimum score of 4

**MATH 115. Mathematical Modeling. 4 Units.**

Mathematical modeling and analysis of phenomena that arise in engineering physical sciences, biology, economics, or social sciences.

Prerequisite: MATH 112A and (MATH 2D or MATH H2D) and (MATH 3A or MATH H3A) and MATH 3D

**MATH 117. Dynamical Systems. 4 Units.**

Introduction to the modern theory of dynamical systems including contraction mapping principle, fractals and chaos, conservative systems, Kepler problem, billiard models, expanding maps, Smale's horseshoe, topological entropy.

Prerequisite: MATH 3D and MATH 140A

**MATH 118. The Theory of Differential Equations. 4 Units.**

Existence and uniqueness of solutions, continuous dependence of solutions on initial conditions and parameters, Lyapunov and asymptotic stability, Floquet theory, nonlinear systems, and bifurcations.

Prerequisite: MATH 3D and MATH 140A

**MATH 120A. Introduction to Abstract Algebra: Groups. 4 Units.**

Axioms for group theory; permutation groups, matrix groups. Isomorphisms, homomorphisms, quotient groups. Advanced topics as time permits. Special emphasis on doing proofs.

Prerequisite: (MATH 3A or MATH H3A) and MATH 13. MATH 13 with a grade of C or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 120B. Introduction to Abstract Algebra: Rings and Fields. 4 Units.**

Basic properties of rings; ideals, quotient rings; polynomial and matrix rings. Elements of field theory.

Prerequisite: MATH 120A. MATH 120A with a grade of C- or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 120C. Introduction to Abstract Algebra: Galois Theory. 4 Units.**

Galois Theory: proof of the impossibility of certain ruler-and-compass constructions (squaring the circle, trisecting angles); nonexistence of analogues to the 'quadratic formula' for polynomial equations of degree 5 or higher.

Prerequisite: MATH 120B

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH H120A. Honors Introduction to Graduate Algebra I. 5 Units.**

Introduction to abstract linear algebra, including bases, linear transformation, eigenvectors, canonical forms, inner products, and symmetric operators. Introduction to groups, rings, and fields, including examples of groups, group actions, Sylow theorems, modules over principal ideal domains, polynomials, and Galois groups.

Prerequisite: (MATH 3A or MATH H3A) and MATH 13 and (MATH 120A or MATH 121A). MATH 13 with a grade of A or better. MATH 120A with a grade of A or better. MATH 121A with a grade of A or better

Restriction: Mathematics Honors students only.

Concurrent with MATH 206A.

**MATH H120B. Honors Introduction to Graduate Algebra II. 5 Units.**

Introduction to abstract linear algebra, including bases, linear transformation, eigenvectors, canonical forms, inner products, and symmetric operators. Introduction to groups, rings, and fields, including examples of groups, group actions, Sylow theorems, modules over principal ideal domains, polynomials, and Galois groups.

Prerequisite: MATH H120A

Restriction: Mathematics Honors students only.

Concurrent with MATH 206B.

**MATH H120C. Honors Introduction to Graduate Algebra III. 5 Units.**

Introduction to abstract linear algebra, including bases, linear transformation, eigenvectors, canonical forms, inner products, and symmetric operators. Introduction to groups, rings, and fields, including examples of groups, group actions, Sylow theorems, modules over principal ideal domains, polynomials, and Galois groups.

Prerequisite: MATH H120B

Restriction: Mathematics Honors students only.

Concurrent with MATH 206C.

**MATH 121A. Linear Algebra. 4 Units.**

Introduction to modern abstract linear algebra. Special emphasis on students doing proofs. Vector spaces, linear independence, bases, dimension. Linear transformations and their matrix representations. Theory of determinants.

Prerequisite: (MATH 3A or MATH H3A) and MATH 13. MATH 13 with a grade of C or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 121B. Linear Algebra. 4 Units.**

Introduction to modern abstract linear algebra. Special emphasis on students doing proofs. Canonical forms; inner products; similarity of matrices.

Prerequisite: MATH 121A

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 130A. Probability I. 4 Units.**

Combinatorial probability, conditional probabilities, independence, discrete and continuous random variables, expectation and variance, common probability distributions.

Prerequisite: (MATH 2A or AP Calculus BC or AP Calculus AB) and (MATH 2B or AP Calculus BC) and (MATH 3A or MATH H3A). AP Calculus BC with a minimum score of 3. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 4

**MATH 130B. Probability II. 4 Units.**

Joint distributions, sums of independent random variables, conditional distributions and conditional expectation, covariances, moment generating functions, limit theorems.

Prerequisite: MATH 130A or MATH 131A or STAT 120A

**MATH 130C. Stochastic Processes. 4 Units.**

Markov chains, Brownian motion, Gaussian processes, applications to option pricing and Markov chain Monte Carlo methods.

Prerequisite: MATH 130B

**MATH 133A. Statistical Methods with Applications to Finance. 4 Units.**

Overview of probability, statistics, and financial concepts: distribution, point estimation, confidence interval, linear regression, hypothesis testing, principal component analysis, financial applications.

Prerequisite: MATH 130A or MATH 131A or STAT 120A

**MATH 133B. Statistical Methods with Applications to Finance. 4 Units.**

Overview of markets and options: asset modeling, Brownian motion, risk neutrality, option pricing, value at risk, MC simulations.

Prerequisite: MATH 133A

**MATH 133C. Statistical Methods with Applications to Finance. 4 Units.**

Overview of interest theory, time value of money, annuities/cash flows with payments that are not contingent, loans, sinking funds, bonds, general cash flow and portfolios, immunization, duration and convexity, swaps.

Prerequisite: MATH 133B

**MATH 134A. Fixed Income. 4 Units.**

Overview of interest theory, time value of money, annuities/cash flows with payments that are not contingent, loans, sinking funds, bonds, general cash flow and portfolios, immunization, duration and convexity, swaps.

Prerequisite: MATH 130A or STAT 120A

Overlaps with MATH 133C.

**MATH 134B. Mathematics of Financial Derivatives. 4 Units.**

General derivatives; call/put options; hedging and investment strategies: spreads and collars; risk management; forwards and futures; bonds.

Prerequisite: MATH 134A or MATH 133C

Overlaps with MATH 133A.

**MATH 134C. Mathematical Models for Finance. 4 Units.**

General properties of options: option contracts (call and put options, European, American and exotic options); binomial option pricing model, Black-Scholes option pricing model; risk-neutral pricing formula using Monte-Carlo simulation; option greeks and risk management; interest rate derivatives, Markowitz portfolio theory.

Prerequisite: MATH 134B or MATH 133A

Overlaps with MATH 133B.

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 140A. Elementary Analysis. 4 Units.**

Introduction to real analysis, including convergence of sequence, infinite series, differentiation and integration, and sequences of functions. Students are expected to do proofs.

Prerequisite: (MATH 2B or AP Calculus BC) and (MATH 2D or MATH H2D) and (MATH 3A or MATH H3A) and MATH 13. AP Calculus BC with a minimum score of 4. MATH 13 with a grade of C or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 140B. Elementary Analysis. 4 Units.**

Introduction to real analysis including convergence of sequences, infinite series, differentiation and integration, and sequences of functions. Students are expected to do proofs.

Prerequisite: MATH 140A. MATH 140A with a grade of C- or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 140C. Analysis in Several Variables . 4 Units.**

Rigorous treatment of multivariable differential calculus. Jacobians, Inverse and Implicit Function theorems.

Prerequisite: MATH 140B

**MATH H140A. Honors Introduction to Graduate Analysis I. 5 Units.**

Construction of the real number system, topology of the real line, concepts of continuity, differential and integral calculus, sequences and series of functions, equicontinuity, metric spaces, multivariable differential and integral calculus, implicit functions, curves and surfaces.

Prerequisite: (MATH 2E or MATH H2E) and (MATH 3A or MATH H3A) and MATH 13 and MATH 121A and MATH 140A and MATH 140B. MATH 2E with a grade of A or better. MATH H2E with a grade of A or better. MATH 13 with a grade of A or better. MATH 140A with a grade of A or better. MATH 140B with a grade of A or better

Restriction: Mathematics Honors students only.

Concurrent with MATH 205A.

**MATH H140B. Honors Introduction to Graduate Analysis II. 5 Units.**

Construction of the real number system, topology of the real line, concepts of continuity, differential and integral calculus, sequences and series of functions, equicontinuity, metric spaces, multivariable differential and integral calculus, implicit functions, curves and surfaces.

Prerequisite: MATH H140A

Restriction: Mathematics Honors students only.

Concurrent with MATH 205B.

**MATH H140C. Honors Introduction to Graduate Analysis III. 5 Units.**

Construction of the real number system; topology of the real line; concepts of continuity, differential, and integral calculus; sequences and series of functions, equicontinuity, metric spaces, multivariable differential, and integral calculus; implicit functions, curves and surfaces.

Prerequisite: MATH H140B

Restriction: Mathematics Honors students only.

Concurrent with MATH 205C.



**MATH 141. Introduction to Topology. 4 Units.**

The elements of naive set theory and the basic properties of metric spaces. Introduction to topological properties.

Prerequisite: MATH 140A

**MATH 147. Complex Analysis. 4 Units.**

Rigorous treatment of basic complex analysis: analytic functions, Cauchy integral theory and its consequences, power series, residue calculus, harmonic functions, conformal mapping. Students are expected to do proofs.

Prerequisite or corequisite: MATH 140A and MATH 140B

Restriction: MATH 114A may not be taken for credit after MATH 147.

**MATH 150. Introduction to Mathematical Logic. 4 Units.**

First order logic through the Completeness Theorem for predicate logic.

Prerequisite: MATH 13 or (ICS 6B and ICS 6D). MATH 13 with a grade of C- or better

Overlaps with LPS 105B, PHIL 105B.

**MATH 161. Modern Geometry. 4 Units.**

Euclidean Geometry; Hilbert's Axioms; Absolute Geometry; Hyperbolic Geometry; the Poincare Models; and Geometric Transformations.

Prerequisite: MATH 13 or (ICS 6B and ICS 6D). MATH 13 with a grade of C- or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 162A. Introduction to Differential Geometry. 4 Units.**

Applications of advanced calculus and linear algebra to the geometry of curves and surfaces in space.

Prerequisite: (MATH 2E or MATH H2E) and (MATH 3A or MATH H3A) and MATH 3D

**MATH 162B. Introduction to Differential Geometry. 4 Units.**

Applications of advanced calculus and linear algebra to the geometry of curves and surfaces in space.

Prerequisite: MATH 162A

**MATH 173A. Introduction to Cryptology. 4 Units.**

Introduction to some of the mathematics used in the making and breaking of codes, with applications to classical ciphers and public key systems. Includes topics from number theory, probability, and abstract algebra.

Prerequisite: (MATH 2B or AP Calculus BC) and (MATH 3A or MATH H3A) and MATH 13 or (ICS 6B and ICS 6D). AP Calculus BC with a minimum score of 4. MATH 13 with a grade of C or better

**MATH 173B. Introduction to Cryptology. 4 Units.**

Introduction to some of the mathematics used in the making and breaking of codes, with applications to classical ciphers and public key systems. The mathematics which is covered includes topics from number theory, probability, and abstract algebra.

Prerequisite: MATH 173A

**MATH 175. Combinatorics . 4 Units.**

Introduction to combinatorics including basic counting principles, permutations, combinations, binomial coefficients, inclusion-exclusion, derangements, ordinary and exponential generating functions, recurrence relations, Catalan numbers, Stirling numbers, and partition numbers.

Prerequisite: (MATH 2B or AP Calculus BC) and MATH 13. AP Calculus BC with a minimum score of 4. MATH 13 with a grade of C or better

**MATH 176. Mathematics of Finance. 4 Units.**

After reviewing tools from probability, statistics, and elementary differential and partial differential equations, concepts such as hedging, arbitrage, Puts, Calls, the design of portfolios, the derivation and solution of the Blac-Scholes, and other equations are discussed.

Prerequisite: MATH 3A or MATH H3A

Same as ECON 135.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Mathematics Majors have first consideration for enrollment.

**MATH 180A. Number Theory. 4 Units.**

Introduction to number theory and applications. Divisibility, prime numbers, factorization. Arithmetic functions. Congruences. Quadratic residue. Diophantine equations. Introduction to cryptography.

Prerequisite: (MATH 3A or MATH H3A) and MATH 13. MATH 13 with a grade of C or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 180B. Number Theory. 4 Units.**

Introduction to number theory and applications. Analytic number theory, character sums, finite fields, discrete logarithm, computational complexity. Introduction to coding theory. Other topics as time permits.

Prerequisite: MATH 180A

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 184. History of Mathematics. 4 Units.**

Topics vary from year to year. Some possible topics: mathematics in ancient times; the development of modern analysis; the evolution of geometric ideas. Students will be assigned individual topics for term papers.

Corequisite: MATH 184L

Prerequisite: MATH 120A and MATH 140A

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 184L. History of Mathematics Lesson Lab. 1 Unit.**

Aspiring math teachers research, design, present, and peer review middle school or high school math lessons that draw from history of mathematics topics.

Corequisite: MATH 184

Prerequisite: PS 5

**MATH 192. Studies in the Learning and Teaching of Secondary Mathematics. 2 Units.**

Focus is on historic and current mathematical concepts related to student learning and effective math pedagogy, with fieldwork in grades 6-14.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**MATH 194. Problem Solving Seminar. 2 Units.**

Develops ability in analytical thinking and problem solving, using problems of the type found in the Mathematics Olympiad and the Putnam Mathematical Competition. Students taking the course in fall will prepare for and take the Putnam examination in December.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**MATH 195W. Mathematical Writing. 4 Units.**

Techniques of mathematical writing and communication. Covers effectively writing mathematical papers, creating effective presentations, and communicating mathematics in a variety of media. Focuses on utilizing LaTeX for typesetting mathematics.

Prerequisite: MATH 120A or MATH 121A or MATH 140A. MATH 120A with a grade of C or better. MATH 121A with a grade of C or better. MATH 140A with a grade of C or better. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Mathematics Majors have first consideration for enrollment.

**(Ib)****MATH 199A. Special Studies in Mathematics. 2-4 Units.**

Supervised reading. For outstanding undergraduate Mathematics majors in supervised but independent reading or research of mathematical topics.

Repeatability: Unlimited as topics vary.

**MATH 199B. Special Studies in Mathematics. 2-4 Units.**

Supervised reading. For outstanding undergraduate Mathematics majors in supervised but independent reading or research of mathematical topics.

Repeatability: Unlimited as topics vary.

**MATH 199C. Special Studies in Mathematics. 2-4 Units.**

Supervised reading. For outstanding undergraduate Mathematics majors in supervised but independent reading or research of mathematical topics.

Repeatability: Unlimited as topics vary.

**MATH 205A. Introduction to Graduate Analysis. 5 Units.**

Construction of the real number system, topology of the real line, concepts of continuity, differential and integral calculus, sequences and series of functions, equicontinuity, metric spaces, multivariable differential and integral calculus, implicit functions, curves and surfaces.

Prerequisite: (MATH 2E or MATH H2E) and (MATH 3A MATH H3A) and MATH 13. MATH 2E with a grade of A or better. MATH H2E with a grade of A or better. MATH 13 with a grade of C or better

Concurrent with MATH H140A.

**MATH 205B. Introduction to Graduate Analysis. 5 Units.**

Construction of the real number system, topology of the real line, concepts of continuity, differential and integral calculus, sequences and series of functions, equicontinuity, metric spaces, multivariable differential and integral calculus, implicit functions, curves and surfaces.

Prerequisite: MATH 205A

Concurrent with MATH H140B.

**MATH 205C. Introduction to Graduate Analysis. 5 Units.**

Construction of the real number system, topology of the real line, concepts of continuity, differential and integral calculus, sequences and series of functions, equicontinuity, metric spaces, multivariable differential and integral calculus, implicit functions, curves and surfaces.

Prerequisite: MATH 205B

Concurrent with MATH H140C.

**MATH 206A. Introduction to Graduate Algebra. 5 Units.**

Introduction to abstract linear algebra, including bases, linear transformation, eigenvectors, canonical forms, inner products, symmetric operators. Introduction to groups, rings, and fields including examples of groups, group actions, Sylow theorems, modules over principal ideal domains, polynomials, and Galois groups.

Prerequisite: MATH 3A or MATH H3A

Concurrent with MATH H120A.

**MATH 206B. Introduction to Graduate Algebra. 5 Units.**

Introduction to abstract linear algebra, including bases, linear transformation, eigenvectors, canonical forms, inner products, symmetric operators. Introduction to groups, rings, and fields including examples of groups, group actions, Sylow theorems, modules over principal ideal domains, polynomials, and Galois groups.

Prerequisite: MATH 206A

Concurrent with MATH H120B.

**MATH 206C. Introduction to Graduate Algebra. 5 Units.**

Introduction to abstract linear algebra, including bases, linear transformation, eigenvectors, canonical forms, inner products, symmetric operators. Introduction to groups, rings, and fields including examples of groups, group actions, Sylow theorems, modules over principal ideal domains, polynomials, and Galois groups.

Prerequisite: MATH 206B

Concurrent with MATH H120C.

**MATH 210A. Real Analysis. 4 Units.**

Measure theory, Lebesgue integral, signed measures, Radon-Nikodym theorem, functions of bounded variation and absolutely continuous functions, classical Banach spaces,  $L_p$  spaces, integration on locally compact spaces and the Riesz-Markov theorem, measure and outer measure, product measure spaces.

Prerequisite: MATH 140C

**MATH 210B. Real Analysis. 4 Units.**

Measure theory, Lebesgue integral, signed measures, Radon-Nikodym theorem, functions of bounded variation and absolutely continuous functions, classical Banach spaces,  $L_p$  spaces, integration on locally compact spaces and the Riesz-Markov theorem, measure and outer measure, product measure spaces.

Prerequisite: MATH 210A

**MATH 210C. Real Analysis. 4 Units.**

Measure theory, Lebesgue integral, signed measures, Radon-Nikodym theorem, functions of bounded variation and absolutely continuous functions, classical Banach spaces,  $L_p$  spaces, integration on locally compact spaces and the Riesz-Markov theorem, measure and outer measure, product measure spaces.

Prerequisite: MATH 210B

**MATH 218A. Introduction to Manifolds and Geometry. 4 Units.**

General topology and fundamental groups, covering space; Stokes theorem on manifolds, selected topics on abstract manifold theory.

Prerequisite: MATH 205C

**MATH 218B. Introduction to Manifolds and Geometry. 4 Units.**

General topology and fundamental groups, covering space; Stokes theorem on manifolds, selected topics on abstract manifold theory.

Prerequisite: MATH 218A

**MATH 218C. Introduction to Manifolds and Geometry. 4 Units.**

General topology and fundamental groups, covering space; Stokes theorem on manifolds, selected topics on abstract manifold theory.

Prerequisite: MATH 218B

**MATH 220A. Analytic Function Theory. 4 Units.**

Standard theorems about analytic functions. Harmonic functions. Normal families. Conformal mapping.

Prerequisite: MATH 140C

**MATH 220B. Analytic Function Theory. 4 Units.**

Standard theorems about analytic functions. Harmonic functions. Normal families. Conformal mapping.

Prerequisite: MATH 220A

**MATH 220C. Analytic Function Theory. 4 Units.**

Standard theorems about analytic functions. Harmonic functions. Normal families. Conformal mapping.

Prerequisite: MATH 220B

**MATH 222A. Several Complex Variables and Complex Geometry. 4 Units.**

Several Complex variables,  $\bar{\partial}$ -bar problems, mappings, Kaehler geometry, de Rham and Dolbeault Theorems, Chern Classes, Hodge Theorems, Calabi conjecture, Kahler-Einstein geometry, Monge-Ampere.

Prerequisite: MATH 218C and MATH 220C

**MATH 225A. Introduction to Numerical Analysis and Scientific Computing. 4 Units.**

Introduction to fundamentals of numerical analysis from an advanced viewpoint. Error analysis, approximation of functions, nonlinear equations.

Prerequisite: MATH 3D and (MATH 105A and MATH 105B) or (MATH 140A and MATH 140B) and MATH 121A and (MATH 112A or MAE 140)

Restriction: Graduate students only.

**MATH 225B. Introduction to Numerical Analysis and Scientific Computing. 4 Units.**

Introduction to fundamentals of numerical analysis from an advanced viewpoint. Numerical linear algebra, numerical solutions of differential equations; stability.

Prerequisite: MATH 225A

Restriction: Graduate students only.

**MATH 225C. Introduction to Numerical Analysis and Scientific Computing. 4 Units.**

Introduction to fundamentals of numerical analysis from an advanced viewpoint. Numerical linear algebra, numerical solutions of differential equations; stability.

Prerequisite: MATH 225B

Restriction: Graduate students only.

**MATH 226A. Computational Differential Equations. 4 Units.**

Finite difference and finite element methods. Quick treatment of functional and nonlinear analysis background: weak solution,  $L_p$  spaces, Sobolev spaces. Approximation theory. Fourier and Petrov-Galerkin methods; mesh generation. Elliptic, parabolic, hyperbolic cases in 226A-B-C, respectively.

Prerequisite: MATH 3D and (MATH 112A or MAE 140) and (MATH 140B or MATH 105B)

**MATH 226B. Computational Differential Equations. 4 Units.**

Finite difference and finite element methods. Quick treatment of functional and nonlinear analysis background: weak solution,  $L_p$  spaces, Sobolev spaces. Approximation theory. Fourier and Petrov-Galerkin methods; mesh generation. Elliptic, parabolic, hyperbolic cases in 226A-B-C, respectively.

Prerequisite: MATH 226A

**MATH 226C. Computational Differential Equations. 4 Units.**

Finite difference and finite element methods. Quick treatment of functional and nonlinear analysis background: weak solution,  $L_p$  spaces, Sobolev spaces. Approximation theory. Fourier and Petrov-Galerkin methods; mesh generation. Elliptic, parabolic, hyperbolic cases in 226A-B-C, respectively.

Prerequisite: MATH 226B

**MATH 227A. Mathematical and Computational Biology. 4 Units.**

Analytical and numerical methods for dynamical systems, temporal-spatial dynamics, steady state, stability, stochasticity. Application to life sciences: genetics, tissue growth and patterning, cancers, ion channels gating, signaling networks, morphogen gradients. Analytical methods.

Prerequisite: (MATH 2A or AP Calculus BC or AP Calculus AB) and (MATH 2B or AP Calculus BC or MATH 5B) and (MATH 3A or MATH H3A). AP Calculus BC with a minimum score of 3. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 4

**MATH 227B. Mathematical and Computational Biology. 4 Units.**

Analytical and numerical methods for dynamical systems, temporal-spatial dynamics, steady state, stability, stochasticity. Application to life sciences: genetics, tissue growth and patterning, cancers, ion channels gating, signaling networks, morphogen gradients. Numerical simulations.

Prerequisite: MATH 227A

**MATH 227C. Mathematical and Computational Biology . 4 Units.**

Analytical and numerical methods for dynamical systems, temporal-spatial dynamics, steady state, stability, stochasticity. Application to life sciences: genetics, tissue growth and patterning, cancers, ion channels gating, signaling networks, morphogen gradients. Probabilistic methods.

Prerequisite: MATH 227A

Same as CS 285.

**MATH 230A. Algebra. 4 Units.**

Elements of the theories of groups, rings, fields, modules. Galois theory. Modules over principal ideal domains. Artinian, Noetherian, and semisimple rings and modules.

Prerequisite: MATH 120A and MATH 121A and MATH 121B

**MATH 230B. Algebra. 4 Units.**

Elements of the theories of groups, rings, fields, modules. Galois theory. Modules over principal ideal domains. Artinian, Noetherian, and semisimple rings and modules.

Prerequisite: MATH 230A

**MATH 230C. Algebra. 4 Units.**

Elements of the theories of groups, rings, fields, modules. Galois theory. Modules over principal ideal domains. Artinian, Noetherian, and semisimple rings and modules.

Prerequisite: MATH 230B

**MATH 232A. Algebraic Number Theory. 4 Units.**

Algebraic integers, prime ideals, class groups, Dirichlet unit theorem, localization, completion, Cebotarev density theorem, L-functions, Gauss sums, diophantine equations, zeta functions over finite fields. Introduction to class field theory.

Prerequisite: MATH 230C

**MATH 232B. Algebraic Number Theory. 4 Units.**

Algebraic integers, prime ideals, class groups, Dirichlet unit theorem, localization, completion, Cebotarev density theorem, L-functions, Gauss sums, diophantine equations, zeta functions over finite fields. Introduction to class field theory.

Prerequisite: MATH 232A

**MATH 232C. Algebraic Number Theory. 4 Units.**

Algebraic integers, prime ideals, class groups, Dirichlet unit theorem, localization, completion, Cebotarev density theorem, L-functions, Gauss sums, diophantine equations, zeta functions over finite fields. Introduction to class field theory.

Prerequisite: MATH 232B

**MATH 233A. Algebraic Geometry. 4 Units.**

Basic commutative algebra and classical algebraic geometry. Algebraic varieties, morphisms, rational maps, blow ups. Theory of schemes, sheaves, divisors, cohomology. Algebraic curves and surfaces, Riemann-Roch theorem, Jacobians, classification of curves and surfaces.

Prerequisite: MATH 230C

**MATH 233B. Algebraic Geometry. 4 Units.**

Basic commutative algebra and classical algebraic geometry. Algebraic varieties, morphisms, rational maps, blow ups. Theory of schemes, sheaves, divisors, cohomology. Algebraic curves and surfaces, Riemann-Roch theorem, Jacobians, classification of curves and surfaces.

Prerequisite: MATH 233A

**MATH 233C. Algebraic Geometry. 4 Units.**

Basic commutative algebra and classical algebraic geometry. Algebraic varieties, morphisms, rational maps, blow ups. Theory of schemes, sheaves, divisors, cohomology. Algebraic curves and surfaces, Riemann-Roch theorem, Jacobians, classification of curves and surfaces.

Prerequisite: MATH 233B

**MATH 235A. Mathematics of Cryptography. 4 Units.**

Mathematics of public key cryptography: encryption and signature schemes; RSA; factoring; primality testing; discrete log based cryptosystems, elliptic and hyperelliptic curve cryptography and additional topics as determined by the instructor.

Prerequisite: MATH 230C

**MATH 239A. Analytic Methods in Arithmetic Geometry. 4 Units.**

Riemann zeta function, Dirichlet L-functions, prime number theorem, zeta functions over finite fields, sieve methods, zeta functions of algebraic curves, algebraic coding theory, L-Functions over number fields, L-functions of modular forms, Eisenstein series.

Prerequisite: MATH 220C and MATH 230C

**MATH 239B. Analytic Methods in Arithmetic Geometry. 4 Units.**

Riemann zeta function, Dirichlet L-functions, prime number theorem, zeta functions over finite fields, sieve methods, zeta functions of algebraic curves, algebraic coding theory, L-Functions over number fields, L-functions of modular forms, Eisenstein series.

Prerequisite: MATH 239A

**MATH 239C. Analytic Methods in Arithmetic Geometry. 4 Units.**

Riemann zeta function, Dirichlet L-functions, prime number theorem, zeta functions over finite fields, sieve methods, zeta functions of algebraic curves, algebraic coding theory, L-Functions over number fields, L-functions of modular forms, Eisenstein series.

Prerequisite: MATH 239B

**MATH 240A. Differential Geometry. 4 Units.**

Riemannian manifolds, connections, curvature and torsion. Submanifolds, mean curvature, Gauss curvature equation. Geodesics, minimal submanifolds, first and second fundamental forms, variational formulas. Comparison theorems and their geometric applications. Hodge theory applications to geometry and topology.

**MATH 240B. Differential Geometry. 4 Units.**

Riemannian manifolds, connections, curvature and torsion. Submanifolds, mean curvature, Gauss curvature equation. Geodesics, minimal submanifolds, first and second fundamental forms, variational formulas. Comparison theorems and their geometric applications. Hodge theory applications to geometry and topology.

Prerequisite: MATH 240A

**MATH 240C. Differential Geometry. 4 Units.**

Riemannian manifolds, connections, curvature and torsion. Submanifolds, mean curvature, Gauss curvature equation. Geodesics, minimal submanifolds, first and second fundamental forms, variational formulas. Comparison theorems and their geometric applications. Hodge theory applications to geometry and topology.

Prerequisite: MATH 240B

**MATH 245A. Topics in Differential Geometry. 4 Units.**

Studies in selected areas of differential geometry, a continuation of MATH 240A-MATH 240B-MATH 240C. Topics addressed vary each quarter.

Prerequisite: MATH 240C

Repeatability: Unlimited as topics vary.

**MATH 245B. Topics in Differential Geometry. 4 Units.**

Studies in selected areas of differential geometry, a continuation of MATH 240A-MATH 240B-MATH 240C. Topics addressed vary each quarter.

Prerequisite: MATH 245A

Repeatability: Unlimited as topics vary.

**MATH 245C. Topics in Differential Geometry. 4 Units.**

Studies in selected areas of differential geometry, a continuation of MATH 240A-MATH 240B-MATH 240C. Topics addressed vary each quarter.

Prerequisite: MATH 245B

Repeatability: Unlimited as topics vary.

**MATH 250A. Algebraic Topology. 4 Units.**

Provides fundamental materials in algebraic topology: fundamental group and covering space, homology and cohomology theory, and homotopy group.

Prerequisite: MATH 230A

**MATH 250B. Algebraic Topology. 4 Units.**

Provides fundamental materials in algebraic topology: fundamental group and covering space, homology and cohomology theory, and homotopy group.

Prerequisite: MATH 250A

**MATH 250C. Algebraic Topology. 4 Units.**

Provides fundamental materials in algebraic topology: fundamental group and covering space, homology and cohomology theory, and homotopy group.

Prerequisite: MATH 250B

**MATH 260A. Functional Analysis. 4 Units.**

Normed linear spaces, Hilbert spaces, Banach spaces, Stone-Weierstrass Theorem, locally convex spaces, bounded operators on Banach and Hilbert spaces, the Gelfand-Neumark Theorem for commutative  $C^*$ -algebras, the spectral theorem for bounded self-adjoint operators, unbounded operators on Hilbert spaces.

Prerequisite: MATH 210C and MATH 220C

**MATH 260B. Functional Analysis. 4 Units.**

Normed linear spaces, Hilbert spaces, Banach spaces, Stone-Weierstrass Theorem, locally convex spaces, bounded operators on Banach and Hilbert spaces, the Gelfand-Neumark Theorem for commutative  $C^*$ -algebras, the spectral theorem for bounded self-adjoint operators, unbounded operators on Hilbert spaces.

Prerequisite: MATH 260A



**MATH 260C. Functional Analysis. 4 Units.**

Normed linear spaces, Hilbert spaces, Banach spaces, Stone-Weierstrass Theorem, locally convex spaces, bounded operators on Banach and Hilbert spaces, the Gelfand-Neumark Theorem for commutative  $C^*$ -algebras, the spectral theorem for bounded self-adjoint operators, unbounded operators on Hilbert spaces.

Prerequisite: MATH 260B

**MATH 270A. Probability. 4 Units.**

Probability spaces, distribution and characteristic functions. Strong limit theorems. Limit distributions for sums of independent random variables. Conditional expectation and martingale theory. Stochastic processes.

Prerequisite: MATH 130C and MATH 210C

**MATH 270B. Probability. 4 Units.**

Probability spaces, distribution and characteristic functions. Strong limit theorems. Limit distributions for sums of independent random variables. Conditional expectation and martingale theory. Stochastic processes.

Prerequisite: MATH 270A

**MATH 270C. Probability. 4 Units.**

Probability spaces, distribution and characteristic functions. Strong limit theorems. Limit distributions for sums of independent random variables. Conditional expectation and martingale theory. Stochastic processes.

Prerequisite: MATH 270B

**MATH 271A. Stochastic Processes. 4 Units.**

Processes with independent increments, Wiener and Gaussian processes, function space integrals, stationary processes, Markov processes.

Prerequisite: MATH 210C

Overlaps with STAT 270.

**MATH 271B. Stochastic Processes. 4 Units.**

Processes with independent increments, Wiener and Gaussian processes, function space integrals, stationary processes, Markov processes.

Prerequisite: MATH 271A

Overlaps with STAT 270.

**MATH 271C. Stochastic Processes. 4 Units.**

Processes with independent increments, Wiener and Gaussian processes, function space integrals, stationary processes, Markov processes.

Prerequisite: MATH 271B

Overlaps with STAT 270.

**MATH 280A. Mathematical Logic. 4 Units.**

Basic set theory; models, compactness, and completeness; basic model theory; Incompleteness and Gödel's Theorems; basic recursion theory; constructible sets.

**MATH 280B. Mathematical Logic. 4 Units.**

Basic set theory; models, compactness, and completeness; basic model theory; Incompleteness and Gödel's Theorems; basic recursion theory; constructible sets.

Prerequisite: MATH 280A

**MATH 280C. Mathematical Logic. 4 Units.**

Basic set theory; models, compactness, and completeness; basic model theory; Incompleteness and Gödel's Theorems; basic recursion theory; constructible sets.

Prerequisite: MATH 280B

**MATH 281A. Set Theory. 4 Units.**

Ordinals, cardinals, cardinal arithmetic, combinatorial set theory, models of set theory, Gödel's constructible universe, forcing, large cardinals, iterate forcing, inner model theory, fine structure.

Prerequisite: MATH 280C

**MATH 281B. Set Theory. 4 Units.**

Ordinals, cardinals, cardinal arithmetic, combinatorial set theory, models of set theory, Gödel's constructible universe, forcing, large cardinals, iterate forcing, inner model theory, fine structure.

Prerequisite: MATH 281A

**MATH 281C. Set Theory. 4 Units.**

Ordinals, cardinals, cardinal arithmetic, combinatorial set theory, models of set theory, Gödel's constructible universe, forcing, large cardinals, iterate forcing, inner model theory, fine structure.

Prerequisite: MATH 281B

**MATH 282A. Model Theory. 4 Units.**

Languages, structures, compactness and completeness. Model-theoretic constructions. Omitting types theorems. Morley's theorem. Ranks, forking. Model completeness. O-minimality. Applications to algebra.

Prerequisite: MATH 280C

**MATH 282B. Model Theory. 4 Units.**

Languages, structures, compactness and completeness. Model-theoretic constructions. Omitting types theorems. Morley's theorem. Ranks, forking. Model completeness. O-minimality. Applications to algebra.

Prerequisite: MATH 282A

**MATH 282C. Model Theory. 4 Units.**

Languages, structures, compactness and completeness. Model-theoretic constructions. Omitting types theorems. Morley's theorem. Ranks, forking. Model completeness. O-minimality. Applications to algebra.

Prerequisite: MATH 282B

**MATH 285A. Topics in Mathematical Logic. 4 Units.**

Studies in selected areas of mathematical logic, a continuation of MATH 280A-MATH 280B-MATH 280C. Topics addressed vary each quarter.

Prerequisite: MATH 280C

Repeatability: Unlimited as topics vary.

**MATH 290A. Methods in Applied Mathematics. 4 Units.**

Introduction to ODEs and dynamical systems: existence and uniqueness. Equilibria and periodic solutions. Bifurcation theory. Perturbation methods: approximate solution of differential equations. Multiple scales and WKB. Matched asymptotic. Calculus of variations: direct methods, Euler-Lagrange equation. Second variation and Legendre condition.

**MATH 290B. Methods in Applied Mathematics. 4 Units.**

Introduction to ODEs and dynamical systems: existence and uniqueness. Equilibria and periodic solutions. Bifurcation theory. Perturbation methods: approximate solution of differential equations. Multiple scales and WKB. Matched asymptotic. Calculus of variations: direct methods, Euler-Lagrange equation. Second variation and Legendre condition.

Prerequisite: MATH 290A

**MATH 290C. Methods in Applied Mathematics. 4 Units.**

Introduction to ODEs and dynamical systems: existence and uniqueness. Equilibria and periodic solutions. Bifurcation theory. Perturbation methods: approximate solution of differential equations. Multiple scales and WKB. Matched asymptotic. Calculus of variations: direct methods, Euler-Lagrange equation. Second variation and Legendre condition.

Prerequisite: MATH 290B

**MATH 295A. Partial Differential Equations. 4 Units.**

Theory and techniques for linear and nonlinear partial differential equations. Local and global theory of partial differential equations: analytic, geometric, and functional analytic methods.

Prerequisite: MATH 210C and MATH 112B and MATH 112C

**MATH 295B. Partial Differential Equations. 4 Units.**

Theory and techniques for linear and nonlinear partial differential equations. Local and global theory of partial differential equations: analytic, geometric, and functional analytic methods.

Prerequisite: MATH 295A

**MATH 295C. Partial Differential Equations. 4 Units.**

Theory and techniques for linear and nonlinear partial differential equations. Local and global theory of partial differential equations: analytic, geometric, and functional analytic methods.

Prerequisite: MATH 295B

**MATH 296. Topics in Partial Differential Equations. 4 Units.**

Studies in selected areas of partial differential equations, a continuation of MATH 295A-MATH 295B-MATH 295C. Topics addressed vary each quarter.

Prerequisite: MATH 295C

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**MATH 297. Mathematics Colloquium. 1 Unit.**

Weekly colloquia on topics of current interest in mathematics.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**MATH 298A. Seminar . 2 Units.**

Seminars organized for detailed discussion of research problems of current interest in the Department. The format, content, frequency, and course value are variable.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

**MATH 298B. Seminar . 2 Units.**

Seminars organized for detailed discussion of research problems of current interest in the Department. The format, content, frequency, and course value are variable.

Prerequisite: MATH 298A

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

**MATH 298C. Seminar . 2 Units.**

Seminars organized for detailed discussion of research problems of current interest in the Department. The format, content, frequency, and course value are variable.

Prerequisite: MATH 298B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

**MATH 299A. Supervised Reading and Research. 1-12 Units.**

Supervised reading and research with Mathematics faculty.

Repeatability: May be repeated for credit unlimited times.

**MATH 299B. Supervised Reading and Research. 1-12 Units.**

Supervised reading and research with Mathematics faculty.

Prerequisite: MATH 299A

Repeatability: May be repeated for credit unlimited times.

**MATH 299C. Supervised Reading and Research. 1-12 Units.**

Supervised reading and research with Mathematics faculty.

Prerequisite: MATH 299B

Repeatability: May be repeated for credit unlimited times.

**MATH 399. University Teaching. 1-4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Physical Sciences Courses

**PHY SCI 5. California Teach 1: Introduction to Science and Mathematics Teaching. 3 Units.**

First in a series for students interested in becoming middle or high school teachers of mathematics or science. Students gain an understanding of effective, research-based teaching strategies. Includes supervised field experience in a K-12 classroom.

Same as BIO SCI 14.

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment. School of Engineering students have first consideration for enrollment.

**PHY SCI 80. Skills Development. 1.5 Workload Unit.**

Undergraduates identify, cultivate, and practice relevant soft skills applicable to careers in mathematics and science. The focus is on career readiness, how to market oneself to future employers, and what to expect from the professional world.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Grading Option: Workload Credit Letter Grade with P/NP.

Restriction: School of Physical Sciences students have first consideration for enrollment.

**PHY SCI 105. California Teach 2: Middle School Science and Mathematics Teaching. 3 Units.**

Second in a series for students interested in becoming middle or high school teachers of mathematics or science. Students gain an understanding of effective, research-based teaching strategies for grades 6-8. Includes supervised field experience in a middle school classroom.

Prerequisite: PHY SCI 5

Same as BIO SCI 101.

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment. School of Engineering students have first consideration for enrollment.

**PHY SCI 139W. Technical Writing and Communication Skills. 4 Units.**

Workshop in writing technical reports, journal articles, proposals. Oral presentations. Communicating with the public. May not be used in satisfaction of any School or departmental requirement.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. School of Physical Sciences students have first consideration for enrollment.

(Ib)

**PHY SCI 220. Science Communication Skills. 2 Units.**

Development of effective communication skills, oral and written presentations. Topics range from the art of creating keynote slides to strategically crafting a personal story, culminating in a live presentation to an invited audience.

## Physics and Astronomy Courses

**PHYSICS 2. Introduction to Mathematical Methods for Physics. 4 Units.**

Provides the applied mathematics and problem solving/presentation skills necessary for success in an introductory physics sequence. Focuses on practical exercises in problem solving. Covers kinematics in one and two dimensions in detail. Additional topics include vectors, differentiation, and integration.

Prerequisite or corequisite: MATH 2A or MATH 5A or AP Calculus AB or AP Calculus BC. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 3

Restriction: PHYSICS 2 may not be taken for credit if taken after PHYSICS 7C.

**PHYSICS 3A. Basic Physics I. 4 Units.**

Vectors; motion, force, and energy.

Corequisite: MATH 2A or MATH 5A, or a score of 4 or higher on the AP Calculus AB exam, or a score of 3 or higher on the AP Calculus BC exam.

Restriction: PHYSICS 3A may not be taken for credit if taken after PHYSICS 7C.

(II and VA ).

**PHYSICS 3B. Basic Physics II. 4 Units.**

Fluids; heat; electricity and magnetism.

Prerequisite: PHYSICS 3A or AP Physics C: Mechanics. AP Physics C: Mechanics with a minimum score of 5

(II and VA ).

**PHYSICS 3C. Basic Physics III. 4 Units.**

Waves and sound; optics; quantum ideas; atomic and nuclear physics; relativity.

Corequisite: MATH 2B or MATH 5B, or a score of 4 or higher on the AP Calculus BC exam.

Prerequisite: PHYSICS 3A or AP Physics C: Mechanics. AP Physics C: Mechanics with a minimum score of 5

(II and Va ).

**PHYSICS 3LB. Basic Physics Laboratory. 1.5 Unit.**

Practical applications of electronics and classical physics to biology. Goals include skill to use oscilloscope and other basic instrumentation. Materials fee.

**PHYSICS 3LC. Basic Physics Laboratory. 1.5 Unit.**

Practical applications of physics to medical imaging. Topics include optics, radioactivity, and acoustics. Materials fee.

**PHYSICS 7C. Classical Physics. 4 Units.**

Topics include force, energy, momentum, rotation, and gravity.

Corequisite: MATH 2B or AP CALCULUS BC, min score = 4.

Prerequisite: PHYSICS 2 or (MATH 2D and (CHEM 1C or CHEM H2C or CHEM M3C) or CHEM M2C) or AP Physics C: Mechanics or AP Physics C: Electricity and Magnetism or SAT Mathematics or ACT Mathematics. PHYSICS 2 with a grade of C or better. AP Physics C: Mechanics with a minimum score of 4. AP Physics C: Electricity and Magnetism with a minimum score of 4. SAT Mathematics with a minimum score of 650. ACT Mathematics with a minimum score of 27. Recommended: One year of high school physics or equivalent physics background.

Restriction: Physics Majors have first consideration for enrollment.

(II and VA ).

**PHYSICS 7D. Classical Physics. 4 Units.**

Electricity and magnetism.

Corequisite: PHYSICS 7LD and MATH 2D

Prerequisite: PHYSICS 7C and (MATH 2B or AP Calculus BC). AP Calculus BC with a minimum score of 4

Restriction: Physics Majors have first consideration for enrollment.

(II and Va ).

**PHYSICS 7E. Classical Physics. 4 Units.**

Fluids; oscillations; waves; and optics.

Prerequisite: PHYSICS 7C and MATH 2B

Restriction: Physics Majors have first consideration for enrollment.

(II and VA ).

**PHYSICS 7LC. Classical Physics Laboratory. 1 Unit.**

Experiments related to lecture topics in Physics 7C. Materials fee.

Corequisite: PHYSICS 7C

Restriction: Physics Majors have first consideration for enrollment.

**PHYSICS 7LD. Classical Physics Laboratory. 1 Unit.**

Electricity and magnetism.

Corequisite: PHYSICS 7D

Restriction: Physics Majors have first consideration for enrollment.

**PHYSICS 12. Science Fiction and Science Fact. 4 Units.**

An introduction to fundamental physics principles, the scientific process, and the mathematical language of science, used to analyze topics drawn from superheroes, science fiction works, and current science news to distinguish science fiction and science fact.

Overlaps with PHYSICS 21.

(II and VA ).

**PHYSICS 14. Energy and the Environment. 4 Units.**

The physics of society's energy production and consumption, and of their influences on the environment. Topics include fossil and renewable energy resources; nuclear power; prospects for a hydrogen economy; efficient and environmentally benign transportation; efficient home and commercial energy usage.

(II, Va)

**PHYSICS 15. Physics of Music. 4 Units.**

Introduces basic physical principles underlying generation and properties of music, including basic properties of sound waves, musical scales and temperament, musical instruments, and acoustics of music halls. No mathematics background required, but high school algebra is recommended.

(II)

**PHYSICS 17. Physics of Athletics. 4 Units.**

Introduces basic physical principles behind motion. Examples are drawn from a range of athletic endeavors (such as ice skating, baseball, diving, and dance). No mathematics background required, but high school algebra is recommended.

(II)

**PHYSICS 18. How Things Work. 4 Units.**

Survey of the physical basis of modern technology, with an emphasis on electronics and materials. Topics include power generation and distribution, communication (radio, TV, telephone, computers, tape recorders, CD players), imaging (optics, x-rays, MRI), and modern materials (alloys, semiconductors, superconductors).

(II)

**PHYSICS 19. Great Ideas of Physics. 4 Units.**

Introduces non-science majors to physics, examining important breakthroughs and controversies. Potential topics: Einstein's Relativity; Heisenberg's Uncertainty Principle; black holes; extra-dimensions; antimatter. Case studies illustrate the essential nature of scientific review and independent confirmation of results. No mathematics background required.

(II)

**PHYSICS 20A. Introduction to Astronomy. 4 Units.**

History of astronomy. Underlying physics. Objects in the solar system and how they are studied. Properties of stars: their formation, structure, and evolution. Pulsars and black holes. Galaxies and quasars.

(II and VA ).

**PHYSICS 20B. Cosmology: Humanity's Place in the Universe. 4 Units.**

An overview of the origin, evolution, and ultimate fate of the Universe. Galaxies and dark matter. The Big Bang and dark energy. Ancient world models.

(II and VA ).

**PHYSICS 20D. Space Science. 4 Units.**

Space exploration. Human missions to the moon, Mars, and beyond. Space stations, observatories, and deep-space probes. Robots and drones on distant worlds. Propulsion mechanisms, rockets, space flight, and the dangers of solar radiation.

(II and VA ).

**PHYSICS 20E. Life in the Universe. 4 Units.**

An overview of the scientific quest to discover life elsewhere in the universe. Topics include the origin of life on Earth, Mars, extra-solar planets, interstellar travel, and extra-terrestrial intelligence.

(II, Va)

**PHYSICS 21. Special Topics in Physics. 4 Units.**

Topics addressed vary each quarter. Past topics have included physics and music, Newton, planetary science. Lectures on areas of special interest in physics used to introduce students to scientific method, fundamental laws of science, qualitative and quantitative analysis of data.

Repeatability: Unlimited as topics vary.

Overlaps with PHYSICS 12, PHYSICS XI12.

(II)

**PHYSICS 50. Introductory Mathematical Physics. 4 Units.**

Introduction to math methods for upper-division physics. Taylor and Fourier series; complex algebra; ordinary differential equations; matrices, tensors and vector spaces; eigensystems; orthogonal coordinates; vector calculus and fields. Symbolic computation with Mathematica is incorporated throughout.

Corequisite: MATH 2E

Prerequisite: MATH 3A

Overlaps with PHYSICS 100.

Restriction: Physics Majors have first consideration for enrollment.

**PHYSICS 51A. Modern Physics. 4 Units.**

Wave-particle duality; quantum mechanics; special relativity; statistical mechanics.

Prerequisite: (PHYSICS 7E or PHYSICS 3C) and MATH 2D

Overlaps with PHYSICS 61A.

Restriction: No Physics Majors.

**PHYSICS 52A. Fundamentals of Experimental Physics. 2 Units.**

Optics: lenses, mirrors, polarization, lasers, optical fibers, interference, spectra. Materials fee.

Corequisite: PHYSICS 7E or PHYSICS 3C.

Restriction: Physics Majors have first consideration for enrollment.

**PHYSICS 52B. Fundamentals of Experimental Physics. 2 Units.**

Circuits: oscilloscope, meters, DC and AC circuits. Materials fee.

Prerequisite: PHYSICS 7D or PHYSICS 3B

Restriction: Physics Majors have first consideration for enrollment.

**PHYSICS 52C. Fundamentals of Experimental Physics. 2 Units.**

Data analysis: random and systematic errors, curve fitting; nuclear counting; quantum experiments. Error analysis: random and systematic errors, curve fitting, nuclear counting, and quantum experiments. Materials fee.

Prerequisite: PHYSICS 51A or PHYSICS 61A

Restriction: Physics Majors have first consideration for enrollment.



**PHYSICS 53. Introduction to Programming and Numerical Analysis. 4 Units.**

Introduction to structured programming; in-depth training in python. Elementary numerical methods applied to physics problems.

Prerequisite: MATH 3A and MATH 3D

Restriction: Physics Majors have first consideration for enrollment.

**PHYSICS 60. Thermal Physics. 4 Units.**

Introduction to thermodynamics and systems of many particles. Topics include first and second laws of thermodynamics, ideal gas laws, kinetic theory, heat engines and refrigerators, thermodynamic potentials, phase transitions, dilute solutions, chemical equilibrium, and basic statistical distributions.

Prerequisite: (PHYSICS 7E or PHYSICS 3C) and MATH 2D

Restriction: Physics Majors only.

**PHYSICS 61A. Modern Physics for Majors. 4 Units.**

Wave-particle duality; Schrödinger equation; angular momentum.

Prerequisite: (PHYSICS 7E or PHYSICS 3C) and MATH 2D

Overlaps with PHYSICS 51A.

Restriction: Physics Majors only.

**PHYSICS 61B. Modern Physics for Majors. 4 Units.**

Atomic transitions; molecules; solids; nuclei; elementary particles; cosmological models.

Prerequisite: PHYSICS 61A or PHYSICS 51A

Overlaps with PHYSICS 51B.

Restriction: Physics Majors only.

**PHYSICS 61C. Introduction to Astrophysics. 4 Units.**

Introduction to fundamental topics in astrophysics, including stellar structure and evolution; stellar remnants; detection and characterization of exoplanets; physics of interstellar gas and star-forming regions.

Prerequisite: PHYSICS 61A or PHYSICS 51A

**PHYSICS H80. Impact of World War I on Science. 4 Units.**

Introduction to science in 1914 and WWI. Participants in groups of two or three will pick a preferred science; find out what happened to it during and after the war; write reports and present what they learned.

Restriction: Campuswide Honors Collegium students only.

**(II)**

**PHYSICS H90. The Idiom and Practice of Science. 4 Units.**

A series of fundamental and applied scientific problems of social relevance. Possible topics include Newton's Law, calculus, earthquake physics, and radiation.

Restriction: Campuswide Honors Collegium students only.

**(II, Va)**

**PHYSICS 99. Current Topics in Physics. 2 Units.**

Designed to introduce undergraduate students to current topics in physics. Focus is discussion of selected readings on current research issues.

Repeatability: Unlimited as topics vary.

**PHYSICS 100. Computational Methods. 4 Units.**

Mathematical and numerical analysis using Mathematica and C programming, as applied to problems in physical science.

Overlaps with PHYSICS 50.

Concurrent with PHYSICS 229A.

**PHYSICS 106W. Advanced Data Acquisition, Analysis, and Scientific Writing. 4 Units.**

Introduces modern practical laboratory techniques for developing data interface devices, acquiring and analyzing data, and writing up results in manuscript format. Experiments include interfacing with instruments through software and hardware development, PID controller, Fourier analysis, and lock-in amplifier.

Prerequisite: PHYSICS 52B and PHYSICS 194

Concurrent with PHYSICS 206 and CHEM 206.

(Ib)

**PHYSICS 111A. Classical Mechanics. 4 Units.**

One-dimensional motion and oscillations; three-dimensional motion, non-inertial coordinates, conservation laws, and Lagrangian and Hamiltonian dynamics; rigid body motion and relativity.

Corequisite: PHYSICS 50

Prerequisite: (PHYSICS 7E or PHYSICS 3C)

**PHYSICS 111B. Classical Mechanics. 4 Units.**

One-dimensional motion and oscillations; three-dimensional motion, non-inertial coordinates, conservation laws, and Lagrangian and Hamiltonian dynamics; rigid body motion and relativity.

Prerequisite: PHYSICS 111A

**PHYSICS 112A. Electromagnetic Theory. 4 Units.**

Electric, magnetic, and gravitational fields and potentials; electrodynamics; mechanical and electromagnetic waves and radiation.

Prerequisite: (PHYSICS 7D or PHYSICS 3B) and PHYSICS 50

**PHYSICS 112B. Electromagnetic Theory. 4 Units.**

Electric, magnetic, and gravitational fields and potentials; electrodynamics; mechanical and electromagnetic waves and radiation.

Prerequisite: PHYSICS 7E and PHYSICS 112A

**PHYSICS 113A. Quantum Physics. 4 Units.**

Inadequacy of classical physics; time independent and time dependent Schrodinger equation; systems in one, two, and three dimensions; matrices; Hermitian operators; symmetries; angular momentum; perturbation theory; scattering theory; applications to atomic structure; emphasis on phenomenology.

Prerequisite: (PHYSICS 51A or PHYSICS 61A) and PHYSICS 50

**PHYSICS 113B. Quantum Physics. 4 Units.**

Inadequacy of classical physics; time independent and time dependent Schrodinger equation; systems in one, two, and three dimensions; matrices; Hermitian operators; symmetries; angular momentum; perturbation theory; scattering theory; applications to atomic structure; emphasis on phenomenology.

Prerequisite: PHYSICS 111B and PHYSICS 112B and PHYSICS 113A

**PHYSICS 113C. Quantum Physics. 4 Units.**

Inadequacy of classical physics; time independent and time dependent Schrodinger equation; systems in one, two, and three dimensions; matrices; Hermitian operators; symmetries; angular momentum; perturbation theory; scattering theory; applications to atomic structure; emphasis on phenomenology.

Prerequisite: PHYSICS 111B and PHYSICS 112B and PHYSICS 113B

**PHYSICS 115A. Statistical Physics. 4 Units.**

Microscopic theory of temperature, heat, and entropy; kinetic theory; multicomponent systems; quantum statistics.

Prerequisite: PHYSICS 50 and (PHYSICS 60 or CHEM 1C or ENGRMAE 91)

**PHYSICS 116. Relativity and Black Holes. 4 Units.**

Introduces students to both special and general relativity; includes the formalism of four-vectors, equivalence principle, curved space-time, and modern issues with black holes.

Prerequisite: PHYSICS 50 and PHYSICS 111A

**PHYSICS 120. Electronics for Scientists. 4 Units.**

Applications of modern semiconductor devices to physical instrumentation. Characteristics of semiconductor devices, integrated circuits, analog and digital circuits. Materials fee.

Prerequisite: PHYSICS 52B

Concurrent with PHYSICS 220.

**PHYSICS 121W. Advanced Laboratory. 4 Units.**

Experiments in atomic, condensed matter, nuclear, particle, and plasma physics. Introduction to instrumentation and a first experience in the research laboratory.

Prerequisite: (PHYSICS 51B or PHYSICS 61B or PHYSICS 61C) and (PHYSICS 52C or PHYSICS 193) and (PHYSICS 194 or EDUC 143BW)

Repeatability: May be taken for credit 3 times.

Restriction: Physics Majors only.

(Ib)

**PHYSICS 125A. Mathematical Physics. 4 Units.**

Complex variables; Legendre and Bessel functions; complete sets of orthogonal functions; partial differential equations; integral equations; calculus of variations; coordinate transformations; special functions and series.

Prerequisite: PHYSICS 50 and MATH 3D

**PHYSICS 125B. Mathematical Physics. 4 Units.**

Complex variables; Legendre and Bessel functions; complete sets of orthogonal functions; partial differential equations; integral equations; calculus of variations; coordinate transformations; special functions and series.

Prerequisite: PHYSICS 125A and PHYSICS 113A

**PHYSICS 133. Introduction to Condensed Matter Physics. 4 Units.**

Phenomena of solids and their interpretation in terms of quantum theory.

Prerequisite: PHYSICS 113B and PHYSICS 115A

**PHYSICS 134A. Physical and Geometrical Optics. 4 Units.**

Focuses on the practical aspects of optics and optical engineering, starting at the fundamentals. Topics include geometrical optics, ray tracing, polarization optics, interferometers, and diffractive optics.

Corequisite: PHYSICS 112B

Prerequisite: PHYSICS 112A

Concurrent with CBEMS 242A and CHEM 242A.

**PHYSICS 135. Plasma Physics. 4 Units.**

Basic concepts, orbits, kinetic and fluid equations, Coulomb collisions, fluctuations, scattering, radiation.

Prerequisite: PHYSICS 112B

Concurrent with PHYSICS 239A.

**PHYSICS 136. Introduction to Particle Physics. 4 Units.**

Experimental techniques and theoretical concepts of high-energy phenomena: accelerators and detectors; classification of particles and interactions; particle properties; symmetries and mass multiplets; production and decay mechanisms.

Prerequisite: PHYSICS 113B

**PHYSICS 137. Introduction to Cosmology. 4 Units.**

Solution of the differential equations governing the expansion of the Universe. Observational determinations of the parameters governing the expansion. Big Bang inflation, primordial nucleosynthesis, and cosmic microwave background. Dark matter, dark energy, and large-scale structure of the Universe.

Prerequisite or corequisite: PHYSICS 111A

**PHYSICS 138. Astrophysics of Galaxies. 4 Units.**

Introduction to the solar neighborhood, Milky Way, and other galaxies. Interstellar medium. Star formation. Stellar populations. Evolution of spiral, elliptical, and irregular galaxies. Supermassive black holes, quasars, and active galaxies. Galaxies as probes of the expansion rate of the Universe.

Prerequisite: PHYSICS 111A and PHYSICS 61C

**PHYSICS 139. Observational Astrophysics. 4 Units.**

Telescopes and astronomical observations, imaging with CCD detectors and image processing techniques. Photometry and spectroscopy of stars, galaxies, and quasars. Advanced imaging techniques such as deconvolution, adaptive optics, and interferometry.

Corequisite: PHYSICS 194

Prerequisite: PHYSICS 52A and PHYSICS 52B and PHYSICS 52C and PHYSICS 53

**PHYSICS 144. Stellar Astrophysics. 4 Units.**

Stars: their structure and evolution; physical state of the interior; the Hertzsprung- Russell diagram, stellar classification, and physical principles responsible for the classification; star formation; nuclear burning; giant and dwarf stars; neutron stars and black holes.

Prerequisite: (PHYSICS 51A or PHYSICS 61A) and PHYSICS 111A and PHYSICS 112A

**PHYSICS 145. High-Energy Astrophysics. 4 Units.**

Production of radiation by high-energy particles, white dwarfs, neutron stars, and black holes. Evolution of galactic nuclei, radio galaxies, quasars, and pulsars. Cosmic rays and the cosmic background radiation.

Prerequisite: (PHYSICS 51A or PHYSICS 61A) and PHYSICS 111A and PHYSICS 112A

**PHYSICS 146A. Biophysics of Molecules and Molecular Machines. 4 Units.**

Physical concepts and experimental and computational techniques used to study the structure and function of biological molecules and molecular machines with examples from enzyme action, protein folding, molecular motors, photobiology, chemotaxis, and vision.

Prerequisite: PHYSICS 115A

Concurrent with PHYSICS 230A.

**PHYSICS 146B. Biophysics of Molecules and Molecular Machines. 4 Units.**

Physical concepts and experimental and computational techniques used to study the structure and function of biological molecules and molecular machines with examples from enzyme action, protein folding, molecular motors, photobiology, chemotaxis, and vision.

Prerequisite: PHYSICS 115A

Concurrent with PHYSICS 230B.

**PHYSICS 147B. Techniques in Medical Imaging I: X-ray, Nuclear, and NMR Imaging. 4 Units.**

Ionizing radiation, planar and tomographic radiographic and nuclear imaging, magnetism, NMR, MRI imaging.

Prerequisite: PHYSICS 147A

Concurrent with PHYSICS 233B and EECS 202B.

**PHYSICS 147C. Techniques in Medical Imaging II: Ultrasound, Electrophysiological, Optical. 4 Units.**

Sound and ultrasound, ultrasonic imaging, physiological electromagnetism, EEG, MEG, ECG, MCG, optical properties of tissues, fluorescence and bioluminescence, MR impedance imaging, MR spectroscopy, electron spin resonance and ESR imaging.

Prerequisite: PHYSICS 147B

Concurrent with PHYSICS 233C and EECS 202C.

**PHYSICS 150. Special Topics in Physics and Astronomy. 4 Units.**

Current topics in physics. Includes topics from nano-science, biological sciences, astrophysics, and the common use of estimation across subdisciplines within physics.

Repeatability: Unlimited as topics vary.

**PHYSICS 191. Field Experience in Physics Education. 1-4 Units.**

Students develop and perform physics assemblies at neighboring public schools.

Prerequisite: PHYSICS 7C and PHYSICS 7D and PHYSICS 7E

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 8 units.

**PHYSICS 192. Tutoring in Physics. 1-2 Units.**

Formalizes the already existing free tutoring for the lower-division physics courses that is provided by the Society of Physics Students (SPS). Includes instructions on tutoring techniques.

Prerequisite: PHYSICS 7E

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 12 units.

Restriction: Society of Physics Students (SPS) tutoring program students only.

**PHYSICS 193. Research Methods. 4 Units.**

Explores tools of inquiry for developing and implementing science research projects. Students undertake independent projects requiring data collection, analysis, and modeling, and the organization and presentation of results. Additional topics include ethical issues and role of scientific literature.

Prerequisite: BIO SCI 14 or PHY SCI 5

Same as BIO SCI 108, CHEM 193.

**PHYSICS 194. Research Communication for Physics Majors. 2 Units.**

Students learn the fundamentals of communicating about research. Topics include preparing abstracts, proposals, and literature reviews. Provides preparation for presentation of independent research projects in PHYSICS 121 and PHYSICS 196.

Prerequisite: PHYSICS 61A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Physics Majors only.

**PHYSICS 195. Undergraduate Research. 4 Units.**

Independent research under the guidance of a Physics faculty member.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Juniors only. Physics Majors only.

**PHYSICS 196A. Thesis in Physics I. 2 Units.**

Independent research for seniors conducted under the guidance of a faculty member. Students' research results are discussed in oral presentations, and a written proposal, progress report, and thesis are submitted.

Corequisite: PHYSICS 194

Overlaps with PHYSICS H196A.

Restriction: Physics Majors only.

**PHYSICS 196B. Thesis in Physics II. 4 Units.**

Independent research for seniors conducted under the guidance of a faculty member. Students' research results are discussed in oral presentations, and a written proposal, progress report, and thesis are submitted.

Prerequisite: PHYSICS 196A

Overlaps with PHYSICS H196B.

Restriction: Physics Majors only.

**PHYSICS 196C. Thesis in Physics III. 4 Units.**

Independent research for seniors conducted under the guidance of a faculty member. Students' research results are discussed in oral presentations, and a written proposal, progress report, and thesis are submitted.

Prerequisite: PHYSICS 196B

Overlaps with PHYSICS H196C.

Restriction: Physics Majors only.

**PHYSICS H196A. Honors Thesis in Physics I. 2 Units.**

Independent research for seniors conducted under the guidance of a faculty member. Students' research results are discussed in oral presentations, and a written proposal, progress report, and thesis are submitted.

Corequisite: PHYSICS 194

Overlaps with PHYSICS 196A.

Restriction: Physics Majors only. Campuswide Honors Collegium students only. Honors Program in Physics students only.

**PHYSICS H196B. Honors Thesis in Physics II. 4 Units.**

Independent research for seniors conducted under the guidance of a faculty member. Students' research results are discussed in oral presentations, and a written proposal, progress report, and thesis are submitted.

Prerequisite: PHYSICS H196A

Overlaps with PHYSICS 196B.

Restriction: Physics Majors only. Campuswide Honors Collegium students only. Honors Program in Physics students only.

**PHYSICS H196C. Honors Thesis in Physics III. 4 Units.**

Independent research for seniors conducted under the guidance of a faculty member. Students' research results are discussed in oral presentations, and a written proposal, progress report, and thesis are submitted.

Prerequisite: PHYSICS H196B

Overlaps with PHYSICS 196C.

Restriction: Physics Majors only. Campuswide Honors Collegium students only. Honors Program in Physics students only.

**PHYSICS 199. Readings on Special Topics. 1-4 Units.**

Readings in selected areas of Physics. Topics addressed vary each quarter.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**PHYSICS 206. Advanced Data Acquisition and Analysis. 4-6 Units.**

Introduces students to a variety of practical laboratory techniques, including lock-in, boxcar, coincidence counting, noise filtering, PID control, properties of common transducers, computer interfacing to instruments, vacuum technology, laboratory safety, basic mechanical design, and shop skills. Materials fee.

Same as CHEM 206.

Concurrent with PHYSICS 106.

**PHYSICS 207. Applied Physical Chemistry. 4 Units.**

Introduction to fundamental concepts in molecular structure and reactivity: theory of bonding, valence and molecular orbitals; structure and reactivity in inorganic chemistry; elements in molecular group theory; nomenclature in organic chemistry; and survey of macromolecules.

Same as CHEM 207.

**PHYSICS 208. Math Methods. 4 Units.**

Applications of mathematics to physical and chemical problems. Calculus of special functions, complex variables and vectors; linear vector spaces and eigenvalue problems. Differential equations.

Same as CHEM 208.

**PHYSICS 211. Classical Mechanics. 4 Units.**

Variational principles, Lagrange's equations; applications to two body problems, small oscillation theory, and other phenomena. Hamilton's equations. Hamilton-Jacobi theory. Canonical transformations.

Restriction: Graduate students only.

**PHYSICS 212A. Mathematical Physics. 4 Units.**

Complex variables and integration; ordinary and partial differential equations; the eigenvalue problem.

Restriction: Graduate students only.

**PHYSICS 213A. Electromagnetic Theory. 4 Units.**

Electrostatics; magnetostatics; relativity; classical electron theory; fields in vacuum and matter; retardation; radiation and absorption; dispersion; propagation of light; diffraction; geometric optics; theories of the electric and magnetic properties of materials; scattering.

**PHYSICS 213B. Electromagnetic Theory. 4 Units.**

Electrostatics; magnetostatics; relativity; classical electron theory; fields in vacuum and matter; retardation; radiation and absorption; dispersion; propagation of light; diffraction; geometric optics; theories of the electric and magnetic properties of materials; scattering.

Prerequisite: PHYSICS 213A

**PHYSICS 214A. Statistical Physics. 4 Units.**

Maxwell-Boltzmann, Bose-Einstein, Fermi-Dirac statistics; ideal and imperfect gases; thermodynamic properties of solids; transport theory.

Restriction: Graduate students only.

**PHYSICS 214C. Many Body Theory. 4 Units.**

Application of field theory methods, perturbative and non-perturbative, to many particle systems; second quantization, Feynman diagrams, linear response theory, and functional integral methods applied to the ground state and at finite temperature.

Prerequisite: PHYSICS 214A and PHYSICS 215A and PHYSICS 215B

Restriction: Graduate students only.

**PHYSICS 215A. Quantum Mechanics. 4 Units.**

Foundations; Dirac notation; basic operators and their eigenstates; perturbation theory; spin.

Restriction: Graduate students only.

**PHYSICS 215B. Quantum Mechanics. 4 Units.**

Atomic physics; scattering theory, formal collision theory; semi-classical radiation theory; many body systems.

Prerequisite: PHYSICS 215A

Restriction: Graduate students only.

**PHYSICS 220. Electronics for Scientists. 4 Units.**

Applications of modern semiconductor devices to physical instrumentation. Characteristics of semiconductor devices, integrated circuits, analog and digital circuits.

Restriction: Graduate students only.

Concurrent with PHYSICS 120.

**PHYSICS 222. Continuum Mechanics. 4 Units.**

Introduction to the continuum limit and stress and strain tensors. Hydrodynamics of perfect fluids; two-dimensional problems, motion of incompressible viscous fluids, Navier Stokes equations. Basic elasticity theory. Description of viscoelastic materials. Introduction to nonlinear behavior instabilities.

**PHYSICS 223. Numerical Methods. 4 Units.**

Introduction to theory and practice of modern numerical methods. Techniques are drawn from topics such as solution of differential equations, Monte Carlo methods, Fast Fourier transforms, and evaluation of special functions.

**PHYSICS 228. Electromagnetism. 4 Units.**

Maxwell's equations, electrodynamics, electromagnetic waves and radiation, wave propagation in media, interference and quantum optics, coherent and incoherent radiation, with practical applications in interferometry, lasers, waveguides, and optical instrumentation.

Same as CHEM 228.



**PHYSICS 229A. Computational Methods. 4 Units.**

Mathematical and numerical analysis using Mathematica and C programming, as applied to problems in physical science.

Same as CHEM 229A.

Concurrent with PHYSICS 100.

**PHYSICS 230A. Biophysics of Molecules and Molecular Machines. 4 Units.**

Physical concepts and experimental and computational techniques used to study the structure and function of biological molecules and molecular machines with examples from enzyme action, protein folding, molecular motors, photobiology, chemotaxis, and vision.

Concurrent with PHYSICS 146A.

**PHYSICS 230B. Biophysics of Molecules and Molecular Machines. 4 Units.**

Physical concepts and experimental and computational techniques used to study the structure and function of biological molecules and molecular machines with examples from enzyme action, protein folding, molecular motors, photobiology, chemotaxis, and vision.

Concurrent with PHYSICS 146B.

**PHYSICS 233A. Principles of Imaging. 4 Units.**

Linear systems, probability and random processes, image processing, projecting imaging, tomographic imaging.

Same as EECS 202A.

Restriction: Graduate students only.

Concurrent with PHYSICS 147A.

**PHYSICS 233B. Techniques in Medical Imaging I: X-ray, Nuclear, and NMR Imaging. 4 Units.**

Ionizing radiation, planar and tomographic radiographic and nuclear imaging, magnetism, NMR, MRI imaging.

Prerequisite: EECS 202A

Same as EECS 202B.

Restriction: Graduate students only.

Concurrent with PHYSICS 147B.

**PHYSICS 233C. Techniques in Medical Imaging II: Ultrasound, Electrophysiological, Optical. 4 Units.**

Sound and ultrasound, ultrasonic imaging, physiological electromagnetism, EEG, MEG, ECG, MCG, optical properties of tissues, fluorescence and bioluminescence, MR impedance imaging, MR spectroscopy, electron spin resonance and ESR imaging.

Prerequisite: EECS 202B

Same as EECS 202C.

Restriction: Graduate students only.

Concurrent with PHYSICS 147C.

**PHYSICS 234A. Elementary Particle Physics. 4 Units.**

Overview of Standard Model theory and phenomenology. Electromagnetic, strong and weak forces, quark model, interactions with matter, particle detectors and accelerators.

Prerequisite: PHYSICS 215B

**PHYSICS 234B. Advanced Elementary Particle Physics. 4 Units.**

$SU(3) \times SU(2) \times U(1)$  model of strong, weak, and electromagnetic interactions. K-meson system and CP violation, neutrino masses and mixing, grand-unified theories, supersymmetry, introduction to cosmology and its connection to particle physics.

Prerequisite: PHYSICS 234A and PHYSICS 235A

**PHYSICS 234C. Advanced Elementary Particle Physics. 4 Units.**

$SU(3) \times SU(2) \times U(1)$  model of strong, weak, and electromagnetic interactions. K-meson system and CP violation, neutrino masses and mixing, grand-unified theories, supersymmetry, introduction to cosmology and its connection to particle physics.

Prerequisite: PHYSICS 234A and PHYSICS 235A

**PHYSICS 235A. Quantum Field Theory. 4 Units.**

Canonical quantization, scalar field theory, Feynman diagrams, tree-level quantum electrodynamics.

Prerequisite: PHYSICS 215B

Restriction: Graduate students only.

**PHYSICS 235B. Advanced Quantum Field Theory. 4 Units.**

Pathintegral techniques, loop diagrams, regularization and renormalization, anomalies.

Prerequisite: PHYSICS 235A

Restriction: Graduate students only.

**PHYSICS 238A. Condensed Matter Physics. 4 Units.**

Bonding in solids; crystal symmetry and group theory, elastic properties of crystals; lattice vibrations, interaction of radiation with matter; cohesion of solids; the electron gas; electron energy bands in solids; ferromagnetism; transport theory; semiconductors and superconductors; many-body perturbation theory.

Prerequisite: PHYSICS 133 and (PHYSICS 214A or CHEM 232A) and (PHYSICS 215B or CHEM 231B)

**PHYSICS 238B. Condensed Matter Physics. 4 Units.**

Bonding in solids; crystal symmetry and group theory, elastic properties of crystals; lattice vibrations, interaction of radiation with matter; cohesion of solids; the electron gas; electron energy bands in solids; ferromagnetism; transport theory; semiconductors and superconductors; many-body perturbation theory.

Prerequisite: PHYSICS 238A

**PHYSICS 238C. Condensed Matter Physics. 4 Units.**

Bonding in solids; crystal symmetry and group theory, elastic properties of crystals; lattice vibrations, interaction of radiation with matter; cohesion of solids; the electron gas; electron energy bands in solids; ferromagnetism; transport theory; semiconductors and superconductors; many-body perturbation theory.

Prerequisite: PHYSICS 238B

**PHYSICS 239A. Plasma Physics. 4 Units.**

Basic concepts, orbits, kinetic and fluid equations, Coulomb collisions, fluctuations, scattering, radiation.

Restriction: Graduate students only.

Concurrent with PHYSICS 135.

**PHYSICS 239B. Plasma Physics. 4 Units.**

Magnetic confinement, MHD equilibrium and stability, collisional transport.

Prerequisite: PHYSICS 239A

Restriction: Graduate students only.

**PHYSICS 239C. Plasma Physics. 4 Units.**

Linear waves and instabilities, uniform un-magnetized and magnetized plasmas, non-uniform plasmas.

Prerequisite: PHYSICS 239B

Restriction: Graduate students only.

**PHYSICS 240A. Galactic Astrophysics. 4 Units.**

The morphology, kinematics, and evolution of our Milky Way and other galaxies. Topics include stellar formation and stellar evolution, end states of stars (supernovae, neutron stars), the distribution of stars, interstellar gas and mass in galaxies. The Local Group.

**PHYSICS 240B. Cosmology. 4 Units.**

An introduction to modern cosmology set within the context of general relativity. Topics include the expansion history of the Universe, inflation, the cosmic microwave background, density fluctuations, structure formation, dark matter, dark energy, and gravitational lensing.

**PHYSICS 240C. Radiative Processes in Astrophysics. 4 Units.**

Exploration of radiation mechanisms (electron scattering, synchrotron emission, collisional excitation, and more) and radiative transfer through matter including absorption and emission. Includes such observational astrophysics topics as spectroscopic study of atoms and nuclei, X-rays, and cosmic rays.

**PHYSICS 241A. Solar System and Extrasolar Planets. 4 Units.**

Formation, evolution, and habitability of planetary systems. Observational and theoretical study of the origin and evolution of the Solar System, present day dynamical state of the Solar System (asteroids, Kuiper Belt Objects, Oort cloud), planetary atmospheres, processes governing planetary climate.

Corequisite: PHYSICS 242

Restriction: Graduate students only.

**PHYSICS 241B. Stellar Astrophysics. 4 Units.**

Physics of stellar interiors and equations of stellar structure. Stellar atmospheres and absorption processes. Introduction to stellar winds. Thermonuclear reactions, nucleosynthesis, and solar neutrinos. Binary stars and mass accretion. White dwarfs, supernovae, neutron stars, and black holes.

Prerequisite: PHYSICS 211 and PHYSICS 240A

**PHYSICS 241C. Extragalactic Astrophysics. 4 Units.**

The physics and phenomenology of galaxies; star formation, interstellar medium, and intergalactic medium. Galaxy structure and dynamics. Galaxy evolution, stellar populations, and scaling relations; the relationship between galaxy properties and environment. Galaxy clusters and active galactic nuclei.

Prerequisite: PHYSICS 211 and PHYSICS 240A

**PHYSICS 241D. Early Universe Physics. 4 Units.**

Includes a thorough quantum treatment of the generation of perturbations during inflation and various topics related to kinetic theory in an expanding Universe. Other topics include the astrophysics and cosmology of weakly interacting particles.

Prerequisite: PHYSICS 234A and (PHYSICS 240B or PHYSICS 255)

**PHYSICS 242. Astro Fundamentals. 4 Units.**

Introduction to topics in astrophysics including measurement of stellar properties, stellar structure and evolution, stellar remnants and supernovae, the interstellar medium, exoplanets, gravitational lensing, galactic structure, extragalactic distance measurements, and the expanding universe.

Restriction: Graduate students only.

**PHYSICS 246. Special Topics in Astrophysics. 4 Units.**

Outlines and emphasizes a subarea of astrophysics that is undergoing rapid development.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 247. Special Topics in Particle Physics. 4 Units.**

Current topics in particle non-accelerator-based research fields.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 248. Special Topics in Condensed Matter Physics. 4 Units.**

Outlines and emphasizes a subarea of condensed matter physics that is undergoing rapid development.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PHYSICS 249. Special Topics in Plasma Physics. 4 Units.**

Outlines and emphasizes a subarea of plasma physics that is undergoing rapid development.

Prerequisite: PHYSICS 239A and PHYSICS 239B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PHYSICS 250. Physics and Astronomy Communications Skills. 4 Units.**

Fundamentals of effectively communicating research through written and oral platforms. Topics include writing compelling proposals and journal articles for peer review, and the development of engaging oral presentations of science results and significance to a wide range of audiences.

Restriction: Graduate students only.

**PHYSICS 255. General Relativity. 4 Units.**

An introduction to Einstein's theory of gravitation. Tensor analysis, Einstein's field equations, astronomical tests of Einstein's theory, gravitational waves.

**PHYSICS 260A. Seminar in Condensed Matter Physics. 1 Unit.**

Seminar designed to acquaint students with recent advances in solid state physics. Lecturers from the Department of Physics and Astronomy (both faculty and graduate students), other UCI departments, and other institutions.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 260B. Seminar in Condensed Matter Physics. 1 Unit.**

Seminar designed to acquaint students with recent advances in solid state physics. Lecturers from the Department of Physics and Astronomy (both faculty and graduate students), other UCI departments, and other institutions.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 260C. Seminar in Condensed Matter Physics. 1 Unit.**

Seminar designed to acquaint students with recent advances in solid state physics. Lecturers from the Department of Physics and Astronomy (both faculty and graduate students), other UCI departments, and other institutions.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 261A. Seminar in Plasma Physics. 1 Unit.**

Advanced topics in plasma physics: wave propagation, nonlinear effects, kinetic theory and turbulence, stability problems, transport coefficients, containment, and diagnostics. Applications to controlled fusion and astrophysics.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**PHYSICS 261B. Seminar in Plasma Physics. 1 Unit.**

Advanced topics in plasma physics: wave propagation, nonlinear effects, kinetic theory and turbulence, stability problems, transport coefficients, containment, and diagnostics. Applications to controlled fusion and astrophysics.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**PHYSICS 261C. Seminar in Plasma Physics. 1 Unit.**

Advanced topics in plasma physics: wave propagation, nonlinear effects, kinetic theory and turbulence, stability problems, transport coefficients, containment, and diagnostics. Applications to controlled fusion and astrophysics.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**PHYSICS 263A. Seminar in Particle Physics. 1 Unit.**

Discussion of advanced topics and reports of current research results in theoretical and experimental particle physics and cosmic rays.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 263B. Seminar in Particle Physics. 1 Unit.**

Discussion of advanced topics and reports of current research results in theoretical and experimental particle physics and cosmic rays.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 263C. Seminar in Particle Physics. 1 Unit.**

Discussion of advanced topics and reports of current research results in theoretical and experimental particle physics and cosmic rays.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 265A. Seminar in Astrophysics. 1 Unit.**

Acquaints students with current research in astrophysics. Lecturers from the Department of Physics and Astronomy and from other institutions.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 265B. Seminar in Astrophysics. 1 Unit.**

Acquaints students with current research in astrophysics. Lecturers from the Department of Physics and Astronomy and from other institutions.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 265C. Seminar in Astrophysics. 1 Unit.**

Acquaints students with current research in astrophysics. Lecturers from the Department of Physics and Astronomy and from other institutions.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 266. Current Topics in Chemical, Applied, and Materials Physics. 1 Unit.**

The subjects covered vary from year to year. Connection between fundamental principles and implementations in practice in science, industry, and technology.

Repeatability: May be repeated for credit unlimited times.

Same as CHEM 266.

**PHYSICS 267B. Current Problems in Particle Physics. 4 Units.**

Presentation and discussion of current research and theory in particle physics. Lectures given by staff and students.

Repeatability: May be repeated for credit unlimited times.

**PHYSICS 267C. Current Problems in Particle Physics. 4 Units.**

Presentation and discussion of current research and theory in particle physics. Lectures given by staff and students.

Repeatability: May be repeated for credit unlimited times.

**PHYSICS 268. Seminar in Systems Microbiology Research. 1 Unit.**

A research and journal club seminar that covers topics on bacteria and phage using approaches and principles from biology, engineering, and physics.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Same as MOL BIO 268, ENGRMSE 267.

Restriction: Upper-division students only. Graduate students only.

**PHYSICS 269. Seminar in Teaching Physics. 2 Units.**

Techniques for effective teaching. Covers active listening and student engagement, problem-solving skills, peer instruction and collaborative learning, and evaluation. Required of all new Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

**PHYSICS 273. Technical Communication Skills. 2 Units.**

Development of effective communication skills, oral and written presentations, through examples and practice.

Grading Option: Satisfactory/unsatisfactory only.

Same as CHEM 273.

**PHYSICS 291. Research Seminar. 1-4 Units.**

Detailed discussion of research problems of current interest in the Department. Format, content, and frequency of the course are variable.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 295. Experimental Research. 4-12 Units.**

With the approval of a faculty member, a student may pursue a research program in experimental physics. Typical areas include astrophysics, condensed matter physics, elementary particle physics, and plasma physics.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Physical Sciences students only.

**PHYSICS 296. Theoretical Research. 4-12 Units.**

With approval of a faculty member, a student may pursue a research program in theoretical physics. Typical areas include astrophysics, condensed matter physics, elementary particle physics, and plasma physics.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Physical Sciences students only.

**PHYSICS 298. Physics Colloquium. 1 Unit.**

Seminar held each week, in which a current research topic is explored. Frequently, off-campus researchers are invited to present the seminar, and on occasion a faculty member or researcher from the Department will speak.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: School of Physical Sciences students only.

**PHYSICS 299. Reading of Special Topic. 4-12 Units.**

With special consent from a faculty member who will agree to supervise the program, a student may receive course credit for individual study of some area of physics.

Restriction: Graduate students only.

**PHYSICS 395. Laboratory Teaching. 1 Unit.**

Required of and limited to teaching assistants of undergraduate laboratory courses. Designed to teach the necessary skills required of teaching assistants for these courses.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PHYSICS 399. University Teaching. 1-4 Units.**

Required of and limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Department of Chemistry

**Douglas J. Tobias, Department Chair**

1120 Natural Sciences II

949-824-6018

<http://www.chem.uci.edu/>

Chemistry is the science of molecules and materials. Chemistry plays a role in virtually all facets of life: whether you are interested in solar cells, medicines, food, personal care products, the atmosphere, minerals, your body, or even the origin of your own emotions, there is chemistry behind it. The Department of Chemistry at UCI is home to world-class faculty who engage in cutting edge research in diverse areas of chemistry, from atmospheric chemistry, to the biochemistry of cancer, to the development of new solar cell materials.

This broad perspective is also reflected in the courses offered through the Department of Chemistry, which range from general chemistry, to organic chemistry, to advanced topics such as molecular spectroscopy, nuclear chemistry, and chemical biology. On the undergraduate level, the Department offers various concentrations and tracks to majors, including programs in computational chemistry, biochemistry, chemical physics, synthesis, and chemistry education. Similarly, the Chemistry Graduate Program offers degrees and courses in all major sub-disciplines of chemistry including atmospheric chemistry, chemical biology, inorganic chemistry, organic chemistry, physical chemistry, and theoretical chemistry.

- Chemistry, B.S.
- Chemistry, Ph.D.

## Faculty

Ioan Andricioaei, Ph.D. Boston University, *Professor of Chemistry; Physics and Astronomy* (chemical biology, physical chemistry and chemical physics, theoretical and computational)

Ara Apkarian, Ph.D. Northwestern University, *UCI Distinguished Professor of Chemistry* (physical chemistry and chemical physics)

Ramesh D. Arasasingham, Ph.D. University of California, Davis, *Professor of Teaching of Chemistry* (chemical education and inorganic chemistry)

Shane Ardo, Ph.D. Johns Hopkins University, *Associate Professor of Chemistry; Chemical and Biomolecular Engineering; Materials Science and Engineering* (inorganic and organometallic, physical chemistry and chemical physics, polymer, materials, nanoscience)

Plamen Atanassov, Ph.D. Bulgarian Academy of Sciences, *UCI Chancellor's Professor of Chemical and Biomolecular Engineering; Chemistry; Materials Science and Engineering* (electrocatalysis and electrocatalysts for energy conversion processes; bio-electrocatalysis and energy harvesting systems)

Elizabeth Bess, Ph.D. University of Utah, *Assistant Professor of Chemistry* (chemical biology)

Donald R. Blake, Ph.D. University of California, Irvine, *UCI Distinguished Professor of Chemistry* (analytical, atmospheric, environmental)

Suzanne A. Blum, Ph.D. University of California, Berkeley, *Professor of Chemistry; Chemistry* (inorganic and organometallic, organic and synthetic, physical chemistry and chemical physics, polymer, materials, nanoscience)

Andrew Borovik, Ph.D. University of North Carolina at Chapel Hill, *Professor of Chemistry* (chemical biology, inorganic and organometallic, organic and synthetic)



David A. Brant, Ph.D. University of Wisconsin-Madison, *Professor Emeritus of Chemistry* (biophysical)

Kieron Burke, Ph.D. University of California, Santa Barbara, *Professor of Chemistry; Physics and Astronomy* (physical chemistry and chemical physics, theoretical and computational)

Ann Marie Carlton, Ph.D. Rutgers University, *Associate Professor of Chemistry* (atmospheric and environmental, physical chemistry and chemical physics, theoretical and computational)

A. Richard Chamberlin, Ph.D. University of California, San Diego, *Department Chair and Professor Emeritus of Pharmaceutical Sciences; Chemistry* (chemical biology, organic and synthetic)

John Charles Chaput, Ph.D. University of California, Riverside, *Professor of Pharmaceutical Sciences; Chemistry; Molecular Biology and Biochemistry* (chemical and synthetic biology)

Robert Corn, Ph.D. University of California, Berkeley, *UCI Distinguished Professor of Chemistry; Biomedical Engineering* (analytical, chemical biology, physical chemistry and chemical physics, polymer, materials, nanoscience)

Robert J. Doedens, Ph.D. University of Wisconsin-Madison, *Professor Emeritus of Chemistry* (inorganic and organometallic)

Vy M. Dong, Ph.D. California Institute of Technology, *Professor of Chemistry* (organic and synthetic)

Kimberly D. Edwards, Ph.D. University of California, Irvine, *Department Vice Chair and Professor of Teaching of Chemistry* (general chemistry, chemical education)

William J. Evans, Ph.D. University of California, Los Angeles, *UCI Distinguished Professor of Chemistry* (inorganic and organometallic)

Celia Faiola, Ph.D. Washington State University, *Assistant Professor of Ecology and Evolutionary Biology; Chemistry*

Sarah Finkeldei, Ph.D. RWTH Aachen University, *Assistant Professor of Chemistry; Materials Science and Engineering* (nuclear chemistry)

Barbara J. Finlayson-Pitts, Ph.D. University of California, Riverside, *Director of AirUCI and UCI Distinguished Professor of Chemistry* (analytical, atmospheric and environmental, physical chemistry and chemical physics)

Fillmore Freeman, Ph.D. Michigan State University, *Professor of Chemistry* (organic and synthetic, theoretical and computational)

Filipp Furche, Ph.D. University of Karlsruhe, *Professor of Chemistry* (physical chemistry and chemical physics, theoretical and computational)

Nien-Hui Ge, Ph.D. University of California, Berkeley, *Professor of Chemistry* (analytical, chemical biology, physical chemistry and chemical physics, polymer, materials, nanoscience)

Robert B. Gerber, Ph.D. Oxford University, *Professor Emeritus of Chemistry* (atmospheric and environmental, physical chemistry and chemical physics, theoretical and computational)

Alon A. Gorodetsky, Ph.D. California Institute of Technology, *Associate Professor of Chemical and Biomolecular Engineering; Chemistry; Materials Science and Engineering* (cephalopods, adaptive materials, camouflage, bioelectronics)

Michael T. Green, Ph.D. University of Chicago, *Professor of Molecular Biology and Biochemistry; Chemistry* (chemical, biology, inorganic and organometallic, physical chemistry and chemical physics, theoretical and computational)

Zhibin Guan, Ph.D. University of North Carolina at Chapel Hill, *Professor of Chemistry; Biomedical Engineering; Chemical and Biomolecular Engineering; Materials Science and Engineering* (chemical biology, organic and synthetic, polymer, materials, nanoscience)

Stephen Hanessian, Ph.D. Ohio State University, *Professor of Pharmaceutical Sciences; Chemistry* (organic chemistry, medicinal chemistry)

John C. Hemminger, Ph.D. Harvard University, *UCI Distinguished Professor of Chemistry* (analytical, atmospheric and environmental, physical chemistry and chemical physics, polymer, materials, nanoscience)

Alan F. Heyduk, Ph.D. Massachusetts Institute of Technology, *Department Vice Chair and Professor of Chemistry* (inorganic and organometallic)

Wilson Ho, Ph.D. University of Pennsylvania, *Donald Bren Professor and Professor of Physics and Astronomy; Chemistry*

Allon Hochbaum, Ph.D. University of California, Berkeley, *Associate Professor of Materials Science and Engineering; Chemical and Biomolecular Engineering; Chemistry* (nanoscale materials and hybrid bio-inorganic devices for applications in clean energy)

Amanda J. Holton, Ph.D. University of California, Irvine, *Associate Professor of Teaching of Chemistry* (chemistry, chemical education)

Kenneth C. Janda, Ph.D. Harvard University, *Professor Emeritus of Chemistry* (physical chemistry and chemical physics)

Elizabeth R. Jarvo, Ph.D. Boston College, *Professor of Chemistry* (inorganic and organometallic, organic and synthetic)

Susan M. King, Ph.D. Massachusetts Institute of Technology, *Professor of Teaching of Chemistry* (organic chemistry, chemical education)

Matthew Law, Ph.D. University of California, Berkeley, *Associate Professor of Chemistry; Chemical and Biomolecular Engineering; Materials Science and Engineering* (inorganic and organometallic, physical chemistry and chemical physics, polymer, materials, nanoscience)

Renee Link, Ph.D. University of California, Irvine, *Associate Professor of Teaching of Chemistry* (organic chemistry, chemical education)

Chang C. Liu, Ph.D. Scripps Research Institute, *Assistant Professor of Biomedical Engineering; Chemistry; Molecular Biology and Biochemistry* (genetic engineering, directed evolution, synthetic biology, chemical biology)

Andrej Luptak, Ph.D. Yale University, *Professor of Pharmaceutical Sciences; Chemistry; Molecular Biology and Biochemistry* (chemical biology)

Vladimir A. Mandelshtam, Ph.D. Russian Academy of Sciences, *Professor of Chemistry* (physical chemistry and chemical physics, theoretical and computational)

Stephen Mang, Ph.D. University of California, Irvine, *Assistant Professor of Teaching of Chemistry* (chemical education, advanced laboratories)

Craig C. Martens, Ph.D. Cornell University, *Professor of Chemistry* (physical chemistry and chemical physics, polymer, materials, nanoscience, theoretical and computational)

Rachel Martin, Ph.D. Yale University, *Department Vice Chair and Professor of Chemistry; Molecular Biology and Biochemistry* (analytical, chemical biology, physical chemistry and chemical physics)

George E. Miller, Ph.D. Oxford University, *Professor of Teaching Emeritus of Chemistry* (analytical and radioanalytical chemistry and chemical education)

David L. Mobley, Ph.D. University of California, Davis, *Vice Chair and Professor of Pharmaceutical Sciences; Chemistry* (chemical biology, physical chemistry and chemical physics, theoretical and computational)

Shaul Mukamel, Ph.D. Tel Aviv University, *UCI Distinguished Professor of Chemistry; Physics and Astronomy* (physical chemistry and chemical physics, polymer, materials, nanoscience, theoretical and computational)

Craig Murray, Ph.D. University of Edinburgh, *Associate Professor of Chemistry* (atmospheric and environmental, physical chemistry and chemical physics)

Sergey Nizkorodov, Ph.D. University of Basel, *Co-Director, AirUCI and Department Vice Chair and Professor of Chemistry* (analytical, atmospheric and environmental, physical chemistry and chemical physics)

James S. Nowick, Ph.D. Massachusetts Institute of Technology, *Professor of Chemistry; Pharmaceutical Sciences* (chemical biology, organic and synthetic, polymer, materials, nanoscience)

Larry E. Overman, Ph.D. University of Wisconsin-Madison, *UCI Distinguished Professor of Chemistry* (inorganic and organometallic, organic and synthetic)

Joseph Patterson, Ph.D. University of Warwick, *Assistant Professor of Chemistry; Materials Science and Engineering* (polymer, materials, nanoscience)

Reginald M. Penner, Ph.D. Texas A&M University, *UCI Chancellor's Professor of Chemistry* (analytical, physical chemistry and chemical physics, polymer, materials, nanoscience)

Eric Potma, Ph.D. University of Groningen, *Professor of Chemistry; Electrical Engineering and Computer Science* (analytical, chemical biology, physical chemistry and chemical physics)

Thomas L. Poulos, Ph.D. University of California, San Diego, *Distinguished Professor of Molecular Biology and Biochemistry; Chemistry; Pharmaceutical Sciences* (chemical biology)

Jennifer A. Prescher, Ph.D. University of California, Berkeley, *Professor of Chemistry; Molecular Biology and Biochemistry; Pharmaceutical Sciences* (chemical biology, organic and synthetic)

Sergey V. Pronin, Ph.D. University of Chicago, *Assistant Professor of Chemistry* (organic and synthetic chemistry)

Markus W. Ribbe, Ph.D. University of Bayreuth, *UCI Chancellor's Professor of Molecular Biology and Biochemistry; Chemistry* (chemical biology, inorganic and organometallic)

Scott D. Rychnovsky, Ph.D. Columbia University, *UCI Distinguished Professor of Chemistry* (chemical biology, organic and synthetic)

Eric S. Saltzman, Ph.D. University of Miami, *UCI Distinguished Professor of Earth System Science; Chemistry*

A. J. Shaka, Ph.D. Oxford University, *Professor of Chemistry* (chemical biology, physical chemistry and chemical physics)

Kenneth J. Shea, Ph.D. Pennsylvania State University, *Distinguished Professor of Chemistry* (analytical, chemical biology, organic and synthetic, polymer, materials, nanoscience)

Manabu Shiraiwa, Ph.D. Max Planck Institute for Chemistry, *Associate Professor of Chemistry* (atmospheric and environmental, chemical biology, physical chemistry and chemical physics, theoretical and computational)

Zuzanna S. Siwy, Ph.D. Silesian University of Technology, *Professor of Physics and Astronomy; Biomedical Engineering; Chemistry*

James N. Smith, Ph.D. California Institute of Technology, *Professor of Chemistry* (analytical, atmospheric and environmental, physical chemistry and chemical physics)

Robert Spitale, Ph.D. University of Rochester, *Director of the UCI Transcriptomics Core and Associate Professor of Pharmaceutical Sciences; Chemistry; Molecular Biology and Biochemistry* (chemistry, chemical biology, RNA biology)

Douglas J. Tobias, Ph.D. Carnegie Mellon University, *Department Chair and Professor of Chemistry* (atmospheric and environmental, chemical biology, physical chemistry and chemical physics, theoretical and computational)

Shiou-Chuan (Sheryl) Tsai, Ph.D. University of California, Berkeley, *Professor of Molecular Biology and Biochemistry; Chemistry; Pharmaceutical Sciences*

Christopher Vanderwal, Ph.D. Scripps Research Institute, *Professor of Chemistry; Pharmaceutical Sciences* (organic and synthetic)

David Van Vranken, Ph.D. Stanford University, *Associate Dean of the School of Physical Sciences and Professor of Chemistry* (organic and synthetic)

Gregory A. Weiss, Ph.D. Harvard University, *Professor of Chemistry; Molecular Biology and Biochemistry; Pharmaceutical Sciences* (analytical, chemical biology, organic and synthetic, polymer, materials, nanoscience)

Jenny Y. Yang, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Chemistry* (inorganic and organometallic, organic and synthetic, polymer, materials, nanoscience)

## Courses

### **CHEM 1A. General Chemistry. 4 Units.**

General chemistry with applications to life sciences, physical sciences, and engineering. Atomic structure; general properties of the elements; covalent, ionic, and metallic bonding; mass relationships.

Prerequisite or corequisite: MATH 5A or MATH 2A or PHYS 7C or CHEM 1X or CHEM 1P or SAT Mathematics or ACT Mathematics or SAT Subject Chemistry or AP Chemistry or AP Calculus AB or AP Calculus BC. CHEM 1P with a grade of C- or better. SAT Mathematics with a minimum score of 600. ACT Mathematics with a minimum score of 27. SAT Subject Chemistry with a minimum score of 700. AP Chemistry with a minimum score of 3. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 3

Overlaps with CHEM H2A, ENGR 1A, CHEM M2A.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

**(II and VA ).**

### **CHEM 1B. General Chemistry. 4 Units.**

General chemistry with applications to life sciences, physical sciences, and engineering. Properties of gases, liquids, solids; intermolecular forces; changes of state; properties of solutions; stoichiometry; thermochemistry; and thermodynamics. Course may be offered online.

Prerequisite: CHEM 1A or ENGR 1A or CHEM H2A or AP Chemistry or CHEM M2A. CHEM 1A with a grade of C- or better. ENGR 1A with a grade of C- or better. CHEM H2A with a grade of C- or better. AP Chemistry with a minimum score of 4. CHEM M2A with a grade of C- or better

Overlaps with CHEM H2B.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

**(II and Va ).**

**CHEM 1C. General Chemistry . 4 Units.**

General chemistry with applications to life sciences, physical sciences, and engineering. Equilibria, aqueous acid-base equilibria, solubility equilibria, oxidation reduction reactions, electrochemistry; kinetics; special topics.

Corequisite: CHEM 1LC

Prerequisite: CHEM 1B. CHEM 1B with a grade of C- or better

Overlaps with CHEM H2C.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

(II and VA ).

**CHEM 1LA. General Chemistry Laboratory. 2 Units.**

Training and experience in basic laboratory techniques through experiments related to lecture topics in Chemistry 1A. Materials fee.

Corequisite: CHEM 1A

Overlaps with CHEM H2LA.

**CHEM 1LC. General Chemistry Laboratory. 3 Units.**

Training and experience in basic laboratory techniques. Chemical practice and principles illustrated through experiments related to lecture topics of CHEM 1A-B-C. Materials fee.

Corequisite: CHEM 1C

Prerequisite: CHEM 1B. CHEM 1B with a grade of C- or better

Overlaps with CHEM 1LE, CHEM H2LB, CHEM M2LB.

Restriction: Div of Undergraduate Education students have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Nursing Science Majors have first consideration for enrollment. Pharmaceutical Sciences Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment.

**CHEM 1LD. General Chemistry Laboratory. 3 Units.**

Training and experience in basic laboratory techniques. Chemical practice and principles illustrated through experiments related to lecture topics in CHEM 1A-B-C. Materials fee.

Prerequisite: (CHEM 1C and CHEM 1LC) or CHEM 1LE. CHEM 1C with a grade of C- or better. CHEM 1LC with a grade of C- or better. CHEM 1LE with a grade of C- or better

Overlaps with CHEM H2LB, CHEM M2LB.

Restriction: School of Biological Sciences students only. School of Physical Sciences students only. School of Engineering students only. Program in Nursing Science students only. Pharmaceutical Sciences Majors only. Public Health Sciences Majors only. No credit for CHEM M2LA if taken after CHEM 1LD. Undecided/Undeclared students also have first consideration for enrollment.

**CHEM 1LE. Accelerated General Chemistry Lab. 3 Units.**

Lecture and experiments covering chemical concepts for accelerated students who do not plan to take organic chemistry. Properties of gases, liquids, solutions, and solids; chemical equilibrium and chemical thermodynamics; atomic and molecular structure; chemical kinetics; electrochemistry. Materials fee.

Prerequisite or corequisite: CHEM 1A or ENGR 1A or AP Chemistry. AP Chemistry with a minimum score of 3

Overlaps with CHEM 1LC.

Restriction: School of Engineering students have first consideration for enrollment. Biomedical Computing Majors have first consideration for enrollment.

**CHEM 1P. Preparation for General Chemistry . 4 Units.**

Units of measurement, dimensional analysis, significant figures; elementary concepts of volume, mass, force, pressure, energy, density, temperature, heat, work; fundamentals of atomic and molecular structure; the mole concept, stoichiometry; properties of the states of matter; gas laws; solutions concentrations.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Biomedical Computing Majors have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

**CHEM 1X. General Chemistry Plus. 2 Units.**

Units of chemical measurements, dimensional analysis, significant figures; elementary physicochemical concepts; fundamentals of atomic and molecular structure; molar amounts and stoichiometry; properties of the states of matter; solutions concentrations.

Prerequisite: Students who meet the requirements for taking Chem 1A through their SAT, ACT, or AP test scores are not eligible for enrollment in Chem 1X. Specifically, the students must have ALL of the following advisory prerequisites (the inverse of the Chem 1A prerequisites): S02<600 (score below 600 on the SAT Mathematics Reasoning test) A02<27 (score below 27 on the ACT Mathematics test) Z43<700 (score below 700 on the SAT Chemistry subject exam) AP25<3 (score below 3 on the AP Chemistry exam) AP66<4 (score below 4 on the AP Calculus AB Exam) AP68<3 (score below 3 on the AP Calculus BC Exam) Students who meet Chem 1A eligibility through ALEKS-based training are permitted to enroll in Chem 1X. Chem 1X is open to interested BioEASE students.

Grading Option: Pass/no pass only.

**CHEM H2A. Honors General Chemistry. 4 Units.**

Covers the same material as CHEM 1A-CHEM 1B-CHEM M3C but in greater depth. Additional topics will also be included as time permits.

Corequisite: CHEM H2LA

Prerequisite: AP Chemistry or SAT Subject Chemistry. AP Chemistry with a minimum score of 4. SAT Subject Chemistry with a minimum score of 700

Overlaps with CHEM 1A.

Restriction: Campuswide Honors Collegium students only.

**(II and Va ).**

**CHEM H2B. Honors General Chemistry. 4 Units.**

Covers the same material as CHEM 1A-CHEM 1B-CHEM M3C but in greater depth. Additional topics are also included as time permits.

Corequisite: CHEM H2LB

Prerequisite: CHEM H2A and (CHEM H2LA or CHEM M2LA). CHEM H2A with a grade of C- or better. CHEM H2LA with a grade of C- or better. CHEM M2LA with a grade of C- or better

Overlaps with CHEM 1B.

Restriction: Campuswide Honors Collegium students only.

**(II and VA ).**

**CHEM H2C. Honors General Chemistry. 4 Units.**

Covers the same material as CHEM 1A-CHEM 1B-CHEM M3C but in greater depth. Additional topics are also included as time permits.

Prerequisite: CHEM H2B and (CHEM H2LB or CHEM M2LB). CHEM H2B with a grade of C- or better. CHEM H2LB with a grade of C- or better. CHEM M2LB with a grade of C- or better

Overlaps with CHEM 1C.

Restriction: Campuswide Honors Collegium students only.

**(II and VA ).**

**CHEM H2LA. Honors General Chemistry Laboratory. 3 Units.**

Training and experience in fundamental and analytical laboratory techniques through experiments related to lecture topics in CHEM H2A-CHEM H2B-CHEM H2C. Materials fee.

Corequisite: CHEM H2A

Prerequisite: AP Chemistry or SAT Subject Chemistry. AP Chemistry with a minimum score of 4. SAT Subject Chemistry with a minimum score of 700

Overlaps with CHEM M2LA.

Restriction: Campuswide Honors Collegium students only.

**CHEM H2LB. Honors General Chemistry Laboratory. 3 Units.**

Training and experience in fundamental and analytical laboratory techniques through experiments related to lecture topics in CHEM H2A-CHEM H2B-CHEM H2C. Materials fee.

Corequisite: CHEM H2B

Prerequisite: CHEM H2A and (CHEM H2LA or CHEM M2LA). CHEM H2A with a grade of B or better. CHEM H2LA with a grade of B or better.

CHEM M2LA with a grade of B or better

Overlaps with CHEM M2LB.

Restriction: No credit for CHEM 1LC if taken after CHEM H2LB or CHEM M2LB.

**CHEM H2LC. Honors General Chemistry Laboratory. 3 Units.**

Training and experience in fundamental and analytical laboratory techniques through experiments related to lecture topics in CHEM H2A-CHEM H2B-CHEM H2C. Materials fee.

Corequisite: CHEM H2C

Prerequisite: CHEM H2B and (CHEM H2LB or CHEM M2LB). CHEM H2B with a grade of B or better. CHEM H2LB with a grade of B or better.

CHEM M2LB with a grade of B or better

**CHEM M2A. Majors General Chemistry Lecture. 4 Units.**

Covers the same material as CHEM 1A but in greater depth. Additional topics are included as time permits.

Prerequisite or corequisite: MATH 5A or MATH 2A or PHYS 7C or CHEM 1X or CHEM 1P or SAT Mathematics or ACT Mathematics or SAT Subject Chemistry or AP Chemistry or AP Calculus AB or AP Calculus BC. CHEM 1P with a grade of C- or better. SAT Mathematics with a minimum score of 600. ACT Mathematics with a minimum score of 27. SAT Subject Chemistry with a minimum score of 700. AP Chemistry with a minimum score of 3. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 3. Placement via a passing score on the ALEKS placement exam is also accepted.

Overlaps with CHEM 1A, CHEM H2A, ENGR 1A.

Restriction: Chemistry Majors have first consideration for enrollment.

**(II and Va ).**

**CHEM M2B. Majors General Chemistry Lecture. 4 Units.**

Covers the same material as CHEM 1B but in greater depth. Additional topics will also be included as time permits.

Prerequisite: CHEM M2A and CHEM M2LA. CHEM M2A with a grade of C- or better. CHEM M2LA with a grade of C- or better

Overlaps with CHEM H2B, CHEM 1B.

Restriction: Chemistry Majors have first consideration for enrollment.

**(II and Va ).**

**CHEM M2C. Majors General Chemistry Lecture. 4 Units.**

Covers the same material as CHEM 1C but in greater depth. Additional topics are also included as time permits.

Prerequisite: CHEM M2B and CHEM M2LB. CHEM M2B with a grade of C- or better. CHEM M2LB with a grade of C- or better

Overlaps with CHEM 1C, CHEM H2C.

Restriction: Chemistry Majors have first consideration for enrollment.

**(II and Va ).**



**CHEM M2LA. Majors General Chemistry Laboratory. 3 Units.**

Training and experience in basic laboratory techniques through experiments related to lecture topics in CHEM 1A-CHEM 1B-CHEM M3C. Materials fee.

Prerequisite or corequisite: CHEM 1A or CHEM M2A or CHEM H2A. CHEM 1A with a grade of C- or better. CHEM M2A with a grade of C- or better. CHEM H2A with a grade of C- or better. High school chemistry.

Overlaps with CHEM H2LA, CHEM 1LD.

Restriction: Chemistry Majors only. No credit for CHEM M2LA if taken after CHEM 1LD.

**CHEM M2LB. Majors General Chemistry Laboratory. 3 Units.**

Training and experience in basic laboratory techniques through experiments related to lecture topics in CHEM 1A-CHEM 1B-CHEM M3C. Materials fee.

Prerequisite or corequisite: (CHEM 1B or CHEM H2B or CHEM M2B) and (CHEM M2A or CHEM H2A) and (CHEM M2LA or CHEM H2LA). CHEM M2A with a grade of C- or better. CHEM H2A with a grade of C- or better. CHEM M2LA with a grade of C- or better. CHEM H2LA with a grade of C- or better

Overlaps with CHEM H2LB.

Restriction: Chemistry Majors only. CHEM 1LC may not be taken for credit if taken after CHEM H2LB or CHEM M2LB.

**CHEM M3C. Majors Quantitative Analytical Chemistry. 4 Units.**

Topics include equilibria, aqueous acid-base equilibria, solubility equilibria, oxidation reduction reactions, electrochemistry, and kinetics with a special emphasis on the statistical treatment of data and analytical methods of chemical analysis.

Corequisite: CHEM M3LC

Prerequisite: (CHEM 1B or CHEM H2B or CHEM M2B) and (CHEM M2LB or CHEM H2LB). CHEM 1B with a grade of C- or better. CHEM H2B with a grade of C- or better. CHEM M2B with a grade of C- or better. CHEM M2LB with a grade of C- or better. CHEM H2LB with a grade of C- or better

Restriction: Chemistry Majors only.

**(II and VA ).**

**CHEM M3LC. Majors Quantitative Analytical Chemistry Laboratory. 4 Units.**

Foundational principles of analytical chemistry and experimental methods for quantitative analysis of real samples. Materials fee.

Prerequisite: (CHEM 1B or CHEM H2B or CHEM M2B) and (CHEM M2LB or CHEM H2LB). CHEM 1B with a grade of C- or better. CHEM H2B with a grade of C- or better. CHEM M2B with a grade of C- or better. CHEM M2LB with a grade of C- or better. CHEM H2LB with a grade of C- or better

Restriction: Chemistry Majors only.

**CHEM 5. Scientific Mathematical and Computing Skills. 4 Units.**

Introduces students to mathematical skills, including complex numbers, linear algebra, differential equations, multivariable calculus, infinite series, Fourier series, and integral transforms; and computing skills, including plotting, data analysis (statistics and curve fitting), linear algebra, symbolic mathematics, and spectral analysis.

Corequisite: (CHEM 1C or CHEM H2C or CHEM M3C) and MATH 2D.

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 11. New Chemistry Student Seminar. 1 Workload Unit.**

Seminar for students who recently joined the chemistry major. Addresses available tracks in the major, research opportunities in the chemistry department, careers in chemistry, and relevant programs and resources for students.

Grading Option: Workload Credit P/NP Only.

Restriction: Freshmen students, transfer students, and students who recently changed their major to Chemistry have first consideration for enrollment.

**CHEM 12. Chemistry Around Us. 4 Units.**

Addresses ways in which chemistry affects everyday life. Topics include pollution, global warming, water supply/demands, biodiesel fuels, foods we eat, natural/synthetic materials, common drugs, drug design. Learn and apply basic chemistry concepts. Use risk/benefit analysis for optimal solutions.

**(II and Va ).**



**CHEM 14. Sense and Sensibility in Science. 4 Units.**

Gives an overview of scientific methods and heuristics through group exercises and discussion. Discusses the benefits and limitations of applying rational scientific approaches to real-world examples from philosophy, cognitive and social psychology, game theory, economics, political science, law, and negotiation.

(II and V.A. ).

**CHEM H30A. Critical Analysis of Health Science Literature. 4 Units.**

Focuses on evaluation of scientific literature. Aspects of scientific inquiry include scientific method, scientific research design, statistical analysis, and publication processes. Addresses why scientific inquiry cannot be separated from sociocultural influences and concerns. Examples drawn from research on health-related issues.

Restriction: Campuswide Honors Collegium students only.

(II and Va. ).

**CHEM 51A. Organic Chemistry. 4 Units.**

Fundamental concepts relating to carbon compounds with emphasis on structural theory and the nature of chemical bonding, stereochemistry, reaction mechanisms, and stereoscopic, physical, and chemical properties of the principal classes of carbon compounds.

Prerequisite or corequisite: (CHEM 1C or CHEM H2C or CHEM M3C) and (CHEM 1LD or CHEM H2LB or CHEM M2LB). CHEM 1C with a grade of C- or better. CHEM H2C with a grade of C- or better. CHEM M3C with a grade of C- or better. CHEM 1LD with a grade of C- or better. CHEM H2LB with a grade of C- or better. CHEM M2LB with a grade of C- or better

Overlaps with CHEM H52A.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

**CHEM 51B. Organic Chemistry. 4 Units.**

Fundamental concepts relating to carbon compounds with emphasis on structural theory and the nature of chemical bonding, stereochemistry, reaction mechanisms, and stereoscopic, physical, and chemical properties of the principal classes of carbon compounds.

Prerequisite: CHEM 51A and (CHEM 1LD or CHEM M52LA or CHEM H52LA). CHEM 51A with a grade of C- or better. CHEM 1LD with a grade of C- or better. CHEM M52LA with a grade of C- or better. CHEM H52LA with a grade of C- or better

Overlaps with CHEM H52B.

Restriction: Undeclared Majors have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment.

**CHEM 51C. Organic Chemistry. 4 Units.**

Fundamental concepts relating to carbon compounds with emphasis on structural theory and the nature of chemical bonding, stereochemistry, reaction mechanisms, and stereoscopic, physical, and chemical properties of the principal classes of carbon compounds.

Prerequisite: CHEM 51B and (CHEM 51LB or CHEM M52LB or CHEM H52LB). CHEM 51B with a grade of C- or better. CHEM 51LB with a grade of C- or better. CHEM M52LB with a grade of C- or better. CHEM H52LB with a grade of C- or better

Overlaps with CHEM H52C.

Restriction: Undeclared Majors have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment.

**CHEM 51LB. Organic Chemistry Laboratory. 3 Units.**

Modern techniques of organic chemistry, using selected experiments to illustrate topics introduced in CHEM 51A-CHEM 51B-CHEM 51C. Materials fee.

Corequisite: CHEM 51B

Prerequisite: CHEM 51A and (CHEM 1LD or CHEM H2LB or CHEM M2LB). CHEM 51A with a grade of C- or better. CHEM 1LD with a grade of C- or better. CHEM H2LB with a grade of C- or better. CHEM M2LB with a grade of C- or better

Overlaps with CHEM H52LA, CHEM M52LA.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

**CHEM 51LC. Organic Chemistry Laboratory. 3 Units.**

Modern techniques of organic chemistry, using selected experiments to illustrate topics introduced in CHEM 51A-B-C. Materials fee.

Corequisite: CHEM 51C

Prerequisite: CHEM 51B and CHEM 51LB. CHEM 51B with a grade of C- or better. CHEM 51LB with a grade of C- or better

Overlaps with CHEM H52LB, CHEM M52LB.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

**CHEM 51LD. Organic Chemistry Laboratory. 3 Units.**

Modern techniques of organic chemistry using selected experiments to illustrate topics introduced in CHEM 51A-CHEM 51B-CHEM 51C. Materials fee.

Prerequisite: CHEM 51C and CHEM 51LC. CHEM 51C with a grade of C- or better. CHEM 51LC with a grade of C- or better

Overlaps with CHEM H52LC.

Restriction: School of Biological Sciences students have first consideration for enrollment. School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Program in Nursing Science students have first consideration for enrollment. Dept Pharmaceutical Sciences students have first consideration for enrollment. Program in Public Health students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

**CHEM H52LA. Honors Organic Chemistry Laboratory. 3 Units.**

Fundamental techniques of modern experimental organic chemistry. Materials fee.

Corequisite: CHEM 51A

Prerequisite: (CHEM 1C or CHEM H2C or CHEM M3C) and (CHEM M2LB or CHEM H2LB or CHEM 1LD). CHEM 1C with a grade of C- or better. CHEM H2C with a grade of C- or better. CHEM M3C with a grade of C- or better. CHEM M2LB with a grade of C- or better. CHEM H2LB with a grade of C- or better. CHEM 1LD with a grade of C- or better

Overlaps with CHEM 51LB, CHEM M52LA.

Restriction: Campuswide Honors Collegium students only.

**CHEM H52LB. Honors Organic Chemistry Laboratory. 3 Units.**

Fundamental techniques of modern experimental organic chemistry. Materials fee.

Corequisite: CHEM 51B

Prerequisite: CHEM 51A and CHEM H52LA. CHEM 51A with a grade of C- or better. CHEM H52LA with a grade of C- or better

Overlaps with CHEM M52LB, CHEM 51LC.

**CHEM H52LC. Honors Organic Chemistry Laboratory. 3 Units.**

Fundamental techniques of modern experimental organic chemistry. Materials fee.

Prerequisite: CHEM 51B and CHEM H52LB. CHEM 51B with a grade of C- or better. CHEM H52LB with a grade of C- or better

Overlaps with CHEM 51LD, CHEM M52LC.

**CHEM M52LA. Majors Organic Chemistry Laboratory. 3 Units.**

Modern techniques of organic chemistry, using selected experiments to illustrate topics introduced in CHEM 51A-B-C. Materials fee.

Corequisite: CHEM 51A

Prerequisite: (CHEM 1C or CHEM H2C or CHEM M3C) and (CHEM H2LB or CHEM M2LB or CHEM 1LD). CHEM 1C with a grade of C- or better.

CHEM H2C with a grade of C- or better. CHEM M3C with a grade of C- or better. CHEM H2LB with a grade of C- or better. CHEM M2LB with a grade of C- or better. CHEM 1LD with a grade of C- or better

Overlaps with CHEM H52LA, CHEM 51LB.

Restriction: Chemistry Majors only.

**CHEM M52LB. Majors Organic Chemistry Laboratory. 3 Units.**

Modern techniques of organic chemistry, using selected experiments to illustrate topics introduced in CHEM 51A-B-C. Materials fee.

Corequisite: CHEM 51B

Prerequisite: CHEM 51A and CHEM M52LA. CHEM 51A with a grade of C- or better. CHEM M52LA with a grade of C- or better

Overlaps with CHEM H52LB, CHEM 51LC.

Restriction: Chemistry Majors only.

**CHEM M52LC. Majors Organic Chemistry Laboratory. 3 Units.**

Modern techniques of organic chemistry, using selected experiments to illustrate topics introduced in CHEM 51A-B-C. Materials fee.

Corequisite: CHEM 51C

Prerequisite: CHEM 51B and CHEM M52LB. CHEM 51B with a grade of C- or better. CHEM M52LB with a grade of C- or better

Overlaps with CHEM H52LC, CHEM 51LD.

Restriction: Chemistry Majors only.

**CHEM H90. The Idiom and Practice of Science. 4 Units.**

A series of fundamental and applied problems in the chemical sciences are addressed. Topics may include the periodic table, electronic structure of atoms, chemical bonding, molecular structure, thermodynamics, and kinetics, with applications to energy and the environment, and/or biochemistry.

Restriction: Campuswide Honors Collegium students only.

**(II, Va)****CHEM 100S. Laboratory Safety for Chemists.**

Provide students with the fundamentals of safety involved in chemical laboratory work.

Prerequisite or corequisite: CHEM 51C

Grading Option: Pass/no pass only.

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 101W. Writing in Chemical Sciences. 4 Units.**

Students receive guidance on preparing research papers, proposals, reports, and other forms of scientific writing in chemistry-related fields, on effectively searching for and using chemical information, and on communicating data in poster and platform presentations.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Chemistry Majors have first consideration for enrollment.

**(Ib)****CHEM 107. Inorganic Chemistry. 4 Units.**

Introduction to modern inorganic chemistry. Principles of structure, bonding, and chemical reactivity with application to compounds of the main group and transition elements, including organometallic chemistry.

Prerequisite: CHEM 51C or CHEM H52C

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 107L. Inorganic Chemistry Laboratory. 3 Units.**

Modern techniques of inorganic and organometallic chemistry, including experience with glove box, Schlenk line, and vacuum line methods. Materials fee.

Prerequisite or corequisite: CHEM 107 and CHEM 100S

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 125. Advanced Organic Chemistry. 4 Units.**

Rapid-paced comprehensive treatment of organic chemistry. Focuses on molecular structure, reactivity, stability, scope and mechanisms of organic reactions. Topics include: structure and bonding; theoretical organic chemistry; acidity and basicity; reactive intermediates; pericyclic reactions; stereochemistry; organic synthesis; natural products; organic photochemistry.

Prerequisite: CHEM 51C

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 127. Inorganic Chemistry II. 4 Units.**

Advanced treatment of selected fundamental topics in inorganic chemistry, building on material presented in Chemistry 107. Molecular symmetry with applications to electronic structure and spectroscopy. Reaction kinetics and mechanisms; inorganic synthesis and catalysis; bioinorganic chemistry.

Prerequisite: CHEM 107

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 128. Introduction to Chemical Biology. 4 Units.**

Introduction to the basic principles of chemical biology: structures and reactivity; chemical mechanisms of enzyme catalysis; chemistry of signalling, biosynthesis, and metabolic pathways.

Corequisite: CHEM 128L

Prerequisite: (CHEM 51C or CHEM H52C)

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 128L. Introduction to Chemical Biology Laboratory Techniques. 3 Units.**

Introduction to the basic laboratory techniques of chemical biology: electrophoresis, plasmid preparation, PCR, protein expression, isolation, and kinetics. Materials fee.

Corequisite: CHEM 128

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 132A. Chemical Thermodynamics, Kinetics, and Dynamics. 4 Units.**

Energy, entropy, and the thermodynamic potentials. Chemical equilibrium. Chemical kinetics.

Prerequisite or corequisite: MATH 2D and (PHYS 7D or PHYS 7E) and (CHEM 5 or (MATH 3D and (EECS 10 or EECS 12 or MAE 10 or ICS 31)))

Overlaps with CHEM 131C.

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 132B. Quantum Principles, Spectroscopy, and Bonding. 4 Units.**

Principles of quantum chemistry with applications to the elements of atomic structure, energy levels, and spectroscopy.

Prerequisite: (CHEM 132A or CEMS 45C) and (PHYS 7D or PHYS 7E). CHEM 132A with a grade of C- or better

Overlaps with CHEM 131A.

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 132C. Molecular Structure and Elementary Statistical Mechanics. 4 Units.**

Principles of quantum mechanics with applications to molecular spectroscopy and structure determination, and chemical bonding in simple molecules. Elements of statistical mechanics.

Prerequisite: CHEM 132B

Overlaps with CHEM 131B.

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 133. Nuclear and Radiochemistry. 4 Units.**

Advanced treatment of nuclear structure, nuclear reactions, and radioactive-decay processes. Introduction to nuclear activation analysis, isotope effects, radiation chemistry, hot-atom chemistry, nuclear age-dating methods, nuclear reactors, and nuclear power.

Prerequisite: (CHEM M3C or CHEM 1C or CHEM H2C) and MATH 2D

Same as CBE 176.

Overlaps with CHEM 170.

Restriction: Chemistry Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment.

Concurrent with CHEM 233 and CBE 276.

**CHEM 133L. Nuclear and Radiochemistry Laboratory. 3 Units.**

Practical aspects of production, separation, safe handling, detection, and measurement of radioactive isotopes. Experiments use the UCI nuclear reactor and emphasize uses of radioisotopes in chemistry, engineering, biology, and medicine. Materials fee.

Prerequisite or corequisite: CHEM 133

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 137. Computational Chemistry. 4 Units.**

Short introduction to programming languages and to representative algorithms employed in chemical research. Students have the opportunity to devise and employ their own codes and also to employ codes which are widely used in various fields of chemistry. Materials fee.

Corequisite: CHEM 132C

Prerequisite: CHEM 51C and (CHEM 131A or CHEM 132B)

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 138. Introduction to Computational Organic Chemistry. 4 Units.**

An introduction to the use of computational chemistry to investigate reaction mechanisms, to calculate structures, and to predict properties of molecules. Students have the opportunity to perform calculations employing computational methods which are widely used in various fields of chemistry. Materials fee.

Prerequisite: CHEM 51C

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 141. Environmental Chemistry. 4 Units.**

Processes that control the fate of chemicals in the environment. Chemistry of the atmosphere, hydrosphere, and soils, especially as it pertains to pollutants.

Prerequisite: (CHEM 51C or CHEM H52C) and (MATH 2B or AP Calculus BC). AP Calculus BC with a minimum score of 4

**CHEM 145A. Gas-Phase Atmospheric Chemistry. 4 Units.**

Sources, chemistry, sinks, and measurements of key atmospheric gaseous species. Chemistry of photochemical oxidant formation, transformation of key inorganic and organic trace gases, and stratospheric ozone cycling. Applications of atmospheric chemistry models to control strategies.

Prerequisite: CHEM 132A and CHEM 132B and CHEM 132C

Concurrent with CHEM 245A.

**CHEM 145B. Multi-Phase Atmospheric Chemistry. 4 Units.**

Chemical and physical processes leading to the production, aging, and removal of atmospheric particles. Multi-phase processes involving gases, particles, water droplets, and environmental surfaces. Approaches for modeling these processes with applications to control strategies.

Prerequisite: CHEM 145A

Concurrent with CHEM 245B.

**CHEM 150. Computational Chemistry. 4 Units.**

Basic concepts, methods, and techniques in computational chemistry: density functional and wavefunction theory, molecular property calculations, analysis tools, potential energy surfaces, vibrational effects, molecular dynamics simulations.

Prerequisite or corequisite: MATH 3A and (CHEM 132A or PHYS 113A)

Restriction: Chemistry Majors have first consideration for enrollment.

Concurrent with CHEM 250.

**CHEM 150L. Computational Chemistry Laboratory. 4 Units.**

Introduction to the practice of modern computational chemistry through a series of advanced computational experiments.

Prerequisite: CHEM 150 and (CHEM 5 or PHYS 50 or EECS 12)

Restriction: Chemistry Majors have first consideration for enrollment.

Concurrent with CHEM 250L.

**CHEM 152. Advanced Analytical Chemistry. 5 Units.**

In-depth treatment of modern instrumental methods for quantitative analysis of real samples and basic principles of instrument design. Laboratory experiments using spectroscopic, chromatographic, mass spectrometric, and other instrumental methods. Materials fee.

Prerequisite: (CHEM 1C or CHEM M3C or CHEM H2C) and (CHEM M3LC or CHEM H2LC)

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 153. Physical Chemistry Laboratory. 4 Units.**

Introduction to the modern experimental approaches and software tools used in spectroscopy, kinetics, electrochemistry, and other physical chemistry experiments. Basics of interfacing with instruments using LabView. Materials fee.

Corequisite: CHEM 132C

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 156. Advanced Laboratory in Chemistry and Synthesis of Materials. 4 Units.**

Modern synthesis and characterization of organic and inorganic materials including polymers, nanomaterials, and biomaterials. State-of-the-art characterization techniques include gel permeation chromatography, dynamic light scattering, thermal analysis, mechanical analysis, electron and scanning probe microscopy, X-ray diffraction, and porosimetry. Materials fee.

Prerequisite: (CHEM 51C or CHEM H52C) and (CHEM 51LC or CHEM H52LC or CHEM M52LC) and (CHEM 131A or CHEM 132B or PHMS 171)

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 160. Organic Synthesis Laboratory. 4 Units.**

Modern experimental techniques in organic synthesis including experience with thin-layer chromatography, liquid chromatography, and gas chromatography. Modern methods of structure elucidation including FT NMR are employed in the characterization of products. Materials fee.

Prerequisite or corequisite: CHEM 51C and CHEM 100S and (CHEM 51LC or CHEM H52LC or CHEM M52LC)

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 170. Radioisotope Techniques. 4 Units.**

Basic theory and practice of production, separation, safe handling, counting, applications of radioactive isotopes with emphasis on applications in chemistry, biology, and medicine. Materials fee.

Prerequisite: (CHEM 1C or CHEM M3C or CHEM H2C) and (CHEM 1LC or CHEM M3LC or CHEM H2LC)

Restriction: Chemistry Majors have first consideration for enrollment.

**CHEM 177. Medicinal Chemistry. 4 Units.**

An introduction of the basics of drug activity and mechanisms. Strategies used to identify lead compounds such as natural product chemistry, combinatorial chemistry, molecular modeling, and high-throughput screening. Relationship of molecular structure to pharmacological activity.

Prerequisite: CHEM 51A and CHEM 51B and CHEM 51C and (BIOL 98 or CHEM 128)

Same as PHMS 177.

Restriction: Pharmaceutical Sciences Majors have first consideration for enrollment.

**CHEM 177L. Medicinal Chemistry Laboratory. 3 Units.**

An introduction of the basics of drug activity and mechanisms. Strategies used to identify lead compounds such as natural product chemistry, combinatorial chemistry, molecular modeling, and high-throughput screening. Relationship of molecular structure to pharmacological activity. Materials fee.

Corequisite: PHRMSCI 177 or CHEM 177.

Prerequisite: CHEM 51A and CHEM 51B and CHEM 51C and BIOL 100 and (BIOL 98 or CHEM 128)

Same as PHMS 177L.

Restriction: Pharmaceutical Sciences Majors have first consideration for enrollment.

**(Ib)****CHEM 180. Undergraduate Research. 4 Units.**

Research for credit arranged with a faculty member to sponsor and supervise work. Student time commitment of 10 to 15 hours per week is expected, and a written research report is required at the end of each quarter.

Prerequisite or corequisite: CHEM 100S

Repeatability: May be repeated for credit unlimited times.

**CHEM 180W. Senior Thesis in Chemistry. 4 Units.**

Students receive guidance on preparing research papers, proposals, reports, and other forms of scientific writing in chemistry-related fields; on effectively searching for and using chemical information; and on communicating data in poster and platform presentations.

Prerequisite: CHEM 180 or CHEM 199 or PHYS 195 or ESS 199 or CEMS 199 or CEE 199 or MAE 199 or BIOL 199 or PUBH 199. CHEM 180 with a grade of A or better. CHEM 199 with a grade of A or better. PHYS 195 with a grade of A or better. ESS 199 with a grade of A or better. CEMS 199 with a grade of A or better. CEE 199 with a grade of A or better. MAE 199 with a grade of A or better. BIOL 199 with a grade of A or better. PUBH 199 with a grade of A or better. Consent of the instructor is also accepted. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Chemistry Majors have first consideration for enrollment.

**(Ib)****CHEM H180A. Honors Research in Chemistry. 4 Units.**

Undergraduate honors research in Chemistry. A student time commitment of 10-15 hours per week is required.

Restriction: Chemistry Honors students only. Campuswide Honors Collegium students only.

**CHEM H180B. Honors Research in Chemistry. 4 Units.**

Undergraduate honors research in Chemistry. A student time commitment of 10-15 hours per week is required.

Prerequisite: CHEM H180A

Restriction: Campuswide Honors Collegium students only.

**CHEM H180C. Honors Research in Chemistry. 4 Units.**

Undergraduate honors research in Chemistry. A student time commitment of 10-15 hours per week is required.

Prerequisite: CHEM H180B

Restriction: Chemistry Honors students only. Chemistry majors participating in the Campuswide Honors Program students only.



**CHEM H181W. Honors Seminar in Chemistry. 2 Units.**

Students will receive guidance in the preparation of oral and written research presentations. A written thesis will be prepared and a formal research seminar will be presented.

Corequisite: CHEM H180C

Prerequisite: CHEM H180A and CHEM H180B. Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**CHEM 191. Chemistry Outreach Program. 2 Units.**

Involves intensive participation in the UCI Chemistry Outreach Program, which performs Chemistry demonstrations at local high schools.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 6 times.

**CHEM 192. Tutoring in Chemistry. 2 Units.**

Enrollment limited to participants in the Chemistry Peer Tutoring Program.

Repeatability: May be taken for credit 9 times.

Restriction: The first eight may be taken for a letter grade. The remaining ten units must be taken Pass/Not Pass only. NOTE: No more than eight units may be counted toward the 180 units required for graduation. Satisfies no degree requirement other than contribution to the 180-unit total.

**CHEM 193. Research Methods. 4 Units.**

Explores tools of inquiry for developing and implementing science research projects. Students undertake independent projects requiring data collection, analysis, and modeling, and the organization and presentation of results. Additional topics include ethical issues and role of scientific literature.

Prerequisite: BIOL 14 or PS 5

Same as BIOL 108, PHYS 193.

**CHEM 197. Professional Internship. .5-4 Units.**

Internship program that provides students with opportunity to develop professional skills necessary for competitive placement in their chosen chemical-inspired industry. Students gain new and field-specific skills outside the classroom while participating in a supervised internship.

Prerequisite: Enrollment requires completion of an application form. Student selection is made by a selection committee.

Repeatability: May be taken for credit for 13 units.

Restriction: Upper-division students only. Chemistry Majors only.

**CHEM 199. Independent Study in Chemistry. 1-4 Units.**

Independent research with Chemistry faculty. Student time commitment of three to four hours per week per unit is expected, and a written report on the independent study is required at the end of each quarter of enrollment.

Repeatability: Unlimited as topics vary.

**CHEM 200. Conduct of Research . 2 Units.**

Introduces new graduate students to ethical conduct of scientific research, mentoring, and current research in the Department of chemistry.

Repeatability: May be taken for credit 2 times.

**CHEM 201. Organic Reaction Mechanisms I. 4 Units.**

Advanced treatment of basic mechanistic principles of modern organic chemistry. Topics include molecular orbital theory, orbital symmetry control of organic reactions, aromaticity, carbonium ion chemistry, free radical chemistry, the chemistry of carbenes and carbanions, photochemistry, electrophilic substitutions, aromatic chemistry.

Prerequisite: CHEM 132A and CHEM 132B and CHEM 132C

**CHEM 202. Organic Reaction Mechanisms II. 4 Units.**

Topics include more in-depth treatment of mechanistic concepts, kinetics, conformational analysis, computational methods, stereoelectronics, and both solution and enzymatic catalysis.

Prerequisite: CHEM 201

**CHEM 203. Organic Spectroscopy. 4 Units.**

Modern methods used in structure determination of organic molecules. Topics include mass spectrometry; ultraviolet, chiroptical, infrared, and nuclear magnetic resonance spectroscopy.

Prerequisite: (CHEM 51A and CHEM 51B and CHEM 51C) or (CHEM H52A and CHEM H52B and CHEM H52C)

Restriction: Graduate students only.

**CHEM 204. Organic Synthesis I. 4 Units.**

Fundamentals of modern synthetic organic chemistry is developed. Major emphasis is on carbon-carbon bond forming methodology. Topics include carbonyl annelations, cycloadditions, sigmatropic rearrangements, and organometallic methods.

**CHEM 205. Organic Synthesis II. 4 Units.**

Fundamentals of modern synthetic organic chemistry will be developed. Major emphasis this quarter is on natural product total synthesis and retrosynthetic (antithetic) analysis.

Prerequisite: CHEM 204

**CHEM 206. Advanced Data Acquisition and Analysis. 4-6 Units.**

Introduces students to a variety of practical laboratory techniques, including lock-in, boxcar, coincidence counting, noise filtering, PID control, properties of common transducers, computer interfacing to instruments, vacuum technology, laboratory safety, basic mechanical design, and shop skills. Materials fee.

Same as PHYS 206.

Concurrent with PHYS 106.

**CHEM 207. Applied Physical Chemistry. 4 Units.**

Introduction to fundamental concepts in molecular structure and reactivity: theory of bonding, valence and molecular orbitals; structure and reactivity in inorganic chemistry; elements in molecular group theory; nomenclature in organic chemistry; and survey of macromolecules.

Same as PHYS 207.

**CHEM 208. Math Methods. 4 Units.**

Applications of mathematics to physical and chemical problems. Calculus of special functions, complex variables and vectors; linear vector spaces and eigenvalue problems. Differential equations.

Same as PHYS 208.

**CHEM 213. Chemical Kinetics. 4 Units.**

Surveys gas phase and organic reaction mechanisms and their relationship to kinetic rate laws; treats the basic theory of elementary reaction rates. A brief presentation of modern cross-sectional kinetics is included.

Prerequisite: CHEM 132A and CHEM 132B and CHEM 132C

**CHEM 215. Inorganic Chemistry I. 4 Units.**

Principles of modern inorganic chemistry with applications to chemical systems of current interest. Inorganic phenomena are organized into general patterns which rationalize observed structures, stabilities, and physical properties.

Prerequisite: CHEM 107 and CHEM 132A and CHEM 132B and CHEM 132C

Restriction: Graduate students only.

**CHEM 216. Organometallic Chemistry. 4 Units.**

Synthesis and reactivity of organometallic complexes with an emphasis on mechanisms. Topics include bonding and fluxional properties; metal-carbon single and multiple bonds; metal  $\pi$ -complexes. Applications to homogenous catalysis and organic synthesis are incorporated throughout the course.

Prerequisite: CHEM 107 or CHEM 215

**CHEM 217. Physical Inorganic Chemistry. 4 Units.**

General principles of the spectroscopy and magnetism of inorganic compounds. Characterization of inorganic complexes by infrared, near-infrared, visible, ultraviolet, NMR, EPR, EXAFS, and Mossbauer spectroscopies. Some necessary group theory developed.

Prerequisite: CHEM 215

**CHEM 218. Metallobiochemistry . 4 Units.**

A review of the biochemistry of metallic elements emphasizing: methods for studying metals in biological systems; the chemical basis for nature's exploitation of specific elements; structures of active sites; mechanisms; solid-state structures and devices; metals in medicine.

Prerequisite or corequisite: CHEM 131C or CHEM 132C

Same as MBB 248.

**CHEM 219. Chemical and Structural Biology. 4 Units.**

A survey of the organic chemistry underlying biological function. Introduction to chemical genetics, receptor-ligand interactions, small molecule agonists and antagonists, combinatorial synthesis, high throughput assays, molecular evolution, protein and small molecule design.

Restriction: Graduate students only.

**CHEM 221A. Fundamentals of Molecular Biophysics. 4 Units.**

An overview of the principles and concepts in molecular biophysics. Topics covered include energy and entropy in biology, non-equilibrium reaction kinetics, random walks and molecular diffusion, molecular forces in biology.

Prerequisite: Undergraduate courses in physical chemistry and biochemistry.

Repeatability: May be taken for credit 3 times.

**CHEM 223. Biological Macromolecules. 4 Units.**

Introduction to nucleic acid and protein structure, dynamics, and function. Topics include analytical methods, molecular evolution, folding, and catalysis.

Same as PHMS 223.

**CHEM 224. Molecular and Cellular Biophotonics. 4 Units.**

Principles underlying the application of photonic technologies to biomolecular and cellular systems. Sample technologies Optical Tweezers, Linear and Nonlinear Optical Microscopy and Fluorescence Lifetime and Correlation Methods, and their use to investigate emergent problems in Molecular, Cellular, and Developmental Biology.

Same as BME 224.

Restriction: Graduate students only.

**CHEM 225. Polymer Chemistry: Synthesis and Characterization of Polymers. 4 Units.**

Structure of synthetic and natural polymers. Survey of modern polymer synthetic methods. Molecular weight and molecular weight distribution. Chain conformation and stereochemistry. Introduction to polymer characterization, chain models, and solution behavior.

Prerequisite: Undergraduate courses in organic and physical chemistry.

**CHEM 228. Electromagnetism. 4 Units.**

Maxwell's equations, electrodynamics, electromagnetic waves and radiation, wave propagation in media, interference and quantum optics, coherent and incoherent radiation, with practical applications in interferometry, lasers, waveguides, and optical instrumentation.

Same as PHYS 228.

**CHEM 229A. Computational Methods. 4 Units.**

Mathematical and numerical analysis using Mathematica and C programming, as applied to problems in physical science.

Same as PHYS 229A.

Concurrent with PHYS 100.

**CHEM 230. Classical Mechanics and Electromagnetic Theory. 4 Units.**

Fundamentals of classical mechanics and electromagnetic theory are developed with specific application to molecular systems. Newtonian, Lagrangian, and Hamiltonian mechanics are developed. Boundary value problems in electrostatics are investigated. Multipole expansion and macroscopic media are discussed from a molecular viewpoint.

Prerequisite: CHEM 132A and CHEM 132B and CHEM 132C

**CHEM 231A. Fundamentals of Quantum Mechanics. 4 Units.**

The postulates of quantum mechanics are discussed and applied to a variety of model problems.

Prerequisite: CHEM 131A and CHEM 131B and CHEM 131C

**CHEM 231B. Applications of Quantum Mechanics. 4 Units.**

Approximate methods for solving atomic and molecular structure problems are developed, and the application of quantum mechanics to spectroscopy is introduced.

Prerequisite: CHEM 231A

**CHEM 231C. Molecular Spectroscopy. 4 Units.**

Theory and techniques of spectroscopy as used for the study of molecular and condensed phase properties. Coherent time domain spectroscopies are covered.

Prerequisite: CHEM 231B

**CHEM 232A. Thermodynamics and Introduction to Statistical Mechanics. 4 Units.**

A detailed discussion from an advanced point of view of the principles of classical thermodynamics. The fundamentals of statistical mechanics. Topics include an introduction to ensemble theory, Boltzmann statistics, classical statistical mechanics, and the statistical mechanics of ideal gas systems.

Prerequisite: CHEM 131A and CHEM 131B and CHEM 131C

**CHEM 232B. Advanced Topics in Statistical Mechanics. 4 Units.**

Continued discussion of the principles of statistical mechanics. Applications to topics of chemical interest including imperfect gases, liquids, solutions, and crystals. Modern techniques such as the use of autocorrelation function methods.

Prerequisite: CHEM 232A

**CHEM 232C. Non-Equilibrium Statistical Mechanics. 4 Units.**

Phenomenology of material processes, including: kinetic theories of transport and continuum, linear response theory, critical phenomena of phase transition, self-assembly, and nucleation.

**CHEM 233. Nuclear and Radiochemistry. 4 Units.**

Advanced treatment of nuclear structure, nuclear reactions, and radioactive-decay processes. Introduction to nuclear activation analysis, isotope effects, radiation chemistry, hot-atom chemistry, nuclear age-dating methods, nuclear reactors, and nuclear power.

Same as CBE 276.

Restriction: Graduate students only.

Concurrent with CHEM 133 and CBE 176.

**CHEM 237. Mathematical Methods in Chemistry. 4 Units.**

Survey of essential math methods in chemistry. Topics may include series and limits, complex analysis, Fourier and Laplace transforms, linear algebra and operators (theory and algorithms), differential equations, and probability concepts for stochastic processes.

**CHEM 241. Current Issues Related to Air Quality, Climate, and Energy. 4 Units.**

Current issues related to the atmosphere, climate, and air quality in the context of energy conversion and sustainability. Topics include transportation systems; building design; impacts on humans and ecosystems; modeling and meteorology; economics; and application to public policies.

Prerequisite: MAE 261 or CHEM 245 or ESS 240

Same as MAE 260.

Restriction: Graduate students only.

**CHEM 242A. Physical and Geometrical Optics. 4 Units.**

Focuses on the practical aspects of optics and optical engineering, starting at the fundamentals. Topics include geometrical optics, ray tracing, polarization optics, interferometers, and diffractive optics.

Restriction: Graduate students only.

Concurrent with PHYS 134A.

**CHEM 243. Advanced Instrumental Analysis. 4 Units.**

Theory and applications of modern advanced instrumental methods of analysis. Includes data acquisition, storage, retrieval, and analysis; Fourier transform methods; vacuum technologies; magnetic sector; quadrupole and ion trap mass spectrometry; surface science spectroscopic methods; lasers and optics.

Prerequisite: CHEM 152 and CHEM 132C. CHEM 152 with a grade of B or better. CHEM 132C with a grade of B or better

**CHEM 244. Detection and Measurement of Radiation. 4 Units.**

Basic principles of detection and measurement of ionizing radiation; both theory and practical aspects of measurement techniques for alpha, beta, gamma, and neutron radiation, properties of different detector materials, electronics and data treatments, and analysis.

Prerequisite: CHEM 233 or CBE 276

Same as CBE 277.

Restriction: Graduate students only.

**CHEM 245A. Gas-Phase Atmospheric Chemistry. 4 Units.**

Sources, chemistry, sinks, and measurements of key atmospheric gaseous species. Chemistry of photochemical oxidant formation, transformation of key inorganic and organic trace gases, and stratospheric ozone cycling. Applications of atmospheric chemistry models to control strategies.

Prerequisite: CHEM 132A and CHEM 132B and CHEM 132C

Concurrent with CHEM 145A.

**CHEM 245B. Multi-Phase Atmospheric Chemistry. 4 Units.**

Chemical and physical processes leading to the production, aging, and removal of atmospheric particles. Multi-phase processes involving gases, particles, water droplets, and environmental surfaces. Approaches for modeling these processes with applications to control strategies.

Prerequisite: CHEM 245A

Concurrent with CHEM 145B.

**CHEM 245C. Special Topics in Atmospheric Chemistry. 4 Units.**

The subjects covered vary from year to year.

Prerequisite: CHEM 245B

Repeatability: Unlimited as topics vary.

**CHEM 246. Separations and Chromatography. 4 Units.**

Introduction to modern separation techniques such as gas chromatography, high-performance liquid chromatography, supercritical fluid chromatography, capillary electrophoresis, and field flow fractionation. Applications of these separation strategies are discussed.

**CHEM 247. Current Problems in Analytical Chemistry. 4 Units.**

Surveys current research challenges in analytical chemistry. Topics include electrochemistry, chromatography, spectroscopy, and mass spectrometry.

**CHEM 248. Electrochemistry. 4 Units.**

Fundamentals of electrochemistry including thermodynamics and the electrochemical potential, charge transfer kinetics, and mass transfer. Methods based on controlled potential and controlled current are described; the effects of slow heterogeneous kinetics and the perturbation caused by homogeneous chemistry are discussed.

**CHEM 249. Analytical Spectroscopy. 4 Units.**

Advanced treatment of spectroscopic techniques and instrumentation. Atomic and molecular absorption, emission, and scattering processes and their application to quantitative chemical analysis are outlined. Puts different spectroscopic techniques in perspective and demonstrates most appropriate applications to analytical problems.

**CHEM 250. Computational Chemistry. 4 Units.**

Basic concepts, methods, and techniques in computational chemistry: density functional and wavefunction theory, molecular property calculations, analysis tools, potential energy surfaces, vibrational effects, molecular dynamics simulations.

Restriction: Graduate students only.

Concurrent with CHEM 150.

**CHEM 250L. Computational Chemistry Laboratory. 4 Units.**

Introduction to the practice of modern computational chemistry through a series of advanced computational experiments.

Prerequisite: CHEM 250

Restriction: Graduate students only.

Concurrent with CHEM 150L.

**CHEM 251. Special Topics in Organic Chemistry. 1-4 Units.**

Advanced topics in organic chemistry.

Repeatability: Unlimited as topics vary.

**CHEM 252. Special Topics in Physical Chemistry. 1-4 Units.**

Advanced topics in physical chemistry. Materials fee.

Repeatability: Unlimited as topics vary.

**CHEM 253. Special Topics in Inorganic Chemistry. 4 Units.**

Advanced topics in inorganic chemistry.

Prerequisite: CHEM 215

Repeatability: Unlimited as topics vary.

**CHEM 254. Special Topics in Computational and Theoretical Chemistry. 4 Units.**

Subjects covered vary from year to year.

Repeatability: Unlimited as topics vary.

**CHEM 263. Materials Chemistry . 4 Units.**

An introduction to crystalline solids, descriptive crystal chemistry, solid-state synthesis and characterization techniques, x-ray and electron diffraction, phase diagrams, electronic band structure of extended solids, semi conductors, and nanoscale inorganic materials.

**CHEM 266. Current Topics in Chemical, Applied, and Materials Physics. 1 Unit.**

The subjects covered vary from year to year. Connection between fundamental principles and implementations in practice in science, industry, and technology.

Repeatability: May be repeated for credit unlimited times.

Same as PHYS 266.

**CHEM 267. Photochemistry. 4 Units.**

Photochemical and photovoltaic processes in molecules and semiconductors; quantum mechanics; statistical thermodynamics; kinetics; and experimental techniques relevant to photon absorption and emission; photochemical charge separation, recombination, and transport of electrons and ions; and interfacial redox chemistry.

Restriction: Seniors only. Graduate students only.

**CHEM 268. NMR Spectroscopy . 4 Units.**

Students learn the theoretical basis of solid-state or solution NMR (alternate times), including the basics of pulse sequence design. Extensive literature reading is required.

Prerequisite: CHEM 231A

Repeatability: May be taken for credit 2 times.

**CHEM 273. Technical Communication Skills. 2 Units.**

Development of effective communication skills, oral and written presentations, through examples and practice.

Grading Option: Satisfactory/unsatisfactory only.

Same as PHYS 273.

**CHEM 280. Research. 2-12 Units.**

Supervised original research toward the preparation of a Ph.D dissertation or M.S. thesis.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CHEM 290. Seminar. 1 Unit.**

Weekly seminars and discussions on general and varied topics of current interest in chemistry.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CHEM 291. Research Seminar. 4 Units.**

Detailed discussion of research problems of current interest in the Department. Format, content, and frequency of the course are variable.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**CHEM 292. Graduate Symposium. 2 Units.**

Students present public seminars on literature-based research topics in contemporary chemistry. Topics to be chosen by student and approved by instructor.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**CHEM 299. Independent Study. 1-4 Units.**

Independent research with Chemistry faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CHEM 399. University Teaching. 1-4 Units.**

Required of and limited to Teaching Assistants.

Repeatability: May be repeated for credit unlimited times.

## Chemistry, B.S.

The major in Chemistry is elected by students planning careers in the chemical sciences and frequently also by those whose interests lie in other disciplines such as biology, medicine, public health, earth sciences, ecology, secondary education, business, and law. New freshman and transfer Chemistry students are strongly encouraged to take an orientation seminar, CHEM 11, where they learn about the Chemistry major requirements, the Chemistry Department, and the career options available to students after graduation.

The curriculum of the Department is designed to satisfy the diverse needs of these students and others who may have occasion to study chemistry. The year-long lecture course sequence of CHEM M2A-CHEM M2B-CHEM M2C and laboratory course sequence of CHEM M2LA-CHEM M2LB-CHEM M3LC (or the Honors sequence of CHEM H2A-CHEM H2B-CHEM H2C and CHEM H2LA-CHEM H2LB-CHEM M3LC) cover the fundamentals of general and analytical chemistry, and serve as prerequisites to all study in the Department at more advanced levels. The subject matter of these courses also serve as a thorough introduction to the varied aspects of modern chemistry for students who do not wish to pursue their studies beyond the introductory level.

Completion of a one-year sequence in organic chemistry lectures, CHEM 51A-CHEM 51B-CHEM 51C, along with organic chemistry laboratory courses, is required for Chemistry majors and for students of the life sciences. These core organic chemistry courses are typically taken by students in their second year at UCI. All Chemistry students then take inorganic chemistry lecture and laboratory courses, CHEM 107 and CHEM 107L, an advanced instrumental analysis course, CHEM 152, and a three-quarter sequence of physical chemistry, CHEM 132A – CHEM 132B – CHEM 132C. Students will also take a mathematical and computing skill course, CHEM 5, in parallel with CHEM 132A, to help them improve their learning experience in the physical chemistry sequence.

To complete the Chemistry major requirements, the students take a minimum of five upper-division elective courses chosen from a broad menu, which includes graduate level courses. Certain advanced courses required of Chemistry majors may also be of interest to other majors. Many students elect to take a pre-defined set of elective courses in order to fulfill requirements for one of the concentrations and specializations, such as Chemical Biology, Chemistry Education, Environmental Chemistry, Medicinal Chemistry, Nuclear and Radiochemistry, Synthetic Chemistry, or Theoretical and Computational Chemistry. For example, Chemistry majors who are interested in teaching chemistry at the secondary level often complete the optional concentration in Chemistry Education.

The undergraduate program of the Chemistry Department emphasizes close contact with research, and all Chemistry majors are encouraged to engage in research or independent study under the direction of a faculty member. Research is an integral requirement of the ACS certified degree, and it greatly increases chances for admission into graduate and professional schools. Students have an opportunity to write their research thesis as part of an upper-



division writing course CHEM 180W (CHEM H181W in the Honors sequences). Information describing the procedures for arranging an undergraduate research opportunity is available on the Chemistry Department website (<http://www.chem.uci.edu/undergrad/>).

Chemistry majors who plan subsequent study in medical, dental, or other professional schools should request information concerning admission requirements directly from the schools which they seek to enter. Excellent counseling about preparation for a career in the health sciences is provided by the health science advisors in the School of Biological Sciences. Those intending to pursue graduate studies in chemistry should discuss their plans with a research area advisor no later than the fall quarter of their senior year. The current advisors for each research area are listed on the Chemistry Department website (<http://www.chem.uci.edu/undergrad/>).

Students may be admitted to the Chemistry major upon entering the University as freshmen, via change of major, or as transfer students from other colleges and universities. Information about change of major policies is available in the Physical Sciences Student Affairs Office and at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>). For transfer student admission, preference will be given to junior-level applicants with the highest grades overall and who have satisfactorily completed the following required courses: one year of general chemistry with laboratory and one year of approved calculus. Completion of one year of organic chemistry is strongly recommended.

**All students must meet the University Requirements.**

**School Requirements: None.**

**Departmental Requirements <sup>1</sup>**

**Basic Requirements**

MATH 2A- 2B- 2D	Single-Variable Calculus and Single-Variable Calculus and Multivariable Calculus
PHYSICS 7C- 7D- 7E	Classical Physics and Classical Physics and Classical Physics
PHYSICS 7LC- 7LD	Classical Physics Laboratory and Classical Physics Laboratory

Select one of the following sequences and accompanying labs:

CHEM M2A- M2B- M2C	Majors General Chemistry Lecture and Majors General Chemistry Lecture and Majors General Chemistry Lecture
CHEM M2LA- M2LB	Majors General Chemistry Laboratory and Majors General Chemistry Laboratory
or	
CHEM H2A- H2B- H2C	Honors General Chemistry and Honors General Chemistry and Honors General Chemistry
CHEM H2LA- H2LB	Honors General Chemistry Laboratory and Honors General Chemistry Laboratory

Complete the analytical chemistry laboratory

CHEM M3LC	Majors Quantitative Analytical Chemistry Laboratory
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Select one of the following organic chemistry sequences and accompanying labs:

CHEM 51A- 51B- 51C	Organic Chemistry and Organic Chemistry and Organic Chemistry
CHEM M52LA- M52LB- M52LC	Majors Organic Chemistry Laboratory and Majors Organic Chemistry Laboratory and Majors Organic Chemistry Laboratory
or	
CHEM H52A-chem h52b-chem h52c	and and
CHEM H52LA- H52LB- H52LC	Honors Organic Chemistry Laboratory and Honors Organic Chemistry Laboratory and Honors Organic Chemistry Laboratory

Complete:

CHEM 5	Scientific Mathematical and Computing Skills
CHEM 107- 107L	Inorganic Chemistry and Inorganic Chemistry Laboratory

CHEM 152	Advanced Analytical Chemistry
CHEM 132A- 132B- 132C	Chemical Thermodynamics, Kinetics, and Dynamics and Quantum Principles, Spectroscopy, and Bonding and Molecular Structure and Elementary Statistical Mechanics

**Elective Requirements <sup>2</sup>**

Select at least five electives from the following lists, including at least two courses selected from the lecture list and two courses selected from the laboratory list:

**Lectures:**

BIO SCI 98	Biochemistry
BIO SCI 99	Molecular Biology
CBE 110	Reaction Kinetics and Reactor Design
CBE 161	Introduction to Biochemical Engineering
CBE 130	Separation Processes
CBE 145	Chemical Process Control
CBE 178	
CBE 181	Polymer Science and Engineering
CHEM 125	Advanced Organic Chemistry
CHEM 127	Inorganic Chemistry II
CHEM 128	Introduction to Chemical Biology
CHEM 133	Nuclear and Radiochemistry
CHEM 137	Computational Chemistry
CHEM 138	Introduction to Computational Organic Chemistry
CHEM 141	Environmental Chemistry
CHEM 145A	Gas-Phase Atmospheric Chemistry
CHEM 145B	Multi-Phase Atmospheric Chemistry
CHEM 150	Computational Chemistry
CHEM 177	Medicinal Chemistry
CHEM 201	Organic Reaction Mechanisms I
CHEM 202	Organic Reaction Mechanisms II
CHEM 203	Organic Spectroscopy
CHEM 204	Organic Synthesis I
CHEM 205	Organic Synthesis II
CHEM 213	Chemical Kinetics
CHEM 215	Inorganic Chemistry I
CHEM 216	Organometallic Chemistry
CHEM 217	Physical Inorganic Chemistry
CHEM 218	Metallobiochemistry
CHEM 219	Chemical and Structural Biology
CHEM 221A	Fundamentals of Molecular Biophysics
CHEM 223	Biological Macromolecules
CHEM 224	Molecular and Cellular Biophotonics
CHEM 225	Polymer Chemistry: Synthesis and Characterization of Polymers
CHEM 228	Electromagnetism
CHEM 229A	Computational Methods
CHEM 230	Classical Mechanics and Electromagnetic Theory
CHEM 231A	Fundamentals of Quantum Mechanics
CHEM 231B	Applications of Quantum Mechanics
CHEM 231C	Molecular Spectroscopy
CHEM 232A	Thermodynamics and Introduction to Statistical Mechanics
CHEM 232B	Advanced Topics in Statistical Mechanics
CHEM 232C	Non-Equilibrium Statistical Mechanics
CHEM 233	Nuclear and Radiochemistry
CHEM 237	Mathematical Methods in Chemistry

CHEM 241	Current Issues Related to Air Quality, Climate, and Energy
CHEM 242A	Physical and Geometrical Optics
CHEM 243	Advanced Instrumental Analysis
CHEM 244	Detection and Measurement of Radiation
CHEM 245A	Gas-Phase Atmospheric Chemistry
CHEM 245B	Multi-Phase Atmospheric Chemistry
CHEM 246	Separations and Chromatography
CHEM 248	Electrochemistry
CHEM 249	Analytical Spectroscopy
CHEM 250	Computational Chemistry
CHEM 263	Materials Chemistry
CHEM 267	Photochemistry
CHEM 268	NMR Spectroscopy
EARTHSS 142	Atmospheric Chemistry
EARTHSS 144	Marine Geochemistry and Biogeochemistry
PHYSICS 111A- 111B	Classical Mechanics and Classical Mechanics
PHYSICS 112A- 112B	Electromagnetic Theory and Electromagnetic Theory

## Laboratories:

BIO SCI M114L	Biochemistry Laboratory
BIO SCI M116L	Molecular Biology Laboratory
BIO SCI M118L	Experimental Microbiology Laboratory
CBE 140A	Chemical Engineering Laboratory I
CHEM 128L	Introduction to Chemical Biology Laboratory Techniques
CHEM 133L	Nuclear and Radiochemistry Laboratory
CHEM 150L	Computational Chemistry Laboratory
CHEM 153	Physical Chemistry Laboratory
CHEM 156	Advanced Laboratory in Chemistry and Synthesis of Materials
CHEM 160	Organic Synthesis Laboratory
CHEM 170	Radioisotope Techniques
CHEM 177L	Medicinal Chemistry Laboratory
CHEM 180	Undergraduate Research <sup>3</sup>
PHYSICS 120- 121W	Electronics for Scientists and Advanced Laboratory
CHEM 197	Professional Internship
CHEM 250L	Computational Chemistry Laboratory

<sup>1</sup> Courses must be taken for a letter grade.

<sup>2</sup> At least three of the courses used to satisfy the Elective Requirement must be courses offered by the Chemistry Department, including at least one lecture course and one laboratory course.

<sup>3</sup> CHEM 180 and CHEM H180 can be counted toward this requirement no more than once.

### Sample Program — Chemistry Majors <sup>1</sup>

Items in parentheses are recommended choices or alternatives.

Freshman		
Fall	Winter	Spring
CHEM M2A- M2LA (CHEM H2A, CHEM H2LA)	CHEM M2B- M2LB (CHEM H2B, CHEM H2LB)	CHEM M2C (CHEM H2C)
MATH 2A	MATH 2B	MATH 2D
Lower-division Writing	Lower-division Writing	CHEM M3LC
CHEM 11		
Sophomore		
Fall	Winter	Spring
CHEM 51A- M52LA (CHEM H52A, CHEM H52LA)	CHEM 51B- M52LB (CHEM H52B, CHEM H52LB)	CHEM 51C- M52LC (CHEM H52C, CHEM H52LC)
CHEM 5	General Education	PHYSICS 7E

PHYSICS 7C- 7LC	PHYSICS 7D- 7LD	General Education
<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
CHEM 132A	CHEM 132B	CHEM 132C
CHEM 107	CHEM 152	CHEM 107L
Chemistry Elective	Chemistry Elective	Elective
General Education	General Education	General Education
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
Elective/Research	Elective/Research	Elective/Research
Upper-division Writing	Chemistry Elective	Chemistry Elective
Chemistry Elective	General Education	General Education
General Education	General Education	

### Optional American Chemical Society Certification

For ACS Certification, the program must include:

A. The Chemical Biology lecture and lab courses:

CHEM 128	Introduction to Chemical Biology
CHEM 128L	Introduction to Chemical Biology Laboratory Techniques

B. One course selected from the following:

CHEM 153	Physical Chemistry Laboratory
CHEM 156	Advanced Laboratory in Chemistry and Synthesis of Materials
CHEM 160	Organic Synthesis Laboratory
CHEM 180	Undergraduate Research
CHEM H180A	Honors Research in Chemistry
CHEM H180B	Honors Research in Chemistry
CHEM H180C	Honors Research in Chemistry

C. One course or the lecture/lab pair selected from:

CHEM 125	Advanced Organic Chemistry
CHEM 127	Inorganic Chemistry II
CHEM 133	Nuclear and Radiochemistry
CHEM 133L	Nuclear and Radiochemistry Laboratory
CHEM 138	Introduction to Computational Organic Chemistry
CHEM 141	Environmental Chemistry
CHEM 150	Computational Chemistry
CHEM 150L	Computational Chemistry Laboratory
CHEM 177	Medicinal Chemistry
CHEM 177L	Medicinal Chemistry Laboratory

or

CHEM 201-205, 213-249

D. One course or the lecture/lab pair selected from list B or C.

E. Independent research with a written thesis submitted as part of CHEM 180W or CHEM H181W.

### Optional Concentrations and Specializations in Chemistry

The core chemistry curriculum provides the students with the foundational knowledge of the traditional areas of chemistry. In addition, the students have an option to focus their education on one of the following areas of chemistry by completing the chemistry core requirements and strategically choosing their elective requirements as shown below. At least two quarters of undergraduate research (CHEM 180, CHEM H180A, CHEM H180B, CHEM H180C) with a research group chosen in consultation with the faculty advisors are strongly recommended but not required for all the concentrations and specializations listed below. The names of the faculty advisors for each concentration and specialization can be found on the Department of Chemistry website.

Only one specialization or concentration may appear on the transcript. If students simultaneously satisfy requirements for more than one specialization or concentration, they should choose which one will be appearing on their transcript.

#### Optional Concentration in Chemical Biology

BIO SCI 97	Genetics
BIO SCI 98	Biochemistry

BIO SCI 99	Molecular Biology
CHEM 128	Introduction to Chemical Biology
CHEM 128L	Introduction to Chemical Biology Laboratory Techniques

### Optional Specialization in Environmental Chemistry

CHEM 145A or EARTHSS 142	Gas-Phase Atmospheric Chemistry
EARTHSS 144	Atmospheric Chemistry
CHEM 141	Marine Geochemistry and Biogeochemistry
CHEM 153	Environmental Chemistry
	Physical Chemistry Laboratory

### Optional Specialization in Medicinal Chemistry

CHEM 128	Introduction to Chemical Biology
CHEM 128L	Introduction to Chemical Biology Laboratory Techniques
CHEM 160	Organic Synthesis Laboratory
CHEM 177	Medicinal Chemistry
CHEM 177L	Medicinal Chemistry Laboratory

### Optional Specialization in Nuclear and Radiochemistry

CHEM 133	Nuclear and Radiochemistry
CHEM 133L	Nuclear and Radiochemistry Laboratory
CBE 178	
CHEM 153	Physical Chemistry Laboratory

### Optional Specialization in Synthetic Chemistry

CHEM 125	Advanced Organic Chemistry
CHEM 127	Inorganic Chemistry II
CHEM 156	Advanced Laboratory in Chemistry and Synthesis of Materials
CHEM 160	Organic Synthesis Laboratory

### Optional Concentration in Chemistry Education

CHEM 193	Research Methods
EDUC 55	Knowing and Learning in Mathematics and Science
PHY SCI 5	California Teach 1: Introduction to Science and Mathematics Teaching
PHY SCI 105	California Teach 2: Middle School Science and Mathematics Teaching

### Optional Concentration in Theoretical and Computational Chemistry

The concentration in Theoretical and Computational Chemistry aims to provide a rigorous education for Chemistry majors with special interests in theory and computation. Compared to the regular Chemistry major, additional courses in mathematics, physics, and computer science are required, while upper-division laboratory courses are option. Enrolling in this concentration requires approval by a faculty advisor. The advisors will be members of the Theoretical and Computational Chemistry faculty group, and will assist the students in choosing elective courses tailored to the students' interests.

A. Complete the following:

MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations
PHYSICS 50	Introductory Mathematical Physics
CHEM 150	Computational Chemistry
CHEM 150L	Computational Chemistry Laboratory

**Select at least nine courses from the following or the Chemistry major electives:**

B. Select at least one from the following:

PHYSICS 111A	Classical Mechanics
PHYSICS 112A	Electromagnetic Theory
PHYSICS 111B	Classical Mechanics
PHYSICS 112B	Electromagnetic Theory
PHYSICS 113A	Quantum Physics

PHYSICS 113B	Quantum Physics
PHYSICS 113C	Quantum Physics
PHYSICS 115A	Statistical Physics
PHYSICS 125A	Mathematical Physics
PHYSICS 125B	Mathematical Physics

C. Select at least one from the following:

MATH 105A- 105LA	Numerical Analysis I and Numerical Analysis Laboratory
MATH 105B- 105LB	Numerical Analysis II and Numerical Analysis Laboratory
STATS 7	Basic Statistics
STATS 110	Statistical Methods for Data Analysis I
STATS 111	Statistical Methods for Data Analysis II
STATS 112	Statistical Methods for Data Analysis III

D. Select at least one of the following:

EECS 12	Introduction to Programming
EECS 20	Computer Systems and C Programming
EECS 22	Advanced C Programming
EECS 22L	Software Engineering Project in C Language

Optional Courses - The following courses are required for the regular Chemistry major, but optional for the Concentration in Theoretical and Computational Chemistry:

CHEM 5	Scientific Mathematical and Computing Skills
CHEM 107L	Inorganic Chemistry Laboratory
CHEM 152	Advanced Analytical Chemistry

All electives listed under the Chemistry major.

### Sample Program - Concentration in Theoretical and Computational Chemistry

Items in parentheses are recommended choices or alternatives.

Freshman		
Fall	Winter	Spring
CHEM M2A- M2LA (CHEM H2A, CHEM H2LA)	CHEM M2B- M2LB (CHEM H2B, CHEM H2LB)	CHEM M3C- M3LC (CHEM H2C, CHEM H2LC)
MATH 2A	MATH 2B	MATH 2D
Lower-Division Writing	Lower-Division Writing	General Education
Sophomore		
Fall	Winter	Spring
CHEM 51A- M52LA (CHEM H52A, CHEM H52LA)	CHEM 51B- M52LB (CHEM H52B, CHEM H52LB)	CHEM 51C- M52LC (CHEM H52C, CHEM H52LC)
PHYSICS 7C- 7LC	PHYSICS 7D- 7LD	PHYSICS 7E
MATH 3A	MATH 3D	
Junior		
Fall	Winter	Spring
CHEM 132A	CHEM 132B	CHEM 132C
CHEM 107	PHYSICS 112A	PHYSICS 113A
PHYSICS 111A	General Education	EECS 20
EECS 12	General Education	General Education
PHYSICS 50		
Senior		
Fall	Winter	Spring
CHEM 150	CHEM 150L	Elective/Research
MATH 105A- 105LA	EECS 22L (MATH 105B - MATH 105LB)	General Education
EECS 22 (STATS 7)	General Education	General Education
Upper-Division Writing	General Education	General Education

### Sample program for transfer students entering at the Junior level

Junior		
Fall	Winter	Spring
CHEM 132A	CHEM 132B	CHEM 132C
CHEM 107	STATS 7	PHYSICS 50

MATH 105A- 105LA	General Education	EECS 20
EECS 12	General Education	General Education
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
CHEM 150	CHEM 150L	PHYSICS 113A
PHYSICS 111A	PHYSICS 112A	EECS 22L
General Education	General Education	General Education
Upper-Division Writing	General Education	General Education

### Secondary Teaching Certification Option

With *additional* course work and field experience offered through the UCI Cal Teach program, students who complete the concentration in Chemistry Education can also earn a California Preliminary Single Subject Teaching Credential. Completing the bachelor's degree, concentration, and teacher certification in four years is possible with careful, early planning. Additional courses required for teacher certification are:

EDUC 109	Reading and Writing in Mathematics and Science
EDUC 143AW- 143BW	Classroom Interactions I and Classroom Interactions II
EDUC 148	Complex Pedagogical Design
EDUC 158	Student Teaching Mathematics and Science in Middle/High School (two quarters)
LPS 60	The Making of Modern Science

Successful completion of EDUC 143AW-EDUC 143BW and EDUC 148 will be accepted in lieu of three electives (from the above Elective Requirements list) for students pursuing the concentration in Chemistry Education. For additional information about teacher certification requirements and enrollment procedures, see Preparation for Teaching Science and Mathematics. Interested students are strongly encouraged to contact the Cal Teach Resource and Advising Center or the Physical Sciences Student Affairs Office.

### Sample Program — Concentration in Chemistry Education (with Secondary Teaching Certification option)

Items in parentheses are recommended choices or alternatives.

<b>Freshman</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
CHEM M2A- M2LA (CHEM H2A, CHEM H2LA)	CHEM M2B- M2LB (CHEM H2B, CHEM H2LB)	CHEM M3C- M3LC (CHEM H2C, CHEM H2LC)
MATH 2A	MATH 2B	MATH 2D
PHY SCI 5	General Education	General Education
<b>Sophomore</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
CHEM 51A- M52LA (CHEM H52C, CHEM H52LA)	CHEM 51B- M52LB (CHEM H52B, CHEM H52LB)	CHEM 51C- M52LC (CHEM H52C, CHEM H52LC)
CHEM 5	PHYSICS 7C- 7LC	PHYSICS 7D- 7LD
PHY SCI 105	CHEM 193	LPS 60
(PHYSICS 2)		General Education
<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
CHEM 132A	CHEM 132B	CHEM 132C
CHEM 107	CHEM 152	CHEM 107L
EDUC 55	EDUC 143AW	EDUC 148
PHYSICS 7E		Chemistry Elective
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
Chemistry Elective	General Education	General Education
EDUC 143BW	EDUC 109	EDUC 158
General Education	EDUC 158	

The departmental requirements leave the student a great deal of latitude in choice of courses; the student can choose to pursue interests ranging from biochemistry on the one hand to chemical physics on the other. Many of the basic requirements above coincide with those of the School of Biological Sciences. For this reason a double major in Chemistry and Biological Sciences is popular. The Department is approved by the American Chemical Society to offer an undergraduate degree certified by the Society as suitable background for a career in chemistry or for graduate study in chemistry. While it is not mandatory, it is desirable for students to pursue a course of study that the Department judges to merit a certified degree. Specifically, the following courses must be included in the program of study and must be taken for a letter grade:

CHEM 128	Introduction to Chemical Biology
or BIO SCI 98	Biochemistry



and two laboratory courses from the list of upper-division laboratory courses that are not already required for the major from the following:

CHEM 128L	Introduction to Chemical Biology Laboratory Techniques
CHEM 152	Advanced Analytical Chemistry
CHEM 153	Physical Chemistry Laboratory
CHEM 156	Advanced Laboratory in Chemistry and Synthesis of Materials
CHEM 160	Organic Synthesis Laboratory
CHEM 170	Radioisotope Techniques
CHEM 180	Undergraduate Research (or CHEM H180)

## Sample Program — Chemistry-Biological Sciences Double Majors

Items in parentheses are recommended choices or alternatives.

Freshman		
Fall	Winter	Spring
CHEM M2A- M2LA (CHEM H2A, CHEM H2LA)	CHEM M2B- M2LB (CHEM H2B, CHEM H2LB)	CHEM M2C- M3LC (CHEM H2C, CHEM M3LC)
MATH 2A	MATH 2B	MATH 2D
BIO SCI 93	BIO SCI 94	General Education
CHEM 11	General Education	
BIO SCI 2A		
Sophomore		
Fall	Winter	Spring
CHEM 51A- M52LA (CHEM H52A, CHEM H52LA)	CHEM 51B- M52LB (CHEM H52B, CHEM H52LB)	CHEM 51C- M52LC (CHEM H52C, CHEM H52LC)
CHEM 5	PHYSICS 7C- 7LC	PHYSICS 7D- 7LD
(Physics 2)	BIO SCI 98	BIO SCI 99
BIO SCI 97	General Education/Elective	BIO SCI 194S
Junior		
Fall	Winter	Spring
CHEM 132A	CHEM 132B	CHEM 132C
PHYSICS 7E	CHEM 107L	Bio. Sci. major course
CHEM 107	General Education/Elective	
BIO SCI 100		
Senior		
Fall	Winter	Spring
Bio. Sci. major course	Chemistry Elective	Chemistry Elective
Bio. Sci. Lab	Bio. Sci. Elective	Chemistry Elective
General Education/Elective	Bio. Sci. Lab	Bio. Sci. Lab
	General Education/Elective	General Education/Elective

The Honors Program in Chemistry is a research-based program offered to selected Chemistry majors during their final year. Applicants to the program must have completed their junior year with a grade point average of at least 3.3 overall and in their Chemistry courses. They must also have demonstrated the potential of carrying out research of honors quality, as judged by the Chemistry faculty member who will supervise their research. Students in this program enroll in Honors Research in Chemistry (CHEM H180A-CHEM H180B-CHEM H180C) throughout their senior year and submit a formal thesis late in the spring quarter. They also enroll in the Honors Seminar in Chemistry (CHEM H181W), in which they receive instruction in scientific writing and present a formal research seminar. Successful completion of CHEM H181W satisfies the UCI upper-division writing requirement. NOTE: Students enrolled in the Honors Research in Chemistry (CHEM H180A-CHEM H180B-CHEM H180C) do not enroll in CHEM 180 (Undergraduate Research).

Students who complete these requirements, whose grade point average remains above the 3.3 standard, and whose research is judged to be of honors quality will graduate with Departmental Honors in Chemistry.

The Department also offers an Honors General Chemistry sequence, CHEM H2A-CHEM H2B-CHEM H2C. This course in general chemistry is designed for members of the Campuswide Honors Collegium (CHC) and other highly qualified students. It covers the same material as CHEM 1A-CHEM 1B-CHEM M3C, but in greater depth.

Additional information is available from the Chemistry Undergraduate Program Office.

## Chemistry, Ph.D.

The Department offers an M.S. and a Ph.D. in Chemistry. The Ph.D. is granted in recognition of breadth and depth of knowledge of the facts and theories of modern chemistry and an ability to carry out independent chemical research demonstrated through submission of an acceptable doctoral

dissertation. The M.S. may be earned either through submission of an acceptable Master's thesis (Plan I) or through an approved program of graduate course work and a comprehensive oral examination (Plan II). A Master's degree is not a prerequisite for admission to the Ph.D. program.

Students in the Ph.D. and M.S. Plan I (Thesis) programs are required to complete a minimum of seven approved four-unit courses including six graduate-level courses. The M.S. Plan II (Non-Thesis) program requires that the student complete 10 four-unit courses including eight graduate level courses and a comprehensive oral examination. Graduate students are expected to attain grades of B or better to remain in good academic standing. The comprehensive oral examination assesses the competence of the candidate in the areas of chemistry covered by the chosen course work, with unanimous agreement among the three examination committee members required for satisfactory completion.

Progress toward the Ph.D. during the first year is assessed by a written examination administered after completion of the first year of study. This examination covers either research accomplishments during the first year or comprehensive knowledge acquired in course work. The time and content of the examination depends upon the student's specific area of interest.

Training in teaching is an integral part of each graduate program, and all graduate degree candidates are expected to participate in the teaching program for at least four quarters during their graduate career.

Participants in the Ph.D. program take an oral examination for formal Advancement to Candidacy. This examination consists of an oral defense before a faculty committee of the student's dissertation research project, and an original research proposition conceived, developed, and documented by the student. The committee may examine the student at this time on any subject it deems relevant to the independent pursuit of chemical research. For students in organic chemistry, the candidacy exam must be taken by the end of the sixth quarter in residence. For students in inorganic chemistry, the candidacy exam must be taken by the end of the seventh quarter in residence.

The most important component of the Ph.D. program is the doctoral dissertation, which must describe the results of original research performed by the student under the supervision of a faculty member of the Department. The criterion for acceptability of the dissertation is that its contents be of a quality suitable for publication in a scientific journal of high editorial standards. Each Ph.D. candidate is expected to present the work described in the completed dissertation in a seminar before the Department, following which the candidate will be examined on the contents of the dissertation by a committee of the faculty. A Master's thesis presented in partial fulfillment of the requirements for the M.S. under Plan I must also describe the results of a student's original research performed under the direction of a faculty member. However, no public oral defense of the Master's thesis is required.

Residency requirements specify a minimum of six quarters in residence at UCI for Ph.D. candidates and three quarters for M.S. candidates.

The normative time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

### **Master of Science in Chemistry Plan I (Thesis Plan)**

- Completion of a minimum of seven approved four-unit courses, including six graduate-level courses (as specified by the Department and excluding CHEM 280, CHEM 290, CHEM 291, and CHEM 399) with maintenance of a grade of B or better.
- Completion of the teaching requirement.
- Completion of three quarters in residence at UCI.
- Submission of an acceptable Master's thesis.

### **Master of Science in Chemistry Plan II (Non-Thesis Plan)**

- Completion of 10 four-unit courses including eight graduate-level courses (as specified by the department and excluding CHEM 290, CHEM 291, and CHEM 399 and counting CHEM 280 no more than once) with a grade of B or better.
- Completion of the teaching requirement.
- Completion of three quarters in residence at UCI.
- Satisfactory completion of a comprehensive oral examination.

### **Doctor of Philosophy in Chemistry**

- Completion of a minimum of seven approved four-unit courses, including six graduate-level courses (as specified by the Department and excluding CHEM 280, CHEM 290, CHEM 291, and CHEM 399) with maintenance of a grade of B or better. In addition, all students will be required to take a "Conduct of Research" course.
- Completion of the second-year Examination requirement.
- Completion of the Oral Examination requirement for Advancement to Candidacy.
- Completion of the teaching requirement.
- Completion of six quarters in residence at UCI.
- Submission of an acceptable doctoral dissertation.

### **Concentration in Chemical and Materials Physics**

This is an interdisciplinary program between condensed matter physics and physical chemistry, which is designed to eliminate the barrier between these two disciplines. Students with a B.S. in Physics, Chemistry, Materials Science and Engineering, or Chemical and Biomolecular Engineering are

encouraged to apply to the program. The goal of the concentration in Chemical and Materials Physics (ChaMP) is to provide students with a broad interdisciplinary education in the applied physical sciences that emphasizes modern laboratory and computational skills. The program accepts students for both the M.S. and the Ph.D. Upon admission to the program, students are assigned two faculty advisors, one from the Department of Physics and Astronomy, and one from the Department of Chemistry, to provide guidance on curriculum and career planning.

### Doctor of Philosophy Requirements

The curriculum for the ChaMP program includes a summer session to assimilate students with different undergraduate backgrounds; formal shop, laboratory, and computational courses; a sequence on current topics to bridge the gap between fundamental principles and applied technology; and a course to develop communication skills. The required courses include 10 core courses and three electives as follows. In certain situations, courses may be substituted by other courses with written approval of the student's research advisor and the ChaMP Chemistry graduate advisor:

#### A. Complete Core Courses:

CHEM 206	Advanced Data Acquisition and Analysis
CHEM 208	Math Methods
CHEM 266	Current Topics in Chemical, Applied, and Materials Physics

#### B. Select one of the following Computation/Machine Learning courses:

CHEM 229A	Computational Methods
CHEM 250	Computational Chemistry
PHYSICS 246	Special Topics in Astrophysics

#### C. Select one of the following Quantum Mechanics courses:

CHEM 231A	Fundamentals of Quantum Mechanics
or PHYSICS 215A	Quantum Mechanics

#### D. Select one of the following ChaMP Chemistry courses:

CHEM 231B	Applications of Quantum Mechanics
PHYSICS 215B	Quantum Mechanics
CHEM 231C	Molecular Spectroscopy
CHEM 263	Materials Chemistry

#### E. Select one of the following Statistical Mechanics/Thermodynamics courses:

CHEM 232A	Thermodynamics and Introduction to Statistical Mechanics
CHEM 232B	Advanced Topics in Statistical Mechanics
PHYSICS 214A	Statistical Physics

#### F. Select one of the following Communication courses:

CHEM 273	Technical Communication Skills
PHYSICS 273	Technical Communication Skills
PHY SCI 220	Science Communication Skills
PHYSICS 250	Physics and Astronomy Communications Skills

#### G. Select one of the following Classical Mechanics/Electromagnetism courses:

CHEM 228	Electromagnetism
CHEM 230	Classical Mechanics and Electromagnetic Theory
PHYSICS 213A	Electromagnetic Theory

#### H. Select one of the following ChaMP Physics courses:

PHYSICS 133	Introduction to Condensed Matter Physics
PHYSICS 238A	Condensed Matter Physics
PHYSICS 239A	Plasma Physics

#### Electives (three of the following must be taken)

CHEM 213	Chemical Kinetics
CHEM 225	Polymer Chemistry: Synthesis and Characterization of Polymers
CHEM 232C	Non-Equilibrium Statistical Mechanics
CHEM 233	Nuclear and Radiochemistry
CHEM 243	Advanced Instrumental Analysis
CHEM 248	Electrochemistry
CHEM 249	Analytical Spectroscopy
CHEM 267	Photochemistry
EECS 285B	Lasers and Photonics

ENGRMSE 259	Transmission Electron Microscopy
PHYSICS 134A	Physical and Geometrical Optics
PHYSICS 211	Classical Mechanics
PHYSICS 215B	Quantum Mechanics
PHYSICS 222	Continuum Mechanics
PHYSICS 230A	Biophysics of Molecules and Molecular Machines
PHYSICS 230B	Biophysics of Molecules and Molecular Machines
PHYSICS 233A- 233B	Principles of Imaging and Techniques in Medical Imaging I: X-ray, Nuclear, and NMR Imaging
PHYSICS 238B- 238C	Condensed Matter Physics and Condensed Matter Physics

or other courses with written approval from the student's research advisor and the ChaMP Chemistry graduate advisor.

In addition to the core ChaMP requirements listed above, students are expected to complete the following Doctor of Philosophy in Chemistry requirements:

- Completion of the second-year Examination requirement.
- Completion of the Oral Examination requirement for Advancement to Candidacy.
- Completion of the teaching requirement.
- Completion of six quarters in residence at UCI.
- Submission of an acceptable doctoral dissertation.

### Master of Science in Chemistry

- Completion of 10 core courses and three electives that make up the required coursework for the Ph.D. program with a grade of B or better.
- Completion of the teaching requirement.
- Completion of three quarters in residence at UCI.
- Satisfactory completion of a comprehensive examination.

### Graduate Gateway Program in Medicinal Chemistry and Pharmacology (MCP)

The one-year graduate Gateway Program in Medicinal Chemistry and Pharmacology (MCP) is designed to function in concert with selected department programs, including the Ph.D. in Chemistry. Detailed information is available in the Department of Pharmaceutical Sciences section and on the Pharmaceutical Sciences website. (<http://www.pharmsci.uci.edu/>)

## Department of Earth System Science

### Eric Rignot, Chair

3200 Croul Hall  
949-824-8794  
<http://www.ess.uci.edu/>

Understanding global environmental issues such as global warming, stratospheric ozone depletion, and worldwide air pollution requires the cooperation of scientists across many fields. Global change is projected to accelerate through the 21st century and will impact the ecosystems that preserve the habitability of the planet. The Department of Earth System Science focuses on the atmosphere, land, and oceans, how these interact as a system, and how the Earth will change over a human lifetime. Earth System Science (ESS) is inherently interdisciplinary in scope, linking oceanography, atmospheric and terrestrial sciences, climatology, hydrology, biology, physics, and chemistry to understand the environment. ESS faculty includes chemists, biologists, ecologists, physicists, hydrologists, geologists, meteorologists, engineers, applied mathematicians, and oceanographers. The wide-ranging expertise of ESS faculty and teaching assistants allows students to learn valuable scientific skills in the classroom, laboratory, and field experiences.

- Earth and Atmospheric Sciences, Minor
- Earth System Science, B.S.
- Earth System Science, Ph.D.

### Faculty

Steven D. Allison, Ph.D. Stanford University, *Professor of Ecology and Evolutionary Biology; Earth System Science*

Elizabeth D. Crook, Ph.D. University of California, Santa Cruz, *Assistant Professor of Teaching of Earth System Science*

Claudia I. Czimczik, Ph.D. Max Planck Institute, *Associate Professor of Earth System Science*

Kristen A. Davis, Ph.D. Stanford University, *Associate Professor of Civil and Environmental Engineering; Earth System Science* (coastal oceanography, fluid mechanics, turbulent flows)

Steven J. Davis, Ph.D. Stanford University, *Associate Professor of Earth System Science; Civil and Environmental Engineering*

Ellen R. Druffel, Ph.D. University of California, San Diego, *Fred Kavli Chair in Earth System Science and Distinguished Professor of Earth System Science*

Benis Egoh, Ph.D. Stellenbosch University, *Assistant Professor of Earth System Science*

Julie E. Ferguson, Ph.D. Oxford University, *Associate Professor of Teaching of Earth System Science*

Michael L. Goulden, Ph.D. Stanford University, *Professor of Earth System Science; Ecology and Evolutionary Biology*

Alex Guenther, Ph.D. Washington State University, *Professor of Earth System Science*

Kathleen Johnson, Ph.D. University of California, Berkeley, *Associate Professor of Earth System Science*

Saewung Kim, Ph.D. Georgia Institute of Technology, *Associate Professor of Earth System Science*

Katherine Mackey, Ph.D. Stanford University, *Clare Booth Luce Assistant Professor of Earth System Science*

Gudrun Magnusdottir, Ph.D. Colorado State University, *Professor of Earth System Science*

Adam Martiny, Ph.D. Technical University of Denmark, *Professor of Earth System Science; Ecology and Evolutionary Biology*

Jefferson Moore, Ph.D. Oregon State University, *Professor of Earth System Science*

Mathieu Morlighem, Ph.D. Ecole Centrale Paris, *Vice Chair and Associate Professor of Earth System Science*

Michael J. Prather, Ph.D. Yale University, *UCI Distinguished Professor of Earth System Science*

Francois W. Primeau, Ph.D. Massachusetts Institute of Technology, *Professor of Earth System Science*

Michael S. Pritchard, Ph.D. University of California, San Diego, *Associate Professor of Earth System Science*

James T. Randerson, Ph.D. Stanford University, *UCI Chancellor's Professor of Earth System Science; Civil and Environmental Engineering; Ecology and Evolutionary Biology*

William S. Reeburgh, Ph.D. Johns Hopkins University, *Professor Emeritus of Earth System Science*

Eric Rignot, Ph.D. University of Southern California, *Department Chair and Donald Bren Professor of Earth System Science; Civil and Environmental Engineering*

Eric S. Saltzman, Ph.D. University of Miami, *UCI Distinguished Professor of Earth System Science; Chemistry*

Soroosh Sorooshian, Ph.D. University of California, Los Angeles, *Director of the Center for Hydrometeorology and Remote Sensing (CHRS) and UCI Distinguished Professor of Civil and Environmental Engineering; Earth System Science* (hydrology, hydrometeorology and hydroclimate modeling, remote sensing, water resources management)

Susan E. Trumbore, Ph.D. Columbia University, *Professor of Earth System Science*

Isabella Velicogna, Ph.D. Università degli Studi di Trieste, *UCI Chancellor's Fellow and Professor of Earth System Science*

Jasper A. Vrugt, Ph.D. University of Amsterdam, *Associate Professor of Civil and Environmental Engineering; Earth System Science* (examining how (eco)systems work, why theories deviate from data, how scientists diagnose change, as applied to biogeosciences, ecology, geomorphology, geophysics, hydrology, soils)

Jin Yi Yu, Ph.D. University of Washington, *Vice Chair and Professor of Earth System Science*

Charles S. Zender, Ph.D. University of Colorado Boulder, *Professor of Earth System Science; Computer Science*

## Courses

### **EARTHSS 1. Introduction to Earth System Science. 4 Units.**

Covers the origin and evolution of the Earth, its atmosphere, and oceans, from the perspective of biogeochemical cycles, energy use, and human impacts on the Earth system.

(II and VA ).

### **EARTHSS 3. Oceanography. 4 Units.**

Examines circulation of the world oceans and ocean chemistry as it relates to river, hydrothermal vent, and atmospheric inputs. Geological features, the wide variety of biological organisms, and global climate changes, such as greenhouse warming, are also studied.

(II, Va)

### **EARTHSS 5. The Atmosphere. 4 Units.**

The composition and circulation of the atmosphere with a focus on explaining the fundamentals of weather and climate. Topics include solar and terrestrial radiation, clouds, and weather patterns.

(II and VA ).

### **EARTHSS 7. Physical Geology. 4 Units.**

Introduction to Earth materials and processes. Topics include rocks and minerals, plate tectonics, volcanoes, earthquakes, Earth surface processes, Earth resources, geologic time, and Earth history. Laboratory work involves hands-on study of geologic materials, maps, and exercises pertaining to geologic processes. Materials fee.

(II and VA ).

### **EARTHSS 15. Introduction to Global Climate Change. 4 Units.**

Introduction of scientific, technological, environmental, economic, and social aspects underlying the threat and understanding of global climate change. Human and natural drivers of climate. Impacts of climate on natural, managed, and human systems, including their vulnerability and ability to adapt.

(II and (VA or VIII) ).

### **EARTHSS 17. Hurricanes, Tsunamis, and Other Catastrophes. 4 Units.**

Introduction to the basic science and state of predictability of various natural catastrophic events including earthquakes, volcanic eruptions, tsunamis, landslides, floods, hurricanes, fires, and asteroid impacts and their interactions and implications with human society in the U.S. and globally.

Overlaps with PUBHLTH 90.

(II and (VA or VIII) ).

### **EARTHSS 19. Introduction to Modeling the Earth System. 4 Units.**

Simulate the Earth's system using computer models. Covers the interaction of the air, land, and ocean, and explores how changes to one part of the environment affect the complete Earth system. Utilizes technological tools to understand scientific principles.

(II, Vb)

### **EARTHSS 21. On Thin Ice: Climate Change and the Cryosphere. 4 Units.**

Introduction of the basic science that governs the cryosphere and its interaction with the climate system. Covers some of the significant economic, sociological, and political consequences of the recent melting of the cryosphere driven by anthropogenic climate change.

(II and (VA or VIII) ).

### **EARTHSS 23. Air Pollution: From Urban Smog to Global Change . 4 Units.**

Air pollution occurs on regional to global scales. A wide range of air pollution sources and physical, chemical, and meteorological sciences behind air pollution are introduced. The consequences of air pollution to our society are also discussed.

(II and (VA or VIII) ).

### **EARTHSS 27. The Sustainable Ocean. 4 Units.**

An introduction to sustainability as it relates to marine resources and conservation. Topics include the scientific basis of our understanding of marine ecosystems, and the political, social, and cultural principles that govern resource protection.

(II and VIII ).

**EARTHSS H30B. Environmental Issues Affecting the Sustainability of Societies I. 4 Units.**

Focuses on several environmental challenges facing the world today, and explores the problem, possible solutions, and their scientific, technical, and social constraints. Models for systems, their assumptions, predictive uncertainty, and interpretation, play a large role.

Prerequisite: CHEM H30A. CHEM H30A with a grade of C or better

Overlaps with EARTHSS 15.

Restriction: Campuswide Honors Collegium students only.

**(II and Vb ).**

**EARTHSS H30C. Environmental Issues Affecting the Sustainability of Societies II. 4 Units.**

Focuses on how we can use Earth's resources, e.g., food and water, in a more sustainable way, exploring their scientific, technical, and social constraints.

Prerequisite: EARTHSS H30B. EARTHSS H30B with a grade of C or better

Restriction: Campuswide Honors Collegium students only.

**(III)**

**EARTHSS 40A. Earth System Chemistry. 4 Units.**

To understand the cycling of matter on Earth, we need to learn about the chemistry of elements and molecules in the environment. Introduces students to the understanding of how chemical principles apply in context to their everyday lives.

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment.

**(II and VA ).**

**EARTHSS 40B. Earth System Biology. 4 Units.**

Earth System Science is a highly interdisciplinary field that requires knowledge of various components of the Earth as a system, including the biosphere. Students are introduced to several fundamental principles of biology, from the smallest cells to the largest ecosystems.

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment.

**(II)**

**EARTHSS 40C. Earth System Physics. 4 Units.**

Covers the fundamental physical forces and laws that affect the Earth system, such as electromagnetic radiation and energy transfer, atmospheric and ocean dynamics. Also covers aspects of physics related to environmental issues, such as electricity generation and transmission.

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment.

**(II and VA ).**

**EARTHSS 45. New Student Seminar. 1 Unit.**

Weekly meetings led by faculty, current students, and staff, to provide information on the Department of Earth System Science, campus resources, and special programs and opportunities. Designed for students who recently joined the Earth System Science and Environmental Science majors.

Grading Option: Pass/no pass only.

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment. New students only (freshman, transfer, and change of major).

**EARTHSS 51. Land Interactions. 4 Units.**

The role of terrestrial processes in the Earth system. Provides an introduction to ecosystem processes that regulate the cycling of energy, water, carbon, and nutrients. Analysis of the impact of human activities. Materials fee.

Corequisite: CHEM 1C

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.



**EARTHSS 53. Ocean Biogeochemistry. 4 Units.**

Overview of oceanography for those interested in Earth System Science. Focus is on physical, chemical, and biological processes that drive biogeochemical cycling in the oceans. Coastal systems are also reviewed, with an emphasis on California waters.

Prerequisite: CHEM 1C

Restriction: Earth System Science Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment.

**EARTHSS 55. Earth's Atmosphere. 4 Units.**

Composition, physics, and circulation of Earth's atmosphere with an emphasis on explaining the role of atmospheric processes in shaping the climate system. Topics include atmospheric composition, the global energy balance, radiative transfer and climate, atmospheric circulation, and climate sensitivity.

Prerequisite or corequisite: (MATH 2B or MATH 5B) and (PHYSICS 3B or PHYSICS 7C)

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 70A. Sustainable Energy Systems. 4 Units.**

Addresses how modern energy services can be provided sustainably and the challenges and barriers that must be overcome. Major environmental issues are discussed, such as climate change, air pollution, and resource demands.

Prerequisite or corequisite: EARTHSS 40C or PHYSICS 3C or PHYSICS 7E

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 70B. Sustainable Food and Water Systems. 4 Units.**

Explores the biophysical underpinnings of food production, the history of agricultural development, and a range of environmental issues facing agricultural systems, including water management, climate change, and land use.

Prerequisite or corequisite: EARTHSS 40B or (BIO SCI 93 and BIO SCI 94)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 100. Special Topics in Earth System Science. 1-4 Units.**

Devoted to current topics in the field of Earth System Science. Topics addressed vary each quarter.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Repeatability: May be taken for credit for 12 units as topics vary.

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 101. Paleoclimatology. 4 Units.**

Explores past changes in Earth's climate. Topics include tools and techniques used to reconstruct past climate from natural archives; records and mechanisms of past climate changes throughout Earth history; and lessons learned from the paleo-record for prediction of future climate.

Prerequisite: EARTHSS 51 and EARTHSS 53 and EARTHSS 55

Restriction: Earth System Science Majors have first consideration for enrollment.

Concurrent with EARTHSS 201.

**EARTHSS 112. Global Climate Change and Impacts. 4 Units.**

Observations over the 20th century show extensive changes in atmospheric composition, climate and weather, and biological systems that have paralleled industrial growth. Evidence of globally driven changes in these biogeochemical systems is studied, including projected impacts over the 21st century.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 114. Earth System Science Laboratory and Field Methods. 4 Units.**

Introduction to methods used to measure exchange of gases and energy between the atmosphere and terrestrial ecosystems. Laboratories include data acquisition and isotopic and chromatographic analysis. Field measurements at UCI's Marsh Reserve include microclimate, hydrology, trace-gas exchange, and plant growth. Materials fee.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 115. Aquatic Field Methods. 4 Units.**

Students design sampling plans, conduct field research techniques, and carry out data analyses that are relevant to aquatic field research. Aquatic field sites covered in the course include marine, estuarine, and fluvial systems. Materials fee.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 116. Introduction to Environmental Data Science. 4 Units.**

Analysis and interpretation of geophysical data, including functional fitting, probability density functions, and multidimensional time-series methods, with applications in atmospheric, oceanic, and biogeochemical sciences.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 118. Analysis, Modeling, and Visualization of Multidimensional Environmental Data. 4 Units.**

Students learn programming and numerical methods in Python with applications in Earth System Science and ecology. Topics include regression, uncertainty and significance, the development of simple box models, and the visualization of multi-dimensional climate and satellite datasets.

Prerequisite: I&C SCI 31 or EARTHSS 116

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 122. Atmospheric Dynamics. 4 Units.**

Fluid dynamical processes that determine the large-scale flow of the atmosphere and ocean. Most important are interactions between the density stratification and the Coriolis force associated with Earth's rotation. Topics include circulation, vorticity, planetary waves, and their role in climate.

Prerequisite: EARTHSS 55 and (PHYSICS 7C or PHYSICS 3B)

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 124. Weather Analysis. 4 Units.**

Provides an overview of weather systems in midlatitudes and tropics. The fundamental dynamics possible for these weather systems are described. Elementary weather analysis and forecasting techniques are introduced.

Prerequisite: EARTHSS 55

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 130. Physical Oceanography. 4 Units.**

Physical processes that determine the distribution of water properties such as salt and temperature. Fluid-dynamical underpinnings of physical oceanography. Wave motions. The wind-driven and thermohaline circulation. Similarities and differences between ocean and atmosphere dynamics.

Prerequisite: (PHYSICS 7C or PHYSICS 3B) and EARTHSS 53

Restriction: Earth System Science Majors have first consideration for enrollment.

**EARTHSS 132. Terrestrial Hydrology. 4 Units.**

Comprehensive treatment of modern conceptual and methodological approaches to hydrological science. Combines qualitative understanding of hydrological processes with quantitative representation, approaches to measurement, and treatment of uncertainty. Components of the hydrological cycle and their linkages within the coupled Earth system.

Prerequisite: (EARTHSS 51 and EARTHSS 55) or (EARTHSS 40C and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 133. Soil: It's the Good Dirt. 4 Units.**

An introduction to the critical role soils play in sustaining land ecosystems and humans. Covers how soils form and how human actions contribute to the pollution and loss but also the health and productivity of soils.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors only. Environmental Science Majors only. Earth System Science Majors only.

**EARTHSS 134. Fundamentals of GIS for Environmental Science. 4 Units.**

Introduction to Geographic Information Systems (GIS). Topics include fundamentals of cartography, creating/editing GIS data, linking spatial and tabular data, georeferencing, map projections, geospatial analysis, spatial statistics, and the development of GIS models. Examples from hydrology, ecology, and geology.

Prerequisite: (EARTHSS 51 and EARTHSS 53) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 138. Satellite Remote Sensing for Earth System Science. 4 Units.**

Satellite remote sensing data are increasingly used to study the Earth system. Provides an overview of the principles behind remote sensing, and the types of satellite data available for study of the oceans, land, and atmosphere.

Prerequisite: (EARTHSS 51 and EARTHSS 53) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 140. Advanced Geology. 4 Units.**

Introduces students to the geological processes which have formed and continue to shape the Earth. Topics include geological time, minerals and the rock cycle, plate tectonics and associated geological hazards, earth resources, and earth surface processes. Materials fee.

Prerequisite: EARTHSS 51 or EARTHSS 70B

Overlaps with EARTHSS 7.

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 142. Atmospheric Chemistry. 4 Units.**

Chemistry of the troposphere and stratosphere. Topics include processes controlling the lifetime and reaction pathways of chemicals in the atmosphere, the role of the atmosphere in biogeochemical cycles, and interactions between atmospheric chemistry and the physical climate system.

Prerequisite: (CHEM 1C or CHEM H2C or CHEM M3C) and (PHYSICS 3C or PHYSICS 7E) and (MATH 2B or MATH 5B or AP Calculus BC). AP Calculus BC with a minimum score of 4

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 144. Marine Geochemistry and Biogeochemistry. 4 Units.**

Processes controlling the major and minor element composition of seawater and element distributions in the ocean. Gas exchange, carbon dioxide system, stable isotopes, radionuclides as tracers and chronometers, particle fluxes, organic geochemistry, sediment geochemistry, global cycles of biogeochemically important elements.

Prerequisite: EARTHSS 53 or CHEM 51C

Restriction: School of Physical Sciences students have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 146. Consequences of Air Pollution. 4 Units.**

From public health to the global climate system, this course explores the impacts of air pollution from the beginning of human history to current and emerging issues. Scientific concepts behind air pollution and solutions are discussed.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 40C and EARTHSS 70A)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 148. Marine Ecosystems and Global Change. 4 Units.**

Presents an overview of marine ecosystem structure, diversity, and processes in the context of global change, including the impacts of climate warming, ocean acidification, marine fisheries, and anthropogenic additions of nutrients and pollutants.

Prerequisite: EARTHSS 53 or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

Concurrent with EARTHSS 248.

**EARTHSS 154. Ecosystem Services. 4 Units.**

Covers what ecosystem services are, how to classify them, what the impacts of land degradation are on ecosystem services, how to quantify and value them, and the importance of mainstreaming ecosystem services in decision-making.

Prerequisite: (EARTHSS 70A and EARTHSS 70B) or (EARTHSS 51 and EARTHSS 53 and EARTHSS 55)

Same as BIO SCI E146.

**EARTHSS 156. The Future of Forests. 4 Units.**

Introduces students to the determinants of global forest distribution; ecosystem services associated with forest functioning; threats to forests resulting from climate and land-use change; and, opportunities for conserving natural forests in the near future.

Prerequisite: (EARTHSS 70A and EARTHSS 70B) or (EARTHSS 51 and EARTHSS 53 and EARTHSS 55)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 158. Research Methods for Sustainable Systems Analysis. 4 Units.**

Develops students' analytical skills that are necessary to engage and assess the sustainability of coupled human and natural systems and effectively communicate their findings.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B). Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment. Global Sustainability Minors have first consideration for enrollment.

**EARTHSS 162. The Impact of Climate Change on California's Landscape. 4 Units.**

Overview of anticipated impacts of climate change on California's landscape. Includes projections of future climate; anticipated impacts on ecology, hydrology, wildfire, coastal environment, and agriculture; and efforts to reduce greenhouse gas emissions or adapt to climate change through land management.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 164. Ecosystem Ecology. 4 Units.**

A mechanistic perspective on ecosystem processes. Covers ecosystem development, element cycling, and interactions with plants and microbes. The role of ecosystems in environmental change is also addressed.

Prerequisite: BIO SCI E106 or EARTHSS 51 or EARTHSS 60A or CHEM 51C

Same as BIO SCI E118.

Restriction: Earth System Science Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Ecology and Evolutionary Biol Majors have first consideration for enrollment.

Concurrent with EARTHSS 264.

**EARTHSS 168. Physiological Plant Ecology. 4 Units.**

An examination of the interactions between plants and their environment. Emphasis on the underlying physiological mechanisms of plant function, adaptations and responses to stress, and the basis of the distribution of plants and plant assemblages across the landscape.

Prerequisite: EARTHSS 51 or BIO SCI 94 or (EARTHSS 60A and EARTHSS 60C)

Same as BIO SCI E127.

Restriction: Biological Sciences Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 171. Microbial Biogeochemistry. 4 Units.**

Develops an understanding of microorganisms in the context of their environment, environmental impact, and role in the global cycles of C,N,P, etc. Focuses on tools used to evaluate microbial diversity and function, and applications of microbial ecology.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B)

Restriction: Environmental Science and Policy Majors only. Environmental Science Majors only. Earth System Science Majors only.

**EARTHSS 176W. Marine Conservation, Policy, and Society. 4 Units.**

Conservation of marine ecosystems is important yet challenging due to competing physical, ecological, social, and regulatory issues. Students explore the principles of marine conservation, the scientific basics of marine ecosystems, and political and social processes involved with resource protection.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B). Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

(Ib)

**EARTHSS 177W. Documenting and Understanding Earth System Change. 4 Units.**

Students select a time series of key environmental interest as the focus for their writing. They become familiar with common writing practices for the Earth Sciences, and exercise their ability to use the scientific method to produce reports.

Prerequisite: (EARTHSS 51 and EARTHSS 53 and EARTHSS 55) or (EARTHSS 70A and EARTHSS 70B). Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Environmental Science and Policy Majors only. Environmental Science Majors only. Earth System Science Majors only.

(Ib)

**EARTHSS 179. Climate Solutions. 4 Units.**

Focuses on carbon neutrality and climate stability, addressing.

Same as ENGRMAE 119, UPPP 111.

Restriction: Upper-division students only.

**EARTHSS 190A. Senior Seminar on Global Sustainability I. 2 Units.**

Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum is also required. Seminar utilized to analyze forum presentations. Prepare bibliography.

Same as BIO SCI 191A, SOCECOL 186A.

Restriction: Seniors only. Global Sustainability Minors have first consideration for enrollment.

**EARTHSS 190B. Senior Seminar on Global Sustainability II. 2 Units.**

Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum is also required. Seminar utilized to analyze forum presentations. Prepare research proposal.

Prerequisite: BIO SCI 191A or SOCECOL 186A or EARTHSS 190A

Same as BIO SCI 191B, SOCECOL 186B.

Restriction: Seniors only.

**EARTHSS 190CW. Writing/Senior Seminar on Global Sustainability III. 4 Units.**

Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum also is required. Seminar utilized to analyze Forum presentations and to prepare senior research paper. Prepare/write research paper under direction of faculty member.

Prerequisite: BIO SCI 191B or EARTHSS 190B or SOCECOL 186B. BIO SCI 191B or EARTHSS 190B or SOCECOL 186B. Satisfactory completion of the Lower-Division Writing requirement.

Same as BIO SCI 191CW, SOCECOL 186CW.

Restriction: Seniors only.

**(Ib)**

**EARTHSS 191. Introduction to Research in Earth System Science. 1 Unit.**

Weekly presentations by Earth System Science faculty describing ongoing research in their laboratories. Students are introduced to the range of research topics and methods in Earth System Science and to the research opportunities available within the Department.

Prerequisite: (EARTHSS 60A and EARTHSS 60B) or (EARTHSS 51 and EARTHSS 53)

Grading Option: Pass/no pass only.

Restriction: Earth & Atmospheric Sciences Minors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 192. Careers in Earth System Science. 1 Unit.**

A weekly seminar course designed to help students transition to post-graduation career paths. Topics include designing effective resumes, applying to graduate school, and seeking employment. Also includes presentations by faculty, business, and government leaders describing potential environmental science career trajectories.

Grading Option: Pass/no pass only.

Restriction: Environmental Science and Policy Majors have first consideration for enrollment. Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 197. Independent Study in Earth System Science. .5-4 Units.**

Field study, educational outreach, or other independent projects under faculty direction. Interested students should arrange with an ESS faculty member to supervise and support an independent study project. A written summary is required at the end of each quarter.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 12 units.

**EARTHSS 198W. Senior Thesis in Earth System Science. 4 Units.**

Students receive guidance on the effective oral and written communication of research results. Students prepare and present a seminar, a poster, and a written thesis describing their research in Earth System Science.

Prerequisite: Two quarters of EARTHSS 199. Satisfactory completion of the Lower-Division Writing requirement.

Overlaps with EARTHSS H198.

(Ib)

**EARTHSS H198. Honors Thesis in Earth System Science. 4 Units.**

Students receive guidance on effective written and oral communication of research results. Students prepare and present a seminar, poster, and written thesis describing their honors research in Earth System Science. Submission of the thesis and successful completion of this course will also satisfy the UCI upper-division writing requirement.

Prerequisite: ESS 199A and ESS 199B

Restriction: Consent of instructor to enroll and Prerequisite required

(Ib)

**EARTHSS 199. Undergraduate Research. 1-4 Units.**

For undergraduates with majors in science or engineering. Interested students should arrange with an ESS faculty member to supervise and support a research project. A written summary is required at the end of each quarter.

Repeatability: May be taken for credit for 12 units.

**EARTHSS H199A. Honors Research in Earth System Science. 4 Units.**

Undergraduate honors research in Earth System Science. A student commitment of 10-15 hours a week is expected, and a written report is required at the end of the quarter.

Restriction: Earth System Science Honors students only. Campuswide Honors Collegium students only.

**EARTHSS H199B. Honors Research in Earth System Science. 4 Units.**

Undergraduate honors research in Earth System Science. A student commitment of 10-15 hours a week is expected, and a written report is required at the end of the quarter.

Restriction: Earth System Science Honors students only. Campuswide Honors Collegium students only.

**EARTHSS H199C. Honors Research in Earth System Science. 4 Units.**

Undergraduate honors research in Earth System Science. A student commitment of 10-15 hours a week is expected, and a written report is required at the end of the quarter.

Restriction: Earth System Science Honors students only. Campuswide Honors Collegium students only.

**EARTHSS 200. Global Physical Climatology. 4 Units.**

A descriptive overview of Earth's climate system and energy budget. Large-scale circulations, key physical processes, and climate sensitivity of the atmosphere, ocean, land surface, and cryosphere.

Restriction: Graduate students only.

**EARTHSS 201. Paleoclimatology. 4 Units.**

Explores past changes in Earth's climate. Topics include tools and techniques used to reconstruct past climate from natural archives; records and mechanisms of past climate changes throughout Earth history; and lessons learned from the paleo-record for predication of future climate.

Restriction: Graduate students only.

Concurrent with EARTHSS 101.

**EARTHSS 202. Climate Change. 4 Units.**

Explores past, present, and projected changes in Earth's climate. Topics include paleoclimate records and mechanisms of natural climate variability at a range of timescales (orbital to seasonal); General Circulation Models; and IPCC observations and projections of future climate change.

Restriction: Graduate students only.



**EARTHSS 204. Humans in the Earth System. 4 Units.**

Focuses on the human systems of energy and food production which have the greatest effects on the Earth system. Assess the physical mechanisms and feedbacks of human-nature interactions and consider approaches of mitigation, interventions, and adaptation.

Restriction: Graduate students only. Earth System Science Majors only.

**EARTHSS 212. Geoscience Modeling and Data Analysis. 4 Units.**

Computer-based course. Fundamental statistical techniques needed to analyze Earth system data and models. Basic numerical techniques to solve Earth system models. Focuses on linear and non-linear ordinary differential equations, as well as simple partial differential equations.

Restriction: Graduate students only.

**EARTHSS 215. Cryosphere. 4 Units.**

A global perspective of the major components of the cryosphere. Includes current extent and trends, mass balance, energetics, and physical processes. Quantitative assessment of current state, in situ and remote observations, and interactions with climate.

Restriction: Graduate students only.

**EARTHSS 224. Ocean Processes. 4 Units.**

Introduction to the physics, chemistry, and biology of the oceans. Offers a mechanistic perspective of the structure and functioning of marine ecosystems, nutrient cycles, and role of ecosystem dynamics in local and global biogeochemistry.

Restriction: Graduate students only.

**EARTHSS 225. Marine Biogeochemistry. 4 Units.**

Overview of ocean biology and biogeochemistry, with a focus on lower trophic levels and the roles of biota in the marine biogeochemical cycles of key elements.

Restriction: Doctor of Philosophy Degree students have first consideration for enrollment. Graduate students only. Earth System Science Majors have first consideration for enrollment.

**EARTHSS 226. Land Surface Processes. 4 Units.**

A mechanistic perspective of the structure and functioning of terrestrial ecosystems. Includes processes such as nutrient cycling, biogeochemical cycling, mass balance, energetics, terrestrial hydrology, and water cycle.

Restriction: Graduate students only.

**EARTHSS 228. Geophysical Fluid Dynamics. 4 Units.**

Introduces fluid dynamical processes that determine the large-scale flow of the atmosphere and ocean, with particular emphasis on the interactions between the stable density stratification and the Coriolis force associated with Earth's rotation.

Restriction: Graduate students only.

**EARTHSS 230. Physical Oceanography. 4 Units.**

Physical processes that determine the distribution of water properties such as salt and temperature. Fluid-dynamical underpinnings of physical oceanography. Wave motions. The wind-driven and thermohaline circulation. Similarities and differences between ocean and atmosphere dynamics.

Prerequisite: MATH 2D and PHYSICS 7A and PHYSICS 7B and PHYSICS 7E

Restriction: Graduate students only.

**EARTHSS 238. Satellite Remote Sensing for Earth System Science. 4 Units.**

Satellite remote sensing data are increasingly used to study the Earth system. Provides an overview of the principles behind remote sensing, and the types of satellite data available for study of the oceans, land, and atmosphere.

**EARTHSS 240. Atmospheric Chemistry and Physics. 4 Units.**

Examines the physical/chemical processes which determine the structure and composition of Earth's atmosphere and its role in the climate system.

Restriction: Graduate students only.

**EARTHSS 242. Advanced Atmospheric Chemistry. 4 Units.**

Chemistry of the troposphere and stratosphere. Topics include: processes controlling the lifetime and reaction pathways of chemicals in the atmosphere, the role of the atmosphere in biogeochemical cycles, and interactions between atmospheric chemistry and the physical climate system.

Restriction: Graduate students only.

**EARTHSS 244. Introduction to Atmospheric Dynamics. 4 Units.**

Covers fundamentals of atmospheric dynamics including thermodynamics, quasi-geostrophy, the weak-temperature gradient of the tropics, and the turbulent boundary layer.

Restriction: Graduate students only.

**EARTHSS 248. Marine Ecosystems and Global Change. 4 Units.**

Presents an overview of marine ecosystem structure, diversity, and processes in the context of global change, including the impacts of climate warming, ocean acidification, marine fisheries, and anthropogenic additions of nutrients and pollutants.

Prerequisite: EARTHSS 224

Restriction: Graduate students only.

Concurrent with EARTHSS 148.

**EARTHSS 252. Environmental Isotope Geochemistry. 4 Units.**

Covers the fundamentals of stable, radioactive, and radiogenic isotope variability in the Earth System. Focuses on theory, measurement techniques, biogeochemistry, hydrology, ecology, and climate related applications.

Restriction: Graduate students only.

Concurrent with EARTHSS 152.

**EARTHSS 256. Paleoclimatology and Paleooceanography. 4 Units.**

Explores past changes in Earth's climate. Topics include tools and techniques used to reconstruct past climate from natural archives; records and mechanisms of past climate changes throughout Earth history; and lessons learned from the paleo-record for prediction of future climate.

Restriction: Graduate students only.

**EARTHSS 264. Ecosystem Ecology . 4 Units.**

A mechanistic perspective on ecosystem processes. Covers ecosystem development, element cycling, and interactions with plants and microbes. The role of ecosystems in environmental change is also addressed.

Prerequisite: CHEM 51C

Concurrent with EARTHSS 164 and BIO SCI E118.

**EARTHSS 266. Global Biogeochemical Cycles. 4 Units.**

Global biogeochemical cycling of the elements. Topics include global cycling of carbon, nitrogen, oxygen, and sulfur; impact of human activities on biogeochemical processes.

Restriction: Graduate students only.

**EARTHSS 280A. Special Topics in Earth System Science. 1-4 Units.**

Each quarter is devoted to current topics in the field of Earth System Science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**EARTHSS 280B. Special Topics in Earth System Science. 1-4 Units.**

Each quarter is devoted to current topics in the field of Earth System Science. Topics addressed vary each quarter.

Prerequisite: EARTHSS 280A

Repeatability: Unlimited as topics vary.

**EARTHSS 280C. Special Topics in Earth System Science. 1-4 Units.**

Each quarter is devoted to current topics in the field of Earth System Science. Topics addressed vary each quarter.

Prerequisite: EARTHSS 280B

Repeatability: Unlimited as topics vary.

**EARTHSS 282C. Special Topics in Climate. 1-4 Units.**

Each quarter is devoted to in-depth analysis of an important and rapidly developing area in the field of climate dynamics. Topics addressed vary each quarter.

Prerequisite: EARTHSS 282B

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EARTHSS 286A. Special Topics in Biogeochemistry. 1-4 Units.**

Each quarter is devoted to in-depth analysis of a subarea in biogeochemistry which is undergoing rapid development. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EARTHSS 286B. Special Topics in Biogeochemistry. 1-4 Units.**

Each quarter is devoted to in-depth analysis of a subarea in biogeochemistry which is undergoing rapid development. Topics addressed vary each quarter.

Prerequisite: EARTHSS 286A

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EARTHSS 286C. Special Topics in Biogeochemistry. 1-4 Units.**

Each quarter is devoted to in-depth analysis of a subarea in biogeochemistry which is undergoing rapid development. Topics addressed vary each quarter.

Prerequisite: EARTHSS 286B

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EARTHSS 288C. Special Topics in Ecosystems. 1-4 Units.**

Each quarter is devoted to current topics relating to Ecosystems. Topics addressed vary each quarter.

Prerequisite: EARTHSS 288B

Repeatability: Unlimited as topics vary.

**EARTHSS 290. Seminar. 1 Unit.**

Weekly seminars and discussions on topics of general and current interest in Earth System Science. Topics addressed vary each quarter.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EARTHSS 298. Practicum in Earth System Science. 4 Units.**

Designed to introduce first-year graduate students to research. Students explore research opportunities and develop a proposal for a summer research project under the direction of a faculty mentor.

Restriction: Graduate students only.

**EARTHSS 299. Research. 2-12 Units.**

Supervised original research in areas of Earth System Science.

Repeatability: May be repeated for credit unlimited times.

**EARTHSS 399. University Teaching. 1-4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Earth and Atmospheric Sciences, Minor

The science of the Earth as a system has implications for many fields of study. Students interested in understanding how the Earth's systems work can complete the requirements for a minor in Earth and Atmospheric Sciences. The program is primarily designed for students in the natural sciences and engineering who wish to explore interdisciplinary problems and broaden their studies to include the application of their fields to understanding the Earth system.

NOTE: This minor is not available to students in the Earth System Science (B.S.) or Environmental Science (B.A.) majors.

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NOTE: This minor is not available to students in the Earth System Science (B.S.) or Environmental Science (B.A.) majors.

### Requirements for the Minor

Select one of the following series:

EARTHSS 51- 53- 55	Land Interactions and Ocean Biogeochemistry and Earth's Atmosphere
or	
EARTHSS 60A-EARTHSS 60B-EARTHSS 60C	and and

and select four electives from the approved elective list for the B.S. in Earth System Science major, at least two of which must be Earth System Science courses.

## Earth System Science, B.S.

<http://ess.uci.edu/undergrad/bs> (<http://ess.uci.edu/undergrad/bs/>)

Earth System Science is an interdisciplinary field of study that combines oceanography, atmospheric science, meteorology, geography, geology, hydrology, and environmental science. ESS students gain an understanding of how individual aspects of the environment interact, including the influence of humans on this complex system.

Examples of important questions in Earth System Science include, but are not limited to, the influence of atmospheric chemistry on climate and air quality, biological controls on the chemistry of the oceans, and physical controls on atmosphere and ocean circulation.

The Earth System Science (B.S.) program provides students with a fundamental understanding of the oceanographic, atmospheric, and terrestrial sciences. This program of study prepares students for careers in science, research, or technical fields. Students learn to apply basic sciences (physics, chemistry, mathematics, and biology) to understand the major processes and systems governing the Earth's climate, biogeochemical cycles, and global change. Central to the B.S. program is an understanding of relevant scientific literature, methods to collect/analyze data, and interpret results in the context of scientific theory. Students will learn to work collaboratively to understand and address complex problems and communicate scientific knowledge.

Through the core course work, students will learn to explain the current and projected future state of the Earth system in the context of past climate change and current human activities. Once the core course work is complete, students are encouraged to focus on a particular area within Earth System Science and to choose electives that build a coherent core of knowledge. Focus areas include but are not limited to climatology, biogeochemical cycles, oceanography, hydrology, terrestrial sciences, and atmospheric sciences. Optional specializations are available in Atmospheric Science, Hydrology and Terrestrial Ecosystems, and Oceanography.

Earth System Science students are encouraged to become directly involved in research. The Department provides excellent opportunities to learn from and work with recognized experts in the field, while fulfilling degree requirements. EARTHSS 198W may satisfy Department and UCI upper-division writing requirements.

Students may be admitted to the Earth System Science major upon entering the University as freshmen, via change of major, or as transfer students from other colleges and universities. Information about change of major policies is available in the Physical Sciences Student Affairs Office and at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu>). For transfer student admission, preference will be given to junior-level applicants with the highest grades overall and who have satisfactorily completed the following required courses: one year of approved calculus and one year of *either* general chemistry with laboratory (preferred) or one-year of calculus-based physics with laboratory.

NOTE: The major is open to all students except Environmental Science majors and Earth and Atmospheric Sciences minors.

**All students must meet the University Requirements.**

**School Requirements: None.**

### Major Requirements

#### A. Complete:

EARTHSS 1 or EARTHSS 3 or EARTHSS 5	Introduction to Earth System Science Oceanography The Atmosphere
EARTHSS 51	Land Interactions
EARTHSS 53	Ocean Biogeochemistry
EARTHSS 55	Earth's Atmosphere
EARTHSS 114 or EARTHSS 115	Earth System Science Laboratory and Field Methods Aquatic Field Methods
EARTHSS 116	Introduction to Environmental Data Science
EARTHSS 192	Careers in Earth System Science
MATH 2A- 2B	Single-Variable Calculus and Single-Variable Calculus
STATS 7	Basic Statistics

Select one of the following sequences and accompanying labs:

CHEM 1A- 1B- 1C	General Chemistry and General Chemistry and General Chemistry
CHEM 1LC- 1LD	General Chemistry Laboratory and General Chemistry Laboratory
or	
CHEM H2A- H2B- H2C	Honors General Chemistry and Honors General Chemistry and Honors General Chemistry
CHEM H2LA- H2LB- H2LC	Honors General Chemistry Laboratory and Honors General Chemistry Laboratory and Honors General Chemistry Laboratory

Select one of the following sequences and accompanying labs:

PHYSICS 3A- 3B- 3C	Basic Physics I and Basic Physics II and Basic Physics III
PHYSICS 3LB- 3LC	Basic Physics Laboratory and Basic Physics Laboratory
or	
PHYSICS 7C- 7E	Classical Physics and Classical Physics
PHYSICS 7LC	Classical Physics Laboratory

#### B. Select seven electives from the following (at least four must be Earth System Science courses):

All 4-unit upper-division EARTHSS courses except EARTHSS 114, EARTHSS 116, and EARTHSS H198 (EARTHSS 199 or one quarter of H199A-B-C may count only once toward the elective requirement)	
BIO SCI 93	From DNA to Organisms
BIO SCI 94	From Organisms to Ecosystems
BIO SCI 98	Biochemistry
BIO SCI D105	Cell, Developmental, and Molecular Biology of Plants
BIO SCI E106	Processes in Ecology and Evolution

BIO SCI E120	Marine Biology
BIO SCI E150	Conservation Biology
BIO SCI E179	Limnology and Freshwater Biology
BIO SCI E179L	Field Freshwater Ecology
BIO SCI E189	Environmental Ethics
CHEM 51A	Organic Chemistry
CHEM 51B- 51LB	Organic Chemistry and Organic Chemistry Laboratory
CHEM 51C- 51LC	Organic Chemistry and Organic Chemistry Laboratory
CHEM 141	Environmental Chemistry
ENGRCEE 162	Introduction to Environmental Chemistry
ENGRCEE 171	Water Resources Engineering
ENGRCEE 172	Groundwater Hydrology
ENGRCEE 176	Hydrology
ENGRCEE 178	Fluid Mechanics of Open Channels
ENGRMAE 91	Introduction to Thermodynamics
ENGRMAE 130A	Introduction to Fluid Mechanics
ENGRMAE 164	Air Pollution and Control
MATH 2D	Multivariable Calculus
MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations
MATH 105A	Numerical Analysis I
MATH 112A	Introduction to Partial Differential Equations and Applications
MATH 115	Mathematical Modeling
PHYSICS 115A	Statistical Physics
UPPP 133	Environmental Law and Policy
UPPP 139	Water Resource Policy
UPPP 145	Environmental Governance
PUBHLTH 161	Environmental Geology
PUBHLTH 163	Introduction to Environmental Health Science
PUBHLTH 167	Air Pollution, Climate, and Health
PUBHLTH 171	Human Exposure to Environmental Contaminants
PUBHLTH 172	Climate Change and Disaster Management
PUBHLTH 173	Health and Global Environmental Change

Computing Skills (one of the following may be counted toward degree): EECS 10, ENGRMAE 10, I&C SCI 31, PHYSICS 53, or an approved programming course.

## Optional Specializations

Three optional specializations are available: Atmospheric Science, Hydrology and Terrestrial Ecosystems, and Oceanography. The specializations require the completion of at least five courses from the following lists (four science courses plus one advanced tools course).

### Specialization in Atmospheric Science

#### Requirements

Three courses selected from the following:

EARTHSS 122	Atmospheric Dynamics
EARTHSS 124	Weather Analysis
EARTHSS 142	Atmospheric Chemistry
EARTHSS 199	Undergraduate Research (one 4-unit course focused on atmospheric research selected from EARTHSS 199, 198, H198, H199A-H199B-H199C)

One advanced tools courses selected from the following:

EARTHSS 118	Analysis, Modeling, and Visualization of Multidimensionnal Environmental Data
EARTHSS 134	Fundamentals of GIS for Environmental Science

**EARTHSS 138**

Satellite Remote Sensing for Earth System Science

(These courses may overlap in Major Requirements, Section B.)

**Specialization in Hydrology and Terrestrial Ecosystems****Requirements**

Three courses selected from the following:

EARTHSS 132

Terrestrial Hydrology

EARTHSS 140

Advanced Geology

or EARTHSS 133

Soil: It's the Good Dirt

EARTHSS 156

The Future of Forests

EARTHSS 199

Undergraduate Research (one 4-unit course focused on terrestrial research selected from EARTHSS 199, 198, H198, H199A-H199B-H199C)

One advanced tools course selected from the following:

EARTHSS 118

Analysis, Modeling, and Visualization of Multidimensionnal Environmental Data

EARTHSS 134

Fundamentals of GIS for Environmental Science

EARTHSS 138

Satellite Remote Sensing for Earth System Science

(These courses may overlap in Major Requirements, Section B.)

**Specialization in Oceanography****Requirements**

Three courses selected from the following:

EARTHSS 130

Physical Oceanography

EARTHSS 144

Marine Geochemistry and Biogeochemistry

EARTHSS 148

Marine Ecosystems and Global Change

EARTHSS 171

Microbial Biogeochemistry

EARTHSS 199

Undergraduate Research (one 4-unit course focused on oceanographic research selected from EARTHSS 199, 198, H198, H199A-H199B-H199C)

One advanced tools course selected from the following:

EARTHSS 118

Analysis, Modeling, and Visualization of Multidimensionnal Environmental Data

EARTHSS 138

Satellite Remote Sensing for Earth System Science

(These courses may overlap in Major Requirements, Section B.)

**Sample Program — Earth System Science****Freshman**

<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 2A	MATH 2B	STATS 7
CHEM 1A	CHEM 1B	CHEM 1C- 1LC
EARTHSS 1	General Education/Elective	General Education/Elective
General Education/Elective	General Education/Elective	General Education/Elective

**Sophomore**

<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
EARTHSS 51	EARTHSS 53	EARTHSS 55
PHYSICS 3A	PHYSICS 3B- 3LB	PHYSICS 3C- 3LC
General Education/Elective	General Education/Elective	General Education/Elective
CHEM 1LD	General Education/Elective	General Education/Elective

**Junior**

<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
EARTHSS 114	EARTHSS 116	ESS Elective
EARTHSS 192	Approved Elective	ESS Elective
General Education/Elective	General Education/Elective	Elective
Elective	Elective	

**Senior**

<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
ESS Elective	ESS Elective	ESS Elective
Approved Elective	Elective	Elective



Elective

Elective

Elective

Elective

Elective

Some students (particularly transfer students) take EARTHSS 51, EARTHSS 53, and EARTHSS 55 in the junior year.

## Concentration in Geosciences Education with Secondary Teaching Certification

This concentration allows students pursuing the B.S. in Earth System Science to earn a bachelor's degree and complete the required course work and field experience for a California Preliminary Single Subject Teaching Credential at the same time. In addition to the requirements listed above, students must complete the following courses:

CHEM 193	Research Methods
or PHYSICS 193	Research Methods
EARTHSS 7	Physical Geology <sup>1</sup>
or EARTHSS 140	Advanced Geology
EDUC 55	Knowing and Learning in Mathematics and Science
EDUC 109	Reading and Writing in Mathematics and Science
EDUC 143AW	Classroom Interactions I
EDUC 143BW	Classroom Interactions II
EDUC 148	Complex Pedagogical Design
EDUC 158	Student Teaching Mathematics and Science in Middle/High School (two quarters)
LPS 60	The Making of Modern Science
PHY SCI 5	California Teach 1: Introduction to Science and Mathematics Teaching
PHY SCI 105	California Teach 2: Middle School Science and Mathematics Teaching
PHYSICS 20A	Introduction to Astronomy
or PHYSICS 20B	Cosmology: Humanity's Place in the Universe

<sup>1</sup> EARTHSS 140 may overlap with the major requirement in section B.

With careful, early planning, it is possible for students to complete the bachelor's degree and the secondary teaching certification in four years.

For additional information about teacher certification requirements and enrollment procedures, visit the Cal Teach website (<http://www.education.uci.edu/calteach/>). Interested students are strongly encouraged to contact the Cal Teach Resource and Advising Center or the Physical Sciences Student Affairs Office.

## Sample Program – Concentration in Geosciences Education with Secondary Teaching Certification

Freshman		
Fall	Winter	Spring
MATH 2A	MATH 2B	STATS 7
CHEM 1A	CHEM 1B	CHEM 1C- 1LC
EARTHSS 1	PHYSICS 20A	General Education
Elective	PHY SCI 5	Elective
Sophomore		
Fall	Winter	Spring
EARTHSS 51	EARTHSS 53	EARTHSS 55
PHYSICS 3A	PHYSICS 3B- 3LB	PHYSICS 3C- 3LC
CHEM 1LD	CHEM 193	LPS 60
PHY SCI 105	General Education	EARTHSS 191
Junior		
Fall	Winter	Spring
EARTHSS 114	EARTHSS 116	ESS Elective
EDUC 55	Approved Elective	ESS Elective
General Education	EDUC 143AW	EDUC 148
EARTHSS 192	Elective	
Senior		
Fall	Winter	Spring
EDUC 143BW	EDUC 109	EDUC 158
EARTHSS 140	EDUC 158	ESS Elective
General Education	ESS Elective	Approved Elective

**Earth System Science Honors Program.** In the year-long honors course sequence, students admitted into the ESS Honors Program pursue research with faculty in the Department, and prepare a written thesis of their work. Visit the Earth System Science Honors Program website (<https://www.ess.uci.edu/undergrad/ess/honors/>) for more information.

**Teaching Certification.** Earth System Science students interested in teaching careers can earn a bachelor's degree concurrently with a California Preliminary Single Subject Teaching Credential. See the Concentration in Geosciences Education with Secondary Teaching Certification section below for more information.

Some students go on to graduate school in physical sciences, engineering, or related areas. Others begin careers as research scientists in academic, public, or private institutions (may require a graduate-level degree). Options that may be available are scientist positions in the following roles: environmental policy and planning, environmental consulting, air quality monitoring and assessment, laboratory analysis, scientific research, science education, natural resource management, wildlife management, conservation and environmental protection, and water resource management.

## Earth System Science, Ph.D.

The Earth, as a coupled system of atmosphere, ocean, land, and cryosphere, has changed in our lifetime. The observed depletion of stratospheric ozone at high latitudes has been attributed directly to industrial use of halocarbons. Global warming a result of increases in the atmospheric concentrations of greenhouse gases, such as carbon dioxide and methane, which are released by the use of fossil fuel and agricultural practices. These examples illustrate the ability of humans to alter the global environment. Understanding the sensitivity of the Earth's climate system requires a broad base of scientific knowledge, which includes detection, quantification, and prediction of the rates of change of chemical, physical, and biological variables. Our program is built around this interdisciplinary and holistic approach to the Earth System.

The Department's doctoral program is aimed at training new research scientists in the field of Earth System Science. The graduate education provides a comprehensive curriculum, along with opportunities to conduct groundbreaking research. The Department's doctoral-level students are expected to become researchers with a global perspective and broad research skills as well as a high level of expertise in specific areas. Active programs of research are underway studying the influence of human activities in the Earth System, biogeochemistry, and physical climate.

NOTE: Students are admitted to the Ph.D. program only; the master's degree is awarded upon progress to the Ph.D.

### Course Requirements

Students must complete a minimum of nine 4-unit approved graduate-level courses, including the core curriculum, with an average grade of B or better. All courses must be approved by the student's advisor.

A. Complete:

EARTHSS 200	Global Physical Climatology
EARTHSS 204	Humans in the Earth System
EARTHSS 266	Global Biogeochemical Cycles
EARTHSS 298	Practicum in Earth System Science

B. Select at least five additional graduate-level courses, two of which must be offered by the Earth System Science Department.

### Residency

Academic Senate regulations specify a minimum period of residence of six quarters for Ph.D. candidates. Enrollment in a minimum of 12 units of graduate/upper-division course work per quarter is required. Registration in every regular academic session is necessary until all requirements for the degree have been completed, unless a formal Leave of Absence is granted by the Graduate Division. All Ph.D. requirements must be completed within 15 quarters in residence (five years), excluding summer quarters. Exceptions must be put to a vote of the Earth System Science faculty. The maximum time permitted is seven years.

### Comprehensive Examination

Progress toward the degree and readiness to begin research is assessed by a comprehensive examination covering breadth, general knowledge, and the ability to integrate and use information covered in the core curriculum and other course work. At the end of the spring quarter, the ESS Comprehensive Examination Committee administers the written and oral examinations.

### Teaching and Seminar

Students are required to complete a teaching assistant training program and to have a minimum of two quarters of experience as a teaching assistant, provided opportunities are available. Students can enroll in EARTHSS 399 while serving as a teaching assistant. Students are also expected to participate in the Earth System Science seminar.

### Advance to Ph.D. Candidacy

Following completion of the Comprehensive Examination, those students who receive a recommendation to continue Ph.D. work will pursue research on a potential dissertation topic and then take the Advancement to Candidacy Examination. This oral examination is given by a faculty committee, including extra-departmental faculty. The normative time for advancement for candidacy is two years.

## Dissertation

After advancing to candidacy, students are expected to be fully involved in research toward writing their Ph.D. dissertation. Students should keep in steady contact/interaction with their Doctoral Committee. A dissertation based on original research and demonstrating critical judgment, intellectual synthesis, creativity, and clarity in written communication is required for the Ph.D. degree. The dissertation must summarize the results of original research performed by the student under the supervision of a faculty member of the Department. The dissertation will be evaluated by the Dissertation Committee, based on suitability for publication in a peer-reviewed journal of high editorial standards. The dissertation may be a compilation of published papers or manuscripts accepted for publication, so long as the candidate has produced a major proportion of the material independently. The Dissertation Committee approves the format and content, which must meet University requirements for style, format, and appearance.

## Additional Requirements

1. Completion of course work (9 courses, including core courses)
2. Six quarters in residence at UCI
3. Completion of the Comprehensive Examination, with recommendation to continue for the Ph.D.
4. Completion of the teaching and seminar requirements
5. Pass the Advancement to Candidacy Examination
6. Presentation of an open research seminar
7. Submission of an acceptable doctoral dissertation and formal defense.

## Department of Mathematics

### Michael C. Cranston, Department Chair

340E Rowland Hall

949-824-7993

<http://www.math.uci.edu/>

The Department of Mathematics is engaged in teaching and in fundamental research in a wide variety of basic mathematical disciplines, and offers undergraduate and graduate students the opportunity to fashion a thorough program of study leading to professional competence in mathematical research or in an area of application.

The curriculum in mathematics includes opportunities for supervised individual study and research and is augmented by seminars and colloquia. It is designed to be compatible with curricular structures at other collegiate institutions in California in order to enable students transferring to UCI to continue their programs of mathematics study.

- Mathematical, Computational, and Systems Biology, M.S.
- Mathematical, Computational, and Systems Biology, Ph.D.
- Mathematics for Biology, Minor
- Mathematics, B.S.
- Mathematics, M.S.
- Mathematics, Minor
- Mathematics, Ph.D.

## Faculty

Takeo Akasaki, Ph.D. University of California, Los Angeles, *Professor Emeritus of Mathematics* (ring theory)

Jun F. Allard, Ph.D. University of British Columbia, *Associate Professor of Mathematics; Physics and Astronomy* (mathematical and computational biology)

Vladimir Baranovsky, Ph.D. University of Chicago, *Professor of Mathematics* (algebra and number theory)

Long Chen, Ph.D. Pennsylvania State University, *Professor of Mathematics* (applied and computational mathematics)

Michael C. Cranston, Ph.D. University of Minnesota, *Department Chair and Professor of Mathematics* (probability)

Christopher J. Davis, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Teaching of Mathematics* (algebra and number theory)

Neil Donaldson, Ph.D. University of Bath, *Lecturer of Mathematics* (differential geometry)

Paul C. Eklof, Ph.D. Cornell University, *Professor Emeritus of Mathematics* (logic and algebra)

German A. Enciso Ruiz, Ph.D. Rutgers, the State University of New Jersey, *Professor of Mathematics; Developmental and Cell Biology* (applied and computational mathematics, mathematical and computational biology)

Asaf Ferber, Ph.D. Tel Aviv University, *Assistant Professor of Mathematics* (combinatorics and probability)

Aleksandr Figotin, Ph.D. Tashkent University of Information Technologies, *Professor of Mathematics* (applied and computational mathematics, mathematical physics)

Mark Finkelstein, Ph.D. Stanford University, *Professor Emeritus of Mathematics; Center for Educational Partnerships* (analysis)

Matthew Foreman, Ph.D. University of California, Berkeley, *Distinguished Professor of Mathematics; Logic and Philosophy of Science* (ergodic theory and dynamical systems, logic and foundations)

Michael D. Fried, Ph.D. University of Michigan, *Professor Emeritus of Mathematics* (arithmetic geometry and complex variables)

Isaac Goldbring, Ph.D. University of Illinois at Urbana-Champaign, *Associate Professor of Mathematics; Logic and Philosophy of Science* (logic and foundations)

Anton Gorodetski, Ph.D. Moscow State University, *Professor of Mathematics* (ergodic theory and dynamical systems)

Patrick Q. Guidotti, Ph.D. University of Zurich, *Professor of Mathematics* (analysis and partial differential equations, applied and computational mathematics)

Hamid Hezari, Ph.D. Johns Hopkins University, *Associate Professor of Mathematics* (analysis and partial differential equations)

Kenneth B. Huber, Ph.D. University of California, Irvine, *Lecturer of Mathematics*

Paata Ivanisvili, Ph.D. Michigan State University, *Assistant Professor of Mathematics* (analysis, probability)

Svetlana Jitomirskaya, Ph.D. Moscow State University, *Distinguished Professor of Mathematics* (mathematical physics)

Nathan Kaplan, Ph.D. Harvard University, *Associate Professor of Mathematics* (algebra and number theory)

Abel Klein, Ph.D. Massachusetts Institute of Technology, *Distinguished Professor of Mathematics* (mathematical physics)

Natalia Komarova, Ph.D. University of Arizona, *UCI Chancellor's Professor of Mathematics; Ecology and Evolutionary Biology* (applied and computational mathematics, mathematical and computational biology, mathematics of complex and social phenomena)

Jason Russell Kronewetter, Ph.D. University of California, Irvine, *Lecturer of Mathematics*

Katsiaryna Krupchyk, Ph.D. Belarusian State University, *Professor of Mathematics* (analysis and partial differential equations, inverse problems, and imaging)

Rachel Lehman, Ph.D. University of California, Irvine, *Lecturer of Mathematics* (mathematics education and probability)

Peter Li, Ph.D. University of California, Berkeley, *Chancellor's Professor Emeritus of Mathematics* (geometry and topology)

Song-Ying Li, Ph.D. University of Pittsburgh, *Professor of Mathematics* (analysis and partial differential equations)

John S. Lowengrub, Ph.D. Courant Institute of Mathematical Sciences, *Chancellor's Professor of Mathematics; Biomedical Engineering* (applied and computational mathematics, mathematical and computational biology)

Zhiqin Lu, Ph.D. Courant Institute of Mathematical Sciences, *Professor of Mathematics* (geometry and topology)

Jeffrey Ludwig, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Teaching of Mathematics*

Connor Mooney, Ph.D. Columbia University, *Assistant Professor of Mathematics* (partial differential equations)

Qing Nie, Ph.D. Ohio State University, *Director of the NSF-Simons Center for Multiscale Cell Fate Research and Chancellor's Professor of Mathematics; Biomedical Engineering* (applied and computational mathematics, mathematical and computational biology)

Alessandra Pantano, Ph.D. Princeton University, *Associate Professor of Teaching of Mathematics* (algebra and number theory)

Roberto Pelayo, Ph.D. California Institute of Technology, *Assistant Professor of Teaching of Mathematics* (algebra and data science)

David L. Rector, Ph.D. Massachusetts Institute of Technology, *Professor Emeritus of Mathematics* (algebraic topology and computer algebra)

Karl Rubin, Ph.D. Harvard University, *Distinguished Professor Emeritus of Mathematics* (algebra and number theory)

- Bernard Russo, Ph.D. University of California, Los Angeles, *Professor Emeritus of Mathematics* (functional analysis)
- Donald G. Saari, Ph.D. Purdue University, *UCI Distinguished Professor Emeritus of Economics; Logic and Philosophy of Science; Mathematics*
- Martin Schechter, Ph.D. New York University, *Professor Emeritus of Mathematics* (analysis and partial differential equations, mathematical physics)
- Stephen Scheinberg, Ph.D. Princeton University, *Professor Emeritus of Mathematics*
- Richard M. Schoen, Ph.D. Stanford University, *UCI Excellence in Teaching Chair in Mathematics and Distinguished Professor of Mathematics* (differential geometry, partial differential equations, general relativity)
- Alice Silverberg, Ph.D. Princeton University, *Distinguished Professor Emerita of Mathematics; Computer Science* (algebra and number theory)
- William H. Smoke, Ph.D. University of California, Berkeley, *Professor Emeritus of Mathematics* (homological algebra)
- Knut Solna, Ph.D. Stanford University, *Professor of Mathematics* (applied and computational mathematics, inverse problems and imaging, probability)
- Ronald J. Stern, Ph.D. University of California, Los Angeles, *Professor Emeritus of Mathematics* (geometry and topology)
- Jeffrey D. Streets, Ph.D. Duke University, *Professor of Mathematics* (geometry and topology)
- Chuu-Lian Terng, Ph.D. Brandeis University, *Professor Emerita of Mathematics* (differential geometry and integrable systems)
- Edriss S. Titi, Ph.D. Indiana University, *Professor Emeritus of Mathematics* (analysis and partial differential equations, applied and computational mathematics)
- Li Sheng Tseng, Ph.D. University of Chicago, *Associate Professor of Mathematics* (geometry and topology, mathematical physics)
- Roman Vershynin, Ph.D. University of Missouri-Columbia, *Professor of Mathematics* (probability, data science)
- Jeffrey Viaclovsky, Ph.D. Princeton University, *Professor of Mathematics* (differential geometry, geometric analysis)
- Daqing Wan, Ph.D. University of Washington, *Professor of Mathematics* (algebra and number theory)
- Frederic Yui-Ming Wan, Ph.D. Massachusetts Institute of Technology, *Professor Emeritus of Mathematics* (applied and computational mathematics, mathematical and computational biology)
- Robert W. West, Ph.D. University of Michigan, *Professor Emeritus of Mathematics* (algebraic topology)
- Joel J. Westman, Ph.D. University of California, Los Angeles, *Professor Emeritus of Mathematics* (analysis)
- Robert J. Whitley, Ph.D. New Mexico State University, *Professor Emeritus of Mathematics* (analysis)
- Janet L. Williams, Ph.D. Brandeis University, *Professor Emerita of Mathematics* (probability and statistics)
- Jesse Wolfson, Ph.D. Northwestern University, *Assistant Professor of Mathematics* (topology)
- Jack Xin, Ph.D. New York University, *Chancellor's Professor of Mathematics* (applied and computational mathematics, mathematical and computational biology, probability)
- James J. Yeh, Ph.D. University of Minnesota, *Professor Emeritus of Mathematics* (analysis and partial differential equations, probability)
- Yifeng Yu, Ph.D. University of California, Berkeley, *Professor of Mathematics* (analysis and partial differential equations)
- Martin Zeman, Ph.D. Humboldt University of Berlin, *Professor of Mathematics; Logic and Philosophy of Science* (logic and foundations)
- Xiangwen Zhang, Ph.D. McGill University, *Assistant Professor of Mathematics* (geometry and topology)
- Hong-Kai Zhao, Ph.D. University of California, Los Angeles, *Chancellor's Professor of Mathematics; Computer Science* (applied and computational mathematics, inverse problems and imaging)
- Weian Zheng, Ph.D. University of Strasbourg, *Professor Emeritus of Mathematics* (probability theory and financial engineering)

## Affiliate Faculty

- Pierre F. Baldi, Ph.D. California Institute of Technology, *Director of the Institute for Genomics and Bioinformatics and Distinguished Professor of Computer Science; Biological Chemistry; Biomedical Engineering; Developmental and Cell Biology; Mathematics* (artificial intelligence and machine learning, biomedical informatics, databases and data mining, environmental informatics, statistics and statistical theory)

Eric D. Mjolsness, Ph.D. California Institute of Technology, *Professor of Computer Science; Mathematics* (artificial intelligence and machine learning, biomedical informatics and computational biology, applied mathematics, mathematical biology, modeling languages)

Dominik Franz X. Wodarz, Ph.D. Oxford University, *Professor of Ecology and Evolutionary Biology; Mathematics*

## Courses

### **MATH 1A. Pre-Calculus. 4 Workload Units.**

Basic equations and inequalities, linear and quadratic functions, and systems of simultaneous equations.

Grading Option: Workload Credit Letter Grade with P/NP.

### **MATH 1B. Pre-Calculus. 4 Units.**

Preparation for calculus and other mathematics courses. Exponentials, logarithms, trigonometry, polynomials, and rational functions. Satisfies no requirements other than contribution to the 180 units required for graduation.

Prerequisite: MATH 1A. Placement into MATH 1B via the Calculus Placement exam, or a score of 450 or higher on the Mathematics section of the SAT Reasoning Test.

Restriction: MATH 1B may not be taken for credit if taken after MATH 2A.

### **MATH 2A. Single-Variable Calculus. 4 Units.**

Introduction to derivatives, calculation of derivatives of algebraic and trigonometric functions; applications including curve sketching, related rates, and optimization. Exponential and logarithm functions.

Prerequisite: MATH 1B or AP Calculus AB or SAT Mathematics or ACT Mathematics. MATH 1B with a grade of C or better. AP Calculus AB with a minimum score of 3. SAT Mathematics with a minimum score of 650. ACT Mathematics with a minimum score of 29. Placement via the Calculus Placement exam (fee required) is also accepted.

Overlaps with MATH 5A.

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment.

### **(Vb)**

### **MATH 2B. Single-Variable Calculus. 4 Units.**

Definite integrals; the fundamental theorem of calculus. Applications of integration including finding areas and volumes. Techniques of integration. Infinite sequences and series.

Prerequisite: MATH 2A or MATH 5A or AP Calculus AB or AP Calculus BC. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 3

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment.

### **(Vb)**

### **MATH 2D. Multivariable Calculus. 4 Units.**

Differential and integral calculus of real-valued functions of several real variables, including applications. Polar coordinates.

Prerequisite: MATH 2B or MATH 5B or AP Calculus BC. AP Calculus BC with a minimum score of 4

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

### **(Vb)**

### **MATH 2E. Multivariable Calculus. 4 Units.**

The differential and integral calculus of vector-valued functions. Implicit and inverse function theorems. Line and surface integrals, divergence and curl, theorems of Greens, Gauss, and Stokes.

Prerequisite: MATH 2D or MATH H2D

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment.



**MATH H2D. Honors Multivariable Calculus. 4 Units.**

Differential and integral calculus of real-valued functions of several real variables, including applications. Polar coordinates. Covers the same material as MATH 2D-E, but with a greater emphasis on the theoretical structure of the subject matter.

Prerequisite: MATH 2B or MATH 5B or (AP Calculus BC and (MATH H3A) or (MATH 3A and MATH 13)). MATH 2B with a grade of A or better. MATH 5B with a grade of A or better. AP Calculus BC with a minimum score of 5. MATH H3A with a grade of B- or better. MATH 3A with a grade of A or better. MATH 13 with a grade of A or better

Overlaps with MATH 2D.

(Vb)

**MATH H2E. Honors Multivariable Calculus. 4 Units.**

Differential and integral calculus of real-valued functions of several real variables, including applications. Polar coordinates. Covers the same material as MATH 2D-E, but with a greater emphasis on the theoretical structure of the subject matter.

Prerequisite: MATH H2D. MATH H2D with a grade of B- or better

Overlaps with MATH 2E.

**MATH 3A. Introduction to Linear Algebra. 4 Units.**

Systems of linear equations, matrix operations, determinants, eigenvalues and eigenvectors, vector spaces, subspaces, and dimension.

Prerequisite: MATH 2B or MATH 5B or AP Calculus BC. AP Calculus BC with a minimum score of 4

Overlaps with ICS 6N.

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment. Undeclared Majors have first consideration for enrollment.

(Vb)

**MATH 3D. Elementary Differential Equations. 4 Units.**

Linear differential equations, variation of parameters, constant coefficient cookbook, systems of equations, Laplace transforms, series solutions.

Prerequisite: (MATH 3A or MATH H3A) and (MATH 2D or MATH H2D) and (MATH 2B or AP Calculus BC). AP Calculus BC with a minimum score of 4

Restriction: School of Physical Sciences students have first consideration for enrollment. School of Engineering students have first consideration for enrollment.

**MATH H3A. Honors Introduction to Linear Algebra. 4 Units.**

Systems of linear equations, matrix operations, determinants, eigenvalues, eigenvectors, vector spaces, subspaces, and dimension.

Prerequisite: MATH 2B or MATH 5B or AP Calculus BC. MATH 2B with a grade of A or better. MATH 5B with a grade of A or better. AP Calculus BC with a minimum score of 5

Overlaps with MATH 3A, ICS 6N.

Restriction: School of Physical Sciences students only. School of Engineering students only. Mathematics Majors only. Undeclared Majors only.

**MATH 5A. Calculus for Life Sciences. 4 Units.**

Differential calculus with applications to life sciences. Exponential, logarithmic, and trigonometric functions. Limits, differentiation techniques, optimization and difference equations.

Prerequisite: MATH 1B or AP Calculus AB or SAT Mathematics or ACT Mathematics. MATH 1B with a grade of C or better. AP Calculus AB with a minimum score of 3. SAT Mathematics with a minimum score of 650. ACT Mathematics with a minimum score of 29. Placement via the Calculus Placement exam (fee required) is also accepted.

Overlaps with MATH 2A.

Restriction: School of Biological Sciences students have first consideration for enrollment.

(Vb)



**MATH 5B. Calculus for Life Sciences. 4 Units.**

Integral calculus and multivariable calculus with applications to life sciences. Integration techniques, applications of the integral, phase plane methods and basic modeling, basic multivariable methods.

Prerequisite: MATH 5A or MATH 2A or AP Calculus AB or AP Calculus BC. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 3

Restriction: School of Biological Sciences students have first consideration for enrollment. Cannot be taken for credit after MATH 2B.

**(Vb)**

**MATH 7A. Single-Variable Calculus I. 4 Units.**

Introduction to derivatives, calculation of derivatives of algebraic and trigonometric functions; applications including curve sketching, related rates, and optimization. Exponential and logarithm functions.

Prerequisite: MATH 1B or AP Calculus AB or SAT Mathematics or ACT Mathematics. MATH 1B with a grade of C or better. AP Calculus AB with a minimum score of 3. SAT Mathematics with a minimum score of 650. ACT Mathematics with a minimum score of 29. Placement via the Calculus Placement exam (fee required) is also accepted.

Overlaps with MATH 2A, MATH 5A.

Restriction: Mathematics Majors only.

**(Vb)**

**MATH 7B. Single-Variable Calculus II. 4 Units.**

Definite integrals; the fundamental theorem of calculus. Applications of integration including finding areas and volumes. Techniques of integration. Infinite sequences and series.

Prerequisite: MATH 2A or MATH 5A or AP Calculus AB or AP Calculus BC or MATH 7A. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 3

Overlaps with MATH 2B, MATH 5B.

Restriction: Mathematics Majors only.

**(Vb)**

**MATH 8. Explorations in Functions and Modeling. 4 Units.**

Explorations of applications and connections in topics in algebra, geometry, calculus, and statistics for future secondary math educators. Emphasis on nonstandard modeling problems.

Prerequisite or corequisite: MATH 2A or AP Calculus AB or AP Calculus BC. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 3

**MATH 9. Introduction to Programming for Numerical Analysis. 4 Units.**

Introduction to computers and programming using Matlab and Mathematica. Representation of numbers and precision, input/output, functions, custom data types, testing/debugging, reading exceptions, plotting data, numerical differentiation, basics of algorithms. Analysis of random processes using computer simulations.

Prerequisite: MATH 2A

Restriction: Mathematics Majors have first consideration for enrollment.

**(II and Vb ).**

**MATH 10. Introduction to Programming for Data Science. 4 Units.**

Intro to algorithms in data science using Python and R. Basic concepts of Python, store, access, and manipulate data in lists; functions, methods, and packages; NumPy, Numerical stability, and accuracy. Gradient descent and Newton's method. Basics of R Programming.

Prerequisite or corequisite: (MATH 2D or MATH H2D) and (MATH 3A or MATH H3A) and MATH 9

Restriction: Mathematics Majors have first consideration for enrollment.

**(II and VB ).**

**MATH 13. Introduction to Abstract Mathematics. 4 Units.**

Introduction to formal definition and rigorous proof writing in mathematics. Topics include basic logic, set theory, equivalence relations, and various proof techniques such as direct, induction, contradiction, contrapositive, and exhaustion.

Prerequisite: MATH 2A or ICS 6D

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 105A. Numerical Analysis I. 4 Units.**

Introduction to the theory and practice of numerical computation with an emphasis on solving equations. Solving transcendental equations; linear systems, Gaussian elimination, QR factorization, iterative methods, eigenvalue computation, power method.

Corequisite: MATH 105LA

Prerequisite: MATH 3A or MATH H3A. Familiarity with computer programming is required.

Overlaps with MAE 185.

**MATH 105B. Numerical Analysis II. 4 Units.**

Introduction to the theory and practice of numerical computation with an emphasis on topics from calculus and approximation theory. Lagrange interpolation; Gaussian quadrature; Fourier series and transforms; Methods from data science including least squares and L1 regression.

Corequisite: MATH 105LB

Prerequisite: MATH 105A

**MATH 105LA. Numerical Analysis Laboratory. 1 Unit.**

Provides practical experience to complement the theory developed in Mathematics 105A.

Corequisite: MATH 105A

**MATH 105LB. Numerical Analysis Laboratory. 1 Unit.**

Provides practical experience to complement the theory developed in Mathematics 105B.

Corequisite: MATH 105B

**MATH 107. Numerical Differential Equations. 4 Units.**

Theory and applications of numerical methods to initial and boundary-value problems for ordinary and partial differential equations.

Corequisite: MATH 107L

Prerequisite: MATH 3D and MATH 105A and MATH 105B

**MATH 107L. Numerical Differential Equations Laboratory. 1 Unit.**

Provides practical experience to complement the theory developed in Mathematics 107.

Corequisite: MATH 107

**MATH 110A. Optimization I. 4 Units.**

Introduction to optimization, linear search method, trust region method, Newton method, linear programming, linear, and non-linear least square methods.

Prerequisite or corequisite: (MATH 2D or MATH H2D) and (MATH 3A or MATH H3A) and MATH 10 and MATH 121A and MATH 121B

**MATH 110B. Optimization II. 4 Units.**

The simplex method, interior point method, penalty barrier method, primal dual method, augmented Lagrangian method, and stochastic gradient method.

Prerequisite: MATH 110A. MATH 110A with a grade of C or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 112A. Introduction to Partial Differential Equations and Applications. 4 Units.**

Introduction to ordinary and partial differential equations and their applications in engineering and science. Basic methods for classical PDEs (potential, heat, and wave equations). Classification of PDEs, separation of variables and series expansions, special functions, eigenvalue problems.

Prerequisite: (MATH 2E or MATH H2E) and MATH 3D

**MATH 112B. Introduction to Partial Differential Equations and Applications. 4 Units.**

Introduction to partial differential equations and their applications in engineering and science. Basic methods for classical PDEs (potential, heat, and wave equations). Green functions and integral representations, method of characteristics.

Prerequisite: MATH 112A

**MATH 112C. Introduction to Partial Differential Equations and Applications. 4 Units.**

Nonhomogeneous problems and Green's functions, Sturm-Liouville theory, general Fourier expansions, applications of partial differential equations in different areas of science.

Prerequisite: MATH 112B

**MATH 113A. Mathematical Modeling in Biology. 4 Units.**

Discrete mathematical and statistical models; difference equations, population dynamics, Markov chains, and statistical models in biology.

Prerequisite: MATH 2B or MATH 5B

**MATH 113B. Mathematical Modeling in Biology. 4 Units.**

Linear algebra; differential equations models; dynamical systems; stability; hysteresis; phase plane analysis; applications to cell biology, viral dynamics, and infectious diseases.

Prerequisite: MATH 2B or AP Calculus BC or MATH 5B. AP Calculus BC with a minimum score of 4

**MATH 115. Mathematical Modeling. 4 Units.**

Mathematical modeling and analysis of phenomena that arise in engineering physical sciences, biology, economics, or social sciences.

Prerequisite: MATH 112A and (MATH 2D or MATH H2D) and (MATH 3A or MATH H3A) and MATH 3D

**MATH 117. Dynamical Systems. 4 Units.**

Introduction to the modern theory of dynamical systems including contraction mapping principle, fractals and chaos, conservative systems, Kepler problem, billiard models, expanding maps, Smale's horseshoe, topological entropy.

Prerequisite: MATH 3D and MATH 140A

**MATH 118. The Theory of Differential Equations. 4 Units.**

Existence and uniqueness of solutions, continuous dependence of solutions on initial conditions and parameters, Lyapunov and asymptotic stability, Floquet theory, nonlinear systems, and bifurcations.

Prerequisite: MATH 3D and MATH 140A

**MATH 120A. Introduction to Abstract Algebra: Groups. 4 Units.**

Axioms for group theory; permutation groups, matrix groups. Isomorphisms, homomorphisms, quotient groups. Advanced topics as time permits. Special emphasis on doing proofs.

Prerequisite: (MATH 3A or MATH H3A) and MATH 13. MATH 13 with a grade of C or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 120B. Introduction to Abstract Algebra: Rings and Fields. 4 Units.**

Basic properties of rings; ideals, quotient rings; polynomial and matrix rings. Elements of field theory.

Prerequisite: MATH 120A. MATH 120A with a grade of C- or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 120C. Introduction to Abstract Algebra: Galois Theory. 4 Units.**

Galois Theory: proof of the impossibility of certain ruler-and-compass constructions (squaring the circle, trisecting angles); nonexistence of analogues to the 'quadratic formula' for polynomial equations of degree 5 or higher.

Prerequisite: MATH 120B

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH H120A. Honors Introduction to Graduate Algebra I. 5 Units.**

Introduction to abstract linear algebra, including bases, linear transformation, eigenvectors, canonical forms, inner products, and symmetric operators. Introduction to groups, rings, and fields, including examples of groups, group actions, Sylow theorems, modules over principal ideal domains, polynomials, and Galois groups.

Prerequisite: (MATH 3A or MATH H3A) and MATH 13 and (MATH 120A or MATH 121A). MATH 13 with a grade of A or better. MATH 120A with a grade of A or better. MATH 121A with a grade of A or better

Restriction: Mathematics Honors students only.

Concurrent with MATH 206A.

**MATH H120B. Honors Introduction to Graduate Algebra II. 5 Units.**

Introduction to abstract linear algebra, including bases, linear transformation, eigenvectors, canonical forms, inner products, and symmetric operators. Introduction to groups, rings, and fields, including examples of groups, group actions, Sylow theorems, modules over principal ideal domains, polynomials, and Galois groups.

Prerequisite: MATH H120A

Restriction: Mathematics Honors students only.

Concurrent with MATH 206B.

**MATH H120C. Honors Introduction to Graduate Algebra III. 5 Units.**

Introduction to abstract linear algebra, including bases, linear transformation, eigenvectors, canonical forms, inner products, and symmetric operators. Introduction to groups, rings, and fields, including examples of groups, group actions, Sylow theorems, modules over principal ideal domains, polynomials, and Galois groups.

Prerequisite: MATH H120B

Restriction: Mathematics Honors students only.

Concurrent with MATH 206C.

**MATH 121A. Linear Algebra. 4 Units.**

Introduction to modern abstract linear algebra. Special emphasis on students doing proofs. Vector spaces, linear independence, bases, dimension. Linear transformations and their matrix representations. Theory of determinants.

Prerequisite: (MATH 3A or MATH H3A) and MATH 13. MATH 13 with a grade of C or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 121B. Linear Algebra. 4 Units.**

Introduction to modern abstract linear algebra. Special emphasis on students doing proofs. Canonical forms; inner products; similarity of matrices.

Prerequisite: MATH 121A

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 130A. Probability I. 4 Units.**

Combinatorial probability, conditional probabilities, independence, discrete and continuous random variables, expectation and variance, common probability distributions.

Prerequisite: (MATH 2A or AP Calculus BC or AP Calculus AB) and (MATH 2B or AP Calculus BC) and (MATH 3A or MATH H3A). AP Calculus BC with a minimum score of 3. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 4

**MATH 130B. Probability II. 4 Units.**

Joint distributions, sums of independent random variables, conditional distributions and conditional expectation, covariances, moment generating functions, limit theorems.

Prerequisite: MATH 130A or MATH 131A or STAT 120A

**MATH 130C. Stochastic Processes. 4 Units.**

Markov chains, Brownian motion, Gaussian processes, applications to option pricing and Markov chain Monte Carlo methods.

Prerequisite: MATH 130B

**MATH 133A. Statistical Methods with Applications to Finance. 4 Units.**

Overview of probability, statistics, and financial concepts: distribution, point estimation, confidence interval, linear regression, hypothesis testing, principal component analysis, financial applications.

Prerequisite: MATH 130A or MATH 131A or STAT 120A

**MATH 133B. Statistical Methods with Applications to Finance. 4 Units.**

Overview of markets and options: asset modeling, Brownian motion, risk neutrality, option pricing, value at risk, MC simulations.

Prerequisite: MATH 133A

**MATH 133C. Statistical Methods with Applications to Finance. 4 Units.**

Overview of interest theory, time value of money, annuities/cash flows with payments that are not contingent, loans, sinking funds, bonds, general cash flow and portfolios, immunization, duration and convexity, swaps.

Prerequisite: MATH 133B

**MATH 134A. Fixed Income. 4 Units.**

Overview of interest theory, time value of money, annuities/cash flows with payments that are not contingent, loans, sinking funds, bonds, general cash flow and portfolios, immunization, duration and convexity, swaps.

Prerequisite: MATH 130A or STAT 120A

Overlaps with MATH 133C.

**MATH 134B. Mathematics of Financial Derivatives. 4 Units.**

General derivatives; call/put options; hedging and investment strategies: spreads and collars; risk management; forwards and futures; bonds.

Prerequisite: MATH 134A or MATH 133C

Overlaps with MATH 133A.

**MATH 134C. Mathematical Models for Finance. 4 Units.**

General properties of options: option contracts (call and put options, European, American and exotic options); binomial option pricing model, Black-Scholes option pricing model; risk-neutral pricing formula using Monte-Carlo simulation; option greeks and risk management; interest rate derivatives, Markowitz portfolio theory.

Prerequisite: MATH 134B or MATH 133A

Overlaps with MATH 133B.

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 140A. Elementary Analysis. 4 Units.**

Introduction to real analysis, including convergence of sequence, infinite series, differentiation and integration, and sequences of functions. Students are expected to do proofs.

Prerequisite: (MATH 2B or AP Calculus BC) and (MATH 2D or MATH H2D) and (MATH 3A or MATH H3A) and MATH 13. AP Calculus BC with a minimum score of 4. MATH 13 with a grade of C or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 140B. Elementary Analysis. 4 Units.**

Introduction to real analysis including convergence of sequences, infinite series, differentiation and integration, and sequences of functions. Students are expected to do proofs.

Prerequisite: MATH 140A. MATH 140A with a grade of C- or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 140C. Analysis in Several Variables . 4 Units.**

Rigorous treatment of multivariable differential calculus. Jacobians, Inverse and Implicit Function theorems.

Prerequisite: MATH 140B

**MATH H140A. Honors Introduction to Graduate Analysis I. 5 Units.**

Construction of the real number system, topology of the real line, concepts of continuity, differential and integral calculus, sequences and series of functions, equicontinuity, metric spaces, multivariable differential and integral calculus, implicit functions, curves and surfaces.

Prerequisite: (MATH 2E or MATH H2E) and (MATH 3A or MATH H3A) and MATH 13 and MATH 121A and MATH 140A and MATH 140B. MATH 2E with a grade of A or better. MATH H2E with a grade of A or better. MATH 13 with a grade of A or better. MATH 140A with a grade of A or better. MATH 140B with a grade of A or better

Restriction: Mathematics Honors students only.

Concurrent with MATH 205A.

**MATH H140B. Honors Introduction to Graduate Analysis II. 5 Units.**

Construction of the real number system, topology of the real line, concepts of continuity, differential and integral calculus, sequences and series of functions, equicontinuity, metric spaces, multivariable differential and integral calculus, implicit functions, curves and surfaces.

Prerequisite: MATH H140A

Restriction: Mathematics Honors students only.

Concurrent with MATH 205B.

**MATH H140C. Honors Introduction to Graduate Analysis III. 5 Units.**

Construction of the real number system; topology of the real line; concepts of continuity, differential, and integral calculus; sequences and series of functions, equicontinuity, metric spaces, multivariable differential, and integral calculus; implicit functions, curves and surfaces.

Prerequisite: MATH H140B

Restriction: Mathematics Honors students only.

Concurrent with MATH 205C.

**MATH 141. Introduction to Topology. 4 Units.**

The elements of naive set theory and the basic properties of metric spaces. Introduction to topological properties.

Prerequisite: MATH 140A

**MATH 147. Complex Analysis. 4 Units.**

Rigorous treatment of basic complex analysis: analytic functions, Cauchy integral theory and its consequences, power series, residue calculus, harmonic functions, conformal mapping. Students are expected to do proofs.

Prerequisite or corequisite: MATH 140A and MATH 140B

Restriction: MATH 114A may not be taken for credit after MATH 147.

**MATH 150. Introduction to Mathematical Logic. 4 Units.**

First order logic through the Completeness Theorem for predicate logic.

Prerequisite: MATH 13 or (ICS 6B and ICS 6D). MATH 13 with a grade of C- or better

Overlaps with LPS 105B, PHIL 105B.

**MATH 161. Modern Geometry. 4 Units.**

Euclidean Geometry; Hilbert's Axioms; Absolute Geometry; Hyperbolic Geometry; the Poincare Models; and Geometric Transformations.

Prerequisite: MATH 13 or (ICS 6B and ICS 6D). MATH 13 with a grade of C- or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 162A. Introduction to Differential Geometry. 4 Units.**

Applications of advanced calculus and linear algebra to the geometry of curves and surfaces in space.

Prerequisite: (MATH 2E or MATH H2E) and (MATH 3A or MATH H3A) and MATH 3D

**MATH 162B. Introduction to Differential Geometry. 4 Units.**

Applications of advanced calculus and linear algebra to the geometry of curves and surfaces in space.

Prerequisite: MATH 162A

**MATH 173A. Introduction to Cryptology. 4 Units.**

Introduction to some of the mathematics used in the making and breaking of codes, with applications to classical ciphers and public key systems. Includes topics from number theory, probability, and abstract algebra.

Prerequisite: (MATH 2B or AP Calculus BC) and (MATH 3A or MATH H3A) and MATH 13 or (ICS 6B and ICS 6D). AP Calculus BC with a minimum score of 4. MATH 13 with a grade of C or better

**MATH 173B. Introduction to Cryptology. 4 Units.**

Introduction to some of the mathematics used in the making and breaking of codes, with applications to classical ciphers and public key systems. The mathematics which is covered includes topics from number theory, probability, and abstract algebra.

Prerequisite: MATH 173A

**MATH 175. Combinatorics . 4 Units.**

Introduction to combinatorics including basic counting principles, permutations, combinations, binomial coefficients, inclusion-exclusion, derangements, ordinary and exponential generating functions, recurrence relations, Catalan numbers, Stirling numbers, and partition numbers.

Prerequisite: (MATH 2B or AP Calculus BC) and MATH 13. AP Calculus BC with a minimum score of 4. MATH 13 with a grade of C or better

**MATH 176. Mathematics of Finance. 4 Units.**

After reviewing tools from probability, statistics, and elementary differential and partial differential equations, concepts such as hedging, arbitrage, Puts, Calls, the design of portfolios, the derivation and solution of the Black-Scholes, and other equations are discussed.

Prerequisite: MATH 3A or MATH H3A

Same as ECON 135.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Mathematics Majors have first consideration for enrollment.

**MATH 180A. Number Theory. 4 Units.**

Introduction to number theory and applications. Divisibility, prime numbers, factorization. Arithmetic functions. Congruences. Quadratic residue. Diophantine equations. Introduction to cryptography.

Prerequisite: (MATH 3A or MATH H3A) and MATH 13. MATH 13 with a grade of C or better

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 180B. Number Theory. 4 Units.**

Introduction to number theory and applications. Analytic number theory, character sums, finite fields, discrete logarithm, computational complexity. Introduction to coding theory. Other topics as time permits.

Prerequisite: MATH 180A

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 184. History of Mathematics. 4 Units.**

Topics vary from year to year. Some possible topics: mathematics in ancient times; the development of modern analysis; the evolution of geometric ideas. Students will be assigned individual topics for term papers.

Corequisite: MATH 184L

Prerequisite: MATH 120A and MATH 140A

Restriction: Mathematics Majors have first consideration for enrollment.

**MATH 184L. History of Mathematics Lesson Lab. 1 Unit.**

Aspiring math teachers research, design, present, and peer review middle school or high school math lessons that draw from history of mathematics topics.

Corequisite: MATH 184

Prerequisite: PS 5



**MATH 192. Studies in the Learning and Teaching of Secondary Mathematics. 2 Units.**

Focus is on historic and current mathematical concepts related to student learning and effective math pedagogy, with fieldwork in grades 6-14.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**MATH 194. Problem Solving Seminar. 2 Units.**

Develops ability in analytical thinking and problem solving, using problems of the type found in the Mathematics Olympiad and the Putnam Mathematical Competition. Students taking the course in fall will prepare for and take the Putnam examination in December.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

**MATH 195W. Mathematical Writing. 4 Units.**

Techniques of mathematical writing and communication. Covers effectively writing mathematical papers, creating effective presentations, and communicating mathematics in a variety of media. Focuses on utilizing LaTeX for typesetting mathematics.

Prerequisite: MATH 120A or MATH 121A or MATH 140A. MATH 120A with a grade of C or better. MATH 121A with a grade of C or better. MATH 140A with a grade of C or better. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Mathematics Majors have first consideration for enrollment.

(Ib)

**MATH 199A. Special Studies in Mathematics. 2-4 Units.**

Supervised reading. For outstanding undergraduate Mathematics majors in supervised but independent reading or research of mathematical topics.

Repeatability: Unlimited as topics vary.

**MATH 199B. Special Studies in Mathematics. 2-4 Units.**

Supervised reading. For outstanding undergraduate Mathematics majors in supervised but independent reading or research of mathematical topics.

Repeatability: Unlimited as topics vary.

**MATH 199C. Special Studies in Mathematics. 2-4 Units.**

Supervised reading. For outstanding undergraduate Mathematics majors in supervised but independent reading or research of mathematical topics.

Repeatability: Unlimited as topics vary.

**MATH 205A. Introduction to Graduate Analysis. 5 Units.**

Construction of the real number system, topology of the real line, concepts of continuity, differential and integral calculus, sequences and series of functions, equicontinuity, metric spaces, multivariable differential and integral calculus, implicit functions, curves and surfaces.

Prerequisite: (MATH 2E or MATH H2E) and (MATH 3A MATH H3A) and MATH 13. MATH 2E with a grade of A or better. MATH H2E with a grade of A or better. MATH 13 with a grade of C or better

Concurrent with MATH H140A.

**MATH 205B. Introduction to Graduate Analysis. 5 Units.**

Construction of the real number system, topology of the real line, concepts of continuity, differential and integral calculus, sequences and series of functions, equicontinuity, metric spaces, multivariable differential and integral calculus, implicit functions, curves and surfaces.

Prerequisite: MATH 205A

Concurrent with MATH H140B.

**MATH 205C. Introduction to Graduate Analysis. 5 Units.**

Construction of the real number system, topology of the real line, concepts of continuity, differential and integral calculus, sequences and series of functions, equicontinuity, metric spaces, multivariable differential and integral calculus, implicit functions, curves and surfaces.

Prerequisite: MATH 205B

Concurrent with MATH H140C.

**MATH 206A. Introduction to Graduate Algebra. 5 Units.**

Introduction to abstract linear algebra, including bases, linear transformation, eigenvectors, canonical forms, inner products, symmetric operators. Introduction to groups, rings, and fields including examples of groups, group actions, Sylow theorems, modules over principal ideal domains, polynomials, and Galois groups.

Prerequisite: MATH 3A or MATH H3A

Concurrent with MATH H120A.

**MATH 206B. Introduction to Graduate Algebra. 5 Units.**

Introduction to abstract linear algebra, including bases, linear transformation, eigenvectors, canonical forms, inner products, symmetric operators. Introduction to groups, rings, and fields including examples of groups, group actions, Sylow theorems, modules over principal ideal domains, polynomials, and Galois groups.

Prerequisite: MATH 206A

Concurrent with MATH H120B.

**MATH 206C. Introduction to Graduate Algebra. 5 Units.**

Introduction to abstract linear algebra, including bases, linear transformation, eigenvectors, canonical forms, inner products, symmetric operators. Introduction to groups, rings, and fields including examples of groups, group actions, Sylow theorems, modules over principal ideal domains, polynomials, and Galois groups.

Prerequisite: MATH 206B

Concurrent with MATH H120C.

**MATH 210A. Real Analysis. 4 Units.**

Measure theory, Lebesgue integral, signed measures, Radon-Nikodym theorem, functions of bounded variation and absolutely continuous functions, classical Banach spaces,  $L_p$  spaces, integration on locally compact spaces and the Riesz-Markov theorem, measure and outer measure, product measure spaces.

Prerequisite: MATH 140C

**MATH 210B. Real Analysis. 4 Units.**

Measure theory, Lebesgue integral, signed measures, Radon-Nikodym theorem, functions of bounded variation and absolutely continuous functions, classical Banach spaces,  $L_p$  spaces, integration on locally compact spaces and the Riesz-Markov theorem, measure and outer measure, product measure spaces.

Prerequisite: MATH 210A

**MATH 210C. Real Analysis. 4 Units.**

Measure theory, Lebesgue integral, signed measures, Radon-Nikodym theorem, functions of bounded variation and absolutely continuous functions, classical Banach spaces,  $L_p$  spaces, integration on locally compact spaces and the Riesz-Markov theorem, measure and outer measure, product measure spaces.

Prerequisite: MATH 210B

**MATH 218A. Introduction to Manifolds and Geometry. 4 Units.**

General topology and fundamental groups, covering space; Stokes theorem on manifolds, selected topics on abstract manifold theory.

Prerequisite: MATH 205C

**MATH 218B. Introduction to Manifolds and Geometry. 4 Units.**

General topology and fundamental groups, covering space; Stokes theorem on manifolds, selected topics on abstract manifold theory.

Prerequisite: MATH 218A

**MATH 218C. Introduction to Manifolds and Geometry. 4 Units.**

General topology and fundamental groups, covering space; Stokes theorem on manifolds, selected topics on abstract manifold theory.

Prerequisite: MATH 218B

**MATH 220A. Analytic Function Theory. 4 Units.**

Standard theorems about analytic functions. Harmonic functions. Normal families. Conformal mapping.

Prerequisite: MATH 140C

**MATH 220B. Analytic Function Theory. 4 Units.**

Standard theorems about analytic functions. Harmonic functions. Normal families. Conformal mapping.

Prerequisite: MATH 220A

**MATH 220C. Analytic Function Theory. 4 Units.**

Standard theorems about analytic functions. Harmonic functions. Normal families. Conformal mapping.

Prerequisite: MATH 220B

**MATH 222A. Several Complex Variables and Complex Geometry. 4 Units.**

Several Complex variables,  $\bar{\partial}$ -problems, mappings, Kaehler geometry, de Rham and Dolbeault Theorems, Chern Classes, Hodge Theorems, Calabi conjecture, Kahler-Einstein geometry, Monge-Ampere.

Prerequisite: MATH 218C and MATH 220C

**MATH 225A. Introduction to Numerical Analysis and Scientific Computing. 4 Units.**

Introduction to fundamentals of numerical analysis from an advanced viewpoint. Error analysis, approximation of functions, nonlinear equations.

Prerequisite: MATH 3D and (MATH 105A and MATH 105B) or (MATH 140A and MATH 140B) and MATH 121A and (MATH 112A or MAE 140)

Restriction: Graduate students only.

**MATH 225B. Introduction to Numerical Analysis and Scientific Computing. 4 Units.**

Introduction to fundamentals of numerical analysis from an advanced viewpoint. Numerical linear algebra, numerical solutions of differential equations; stability.

Prerequisite: MATH 225A

Restriction: Graduate students only.

**MATH 225C. Introduction to Numerical Analysis and Scientific Computing. 4 Units.**

Introduction to fundamentals of numerical analysis from an advanced viewpoint. Numerical linear algebra, numerical solutions of differential equations; stability.

Prerequisite: MATH 225B

Restriction: Graduate students only.

**MATH 226A. Computational Differential Equations. 4 Units.**

Finite difference and finite element methods. Quick treatment of functional and nonlinear analysis background: weak solution,  $L_p$  spaces, Sobolev spaces. Approximation theory. Fourier and Petrov-Galerkin methods; mesh generation. Elliptic, parabolic, hyperbolic cases in 226A-B-C, respectively.

Prerequisite: MATH 3D and (MATH 112A or MAE 140) and (MATH 140B or MATH 105B)

**MATH 226B. Computational Differential Equations. 4 Units.**

Finite difference and finite element methods. Quick treatment of functional and nonlinear analysis background: weak solution,  $L_p$  spaces, Sobolev spaces. Approximation theory. Fourier and Petrov-Galerkin methods; mesh generation. Elliptic, parabolic, hyperbolic cases in 226A-B-C, respectively.

Prerequisite: MATH 226A

**MATH 226C. Computational Differential Equations. 4 Units.**

Finite difference and finite element methods. Quick treatment of functional and nonlinear analysis background: weak solution,  $L_p$  spaces, Sobolev spaces. Approximation theory. Fourier and Petrov-Galerkin methods; mesh generation. Elliptic, parabolic, hyperbolic cases in 226A-B-C, respectively.

Prerequisite: MATH 226B

**MATH 227A. Mathematical and Computational Biology. 4 Units.**

Analytical and numerical methods for dynamical systems, temporal-spatial dynamics, steady state, stability, stochasticity. Application to life sciences: genetics, tissue growth and patterning, cancers, ion channels gating, signaling networks, morphogen gradients. Analytical methods.

Prerequisite: (MATH 2A or AP Calculus BC or AP Calculus AB) and (MATH 2B or AP Calculus BC or MATH 5B) and (MATH 3A or MATH H3A). AP Calculus BC with a minimum score of 3. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 4

**MATH 227B. Mathematical and Computational Biology. 4 Units.**

Analytical and numerical methods for dynamical systems, temporal-spatial dynamics, steady state, stability, stochasticity. Application to life sciences: genetics, tissue growth and patterning, cancers, ion channels gating, signaling networks, morphogen gradients. Numerical simulations.

Prerequisite: MATH 227A

**MATH 227C. Mathematical and Computational Biology . 4 Units.**

Analytical and numerical methods for dynamical systems, temporal-spatial dynamics, steady state, stability, stochasticity. Application to life sciences: genetics, tissue growth and patterning, cancers, ion channels gating, signaling networks, morphogen gradients. Probabilistic methods.

Prerequisite: MATH 227A

Same as CS 285.

**MATH 230A. Algebra. 4 Units.**

Elements of the theories of groups, rings, fields, modules. Galois theory. Modules over principal ideal domains. Artinian, Noetherian, and semisimple rings and modules.

Prerequisite: MATH 120A and MATH 121A and MATH 121B

**MATH 230B. Algebra. 4 Units.**

Elements of the theories of groups, rings, fields, modules. Galois theory. Modules over principal ideal domains. Artinian, Noetherian, and semisimple rings and modules.

Prerequisite: MATH 230A

**MATH 230C. Algebra. 4 Units.**

Elements of the theories of groups, rings, fields, modules. Galois theory. Modules over principal ideal domains. Artinian, Noetherian, and semisimple rings and modules.

Prerequisite: MATH 230B

**MATH 232A. Algebraic Number Theory. 4 Units.**

Algebraic integers, prime ideals, class groups, Dirichlet unit theorem, localization, completion, Cebotarev density theorem, L-functions, Gauss sums, diophantine equations, zeta functions over finite fields. Introduction to class field theory.

Prerequisite: MATH 230C

**MATH 232B. Algebraic Number Theory. 4 Units.**

Algebraic integers, prime ideals, class groups, Dirichlet unit theorem, localization, completion, Cebotarev density theorem, L-functions, Gauss sums, diophantine equations, zeta functions over finite fields. Introduction to class field theory.

Prerequisite: MATH 232A

**MATH 232C. Algebraic Number Theory. 4 Units.**

Algebraic integers, prime ideals, class groups, Dirichlet unit theorem, localization, completion, Cebotarev density theorem, L-functions, Gauss sums, diophantine equations, zeta functions over finite fields. Introduction to class field theory.

Prerequisite: MATH 232B

**MATH 233A. Algebraic Geometry. 4 Units.**

Basic commutative algebra and classical algebraic geometry. Algebraic varieties, morphisms, rational maps, blow ups. Theory of schemes, sheaves, divisors, cohomology. Algebraic curves and surfaces, Riemann-Roch theorem, Jacobians, classification of curves and surfaces.

Prerequisite: MATH 230C

**MATH 233B. Algebraic Geometry. 4 Units.**

Basic commutative algebra and classical algebraic geometry. Algebraic varieties, morphisms, rational maps, blow ups. Theory of schemes, sheaves, divisors, cohomology. Algebraic curves and surfaces, Riemann-Roch theorem, Jacobians, classification of curves and surfaces.

Prerequisite: MATH 233A

**MATH 233C. Algebraic Geometry. 4 Units.**

Basic commutative algebra and classical algebraic geometry. Algebraic varieties, morphisms, rational maps, blow ups. Theory of schemes, sheaves, divisors, cohomology. Algebraic curves and surfaces, Riemann-Roch theorem, Jacobians, classification of curves and surfaces.

Prerequisite: MATH 233B

**MATH 235A. Mathematics of Cryptography. 4 Units.**

Mathematics of public key cryptography: encryption and signature schemes; RSA; factoring; primality testing; discrete log based cryptosystems, elliptic and hyperelliptic curve cryptography and additional topics as determined by the instructor.

Prerequisite: MATH 230C

**MATH 239A. Analytic Methods in Arithmetic Geometry. 4 Units.**

Riemann zeta function, Dirichlet L-functions, prime number theorem, zeta functions over finite fields, sieve methods, zeta functions of algebraic curves, algebraic coding theory, L-Functions over number fields, L-functions of modular forms, Eisenstein series.

Prerequisite: MATH 220C and MATH 230C

**MATH 239B. Analytic Methods in Arithmetic Geometry. 4 Units.**

Riemann zeta function, Dirichlet L-functions, prime number theorem, zeta functions over finite fields, sieve methods, zeta functions of algebraic curves, algebraic coding theory, L-Functions over number fields, L-functions of modular forms, Eisenstein series.

Prerequisite: MATH 239A

**MATH 239C. Analytic Methods in Arithmetic Geometry. 4 Units.**

Riemann zeta function, Dirichlet L-functions, prime number theorem, zeta functions over finite fields, sieve methods, zeta functions of algebraic curves, algebraic coding theory, L-Functions over number fields, L-functions of modular forms, Eisenstein series.

Prerequisite: MATH 239B

**MATH 240A. Differential Geometry. 4 Units.**

Riemannian manifolds, connections, curvature and torsion. Submanifolds, mean curvature, Gauss curvature equation. Geodesics, minimal submanifolds, first and second fundamental forms, variational formulas. Comparison theorems and their geometric applications. Hodge theory applications to geometry and topology.

**MATH 240B. Differential Geometry. 4 Units.**

Riemannian manifolds, connections, curvature and torsion. Submanifolds, mean curvature, Gauss curvature equation. Geodesics, minimal submanifolds, first and second fundamental forms, variational formulas. Comparison theorems and their geometric applications. Hodge theory applications to geometry and topology.

Prerequisite: MATH 240A

**MATH 240C. Differential Geometry. 4 Units.**

Riemannian manifolds, connections, curvature and torsion. Submanifolds, mean curvature, Gauss curvature equation. Geodesics, minimal submanifolds, first and second fundamental forms, variational formulas. Comparison theorems and their geometric applications. Hodge theory applications to geometry and topology.

Prerequisite: MATH 240B

**MATH 245A. Topics in Differential Geometry. 4 Units.**

Studies in selected areas of differential geometry, a continuation of MATH 240A-MATH 240B-MATH 240C. Topics addressed vary each quarter.

Prerequisite: MATH 240C

Repeatability: Unlimited as topics vary.

**MATH 245B. Topics in Differential Geometry. 4 Units.**

Studies in selected areas of differential geometry, a continuation of MATH 240A-MATH 240B-MATH 240C. Topics addressed vary each quarter.

Prerequisite: MATH 245A

Repeatability: Unlimited as topics vary.

**MATH 245C. Topics in Differential Geometry. 4 Units.**

Studies in selected areas of differential geometry, a continuation of MATH 240A-MATH 240B-MATH 240C. Topics addressed vary each quarter.

Prerequisite: MATH 245B

Repeatability: Unlimited as topics vary.

**MATH 250A. Algebraic Topology. 4 Units.**

Provides fundamental materials in algebraic topology: fundamental group and covering space, homology and cohomology theory, and homotopy group.

Prerequisite: MATH 230A

**MATH 250B. Algebraic Topology. 4 Units.**

Provides fundamental materials in algebraic topology: fundamental group and covering space, homology and cohomology theory, and homotopy group.

Prerequisite: MATH 250A

**MATH 250C. Algebraic Topology. 4 Units.**

Provides fundamental materials in algebraic topology: fundamental group and covering space, homology and cohomology theory, and homotopy group.

Prerequisite: MATH 250B

**MATH 260A. Functional Analysis. 4 Units.**

Normed linear spaces, Hilbert spaces, Banach spaces, Stone-Weierstrass Theorem, locally convex spaces, bounded operators on Banach and Hilbert spaces, the Gelfand-Neumark Theorem for commutative  $C^*$ -algebras, the spectral theorem for bounded self-adjoint operators, unbounded operators on Hilbert spaces.

Prerequisite: MATH 210C and MATH 220C

**MATH 260B. Functional Analysis. 4 Units.**

Normed linear spaces, Hilbert spaces, Banach spaces, Stone-Weierstrass Theorem, locally convex spaces, bounded operators on Banach and Hilbert spaces, the Gelfand-Neumark Theorem for commutative  $C^*$ -algebras, the spectral theorem for bounded self-adjoint operators, unbounded operators on Hilbert spaces.

Prerequisite: MATH 260A

**MATH 260C. Functional Analysis. 4 Units.**

Normed linear spaces, Hilbert spaces, Banach spaces, Stone-Weierstrass Theorem, locally convex spaces, bounded operators on Banach and Hilbert spaces, the Gelfand-Neumark Theorem for commutative  $C^*$ -algebras, the spectral theorem for bounded self-adjoint operators, unbounded operators on Hilbert spaces.

Prerequisite: MATH 260B

**MATH 270A. Probability. 4 Units.**

Probability spaces, distribution and characteristic functions. Strong limit theorems. Limit distributions for sums of independent random variables. Conditional expectation and martingale theory. Stochastic processes.

Prerequisite: MATH 130C and MATH 210C

**MATH 270B. Probability. 4 Units.**

Probability spaces, distribution and characteristic functions. Strong limit theorems. Limit distributions for sums of independent random variables. Conditional expectation and martingale theory. Stochastic processes.

Prerequisite: MATH 270A

**MATH 270C. Probability. 4 Units.**

Probability spaces, distribution and characteristic functions. Strong limit theorems. Limit distributions for sums of independent random variables. Conditional expectation and martingale theory. Stochastic processes.

Prerequisite: MATH 270B

**MATH 271A. Stochastic Processes. 4 Units.**

Processes with independent increments, Wiener and Gaussian processes, function space integrals, stationary processes, Markov processes.

Prerequisite: MATH 210C

Overlaps with STAT 270.

**MATH 271B. Stochastic Processes. 4 Units.**

Processes with independent increments, Wiener and Gaussian processes, function space integrals, stationary processes, Markov processes.

Prerequisite: MATH 271A

Overlaps with STAT 270.

**MATH 271C. Stochastic Processes. 4 Units.**

Processes with independent increments, Wiener and Gaussian processes, function space integrals, stationary processes, Markov processes.

Prerequisite: MATH 271B

Overlaps with STAT 270.

**MATH 280A. Mathematical Logic. 4 Units.**

Basic set theory; models, compactness, and completeness; basic model theory; Incompleteness and Gödel's Theorems; basic recursion theory; constructible sets.

**MATH 280B. Mathematical Logic. 4 Units.**

Basic set theory; models, compactness, and completeness; basic model theory; Incompleteness and Gödel's Theorems; basic recursion theory; constructible sets.

Prerequisite: MATH 280A

**MATH 280C. Mathematical Logic. 4 Units.**

Basic set theory; models, compactness, and completeness; basic model theory; Incompleteness and Gödel's Theorems; basic recursion theory; constructible sets.

Prerequisite: MATH 280B

**MATH 281A. Set Theory. 4 Units.**

Ordinals, cardinals, cardinal arithmetic, combinatorial set theory, models of set theory, Gödel's constructible universe, forcing, large cardinals, iterate forcing, inner model theory, fine structure.

Prerequisite: MATH 280C

**MATH 281B. Set Theory. 4 Units.**

Ordinals, cardinals, cardinal arithmetic, combinatorial set theory, models of set theory, Gödel's constructible universe, forcing, large cardinals, iterate forcing, inner model theory, fine structure.

Prerequisite: MATH 281A

**MATH 281C. Set Theory. 4 Units.**

Ordinals, cardinals, cardinal arithmetic, combinatorial set theory, models of set theory, Gödel's constructible universe, forcing, large cardinals, iterate forcing, inner model theory, fine structure.

Prerequisite: MATH 281B

**MATH 282A. Model Theory. 4 Units.**

Languages, structures, compactness and completeness. Model-theoretic constructions. Omitting types theorems. Morley's theorem. Ranks, forking. Model completeness. O-minimality. Applications to algebra.

Prerequisite: MATH 280C

**MATH 282B. Model Theory. 4 Units.**

Languages, structures, compactness and completeness. Model-theoretic constructions. Omitting types theorems. Morley's theorem. Ranks, forking. Model completeness. O-minimality. Applications to algebra.

Prerequisite: MATH 282A

**MATH 282C. Model Theory. 4 Units.**

Languages, structures, compactness and completeness. Model-theoretic constructions. Omitting types theorems. Morley's theorem. Ranks, forking. Model completeness. O-minimality. Applications to algebra.

Prerequisite: MATH 282B

**MATH 285A. Topics in Mathematical Logic. 4 Units.**

Studies in selected areas of mathematical logic, a continuation of MATH 280A-MATH 280B-MATH 280C. Topics addressed vary each quarter.

Prerequisite: MATH 280C

Repeatability: Unlimited as topics vary.



**MATH 290A. Methods in Applied Mathematics. 4 Units.**

Introduction to ODEs and dynamical systems: existence and uniqueness. Equilibria and periodic solutions. Bifurcation theory. Perturbation methods: approximate solution of differential equations. Multiple scales and WKB. Matched asymptotic. Calculus of variations: direct methods, Euler-Lagrange equation. Second variation and Legendre condition.

**MATH 290B. Methods in Applied Mathematics. 4 Units.**

Introduction to ODEs and dynamical systems: existence and uniqueness. Equilibria and periodic solutions. Bifurcation theory. Perturbation methods: approximate solution of differential equations. Multiple scales and WKB. Matched asymptotic. Calculus of variations: direct methods, Euler-Lagrange equation. Second variation and Legendre condition.

Prerequisite: MATH 290A

**MATH 290C. Methods in Applied Mathematics. 4 Units.**

Introduction to ODEs and dynamical systems: existence and uniqueness. Equilibria and periodic solutions. Bifurcation theory. Perturbation methods: approximate solution of differential equations. Multiple scales and WKB. Matched asymptotic. Calculus of variations: direct methods, Euler-Lagrange equation. Second variation and Legendre condition.

Prerequisite: MATH 290B

**MATH 295A. Partial Differential Equations. 4 Units.**

Theory and techniques for linear and nonlinear partial differential equations. Local and global theory of partial differential equations: analytic, geometric, and functional analytic methods.

Prerequisite: MATH 210C and MATH 112B and MATH 112C

**MATH 295B. Partial Differential Equations. 4 Units.**

Theory and techniques for linear and nonlinear partial differential equations. Local and global theory of partial differential equations: analytic, geometric, and functional analytic methods.

Prerequisite: MATH 295A

**MATH 295C. Partial Differential Equations. 4 Units.**

Theory and techniques for linear and nonlinear partial differential equations. Local and global theory of partial differential equations: analytic, geometric, and functional analytic methods.

Prerequisite: MATH 295B

**MATH 296. Topics in Partial Differential Equations. 4 Units.**

Studies in selected areas of partial differential equations, a continuation of MATH 295A-MATH 295B-MATH 295C. Topics addressed vary each quarter.

Prerequisite: MATH 295C

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**MATH 297. Mathematics Colloquium. 1 Unit.**

Weekly colloquia on topics of current interest in mathematics.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**MATH 298A. Seminar . 2 Units.**

Seminars organized for detailed discussion of research problems of current interest in the Department. The format, content, frequency, and course value are variable.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

**MATH 298B. Seminar . 2 Units.**

Seminars organized for detailed discussion of research problems of current interest in the Department. The format, content, frequency, and course value are variable.

Prerequisite: MATH 298A

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

**MATH 298C. Seminar . 2 Units.**

Seminars organized for detailed discussion of research problems of current interest in the Department. The format, content, frequency, and course value are variable.

Prerequisite: MATH 298B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

**MATH 299A. Supervised Reading and Research. 1-12 Units.**

Supervised reading and research with Mathematics faculty.

Repeatability: May be repeated for credit unlimited times.

**MATH 299B. Supervised Reading and Research. 1-12 Units.**

Supervised reading and research with Mathematics faculty.

Prerequisite: MATH 299A

Repeatability: May be repeated for credit unlimited times.

**MATH 299C. Supervised Reading and Research. 1-12 Units.**

Supervised reading and research with Mathematics faculty.

Prerequisite: MATH 299B

Repeatability: May be repeated for credit unlimited times.

**MATH 399. University Teaching. 1-4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Mathematics for Biology, Minor

The Mathematics for Biology Minor is an excellent complement to many majors; including physics, chemistry, engineering, computer science, biology, and more. The curriculum is designed to provide students with the opportunity to widen their background and skills in mathematics in order to gain a deeper understanding of the role that mathematics can play in their major coursework, with emphasis on mathematical modeling in biology.

A. Complete:

MATH 13	Introduction to Abstract Mathematics
MATH 113A- 113B	Mathematical Modeling in Biology and Mathematical Modeling in Biology

B. Select two of the following:

MATH 105A	Numerical Analysis I (plus MATH 105LA)
MATH 112A	Introduction to Partial Differential Equations and Applications
MATH 117	Dynamical Systems
MATH 118	The Theory of Differential Equations
MATH 121A	Linear Algebra
MATH 140A	Elementary Analysis

C. One additional four-unit upper-division lecture course in MATH numbered 100–189.

NOTE: Nearly all upper-division courses in Mathematics have MATH 2A-MATH 2B as prerequisites, and many courses have additional prerequisites such as MATH 2D, MATH 2E, MATH 3A, and/or MATH 3D.

## Mathematics, B.S.

The Department offers a B.S. in Mathematics. Within this program there are seven tracks; besides the standard track, there are six specializations or concentrations (in Mathematical Biology, Mathematical Finance, Data Science, Applied and Computational Mathematics, Mathematics for Education, and Mathematics for Education/Secondary Teaching Certification). In addition, the Department offers minors in Mathematics and Mathematics for Biology.

Undergraduate mathematics courses are of several kinds: courses preparatory to advanced work in mathematics, the exact sciences, and engineering; courses for students of the social and biological sciences; and courses for liberal arts students and those planning to enter the teaching field.

Students may be admitted to the Mathematics major upon entering the University as freshmen, via change of major, or as transfer students from other colleges and universities. Information about change of major policies is available in the Physical Sciences Student Affairs Office and at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>). For transfer student admission, preference will be given to junior-level applicants with the highest grades overall and who have satisfactorily completed the required coursework of one year of approved calculus. Additional course work in multivariable calculus, linear algebra, and differential equations is strongly recommended.

**All students must meet the University Requirements.**

**School Requirements: None.**

### Core Requirements for all Mathematics Majors

#### Lower-Division Requirements:

A. Complete the following:

MATH 2A- 2B	Single-Variable Calculus and Single-Variable Calculus
MATH 2D	Multivariable Calculus
MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations
MATH 13	Introduction to Abstract Mathematics

B. Computing skills:

MATH 9	Introduction to Programming for Numerical Analysis
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C. Select one three-quarter lecture course sequence from the following:

CHEM 1A- 1B- 1C	General Chemistry and General Chemistry and General Chemistry
PHYSICS 7C- 7D- 7E	Classical Physics and Classical Physics and Classical Physics
STATS 7-MATH 10-PHYSICS 7C	Basic Statistics and Introduction to Programming for Data Science and Classical Physics

#### Upper-Division Requirements:

A. Complete:

MATH 120A	Introduction to Abstract Algebra: Groups
MATH 121A	Linear Algebra
MATH 130A	Probability I
MATH 140A- 140B	Elementary Analysis and Elementary Analysis

### Requirements for the Pure Mathematics Major

**Core requirements for all Mathematics majors plus:**

#### Lower-Division Requirements:

A. Complete:

MATH 2E	Multivariable Calculus
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#### Upper-Division Requirements:

A. Complete:

MATH 120B	Introduction to Abstract Algebra: Rings and Fields
MATH 121B	Linear Algebra
MATH 147	Complex Analysis

B. Five additional four-unit MATH lecture courses numbered 100–189.

### Sample Program — Pure Mathematics

Freshman		
Fall	Winter	Spring
MATH 2A	MATH 2B	MATH 2D
PHYSICS 7C- 7LC (or CHEM 1A)	PHYSICS 7D- 7LD (or CHEM 1B)	PHYSICS 7E or CHEM 1C
General Education/Elective	MATH 13	General Education/Elective
General Education/Elective	General Education/Elective	General Education/Elective
Sophomore		
Fall	Winter	Spring
General Education/Elective	MATH 3A	MATH 3D
MATH 2E	MATH 9	General Education/Elective
General Education/Elective	General Education/Elective	General Education/Elective
General Education/Elective	General Education/Elective	General Education/Elective
Junior		
Fall	Winter	Spring
MATH 130A	MATH 140A	MATH 140B
MATH 120A	MATH 120B	MATH 141
General Education/Elective	General Education/Elective	General Education/Elective
General Education/Elective	General Education/Elective	General Education/Elective
Senior		
Fall	Winter	Spring
MATH 121A	MATH 121B	MATH 115
MATH 150	MATH 147	General Education/Elective
MATH 112A	MATH 180A	General Education/Elective
General Education/Elective	General Education/Elective	General Education/Elective

The Department offers two concentrations and three specializations. Note that all require the completion of an application and an interview with the faculty advisor for that concentration or specialization. **Admission into a concentration or specialization is not guaranteed.** Students must complete the basic 'Core' requirements for the B.S. in Mathematics along with the lower- and upper-division requirements specified for each concentration and specialization.

### Requirements for Mathematics Major with a Concentration in Data Science

Admission to this specialization requires approval in advance by the Mathematics Department. Students need a GPA of 3.0 in all lower-division and upper-division MATH courses to be admitted to the concentration and must maintain the GPA to remain and graduate in the concentration. The admissions process begins with completing a form at the Department office, and includes an interview with the Department's advisor for the specialization. This approval should be applied for no later than the end of the junior year.

#### Core requirements for all Mathematics majors plus:

##### Lower-Division Requirements:

A. Complete:

MATH 2E	Multivariable Calculus
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B. Replace item C in the Core Requirements with the following:

MATH 10	Introduction to Programming for Data Science
STATS 7	Basic Statistics
PHYSICS 7C	Classical Physics

##### Upper-Division Requirements

A. Complete:

MATH 105A- 105B	Numerical Analysis I and Numerical Analysis II
MATH 121B	Linear Algebra
MATH 130B	Probability II
MATH 110A- 110B	Optimization I and Optimization II
MATH 120B	Introduction to Abstract Algebra: Rings and Fields

MATH 147	Complex Analysis
B. Select three electives from the following: <sup>1</sup>	
MATH 115	Mathematical Modeling
MATH 117	Dynamical Systems
MATH 118	The Theory of Differential Equations
MATH 130C	Stochastic Processes
MATH 133A- 133B	Statistical Methods with Applications to Finance and Statistical Methods with Applications to Finance
or MATH 134A & MATH 134B	Fixed Income and Mathematics of Financial Derivatives
MATH 140C	Analysis in Several Variables
MATH 162A- 162B	Introduction to Differential Geometry and Introduction to Differential Geometry
MATH 173A- 173B	Introduction to Cryptology and Introduction to Cryptology
MATH 175	Combinatorics
MATH 176	Mathematics of Finance
STATS 110	Statistical Methods for Data Analysis I
COMPSCI 171	Introduction to Artificial Intelligence
COMPSCI 172B	Neural Networks and Deep Learning
COMPSCI 177	Applications of Probability in Computer Science
COMPSCI 178	Machine Learning and Data-Mining
COMPSCI 179	Algorithms for Probabilistic and Deterministic Graphical Models
COMPSCI 183	Introduction to Computational Biology
COMPSCI 184A- 184C	Artificial Intelligence in Biology and Medicine and Computational Systems Biology
I&C SCI 105	Digital Information Systems

<sup>1</sup> At least one of the electives must be from outside the Mathematics department. Other upper-division elective courses may be chosen with the approval of the faculty advisor.

### Sample Program - Mathematics Major Concentrating in Data Science

Freshman		
Fall	Winter	Spring
MATH 2A	MATH 2B	MATH 3A
STATS 7	PHYSICS 7C	MATH 9
Sophomore		
Fall	Winter	Spring
MATH 10	MATH 2D	MATH 2E
MATH 13		MATH 3D
Junior		
Fall	Winter	Spring
MATH 105A	MATH 105B	MATH 120A
MATH 121A	MATH 121B	
MATH 130A	MATH 130B	
Senior		
Fall	Winter	Spring
MATH 110A	MATH 110B	Upper-Division Elective
MATH 140A	MATH 140B	
Upper-Division Elective	Upper-Division Elective	

### Requirements for Mathematics Major with a Concentration in Mathematical Finance

Admission to this concentration requires approval in advance by the Mathematics Department. Students need a GPA of 3.0 in university mathematics courses to be admitted to the concentration and must maintain the GPA to remain and graduate in the concentration. The department may limit the number of students admitted into this concentration during impacted years. The admissions process begins with completing a form at the Department office and includes an interview with the Department's advisor for the concentration. This approval should be applied for after the student has completed ECON 20A-ECON 20B, but no later than the end of the junior year.

**Core requirements for all Mathematics majors plus:****Lower-Division Requirements:**

A. Complete:

MATH 2E	Multivariable Calculus
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B. Replace item C in the Core Requirements with the following:

MATH 10	Introduction to Programming for Data Science
STATS 7	Basic Statistics
PHYSICS 7C	Classical Physics

**Upper-Division Requirements:**

A. Complete:

MATH 120B	Introduction to Abstract Algebra: Rings and Fields
MATH 121B	Linear Algebra
MATH 130B	Probability II
MATH 130C	Stochastic Processes
MATH 134A	Fixed Income
MATH 134B	Mathematics of Financial Derivatives
MATH 134C	Mathematical Models for Finance
MATH 147	Complex Analysis

B. Select one elective lecture course from the following:

MATH 105A- 105B	Numerical Analysis I and Numerical Analysis II (plus MATH 105LA-105LB)
MATH 110A	Optimization I
MATH 173A	Introduction to Cryptology
MATH 176	Mathematics of Finance
COMPSCI 171	Introduction to Artificial Intelligence
COMPSCI 172B	Neural Networks and Deep Learning
COMPSCI 177	Applications of Probability in Computer Science
COMPSCI 178	Machine Learning and Data-Mining

C. Complete the following eight required Economics courses:

ECON 20A- 20B	Basic Economics I and Basic Economics II
ECON 105A- 105B- 105C	Intermediate Quantitative Economics I and Intermediate Quantitative Economics II and Intermediate Quantitative Economics III
ECON 122A or ECON 123A	Applied Econometrics I Econometrics I
ECON 132A	Introduction to Financial Investments
ECON 134A or ECON 161A	Corporate Finance Money and Banking

**Sample Program — Mathematics Major Concentrating in Mathematical Finance****Freshman**

Fall	Winter	Spring
MATH 2A	MATH 2B	MATH 2D
STATS 7	MATH 9	MATH 10
General Education/Elective	MATH 13	General Education/Elective
General Education/Elective	General Education/Elective	General Education/Elective

**Sophomore**

Fall	Winter	Spring
MATH 2E	MATH 3A	MATH 3D
ECON 20A	ECON 20B	General Education/Elective
General Education/Elective	PHYSICS 7C	General Education/Elective
General Education/Elective	General Education/Elective	General Education/Elective

<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 130A	MATH 130B	MATH 130C
MATH 140A	MATH 140B	MATH 140C
ECON 105A	ECON 105B	ECON 105C
MATH 121A	MATH 121B	General Education/Elective
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 134A	MATH 134B	MATH 134C
MATH 120A	MATH 176	MATH 121A
ECON 134A	ECON 132A	General Education/Elective
MATH 147	General Education/Elective	

## Requirements for Mathematics Major with a Specialization in Applied and Computational Mathematics

Admission to this specialization requires approval in advance by the Mathematics Department. The admissions process begins with completing a form at the Department office, and includes an interview with the Department's advisor for the specialization. This approval should be applied for no later than the end of the junior year.

### Core requirements for all Mathematics majors plus:

#### Lower-Division Requirements:

A. Complete:

MATH 2E	Multivariable Calculus
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#### Upper-Division Requirements:

A. Six required lecture courses:

MATH 105A- 105B	Numerical Analysis I and Numerical Analysis II (plus MATH 105LA-LB)
MATH 112A- 112B	Introduction to Partial Differential Equations and Applications and Introduction to Partial Differential Equations and Applications
MATH 115	Mathematical Modeling
MATH 121B	Linear Algebra

B. Select three additional Mathematics courses from the following:

MATH 107	Numerical Differential Equations (plus MATH 107L)
MATH 112C	Introduction to Partial Differential Equations and Applications
MATH 117	Dynamical Systems
MATH 118	The Theory of Differential Equations
MATH 130B- 130C	Probability II and Stochastic Processes
MATH 133A- 133B	Statistical Methods with Applications to Finance and Statistical Methods with Applications to Finance
or MATH 134A & MATH 134B	Fixed Income and Mathematics of Financial Derivatives
MATH 140C	Analysis in Several Variables
MATH 176	Mathematics of Finance

C. Two approved upper-division courses in an area of application outside of Mathematics. Approval must be obtained in advance from the advisor for this specialization. The student is responsible for satisfying any prerequisites for these courses.

## Sample Program — Mathematics Major Specializing in Applied and Computational Mathematics

<b>Freshman</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 2A	MATH 2B	MATH 2D
PHYSICS 7C- 7LC (or CHEM 1A)	PHYSICS 7D- 7LD (or CHEM 1B)	PHYSICS 7E or CHEM 1C
General Education/Elective	General Education/Elective	MATH 13
General Education/Elective	General Education/Elective	General Education/Elective
<b>Sophomore</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 2E	MATH 3A	MATH 3D
MATH 9	General Education/Elective	General Education/Elective
General Education/Elective	General Education/Elective	General Education/Elective



General Education/Elective	General Education/Elective	General Education/Elective
<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 112A	MATH 112B	MATH 115
MATH 121A	MATH 121B	MATH 140B
MATH 130A	MATH 140A	General Education/Elective
General Education/Elective	General Education/Elective	General Education/Elective
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 105A- 105LA	MATH 105B- 105LB	MATH 107- 107L
MATH 117	MATH 118	Technical Elective
MATH 120A	Technical Elective	General Education/Elective
General Education/Elective	General Education/Elective	General Education/Elective

## Requirements for Mathematics Major with a Specialization in Mathematical Biology

Admission to this specialization requires approval in advance by the Mathematics Department. The admissions process begins with completing a form at the Department Office, and includes an interview with the Department's advisor for the specialization. This approval should be applied for no later than the end of the junior year.

### Core requirements for all Mathematics majors plus:

#### Lower-Division Requirements:

A. Complete:

MATH 2E	Multivariable Calculus
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B. Replace item C in the Core Requirements with the following:

BIO SCI 93	From DNA to Organisms
BIO SCI 94	From Organisms to Ecosystems

and two courses selected from the following:

BIO SCI 97	Genetics
CHEM 1A	General Chemistry
CHEM 1B	General Chemistry
PHYSICS 2	Introduction to Mathematical Methods for Physics
PHYSICS 7C	Classical Physics
PHYSICS 7D	Classical Physics

#### Upper-Division Requirements:

A. Complete the following seven required upper-division lecture courses:

MATH 105A- 105B	Numerical Analysis I and Numerical Analysis II (plus MATH 105LA-LB)
MATH 112A- 112B	Introduction to Partial Differential Equations and Applications and Introduction to Partial Differential Equations and Applications
MATH 113A- 113B	Mathematical Modeling in Biology and Mathematical Modeling in Biology
MATH 115	Mathematical Modeling

B. Two additional elective courses, at least one from MATH courses numbered 100–189. The second elective may be either an upper-division MATH course or a four-unit upper-division Biological Sciences course with the advanced approval by the advisor for this specialization.

### Sample Program — Mathematics Major Specializing in Mathematical Biology

<b>Freshman</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 2A	MATH 2B	MATH 2D
BIO SCI 93	BIO SCI 94	MATH 13
General Education	General Education	General Education
General Education	General Education	General Education
<b>Sophomore</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 2E	MATH 3A	MATH 3D
CHEM 1A	CHEM 1B	General Education/Elective
MATH 9	General Education/Elective	General Education/Elective
General Education/Elective		

<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 113A	MATH 113B	MATH 115
MATH 105A- 105LA	MATH 105B- 105LB	MATH 121A
General Education/Elective	MATH 140A	MATH 140B
General Education/Elective	General Education/Elective	General Education/Elective
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 112A	MATH 112B	MATH 115
MATH 130A	MATH 120A	MATH Elective
Bio. Elective	General Education/Elective	General Education/Elective
General Education/Elective	General Education/Elective	General Education/Elective

## Requirements for Mathematics Major with a Specialization in Mathematics for Education

Admission to this specialization requires approval in advance by the Mathematics Department. The admission process begins with completing a form at the Department office, and includes an interview with the Department's advisor for the specialization. This approval should be applied for no later than the end of the junior year.

This specialization is designed to help prepare students for teaching mathematics. Students wishing to go on and teach at the intermediate and high school levels should also consult with an academic advisor in the School of Education. A Commission on Teacher Credentialing (CTC)-approved subject-matter program (SMP) in Mathematics can be easily satisfied in tandem with this specialization, and enables students to waive a subject matter exam for teachers. Specific SMP requirements and enrollment procedures are available from the School of Education.

### Core requirements for all Mathematics majors plus:

#### Lower-Division Requirements:

A. Complete:

MATH 8	Explorations in Functions and Modeling
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#### Upper-Division Requirements:

A. Complete:

MATH 105A- 105LA	Numerical Analysis I and Numerical Analysis Laboratory
MATH 120B	Introduction to Abstract Algebra: Rings and Fields
MATH 130B	Probability II
MATH 150	Introduction to Mathematical Logic
MATH 161	Modern Geometry
MATH 180A	Number Theory
MATH 184- 184L	History of Mathematics and History of Mathematics Lesson Lab

Plus one additional four-unit MATH course numbered 100–189.

B. Complete:

PHY SCI 5	California Teach 1: Introduction to Science and Mathematics Teaching
PHY SCI 105	California Teach 2: Middle School Science and Mathematics Teaching

### Sample Program — Mathematics Major Specializing in Mathematics for Education

<b>Freshman</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 2A	MATH 2B	MATH 2D
PHYSICS 7C- 7LC (or CHEM 1A)	PHYSICS 7D- 7LD (or CHEM 1B)	PHYSICS 7E or CHEM 1C
General Education	MATH 13	General Education
General Education/Elective	General Education	
<b>Sophomore</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 3A	MATH 3D	MATH 8
PHY SCI 5	PHY SCI 105	MATH 121A
General Education	General Education	MATH 9
General Education		
<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 130A	MATH 130B	MATH 161

MATH 140A General Education	MATH 120A MATH 140B	MATH 120B General Education/Elective
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 105A- 105LA	MATH 180A	MATH 184- 184L
MATH 150	General Education/Elective	General Education
General Education/Elective	Math. Elective	General Education

## Requirements for Mathematics Major with a Concentration in Mathematics for Education/Secondary Teaching Certification

Admission to this concentration requires approval in advance. The admission process begins with completing an Intent form at the Cal Teach Resource and Advising Center.

Following completion of the Intent form, students must complete an application in the Mathematics Department office and an interview with the Department's advisor for the concentration. These approvals should be applied for no later than the end of the sophomore year.

This concentration allows students pursuing the B.S. in Mathematics to earn a bachelor's degree and complete the required course work and field experience for a California Preliminary Single Subject Teaching Credential at the same time. With careful, early planning, it is possible for students to complete both in four years. For additional information about teacher certification requirements and enrollment procedures, see Preparation for Teaching Science and Mathematics or contact the Cal Teach Resource and Advising Center. A Commission on Teacher Credentialing (CTC)-approved subject-matter program (SMP) in Mathematics can be satisfied in tandem with this concentration, and enables students to waive a subject matter exam for teachers. Specific SMP requirements and enrollment procedures are available from the Cal Teach Resource and Advising Center or the School of Education.

### Core requirements for all Mathematics majors plus:

#### Lower-Division Requirements:

A. Complete:

MATH 8	Explorations in Functions and Modeling
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#### Upper-Division Requirements:

A. Complete:

MATH 105A- 105LA	Numerical Analysis I and Numerical Analysis Laboratory
MATH 120B	Introduction to Abstract Algebra: Rings and Fields
MATH 130B	Probability II
MATH 150	Introduction to Mathematical Logic
MATH 161	Modern Geometry
MATH 180A	Number Theory
MATH 184- 184L	History of Mathematics and History of Mathematics Lesson Lab

Plus one additional four-unit MATH course numbered 100–189.

B. Complete:

CHEM 193 or PHYSICS 193	Research Methods Research Methods
EDUC 55	Knowing and Learning in Mathematics and Science
EDUC 109	Reading and Writing in Mathematics and Science
EDUC 143AW	Classroom Interactions I
EDUC 143BW	Classroom Interactions II
EDUC 148	Complex Pedagogical Design
EDUC 158	Student Teaching Mathematics and Science in Middle/High School (two quarters)
PHY SCI 5	California Teach 1: Introduction to Science and Mathematics Teaching
PHY SCI 105	California Teach 2: Middle School Science and Mathematics Teaching

NOTE: Students may pursue either the concentration in Mathematics for Education/Secondary Teaching Certification or the specialization in Mathematics for Education, but not both.

**Sample Program - Concentration in Mathematics for Education/Secondary Teaching Certification**

<b>Freshman</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 2A	MATH 2B	MATH 2D
PHYSICS 7C- 7LC (or CHEM 1A)	PHYSICS 7D- 7LD (or CHEM 1B)	PHYSICS 7E or CHEM 1C
PHY SCI 5	MATH 13	MATH 8
General Education	General Education	MATH 9
<b>Sophomore</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 3A	MATH 3D	MATH 161
PHY SCI 105	MATH 180A	MATH 121A
General Education	CHEM 193	General Education
<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 130A	MATH 130B	MATH 184- 184L
MATH 140A	MATH 120A	MATH 120B
EDUC 55	MATH 140B	EDUC 148
	EDUC 143AW	Math. Elective
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 105A- 105LA	EDUC 109	EDUC 158
MATH 150	EDUC 158	General Education
EDUC 143BW	General Education	General Education

The Honors Program in Mathematics is designed for students contemplating graduate work in mathematics. The program is open to junior and senior Mathematics majors who meet the minimum academic qualifications of a 3.5 GPA in Mathematics courses and a 3.2 GPA overall. It is highly recommended that students meet with the Honors Advisor by the beginning of their junior year to begin planning courses. Students should officially apply for the Honors Program no later than the Fall quarter of their senior year. Recognition for completing the program is conferred upon graduation.

Participants must meet the following requirements:

A. Complete the requirements for the major in Mathematics (in any one of its tracks)

B. Complete:

MATH 120B	Introduction to Abstract Algebra: Rings and Fields
MATH 121B	Linear Algebra

C. Complete one of the following series:

MATH H140A	Honors Introduction to Graduate Analysis I
MATH H140B	Honors Introduction to Graduate Analysis II
MATH H140C	Honors Introduction to Graduate Analysis III
or	
MATH H120A	Honors Introduction to Graduate Algebra I
MATH H120B	Honors Introduction to Graduate Algebra II
MATH H120C	Honors Introduction to Graduate Algebra III
or	
(MATH 120C or MATH 140C) and MATH 133A - MATH 133B	
or	
(MATH 120C or MATH 140C) and MATH 180A - MATH 180B	
or	
(MATH 120C or MATH 140C) and MATH 113A - MATH 113B	
or	
(MATH 120C or MATH 140C) and MATH 162A - MATH 162B	

D. Complete one quarter of Math 199, or a research project and thesis approved by the Honors Program Advisor.

These requirements are in addition to the Mathematics major requirements and the requirements for any specialization/concentration. However, MATH H120A-MATH H120B-MATH H120C in item C may be used to satisfy upper-division electives or taken in place of MATH 120A-MATH 120B-MATH 120C and MATH 121A-MATH 121B. Similarly, MATH H140A-MATH H140B-MATH H140C may be used to satisfy upper-division electives or taken in place of MATH 140A-MATH 140B-MATH 140C and MATH 141.

NOTE: If all requirements are completed and the student's work and final GPA satisfies the program restrictions, the student will graduate with Honors in Mathematics, and this distinction is noted on the transcript.

## Sample Program — Mathematics Major Honors Program

Freshman		
Fall	Winter	Spring
MATH 2B	MATH 2D	MATH 2E
PHYSICS 7C- 7LC (or CHEM 1A)	PHYSICS 7D- 7LD (or CHEM 1B)	PHYSICS 7E or CHEM 1C
General Education/Elective	MATH 13	General Education/Elective
General Education/Elective	General Education/Elective	General Education/Elective
Sophomore		
Fall	Winter	Spring
MATH 3A	MATH 3D	MATH 121B
General Education/Elective	MATH 121A	General Education/Elective
General Education/Elective	MATH 9	General Education/Elective
General Education/Elective	General Education/Elective	General Education/Elective
Junior		
Fall	Winter	Spring
MATH H120A	MATH H120B	MATH H120C
MATH H140A	MATH H140B	MATH H140C
MATH 130A	MATH 147	General Education/Elective
General Education/Elective	General Education/Elective	General Education/Elective
Senior		
Fall	Winter	Spring
MATH 150	MATH 162A	MATH 162B
General Education/Elective	MATH 199	General Education/Elective
		MATH 199

In order to prepare for independent study/independent research, it is highly recommended that students take at least one course sequence in the field they are interested in studying. The following list contains the major mathematical disciplines and the course work suggested for completion prior to doing independent study in that field:

- Applied Mathematics: MATH 117 and MATH 118
- Algebra: MATH 120A-MATH 120B-MATH 120C
- Probability and Statistics: MATH 130A-MATH 130B-MATH 130C
- Analysis: MATH 140A-MATH 140B-MATH 140C
- Logic: MATH 150
- Geometry: MATH 162A-MATH 162B
- Number Theory: MATH 180A-MATH 180B

For all Mathematics majors, or prospective majors, assistance in planning a program of study is available from the School of Physical Sciences academic counselors, as well as from the Mathematics Department Undergraduate Advisor for the various tracks. The application process for the specializations and concentrations requires students to plan a program of study with the assistance of a faculty advisor (<https://www.math.uci.edu/undergraduate-studies/concentrations-and-specializations>).

Those in the specialization for Education should note that MATH 184 may not be offered more than once every other year and thus should be taken when offered.

## Mathematics, M.S.

Graduate courses are designed to meet the needs of students doing graduate work in mathematics and in those disciplines that require graduate-level mathematics for their study. Among the fields covered are analysis, algebra, applied and computational mathematics, mathematical biology, geometry and topology, probability, ordinary and partial differential equations, and mathematical logic.

To earn the Master of Science degree, the student must satisfy course and residency requirements, and achieve two passes at the M.S. level among three exams in Real Analysis, Complex Analysis, and Algebra prior to the beginning of the second year.

### Requirements

The total number of required courses for the M.S. is 12, completed with satisfactory performance, that is, with a grade of B or better. Students are required to complete at least one series of the following courses:

MATH 210A- 210B- 210C

Real Analysis  
and Real Analysis  
and Real Analysis

or

MATH 220A- 220B- 220C

Analytic Function Theory  
and Analytic Function Theory  
and Analytic Function Theory

or

MATH 230A- 230B- 230C

Algebra  
and Algebra  
and Algebra

At most one undergraduate course may count as an elective course, provided it is sponsored by rank faculty and approved by the Graduate Advisor. At most one elective course (at least three units) is allowed outside the Department.

To satisfy exam requirements, students may take the Core Assessment Exam (offered in the spring of every year), the Comprehensive Exams (offered in the spring of every year), or the Qualifying Exams (offered before the start of each fall quarter) in Real Analysis, Complex Analysis, and Algebra. Students may not attempt to pass an exam in any particular area more than three times. Some students may require additional background before entering MATH 210 or MATH 230. This will be determined by assessment prior to the start of the students' first year by the Vice Chair of Graduate Studies, upon consultation with the Graduate Studies Committee. Such students will be directed into MATH 205 and/or MATH 206 during their first year. They may pass one Comprehensive Exam in the areas of Analysis or Algebra in lieu of achieving an M.S. pass in one of the Core Assessment or Qualifying Exams that must be obtained prior to the start of their second year.

Students who fail to pass the required examinations satisfactorily within the period specified will be recommended for academic disqualification by the Graduate Dean.

MATH 199, MATH 297, MATH 298, MATH 299, and may not be used to fulfill course requirements.

The residency requirement ordinarily is satisfied by full-time enrollment for three quarters immediately preceding the award of the M.S. When appropriate, a leave of absence may be granted between matriculation and the final quarters of study.

If the candidate is not advanced before the beginning of the quarter in which all requirements are completed, the degree will not be conferred until the end of the following quarter. Deadlines for submission of the Application for Advancement to Candidacy are published on the Graduate Division website (<https://www.grad.uci.edu/academics/advancement-to-candidacy.php>) under filing fees and deadlines.

### Advancement to M.S. Candidacy

All Master's students must be advanced to candidacy for the degree prior to the beginning of their final quarter of enrollment. An application for Advancement to Candidacy must be completed by the student and submitted for approval to the Department. The approved application must be submitted to the Graduate Division by the deadline published on the Graduate Division website (<http://www.grad.uci.edu/>). Advancement to M.S.Candidacy must occur one quarter prior to the degree conferral quarter.

Filing fee information can be located on the Graduate Division website (<http://www.grad.uci.edu/>).

### Master of Science in Mathematics with a Teaching Credential

In cooperation with the UCI School of Education, the Department of Mathematics sponsors a coordinated program for the M.S. degree in Mathematics and the California Single Subject Teaching Credential. The requirements for this option are the same as the Master of Science in Mathematics requirements listed above.

The student will complete the requirements for the Master's degree with the Mathematics Department (generally a two-year commitment) and then will petition with the UCI School of Education to take the School of Education's credential courses (generally a one-year commitment). The student must meet the requirements of the School of Education for the CBEST, CSET, TB test, and Certificate of Clearance. Prospective graduate students interested in this program should so indicate on their applications. A detailed description of the program can be requested from the School of Education.

## Mathematics, Minor

The Mathematics Minor is an excellent complement to many majors; including physics, chemistry, engineering, computer science, business, economics, biology, and more. The curriculum is designed to provide students with the opportunity to widen their background and skills in mathematics in order to gain a deeper understanding of the role that mathematics can play in their major coursework.

A. Complete:

MATH 13

Introduction to Abstract Mathematics

MATH 120A

Introduction to Abstract Algebra: Groups

or MATH 140A

Elementary Analysis

B. Select five additional four-unit courses in MATH (plus the associated lab, where applicable) numbered 77–189.

NOTE: Nearly all upper-division courses in Mathematics have MATH 2A-MATH 2B as prerequisites, and many courses have additional prerequisites such as MATH 2D, MATH 2E, MATH 3A, and/or MATH 3D.

## Mathematics, Ph.D.

Graduate courses are designed to meet the needs of students doing graduate work in mathematics and in those disciplines that require graduate-level mathematics for their study. Among the fields covered are analysis, algebra, applied and computational mathematics, mathematical biology, geometry and topology, probability, ordinary and partial differential equations, and mathematical logic.

In addition to formal courses, there are seminars for advanced study toward the Ph.D. in various fields of mathematics. Topics will vary from year to year. Each seminar is conducted by a faculty member specializing in the subject studied. Enrollment will be subject to the approval of the instructor in charge.

When accepted into the doctoral program, the student embarks on a program of formal courses, seminars, and individual study courses to prepare for the Ph.D. written examinations, Advancement to Candidacy examination, and dissertation.

### Requirements

Upon entering the program, students are expected to take MATH 210A, MATH 210B, MATH 210C, MATH 220A, MATH 220B, MATH 220C, MATH 230A, MATH 230B, and MATH 230C, which must be passed with a grade of B or better. Students must complete these sequences by the end of the second year.

By the start of the second year, students must achieve at least two passes at the M.S. level among three exams in Real Analysis, Complex Analysis, and Algebra. By the start of the third year, students must achieve two Ph.D. level passes among three exams in Real Analysis, Complex Analysis, and Algebra.

To satisfy the exam requirements, students may take the Core Assessment Exams (offered in spring of every year) or the Qualifying Exams (offered before the start of the fall quarter) in these areas. Students may not attempt to take an exam in a particular subject area more than three times. A student who passes a Qualifying Examination at the Ph.D. level prior to taking the corresponding course will be exempted from taking the course.

Some students may require additional background prior to entering MATH 210A, MATH 210B, MATH 210C, MATH 230A, MATH 230B, and MATH 230C. This will be determined by assessment prior to the start of the students' first year by the Vice Chair for Graduate Studies, upon consultation with the Graduate Studies Committee. Such students will be directed into MATH 205 and/or MATH 206, or equivalent, during their first year. These students may pass one Comprehensive Exam in the areas of Algebra or Analysis in lieu of achieving an M.S. pass on one Core Assessment or Qualifying Exam that must be obtained prior to the start of the students' second year. Comprehensive Exams in Analysis and Algebra will be offered once per year in the spring quarter.

By the end of their second year, students must declare a major specialization from the following areas: Algebra, Analysis, Applied and Computational Mathematics, Geometry and Topology, Logic, or Probability. Students are required to take two series of courses from their chosen area. (Students who later decide to change their area must also take two series of courses from the new area.) Additionally, all students must take two series outside their declared major area of specialization. Special topics courses within certain areas of specialization and courses counted toward the M.S., other than MATH 205A-MATH 205B-MATH 205C and MATH 206A-MATH 206B-MATH 206C, will count toward the fulfillment of the major specialization requirement.

By the beginning of their third year, students must have an advisor specializing in their major area. With the advisor's aid, the student forms a committee for the Advancement to Candidacy oral examination. This committee will be approved by the Department on behalf of the Dean of the Graduate Division and the Graduate Council and will consist of five faculty members. At least one, and at most two, of the members must be faculty from outside the Department. Before the end of the third year, students must have a written proposal, approved by their committee, for the Advancement to Candidacy examination. The proposal should explain the role of at least two series of courses from the student's major area of specialization that will be used to satisfy the Advancement to Candidacy requirements. The proposal should also explain the role of additional research reading material as well as providing a plan for investigating specific topics under the direction of the student's advisor(s). Only one of the courses MATH 210A-MATH 210B-MATH 210C, MATH 220A-MATH 220B-MATH 220C, and MATH 230A-MATH 230B-MATH 230C may count for the course requirement for Advancement to Candidacy Examinations. After the student meets the requirements, the Graduate Studies Committee recommends to the Dean of the Graduate Division the advancement to candidacy for the Ph.D. Students should advance to candidacy by the beginning of their fourth year.

After advancing to candidacy, students are expected to be fully involved in research toward writing their Ph.D. dissertation. Ideally, students should keep in steady contact/interaction with their Doctoral Committee.

Teaching experience and training is an integral part of the Ph.D. program. All doctoral students are expected to participate in the Department's teaching program.



The candidate must demonstrate independent, creative research in Mathematics by writing and defending a dissertation that makes a new and valuable contribution to mathematics in the candidate's area of concentration. Upon Advancement to Candidacy a student must form a Thesis Committee, a subcommittee of the Advancement Examination Committee, consisting of at least three faculty members and chaired by the student's advisor. The committee guides and supervises the candidate's research, study, and writing of the dissertation; conducts an oral defense of the dissertation; and recommends that the Ph.D. be conferred upon approval of the Doctoral Dissertation. The normative time for completion of the Ph.D. is six years, and the maximum time permitted is seven years. Completion of the Ph.D. degree must occur within nine quarters of Advancement to Ph.D. candidacy.

## Examinations

Ph.D. examinations are given in Algebra, Complex Analysis, and Real Analysis. All students seeking the Ph.D. must successfully complete two examinations before the end of the third year of entering the graduate program. Only two attempts are allowed for a Ph.D. student on each exam.

## Area Requirements

Ph.D. students will choose from one of six areas of specialization in the Mathematics Department, which determines course work requirements. Each area of specialization will have a core course, which the Department will do its best to offer each year. The Department will offer other courses every other year, or more frequently depending on student demands and other Department priorities.

### Algebra

MATH 230A- 230B- 230C	Algebra and Algebra and Algebra (core)
MATH 232A- 232B- 232C	Algebraic Number Theory and Algebraic Number Theory and Algebraic Number Theory
MATH 233A- 233B- 233C	Algebraic Geometry and Algebraic Geometry and Algebraic Geometry
MATH 235A	Mathematics of Cryptography

### Analysis

MATH 210A- 210B- 210C	Real Analysis and Real Analysis and Real Analysis (core)
MATH 220A- 220B- 220C	Analytic Function Theory and Analytic Function Theory and Analytic Function Theory (core)
MATH 260A- 260B- 260C	Functional Analysis and Functional Analysis and Functional Analysis
MATH 295A- 295B- 295C	Partial Differential Equations and Partial Differential Equations and Partial Differential Equations
MATH 296	Topics in Partial Differential Equations

### Applied and Computational Mathematics

MATH 290A- 290B- 290C	Methods in Applied Mathematics and Methods in Applied Mathematics and Methods in Applied Mathematics (core)
MATH 225A- 225B- 225C	Introduction to Numerical Analysis and Scientific Computing and Introduction to Numerical Analysis and Scientific Computing and Introduction to Numerical Analysis and Scientific Computing
MATH 226A- 226B- 226C	Computational Differential Equations and Computational Differential Equations and Computational Differential Equations
MATH 227A- 227B	Mathematical and Computational Biology and Mathematical and Computational Biology
MATH 295A- 295B- 295C	Partial Differential Equations and Partial Differential Equations and Partial Differential Equations

### Geometry and Topology

MATH 218A- 218B- 218C	Introduction to Manifolds and Geometry and Introduction to Manifolds and Geometry and Introduction to Manifolds and Geometry (core)
MATH 222A	Several Complex Variables and Complex Geometry
MATH 240A- 240B- 240C	Differential Geometry and Differential Geometry and Differential Geometry
MATH 245A- 245C- 245C	Topics in Differential Geometry and Topics in Differential Geometry and Topics in Differential Geometry
MATH 250A- 250B- 250C	Algebraic Topology and Algebraic Topology and Algebraic Topology
<b>Logic</b>	
MATH 280A- 280B- 280C	Mathematical Logic and Mathematical Logic and Mathematical Logic (core)
MATH 281A- 281B- 281C	Set Theory and Set Theory and Set Theory
MATH 282A- 282B- 282C	Model Theory and Model Theory and Model Theory
MATH 285A-MATH 285B-MATH 285C	Topics in Mathematical Logic and and
<b>Probability</b>	
MATH 210A- 210B- 210C	Real Analysis and Real Analysis and Real Analysis
MATH 270A- 270B- 270C	Probability and Probability and Probability (core)
MATH 271A- 271B- 271C	Stochastic Processes and Stochastic Processes and Stochastic Processes (core)
MATH 274	

## Department of Physics and Astronomy

### Tim Tait, Department Chair

4129 Frederick Reines Hall

949-824-7727

<http://www.physics.uci.edu> (<http://www.physics.uci.edu/>)

Physics is that branch of science concerned with the study of natural phenomena at the fundamental level. Physicists study the smallest particles of matter (quarks and leptons), nuclei, and atoms; the fundamental forces; the properties of solids, liquids, gases, and plasmas; the behavior of matter on the grand scale in stars and galaxies; and even the origin and fate of the universe. Other disciplines such as chemistry, biology, medicine, and engineering often build upon the foundations laid by physics.

The Department of Physics and Astronomy offers introductory and advanced courses for students of various interests, from those in the humanities and social sciences, to those in biological sciences, and to those in physics, engineering, and other sciences. The Department offers majors in Physics and Applied Physics, with interdisciplinary concentrations and tracks that include astrophysics, engineering physics, science education, and courses taught by faculty in Biological Sciences, Chemistry, Engineering, and Medicine.

Furthermore, the faculty is vigorous, innovative, and engaged in a wide variety of research, education, and public service activities. The Department encourages student-faculty interaction and student involvement in undergraduate research. Faculty conduct active research in forefront research areas, providing students access to research opportunities in specialized areas like cosmology, particle physics, plasmas and fusion, condensed matter physics, biophysics, and medical physics.

- Applied Physics, B.S.
- Physics, B.S.
- Physics, Ph.D.

## Faculty

Kevork N. Abazajian, Ph.D. University of California, San Diego, *Professor of Physics and Astronomy*

Jun F. Allard, Ph.D. University of British Columbia, *Associate Professor of Mathematics; Physics and Astronomy* (mathematical and computational biology)

Ioan Andricioaei, Ph.D. Boston University, *Professor of Chemistry; Physics and Astronomy* (chemical biology, physical chemistry and chemical physics, theoretical and computational)

Aaron J. Barth, Ph.D. University of California, Berkeley, *Professor of Physics and Astronomy*

Christopher P.J. Barty, Ph.D. Stanford University, *Distinguished Professor of Physics and Astronomy*

Steven W. Barwick, Ph.D. University of California, Berkeley, *Professor of Physics and Astronomy*

Gregory A. Benford, Ph.D. University of California, San Diego, *Professor Emeritus of Physics and Astronomy*

Jianming Bian, Ph.D. Chinese Academy of Sciences, *Assistant Professor of Physics and Astronomy*

Paulo Brando, Ph.D. University of Florida, *Assistant Professor of Physics and Astronomy*

James S. Bullock, Ph.D. University of California, Santa Cruz, *Dean of the School of Physical Sciences and Professor of Physics and Astronomy*

David A. Buote, Ph.D. Massachusetts Institute of Technology, *Professor of Physics and Astronomy*

Kieron Burke, Ph.D. University of California, Santa Barbara, *Professor of Chemistry; Physics and Astronomy* (physical chemistry and chemical physics, theoretical and computational)

David W. Casper, Ph.D. University of Michigan, *Associate Professor of Physics and Astronomy*

Gary A. Chanan, Ph.D. University of California, Berkeley, *Professor Emeritus of Physics and Astronomy*

Liu Chen, Ph.D. University of California, Berkeley, *Research Professor and Professor Emeritus of Physics and Astronomy*

Mu-Chun Chen, Ph.D. University of Colorado Boulder, *Professor of Physics and Astronomy*

Alexander L. Chernyshev, Ph.D. Russian Academy of Sciences, *Professor of Physics and Astronomy*

Philip Collins, Ph.D. University of California, Berkeley, *Professor of Physics and Astronomy*

Michael Cooper, Ph.D. University of California, Berkeley, *Professor of Physics and Astronomy*

Asantha R. Cooray, Ph.D. University of Chicago, *Professor of Physics and Astronomy*

Michael B. Dennin, Ph.D. University of California, Santa Barbara, *Professor of Physics and Astronomy*

Franklin Dollar, Ph.D. University of Michigan, *Associate Professor of Physics and Astronomy* (applied physics)

Igor E. Dzyaloshinskii, Ph.D. Moscow State University, *Professor Emeritus of Physics and Astronomy*

Jonathan L. Feng, Ph.D. Stanford University, *Professor of Physics and Astronomy*

Zachary Fisk, Ph.D. University of California, San Diego, *UCI Distinguished Professor Emeritus of Physics and Astronomy*

Enrico Gratton, Ph.D. University of Rome, *Distinguished Professor of Biomedical Engineering; Developmental and Cell Biology; Physics and Astronomy* (design of new fluorescence instruments, protein dynamics, single molecule, fluorescence microscopy, photon migration in tissues)

Steven P. Gross, Ph.D. University of Texas at Austin, *Professor of Developmental and Cell Biology; Physics and Astronomy* (force generation by molecular motors in living cells)

Arnold Guerra, Ph.D. University of California, Irvine, *Lecturer of Physics and Astronomy*

Gultekin Gulsen, Ph.D. Bogazici University, *Associate Professor of Radiological Sciences; Biomedical Engineering; Physics and Astronomy*

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Wilson Ho, Ph.D. University of Pennsylvania, *Donald Bren Professor and Professor of Physics and Astronomy; Chemistry*

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Andrew J. Lankford, Ph.D. Yale University, *Professor of Physics and Astronomy*

Jon M. Lawrence, Ph.D. University of Rochester, *Professor Emeritus of Physics and Astronomy*

Zhihong Lin, Ph.D. Princeton University, *Professor of Physics and Astronomy*

Mark A. Mandelkern, Ph.D. University of California, Berkeley, *Research Professor and Professor Emeritus of Physics and Astronomy*

Alexei A. Maradudin, Ph.D. University of Bristol, *Professor Emeritus of Physics and Astronomy*

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William R. Molzon, Ph.D. University of Chicago, *Professor of Physics and Astronomy*

Shaul Mukamel, Ph.D. Tel Aviv University, *UCI Distinguished Professor of Chemistry; Physics and Astronomy* (physical chemistry and chemical physics, polymer, materials, nanoscience, theoretical and computational)

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Juan Pedro Ochoa-Ricoux, Ph.D. California Institute of Technology, *Assistant Professor of Physics and Astronomy*

Xiaoqing Pan, Ph.D. Saarlandes University, *Henry Samuelli Endowed Chair and Director of Irvine Materials Research Institute (IMRI) and Professor of Materials Science and Engineering; Physics and Astronomy* (atomic-scale structure, properties and dynamic behaviors of advanced materials including thin films and nanostructures for memories, catalysts, and energy conversion and storage devices)

William H. Parker, Ph.D. University of Pennsylvania, *Professor Emeritus of Physics and Astronomy*

Arvind Rajaraman, Ph.D. Stanford University, *Professor of Physics and Astronomy*

Michael Ratz, Ph.D. Technical University of Munich, *Professor of Physics and Astronomy*

Thorsten Ritz, Ph.D. University of Ulm, *Professor of Physics and Astronomy*

Paul M. Robertson, Ph.D. University of Texas at Austin, *Assistant Professor of Physics and Astronomy*

Judit Romhányi, Ph.D. Budapest University of Technology and Economy, *Assistant Professor of Physics and Astronomy*

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Aomawa Shields, Ph.D. University of Washington, *Assistant Professor of Physics and Astronomy*

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Zuzanna S. Siwy, Ph.D. Silesian University of Technology, *Professor of Physics and Astronomy; Biomedical Engineering; Chemistry*

Tammy Ann Smecker-Hane, Ph.D. Johns Hopkins University, *Associate Professor of Physics and Astronomy*

Henry W. Sobel, Ph.D. Case Western Reserve University, *Professor Emeritus of Physics and Astronomy*

Min-Ying Su, Ph.D. University of California, Irvine, *Professor of Radiological Sciences; Physics and Astronomy*

Peter Taborek, Ph.D. California Institute of Technology, *Professor of Physics and Astronomy*

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Laura Tucker, Ph.D. University of California, San Diego, *Assistant Professor of Teaching of Physics and Astronomy*

Mark Vagins, Ph.D. Yale University, *Adjunct Professor of Physics and Astronomy*

Gerard Vanhoven, Ph.D. Stanford University, *Professor Emeritus of Physics and Astronomy*

Richard F. Wallis, Ph.D. Catholic University of America, *Professor Emeritus of Physics and Astronomy*

Frank J. Wessel, Ph.D. University of California, Irvine, *Project Scientist of Physics and Astronomy*

Steven R. White, Ph.D. Cornell University, *Professor of Physics and Astronomy*

Daniel Whiteson, Ph.D. University of California, Berkeley, *Professor of Physics and Astronomy; Logic and Philosophy of Science*

Ruqian Wu, Ph.D. Institute of Physics, Chinese Academy of Science, *Professor of Physics and Astronomy*

Jing Xia, Ph.D. Stanford University, *Professor of Physics and Astronomy*

Huolin Xin, Ph.D. Cornell University, *Assistant Professor of Physics and Astronomy; Materials Science and Engineering*

Clare C. Yu, Ph.D. Princeton University, *Professor of Physics and Astronomy*

Jin Yu, Ph.D. University of Illinois at Urbana-Champaign, *Assistant Professor of Physics and Astronomy*

## Courses

### **PHYSICS 2. Introduction to Mathematical Methods for Physics. 4 Units.**

Provides the applied mathematics and problem solving/presentation skills necessary for success in an introductory physics sequence. Focuses on practical exercises in problem solving. Covers kinematics in one and two dimensions in detail. Additional topics include vectors, differentiation, and integration.

Prerequisite or corequisite: MATH 2A or MATH 5A or AP Calculus AB or AP Calculus BC. AP Calculus AB with a minimum score of 4. AP Calculus BC with a minimum score of 3

Restriction: PHYSICS 2 may not be taken for credit if taken after PHYSICS 7C.

### **PHYSICS 3A. Basic Physics I. 4 Units.**

Vectors; motion, force, and energy.

Corequisite: MATH 2A or MATH 5A, or a score of 4 or higher on the AP Calculus AB exam, or a score of 3 or higher on the AP Calculus BC exam.

Restriction: PHYSICS 3A may not be taken for credit if taken after PHYSICS 7C.

(II and VA ).

**PHYSICS 3B. Basic Physics II. 4 Units.**

Fluids; heat; electricity and magnetism.

Prerequisite: PHYSICS 3A or AP Physics C: Mechanics. AP Physics C: Mechanics with a minimum score of 5

(II and VA ).

**PHYSICS 3C. Basic Physics III. 4 Units.**

Waves and sound; optics; quantum ideas; atomic and nuclear physics; relativity.

Corequisite: MATH 2B or MATH 5B, or a score of 4 or higher on the AP Calculus BC exam.

Prerequisite: PHYSICS 3A or AP Physics C: Mechanics. AP Physics C: Mechanics with a minimum score of 5

(II and Va ).

**PHYSICS 3LB. Basic Physics Laboratory. 1.5 Unit.**

Practical applications of electronics and classical physics to biology. Goals include skill to use oscilloscope and other basic instrumentation. Materials fee.

**PHYSICS 3LC. Basic Physics Laboratory. 1.5 Unit.**

Practical applications of physics to medical imaging. Topics include optics, radioactivity, and acoustics. Materials fee.

**PHYSICS 7C. Classical Physics. 4 Units.**

Topics include force, energy, momentum, rotation, and gravity.

Corequisite: MATH 2B or AP CALCULUS BC, min score = 4.

Prerequisite: PHYSICS 2 or (MATH 2D and (CHEM 1C or CHEM H2C or CHEM M3C) or CHEM M2C) or AP Physics C: Mechanics or AP Physics C: Electricity and Magnetism or SAT Mathematics or ACT Mathematics. PHYSICS 2 with a grade of C or better. AP Physics C: Mechanics with a minimum score of 4. AP Physics C: Electricity and Magnetism with a minimum score of 4. SAT Mathematics with a minimum score of 650. ACT Mathematics with a minimum score of 27. Recommended: One year of high school physics or equivalent physics background.

Restriction: Physics Majors have first consideration for enrollment.

(II and VA ).

**PHYSICS 7D. Classical Physics. 4 Units.**

Electricity and magnetism.

Corequisite: PHYSICS 7LD and MATH 2D

Prerequisite: PHYSICS 7C and (MATH 2B or AP Calculus BC). AP Calculus BC with a minimum score of 4

Restriction: Physics Majors have first consideration for enrollment.

(II and Va ).

**PHYSICS 7E. Classical Physics. 4 Units.**

Fluids; oscillations; waves; and optics.

Prerequisite: PHYSICS 7C and MATH 2B

Restriction: Physics Majors have first consideration for enrollment.

(II and VA ).

**PHYSICS 7LC. Classical Physics Laboratory. 1 Unit.**

Experiments related to lecture topics in Physics 7C. Materials fee.

Corequisite: PHYSICS 7C

Restriction: Physics Majors have first consideration for enrollment.

**PHYSICS 7LD. Classical Physics Laboratory. 1 Unit.**

Electricity and magnetism.

Corequisite: PHYSICS 7D

Restriction: Physics Majors have first consideration for enrollment.

**PHYSICS 12. Science Fiction and Science Fact. 4 Units.**

An introduction to fundamental physics principles, the scientific process, and the mathematical language of science, used to analyze topics drawn from superheroes, science fiction works, and current science news to distinguish science fiction and science fact.

Overlaps with PHYSICS 21.

(II and VA ).

**PHYSICS 14. Energy and the Environment. 4 Units.**

The physics of society's energy production and consumption, and of their influences on the environment. Topics include fossil and renewable energy resources; nuclear power; prospects for a hydrogen economy; efficient and environmentally benign transportation; efficient home and commercial energy usage.

(II, Va)

**PHYSICS 15. Physics of Music. 4 Units.**

Introduces basic physical principles underlying generation and properties of music, including basic properties of sound waves, musical scales and temperament, musical instruments, and acoustics of music halls. No mathematics background required, but high school algebra is recommended.

(II)

**PHYSICS 17. Physics of Athletics. 4 Units.**

Introduces basic physical principles behind motion. Examples are drawn from a range of athletic endeavors (such as ice skating, baseball, diving, and dance). No mathematics background required, but high school algebra is recommended.

(II)

**PHYSICS 18. How Things Work. 4 Units.**

Survey of the physical basis of modern technology, with an emphasis on electronics and materials. Topics include power generation and distribution, communication (radio, TV, telephone, computers, tape recorders, CD players), imaging (optics, x-rays, MRI), and modern materials (alloys, semiconductors, superconductors).

(II)

**PHYSICS 19. Great Ideas of Physics. 4 Units.**

Introduces non-science majors to physics, examining important breakthroughs and controversies. Potential topics: Einstein's Relativity; Heisenberg's Uncertainty Principle; black holes; extra-dimensions; antimatter. Case studies illustrate the essential nature of scientific review and independent confirmation of results. No mathematics background required.

(II)

**PHYSICS 20A. Introduction to Astronomy. 4 Units.**

History of astronomy. Underlying physics. Objects in the solar system and how they are studied. Properties of stars: their formation, structure, and evolution. Pulsars and black holes. Galaxies and quasars.

(II and VA ).

**PHYSICS 20B. Cosmology: Humanity's Place in the Universe. 4 Units.**

An overview of the origin, evolution, and ultimate fate of the Universe. Galaxies and dark matter. The Big Bang and dark energy. Ancient world models.

(II and VA ).

**PHYSICS 20D. Space Science. 4 Units.**

Space exploration. Human missions to the moon, Mars, and beyond. Space stations, observatories, and deep-space probes. Robots and drones on distant worlds. Propulsion mechanisms, rockets, space flight, and the dangers of solar radiation.

(II and VA ).

**PHYSICS 20E. Life in the Universe. 4 Units.**

An overview of the scientific quest to discover life elsewhere in the universe. Topics include the origin of life on Earth, Mars, extra-solar planets, interstellar travel, and extra-terrestrial intelligence.

(II, Va)



**PHYSICS 21. Special Topics in Physics. 4 Units.**

Topics addressed vary each quarter. Past topics have included physics and music, Newton, planetary science. Lectures on areas of special interest in physics used to introduce students to scientific method, fundamental laws of science, qualitative and quantitative analysis of data.

Repeatability: Unlimited as topics vary.

Overlaps with PHYSICS 12, PHYSICS XI12.

**(II)****PHYSICS 50. Introductory Mathematical Physics. 4 Units.**

Introduction to math methods for upper-division physics. Taylor and Fourier series; complex algebra; ordinary differential equations; matrices, tensors and vector spaces; eigensystems; orthogonal coordinates; vector calculus and fields. Symbolic computation with Mathematica is incorporated throughout.

Corequisite: MATH 2E

Prerequisite: MATH 3A

Overlaps with PHYSICS 100.

Restriction: Physics Majors have first consideration for enrollment.

**PHYSICS 51A. Modern Physics. 4 Units.**

Wave-particle duality; quantum mechanics; special relativity; statistical mechanics.

Prerequisite: (PHYSICS 7E or PHYSICS 3C) and MATH 2D

Overlaps with PHYSICS 61A.

Restriction: No Physics Majors.

**PHYSICS 52A. Fundamentals of Experimental Physics. 2 Units.**

Optics: lenses, mirrors, polarization, lasers, optical fibers, interference, spectra. Materials fee.

Corequisite: PHYSICS 7E or PHYSICS 3C.

Restriction: Physics Majors have first consideration for enrollment.

**PHYSICS 52B. Fundamentals of Experimental Physics. 2 Units.**

Circuits: oscilloscope, meters, DC and AC circuits. Materials fee.

Prerequisite: PHYSICS 7D or PHYSICS 3B

Restriction: Physics Majors have first consideration for enrollment.

**PHYSICS 52C. Fundamentals of Experimental Physics. 2 Units.**

Data analysis: random and systematic errors, curve fitting; nuclear counting; quantum experiments. Error analysis: random and systematic errors, curve fitting, nuclear counting, and quantum experiments. Materials fee.

Prerequisite: PHYSICS 51A or PHYSICS 61A

Restriction: Physics Majors have first consideration for enrollment.

**PHYSICS 53. Introduction to Programming and Numerical Analysis. 4 Units.**

Introduction to structured programming; in-depth training in python. Elementary numerical methods applied to physics problems.

Prerequisite: MATH 3A and MATH 3D

Restriction: Physics Majors have first consideration for enrollment.

**PHYSICS 60. Thermal Physics. 4 Units.**

Introduction to thermodynamics and systems of many particles. Topics include first and second laws of thermodynamics, ideal gas laws, kinetic theory, heat engines and refrigerators, thermodynamic potentials, phase transitions, dilute solutions, chemical equilibrium, and basic statistical distributions.

Prerequisite: (PHYSICS 7E or PHYSICS 3C) and MATH 2D

Restriction: Physics Majors only.

**PHYSICS 61A. Modern Physics for Majors. 4 Units.**

Wave-particle duality; Schrödinger equation; angular momentum.

Prerequisite: (PHYSICS 7E or PHYSICS 3C) and MATH 2D

Overlaps with PHYSICS 51A.

Restriction: Physics Majors only.

**PHYSICS 61B. Modern Physics for Majors. 4 Units.**

Atomic transitions; molecules; solids; nuclei; elementary particles; cosmological models.

Prerequisite: PHYSICS 61A or PHYSICS 51A

Overlaps with PHYSICS 51B.

Restriction: Physics Majors only.

**PHYSICS 61C. Introduction to Astrophysics. 4 Units.**

Introduction to fundamental topics in astrophysics, including stellar structure and evolution; stellar remnants; detection and characterization of exoplanets; physics of interstellar gas and star-forming regions.

Prerequisite: PHYSICS 61A or PHYSICS 51A

**PHYSICS H80. Impact of World War I on Science. 4 Units.**

Introduction to science in 1914 and WWI. Participants in groups of two or three will pick a preferred science; find out what happened to it during and after the war; write reports and present what they learned.

Restriction: Campuswide Honors Collegium students only.

**(II)**

**PHYSICS H90. The Idiom and Practice of Science. 4 Units.**

A series of fundamental and applied scientific problems of social relevance. Possible topics include Newton's Law, calculus, earthquake physics, and radiation.

Restriction: Campuswide Honors Collegium students only.

**(II, Va)**

**PHYSICS 99. Current Topics in Physics. 2 Units.**

Designed to introduce undergraduate students to current topics in physics. Focus is discussion of selected readings on current research issues.

Repeatability: Unlimited as topics vary.

**PHYSICS 100. Computational Methods. 4 Units.**

Mathematical and numerical analysis using Mathematica and C programming, as applied to problems in physical science.

Overlaps with PHYSICS 50.

Concurrent with PHYSICS 229A.

**PHYSICS 106W. Advanced Data Acquisition, Analysis, and Scientific Writing. 4 Units.**

Introduces modern practical laboratory techniques for developing data interface devices, acquiring and analyzing data, and writing up results in manuscript format. Experiments include interfacing with instruments through software and hardware development, PID controller, Fourier analysis, and lock-in amplifier.

Prerequisite: PHYSICS 52B and PHYSICS 194

Concurrent with PHYSICS 206 and CHEM 206.

**(Ib)**

**PHYSICS 111A. Classical Mechanics. 4 Units.**

One-dimensional motion and oscillations; three-dimensional motion, non-inertial coordinates, conservation laws, and Lagrangian and Hamiltonian dynamics; rigid body motion and relativity.

Corequisite: PHYSICS 50

Prerequisite: (PHYSICS 7E or PHYSICS 3C)

**PHYSICS 111B. Classical Mechanics. 4 Units.**

One-dimensional motion and oscillations; three-dimensional motion, non-inertial coordinates, conservation laws, and Lagrangian and Hamiltonian dynamics; rigid body motion and relativity.

Prerequisite: PHYSICS 111A

**PHYSICS 112A. Electromagnetic Theory. 4 Units.**

Electric, magnetic, and gravitational fields and potentials; electrodynamics; mechanical and electromagnetic waves and radiation.

Prerequisite: (PHYSICS 7D or PHYSICS 3B) and PHYSICS 50

**PHYSICS 112B. Electromagnetic Theory. 4 Units.**

Electric, magnetic, and gravitational fields and potentials; electrodynamics; mechanical and electromagnetic waves and radiation.

Prerequisite: PHYSICS 7E and PHYSICS 112A

**PHYSICS 113A. Quantum Physics. 4 Units.**

Inadequacy of classical physics; time independent and time dependent Schrodinger equation; systems in one, two, and three dimensions; matrices; Hermitian operators; symmetries; angular momentum; perturbation theory; scattering theory; applications to atomic structure; emphasis on phenomenology.

Prerequisite: (PHYSICS 51A or PHYSICS 61A) and PHYSICS 50

**PHYSICS 113B. Quantum Physics. 4 Units.**

Inadequacy of classical physics; time independent and time dependent Schrodinger equation; systems in one, two, and three dimensions; matrices; Hermitian operators; symmetries; angular momentum; perturbation theory; scattering theory; applications to atomic structure; emphasis on phenomenology.

Prerequisite: PHYSICS 111B and PHYSICS 112B and PHYSICS 113A

**PHYSICS 113C. Quantum Physics. 4 Units.**

Inadequacy of classical physics; time independent and time dependent Schrodinger equation; systems in one, two, and three dimensions; matrices; Hermitian operators; symmetries; angular momentum; perturbation theory; scattering theory; applications to atomic structure; emphasis on phenomenology.

Prerequisite: PHYSICS 111B and PHYSICS 112B and PHYSICS 113B

**PHYSICS 115A. Statistical Physics. 4 Units.**

Microscopic theory of temperature, heat, and entropy; kinetic theory; multicomponent systems; quantum statistics.

Prerequisite: PHYSICS 50 and (PHYSICS 60 or CHEM 1C or ENGRMAE 91)

**PHYSICS 116. Relativity and Black Holes. 4 Units.**

Introduces students to both special and general relativity; includes the formalism of four-vectors, equivalence principle, curved space-time, and modern issues with black holes.

Prerequisite: PHYSICS 50 and PHYSICS 111A

**PHYSICS 120. Electronics for Scientists. 4 Units.**

Applications of modern semiconductor devices to physical instrumentation. Characteristics of semiconductor devices, integrated circuits, analog and digital circuits. Materials fee.

Prerequisite: PHYSICS 52B

Concurrent with PHYSICS 220.

**PHYSICS 121W. Advanced Laboratory. 4 Units.**

Experiments in atomic, condensed matter, nuclear, particle, and plasma physics. Introduction to instrumentation and a first experience in the research laboratory.

Prerequisite: (PHYSICS 51B or PHYSICS 61B or PHYSICS 61C) and (PHYSICS 52C or PHYSICS 193) and (PHYSICS 194 or EDUC 143BW)

Repeatability: May be taken for credit 3 times.

Restriction: Physics Majors only.

**(Ib)**

**PHYSICS 125A. Mathematical Physics. 4 Units.**

Complex variables; Legendre and Bessel functions; complete sets of orthogonal functions; partial differential equations; integral equations; calculus of variations; coordinate transformations; special functions and series.

Prerequisite: PHYSICS 50 and MATH 3D

**PHYSICS 125B. Mathematical Physics. 4 Units.**

Complex variables; Legendre and Bessel functions; complete sets of orthogonal functions; partial differential equations; integral equations; calculus of variations; coordinate transformations; special functions and series.

Prerequisite: PHYSICS 125A and PHYSICS 113A

**PHYSICS 133. Introduction to Condensed Matter Physics. 4 Units.**

Phenomena of solids and their interpretation in terms of quantum theory.

Prerequisite: PHYSICS 113B and PHYSICS 115A

**PHYSICS 134A. Physical and Geometrical Optics. 4 Units.**

Focuses on the practical aspects of optics and optical engineering, starting at the fundamentals. Topics include geometrical optics, ray tracing, polarization optics, interferometers, and diffractive optics.

Corequisite: PHYSICS 112B

Prerequisite: PHYSICS 112A

Concurrent with CBEMS 242A and CHEM 242A.

**PHYSICS 135. Plasma Physics. 4 Units.**

Basic concepts, orbits, kinetic and fluid equations, Coulomb collisions, fluctuations, scattering, radiation.

Prerequisite: PHYSICS 112B

Concurrent with PHYSICS 239A.

**PHYSICS 136. Introduction to Particle Physics. 4 Units.**

Experimental techniques and theoretical concepts of high-energy phenomena: accelerators and detectors; classification of particles and interactions; particle properties; symmetries and mass multiplets; production and decay mechanisms.

Prerequisite: PHYSICS 113B

**PHYSICS 137. Introduction to Cosmology. 4 Units.**

Solution of the differential equations governing the expansion of the Universe. Observational determinations of the parameters governing the expansion. Big Bang inflation, primordial nucleosynthesis, and cosmic microwave background. Dark matter, dark energy, and large-scale structure of the Universe.

Prerequisite or corequisite: PHYSICS 111A

**PHYSICS 138. Astrophysics of Galaxies. 4 Units.**

Introduction to the solar neighborhood, Milky Way, and other galaxies. Interstellar medium. Star formation. Stellar populations. Evolution of spiral, elliptical, and irregular galaxies. Supermassive black holes, quasars, and active galaxies. Galaxies as probes of the expansion rate of the Universe.

Prerequisite: PHYSICS 111A and PHYSICS 61C

**PHYSICS 139. Observational Astrophysics. 4 Units.**

Telescopes and astronomical observations, imaging with CCD detectors and image processing techniques. Photometry and spectroscopy of stars, galaxies, and quasars. Advanced imaging techniques such as deconvolution, adaptive optics, and interferometry.

Corequisite: PHYSICS 194

Prerequisite: PHYSICS 52A and PHYSICS 52B and PHYSICS 52C and PHYSICS 53

**PHYSICS 144. Stellar Astrophysics. 4 Units.**

Stars: their structure and evolution; physical state of the interior; the Hertzsprung- Russell diagram, stellar classification, and physical principles responsible for the classification; star formation; nuclear burning; giant and dwarf stars; neutron stars and black holes.

Prerequisite: (PHYSICS 51A or PHYSICS 61A) and PHYSICS 111A and PHYSICS 112A

**PHYSICS 145. High-Energy Astrophysics. 4 Units.**

Production of radiation by high-energy particles, white dwarfs, neutron stars, and black holes. Evolution of galactic nuclei, radio galaxies, quasars, and pulsars. Cosmic rays and the cosmic background radiation.

Prerequisite: (PHYSICS 51A or PHYSICS 61A) and PHYSICS 111A and PHYSICS 112A

**PHYSICS 146A. Biophysics of Molecules and Molecular Machines. 4 Units.**

Physical concepts and experimental and computational techniques used to study the structure and function of biological molecules and molecular machines with examples from enzyme action, protein folding, molecular motors, photobiology, chemotaxis, and vision.

Prerequisite: PHYSICS 115A

Concurrent with PHYSICS 230A.

**PHYSICS 146B. Biophysics of Molecules and Molecular Machines. 4 Units.**

Physical concepts and experimental and computational techniques used to study the structure and function of biological molecules and molecular machines with examples from enzyme action, protein folding, molecular motors, photobiology, chemotaxis, and vision.

Prerequisite: PHYSICS 115A

Concurrent with PHYSICS 230B.

**PHYSICS 147B. Techniques in Medical Imaging I: X-ray, Nuclear, and NMR Imaging. 4 Units.**

Ionizing radiation, planar and tomographic radiographic and nuclear imaging, magnetism, NMR, MRI imaging.

Prerequisite: PHYSICS 147A

Concurrent with PHYSICS 233B and EECS 202B.

**PHYSICS 147C. Techniques in Medical Imaging II: Ultrasound, Electrophysiological, Optical. 4 Units.**

Sound and ultrasound, ultrasonic imaging, physiological electromagnetism, EEG, MEG, ECG, MCG, optical properties of tissues, fluorescence and bioluminescence, MR impedance imaging, MR spectroscopy, electron spin resonance and ESR imaging.

Prerequisite: PHYSICS 147B

Concurrent with PHYSICS 233C and EECS 202C.

**PHYSICS 150. Special Topics in Physics and Astronomy. 4 Units.**

Current topics in physics. Includes topics from nano-science, biological sciences, astrophysics, and the common use of estimation across subdisciplines within physics.

Repeatability: Unlimited as topics vary.

**PHYSICS 191. Field Experience in Physics Education. 1-4 Units.**

Students develop and perform physics assemblies at neighboring public schools.

Prerequisite: PHYSICS 7C and PHYSICS 7D and PHYSICS 7E

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 8 units.

**PHYSICS 192. Tutoring in Physics. 1-2 Units.**

Formalizes the already existing free tutoring for the lower-division physics courses that is provided by the Society of Physics Students (SPS). Includes instructions on tutoring techniques.

Prerequisite: PHYSICS 7E

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 12 units.

Restriction: Society of Physics Students (SPS) tutoring program students only.

**PHYSICS 193. Research Methods. 4 Units.**

Explores tools of inquiry for developing and implementing science research projects. Students undertake independent projects requiring data collection, analysis, and modeling, and the organization and presentation of results. Additional topics include ethical issues and role of scientific literature.

Prerequisite: BIO SCI 14 or PHY SCI 5

Same as BIO SCI 108, CHEM 193.

**PHYSICS 194. Research Communication for Physics Majors. 2 Units.**

Students learn the fundamentals of communicating about research. Topics include preparing abstracts, proposals, and literature reviews. Provides preparation for presentation of independent research projects in PHYSICS 121 and PHYSICS 196.

Prerequisite: PHYSICS 61A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Physics Majors only.

**PHYSICS 195. Undergraduate Research. 4 Units.**

Independent research under the guidance of a Physics faculty member.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Juniors only. Physics Majors only.

**PHYSICS 196A. Thesis in Physics I. 2 Units.**

Independent research for seniors conducted under the guidance of a faculty member. Students' research results are discussed in oral presentations, and a written proposal, progress report, and thesis are submitted.

Corequisite: PHYSICS 194

Overlaps with PHYSICS H196A.

Restriction: Physics Majors only.

**PHYSICS 196B. Thesis in Physics II. 4 Units.**

Independent research for seniors conducted under the guidance of a faculty member. Students' research results are discussed in oral presentations, and a written proposal, progress report, and thesis are submitted.

Prerequisite: PHYSICS 196A

Overlaps with PHYSICS H196B.

Restriction: Physics Majors only.

**PHYSICS 196C. Thesis in Physics III. 4 Units.**

Independent research for seniors conducted under the guidance of a faculty member. Students' research results are discussed in oral presentations, and a written proposal, progress report, and thesis are submitted.

Prerequisite: PHYSICS 196B

Overlaps with PHYSICS H196C.

Restriction: Physics Majors only.

**PHYSICS H196A. Honors Thesis in Physics I. 2 Units.**

Independent research for seniors conducted under the guidance of a faculty member. Students' research results are discussed in oral presentations, and a written proposal, progress report, and thesis are submitted.

Corequisite: PHYSICS 194

Overlaps with PHYSICS 196A.

Restriction: Physics Majors only. Campuswide Honors Collegium students only. Honors Program in Physics students only.

**PHYSICS H196B. Honors Thesis in Physics II. 4 Units.**

Independent research for seniors conducted under the guidance of a faculty member. Students' research results are discussed in oral presentations, and a written proposal, progress report, and thesis are submitted.

Prerequisite: PHYSICS H196A

Overlaps with PHYSICS 196B.

Restriction: Physics Majors only. Campuswide Honors Collegium students only. Honors Program in Physics students only.

**PHYSICS H196C. Honors Thesis in Physics III. 4 Units.**

Independent research for seniors conducted under the guidance of a faculty member. Students' research results are discussed in oral presentations, and a written proposal, progress report, and thesis are submitted.

Prerequisite: PHYSICS H196B

Overlaps with PHYSICS 196C.

Restriction: Physics Majors only. Campuswide Honors Collegium students only. Honors Program in Physics students only.

**PHYSICS 199. Readings on Special Topics. 1-4 Units.**

Readings in selected areas of Physics. Topics addressed vary each quarter.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**PHYSICS 206. Advanced Data Acquisition and Analysis. 4-6 Units.**

Introduces students to a variety of practical laboratory techniques, including lock-in, boxcar, coincidence counting, noise filtering, PID control, properties of common transducers, computer interfacing to instruments, vacuum technology, laboratory safety, basic mechanical design, and shop skills. Materials fee.

Same as CHEM 206.

Concurrent with PHYSICS 106.

**PHYSICS 207. Applied Physical Chemistry. 4 Units.**

Introduction to fundamental concepts in molecular structure and reactivity: theory of bonding, valence and molecular orbitals; structure and reactivity in inorganic chemistry; elements in molecular group theory; nomenclature in organic chemistry; and survey of macromolecules.

Same as CHEM 207.

**PHYSICS 208. Math Methods. 4 Units.**

Applications of mathematics to physical and chemical problems. Calculus of special functions, complex variables and vectors; linear vector spaces and eigenvalue problems. Differential equations.

Same as CHEM 208.

**PHYSICS 211. Classical Mechanics. 4 Units.**

Variational principles, Lagrange's equations; applications to two body problems, small oscillation theory, and other phenomena. Hamilton's equations. Hamilton-Jacobi theory. Canonical transformations.

Restriction: Graduate students only.

**PHYSICS 212A. Mathematical Physics. 4 Units.**

Complex variables and integration; ordinary and partial differential equations; the eigenvalue problem.

Restriction: Graduate students only.



**PHYSICS 213A. Electromagnetic Theory. 4 Units.**

Electrostatics; magnetostatics; relativity; classical electron theory; fields in vacuum and matter; retardation; radiation and absorption; dispersion; propagation of light; diffraction; geometric optics; theories of the electric and magnetic properties of materials; scattering.

**PHYSICS 213B. Electromagnetic Theory. 4 Units.**

Electrostatics; magnetostatics; relativity; classical electron theory; fields in vacuum and matter; retardation; radiation and absorption; dispersion; propagation of light; diffraction; geometric optics; theories of the electric and magnetic properties of materials; scattering.

Prerequisite: PHYSICS 213A

**PHYSICS 214A. Statistical Physics. 4 Units.**

Maxwell-Boltzmann, Bose-Einstein, Fermi-Dirac statistics; ideal and imperfect gases; thermodynamic properties of solids; transport theory.

Restriction: Graduate students only.

**PHYSICS 214C. Many Body Theory. 4 Units.**

Application of field theory methods, perturbative and non-perturbative, to many particle systems; second quantization, Feynman diagrams, linear response theory, and functional integral methods applied to the ground state and at finite temperature.

Prerequisite: PHYSICS 214A and PHYSICS 215A and PHYSICS 215B

Restriction: Graduate students only.

**PHYSICS 215A. Quantum Mechanics. 4 Units.**

Foundations; Dirac notation; basic operators and their eigenstates; perturbation theory; spin.

Restriction: Graduate students only.

**PHYSICS 215B. Quantum Mechanics. 4 Units.**

Atomic physics; scattering theory, formal collision theory; semi-classical radiation theory; many body systems.

Prerequisite: PHYSICS 215A

Restriction: Graduate students only.

**PHYSICS 220. Electronics for Scientists. 4 Units.**

Applications of modern semiconductor devices to physical instrumentation. Characteristics of semiconductor devices, integrated circuits, analog and digital circuits.

Restriction: Graduate students only.

Concurrent with PHYSICS 120.

**PHYSICS 222. Continuum Mechanics. 4 Units.**

Introduction to the continuum limit and stress and strain tensors. Hydrodynamics of perfect fluids; two-dimensional problems, motion of incompressible viscous fluids, Navier Stokes equations. Basic elasticity theory. Description of viscoelastic materials. Introduction to nonlinear behavior instabilities.

**PHYSICS 223. Numerical Methods. 4 Units.**

Introduction to theory and practice of modern numerical methods. Techniques are drawn from topics such as solution of differential equations, Monte Carlo methods, Fast Fourier transforms, and evaluation of special functions.

**PHYSICS 228. Electromagnetism. 4 Units.**

Maxwell's equations, electrodynamics, electromagnetic waves and radiation, wave propagation in media, interference and quantum optics, coherent and incoherent radiation, with practical applications in interferometry, lasers, waveguides, and optical instrumentation.

Same as CHEM 228.

**PHYSICS 229A. Computational Methods. 4 Units.**

Mathematical and numerical analysis using Mathematica and C programming, as applied to problems in physical science.

Same as CHEM 229A.

Concurrent with PHYSICS 100.

**PHYSICS 230A. Biophysics of Molecules and Molecular Machines. 4 Units.**

Physical concepts and experimental and computational techniques used to study the structure and function of biological molecules and molecular machines with examples from enzyme action, protein folding, molecular motors, photobiology, chemotaxis, and vision.

Concurrent with PHYSICS 146A.

**PHYSICS 230B. Biophysics of Molecules and Molecular Machines. 4 Units.**

Physical concepts and experimental and computational techniques used to study the structure and function of biological molecules and molecular machines with examples from enzyme action, protein folding, molecular motors, photobiology, chemotaxis, and vision.

Concurrent with PHYSICS 146B.

**PHYSICS 233A. Principles of Imaging. 4 Units.**

Linear systems, probability and random processes, image processing, projecting imaging, tomographic imaging.

Same as EECS 202A.

Restriction: Graduate students only.

Concurrent with PHYSICS 147A.

**PHYSICS 233B. Techniques in Medical Imaging I: X-ray, Nuclear, and NMR Imaging. 4 Units.**

Ionizing radiation, planar and tomographic radiographic and nuclear imaging, magnetism, NMR, MRI imaging.

Prerequisite: EECS 202A

Same as EECS 202B.

Restriction: Graduate students only.

Concurrent with PHYSICS 147B.

**PHYSICS 233C. Techniques in Medical Imaging II: Ultrasound, Electrophysiological, Optical. 4 Units.**

Sound and ultrasound, ultrasonic imaging, physiological electromagnetism, EEG, MEG, ECG, MCG, optical properties of tissues, fluorescence and bioluminescence, MR impedance imaging, MR spectroscopy, electron spin resonance and ESR imaging.

Prerequisite: EECS 202B

Same as EECS 202C.

Restriction: Graduate students only.

Concurrent with PHYSICS 147C.

**PHYSICS 234A. Elementary Particle Physics. 4 Units.**

Overview of Standard Model theory and phenomenology. Electromagnetic, strong and weak forces, quark model, interactions with matter, particle detectors and accelerators.

Prerequisite: PHYSICS 215B

**PHYSICS 234B. Advanced Elementary Particle Physics. 4 Units.**

$SU(3) \times SU(2) \times U(1)$  model of strong, weak, and electromagnetic interactions. K-meson system and CP violation, neutrino masses and mixing, grand-unified theories, supersymmetry, introduction to cosmology and its connection to particle physics.

Prerequisite: PHYSICS 234A and PHYSICS 235A

**PHYSICS 234C. Advanced Elementary Particle Physics. 4 Units.**

$SU(3) \times SU(2) \times U(1)$  model of strong, weak, and electromagnetic interactions. K-meson system and CP violation, neutrino masses and mixing, grand-unified theories, supersymmetry, introduction to cosmology and its connection to particle physics.

Prerequisite: PHYSICS 234A and PHYSICS 235A

**PHYSICS 235A. Quantum Field Theory. 4 Units.**

Canonical quantization, scalar field theory, Feynman diagrams, tree-level quantum electrodynamics.

Prerequisite: PHYSICS 215B

Restriction: Graduate students only.

**PHYSICS 235B. Advanced Quantum Field Theory. 4 Units.**

Pathintegral techniques, loop diagrams, regularization and renormalization, anomalies.

Prerequisite: PHYSICS 235A

Restriction: Graduate students only.

**PHYSICS 238A. Condensed Matter Physics. 4 Units.**

Bonding in solids; crystal symmetry and group theory, elastic properties of crystals; lattice vibrations, interaction of radiation with matter; cohesion of solids; the electron gas; electron energy bands in solids; ferromagnetism; transport theory; semiconductors and superconductors; many-body perturbation theory.

Prerequisite: PHYSICS 133 and (PHYSICS 214A or CHEM 232A) and (PHYSICS 215B or CHEM 231B)

**PHYSICS 238B. Condensed Matter Physics. 4 Units.**

Bonding in solids; crystal symmetry and group theory, elastic properties of crystals; lattice vibrations, interaction of radiation with matter; cohesion of solids; the electron gas; electron energy bands in solids; ferromagnetism; transport theory; semiconductors and superconductors; many-body perturbation theory.

Prerequisite: PHYSICS 238A

**PHYSICS 238C. Condensed Matter Physics. 4 Units.**

Bonding in solids; crystal symmetry and group theory, elastic properties of crystals; lattice vibrations, interaction of radiation with matter; cohesion of solids; the electron gas; electron energy bands in solids; ferromagnetism; transport theory; semiconductors and superconductors; many-body perturbation theory.

Prerequisite: PHYSICS 238B

**PHYSICS 239A. Plasma Physics. 4 Units.**

Basic concepts, orbits, kinetic and fluid equations, Coulomb collisions, fluctuations, scattering, radiation.

Restriction: Graduate students only.

Concurrent with PHYSICS 135.

**PHYSICS 239B. Plasma Physics. 4 Units.**

Magnetic confinement, MHD equilibrium and stability, collisional transport.

Prerequisite: PHYSICS 239A

Restriction: Graduate students only.

**PHYSICS 239C. Plasma Physics. 4 Units.**

Linear waves and instabilities, uniform un-magnetized and magnetized plasmas, non-uniform plasmas.

Prerequisite: PHYSICS 239B

Restriction: Graduate students only.

**PHYSICS 240A. Galactic Astrophysics. 4 Units.**

The morphology, kinematics, and evolution of our Milky Way and other galaxies. Topics include stellar formation and stellar evolution, end states of stars (supernovae, neutron stars), the distribution of stars, interstellar gas and mass in galaxies. The Local Group.

**PHYSICS 240B. Cosmology. 4 Units.**

An introduction to modern cosmology set within the context of general relativity. Topics include the expansion history of the Universe, inflation, the cosmic microwave background, density fluctuations, structure formation, dark matter, dark energy, and gravitational lensing.

**PHYSICS 240C. Radiative Processes in Astrophysics. 4 Units.**

Exploration of radiation mechanisms (electron scattering, synchrotron emission, collisional excitation, and more) and radiative transfer through matter including absorption and emission. Includes such observational astrophysics topics as spectroscopic study of atoms and nuclei, X-rays, and cosmic rays.

**PHYSICS 241A. Solar System and Extrasolar Planets. 4 Units.**

Formation, evolution, and habitability of planetary systems. Observational and theoretical study of the origin and evolution of the Solar System, present day dynamical state of the Solar System (asteroids, Kuiper Belt Objects, Oort cloud), planetary atmospheres, processes governing planetary climate.

Corequisite: PHYSICS 242

Restriction: Graduate students only.

**PHYSICS 241B. Stellar Astrophysics. 4 Units.**

Physics of stellar interiors and equations of stellar structure. Stellar atmospheres and absorption processes. Introduction to stellar winds. Thermonuclear reactions, nucleosynthesis, and solar neutrinos. Binary stars and mass accretion. White dwarfs, supernovae, neutron stars, and black holes.

Prerequisite: PHYSICS 211 and PHYSICS 240A

**PHYSICS 241C. Extragalactic Astrophysics. 4 Units.**

The physics and phenomenology of galaxies; star formation, interstellar medium, and intergalactic medium. Galaxy structure and dynamics. Galaxy evolution, stellar populations, and scaling relations; the relationship between galaxy properties and environment. Galaxy clusters and active galactic nuclei.

Prerequisite: PHYSICS 211 and PHYSICS 240A

**PHYSICS 241D. Early Universe Physics. 4 Units.**

Includes a thorough quantum treatment of the generation of perturbations during inflation and various topics related to kinetic theory in an expanding Universe. Other topics include the astrophysics and cosmology of weakly interacting particles.

Prerequisite: PHYSICS 234A and (PHYSICS 240B or PHYSICS 255)

**PHYSICS 242. Astro Fundamentals. 4 Units.**

Introduction to topics in astrophysics including measurement of stellar properties, stellar structure and evolution, stellar remnants and supernovae, the interstellar medium, exoplanets, gravitational lensing, galactic structure, extragalactic distance measurements, and the expanding universe.

Restriction: Graduate students only.

**PHYSICS 246. Special Topics in Astrophysics. 4 Units.**

Outlines and emphasizes a subarea of astrophysics that is undergoing rapid development.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 247. Special Topics in Particle Physics. 4 Units.**

Current topics in particle non-accelerator-based research fields.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 248. Special Topics in Condensed Matter Physics. 4 Units.**

Outlines and emphasizes a subarea of condensed matter physics that is undergoing rapid development.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PHYSICS 249. Special Topics in Plasma Physics. 4 Units.**

Outlines and emphasizes a subarea of plasma physics that is undergoing rapid development.

Prerequisite: PHYSICS 239A and PHYSICS 239B

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PHYSICS 250. Physics and Astronomy Communications Skills. 4 Units.**

Fundamentals of effectively communicating research through written and oral platforms. Topics include writing compelling proposals and journal articles for peer review, and the development of engaging oral presentations of science results and significance to a wide range of audiences.

Restriction: Graduate students only.

**PHYSICS 255. General Relativity. 4 Units.**

An introduction to Einstein's theory of gravitation. Tensor analysis, Einstein's field equations, astronomical tests of Einstein's theory, gravitational waves.

**PHYSICS 260A. Seminar in Condensed Matter Physics. 1 Unit.**

Seminar designed to acquaint students with recent advances in solid state physics. Lecturers from the Department of Physics and Astronomy (both faculty and graduate students), other UCI departments, and other institutions.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 260B. Seminar in Condensed Matter Physics. 1 Unit.**

Seminar designed to acquaint students with recent advances in solid state physics. Lecturers from the Department of Physics and Astronomy (both faculty and graduate students), other UCI departments, and other institutions.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 260C. Seminar in Condensed Matter Physics. 1 Unit.**

Seminar designed to acquaint students with recent advances in solid state physics. Lecturers from the Department of Physics and Astronomy (both faculty and graduate students), other UCI departments, and other institutions.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 261A. Seminar in Plasma Physics. 1 Unit.**

Advanced topics in plasma physics: wave propagation, nonlinear effects, kinetic theory and turbulence, stability problems, transport coefficients, containment, and diagnostics. Applications to controlled fusion and astrophysics.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**PHYSICS 261B. Seminar in Plasma Physics. 1 Unit.**

Advanced topics in plasma physics: wave propagation, nonlinear effects, kinetic theory and turbulence, stability problems, transport coefficients, containment, and diagnostics. Applications to controlled fusion and astrophysics.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**PHYSICS 261C. Seminar in Plasma Physics. 1 Unit.**

Advanced topics in plasma physics: wave propagation, nonlinear effects, kinetic theory and turbulence, stability problems, transport coefficients, containment, and diagnostics. Applications to controlled fusion and astrophysics.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**PHYSICS 263A. Seminar in Particle Physics. 1 Unit.**

Discussion of advanced topics and reports of current research results in theoretical and experimental particle physics and cosmic rays.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 263B. Seminar in Particle Physics. 1 Unit.**

Discussion of advanced topics and reports of current research results in theoretical and experimental particle physics and cosmic rays.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 263C. Seminar in Particle Physics. 1 Unit.**

Discussion of advanced topics and reports of current research results in theoretical and experimental particle physics and cosmic rays.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 265A. Seminar in Astrophysics. 1 Unit.**

Acquaints students with current research in astrophysics. Lecturers from the Department of Physics and Astronomy and from other institutions.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 265B. Seminar in Astrophysics. 1 Unit.**

Acquaints students with current research in astrophysics. Lecturers from the Department of Physics and Astronomy and from other institutions.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 265C. Seminar in Astrophysics. 1 Unit.**

Acquaints students with current research in astrophysics. Lecturers from the Department of Physics and Astronomy and from other institutions.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 266. Current Topics in Chemical, Applied, and Materials Physics. 1 Unit.**

The subjects covered vary from year to year. Connection between fundamental principles and implementations in practice in science, industry, and technology.

Repeatability: May be repeated for credit unlimited times.

Same as CHEM 266.

**PHYSICS 267B. Current Problems in Particle Physics. 4 Units.**

Presentation and discussion of current research and theory in particle physics. Lectures given by staff and students.

Repeatability: May be repeated for credit unlimited times.

**PHYSICS 267C. Current Problems in Particle Physics. 4 Units.**

Presentation and discussion of current research and theory in particle physics. Lectures given by staff and students.

Repeatability: May be repeated for credit unlimited times.

**PHYSICS 268. Seminar in Systems Microbiology Research. 1 Unit.**

A research and journal club seminar that covers topics on bacteria and phage using approaches and principles from biology, engineering, and physics.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Same as MOL BIO 268, ENGRMSE 267.

Restriction: Upper-division students only. Graduate students only.

**PHYSICS 269. Seminar in Teaching Physics. 2 Units.**

Techniques for effective teaching. Covers active listening and student engagement, problem-solving skills, peer instruction and collaborative learning, and evaluation. Required of all new Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

**PHYSICS 273. Technical Communication Skills. 2 Units.**

Development of effective communication skills, oral and written presentations, through examples and practice.

Grading Option: Satisfactory/unsatisfactory only.

Same as CHEM 273.

**PHYSICS 291. Research Seminar. 1-4 Units.**

Detailed discussion of research problems of current interest in the Department. Format, content, and frequency of the course are variable.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PHYSICS 295. Experimental Research. 4-12 Units.**

With the approval of a faculty member, a student may pursue a research program in experimental physics. Typical areas include astrophysics, condensed matter physics, elementary particle physics, and plasma physics.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Physical Sciences students only.

**PHYSICS 296. Theoretical Research. 4-12 Units.**

With approval of a faculty member, a student may pursue a research program in theoretical physics. Typical areas include astrophysics, condensed matter physics, elementary particle physics, and plasma physics.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. School of Physical Sciences students only.

**PHYSICS 298. Physics Colloquium. 1 Unit.**

Seminar held each week, in which a current research topic is explored. Frequently, off-campus researchers are invited to present the seminar, and on occasion a faculty member or researcher from the Department will speak.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: School of Physical Sciences students only.

**PHYSICS 299. Reading of Special Topic. 4-12 Units.**

With special consent from a faculty member who will agree to supervise the program, a student may receive course credit for individual study of some area of physics.

Restriction: Graduate students only.



**PHYSICS 395. Laboratory Teaching. 1 Unit.**

Required of and limited to teaching assistants of undergraduate laboratory courses. Designed to teach the necessary skills required of teaching assistants for these courses.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PHYSICS 399. University Teaching. 1-4 Units.**

Required of and limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

## Applied Physics, B.S.

The goal of the undergraduate majors in Physics and Applied Physics is to develop expert problem solvers with a broad understanding of physical principles. The programs are flexible and prepare students for careers in industrial research, applications programming, education, law, or business, as well as for graduate study in astronomy, biomedical physics, engineering, or physics.

Students choose a major in either pure Physics or Applied Physics. The major in Physics includes a standard track for graduate study in physics, a Specialization in Astrophysics, and Concentrations in Computational Physics, the Philosophy of Physics, and Physics Education. The major in Applied Physics allows students to combine physics courses with courses from overlapping disciplines, such as materials science, electrical engineering, geosciences, biomedical imaging, or other fields. Annual mandatory meetings with faculty advisors assist students in selecting the right program for their aptitudes and interests.

Different sequences of lower-division physics courses are distinguished by their intended audience, their mathematical prerequisites, and the extent to which they offer preparation for more advanced courses. These aspects of the introductory courses are summarized as follows:

**Physics 3:** *Intended audience:* Premedical students, Biological Sciences majors. *Prerequisites:* concurrent enrollment in MATH 2A. *Preparation for advanced courses:* PHYSICS 7D with permission.

**Physics 7:** *Intended audience:* Physical Sciences and Engineering majors. *Prerequisite:* concurrent enrollment in MATH 2B. *Preparation for advanced courses:* PHYSICS 51A or PHYSICS 61A.

**Physics 12-21:** *Intended audience:* Nonscience majors. *Prerequisites:* none. *Preparation for advanced courses:* none.

Students may be admitted to the Physics or Applied Physics majors upon entering the University as freshmen, via change of major, or as transfer students from other colleges and universities. Information about change of major policies is available in the Physical Sciences Student Affairs Office and at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>). For transfer student admission, preference will be given to junior-level applicants with the highest grades overall and who have satisfactorily completed the following required courses: one year of approved calculus and one year of calculus-based physics with laboratory for engineering and physics majors. Completion of multivariable calculus, linear algebra, and differential equations is recommended.

**All students must meet the University Requirements.**

**School Requirements: None**

**Departmental Requirements**

A. Complete the following:

MATH 2A or MATH 5A	Single-Variable Calculus Calculus for Life Sciences
MATH 2B	Single-Variable Calculus
MATH 2D- 2E	Multivariable Calculus and Multivariable Calculus
MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations
PHYSICS 50	Introductory Mathematical Physics
PHYSICS 61A or PHYSICS 51A	Modern Physics for Majors Modern Physics
PHYSICS 111A	Classical Mechanics
PHYSICS 112A	Electromagnetic Theory
PHYSICS 113A	Quantum Physics

PHYSICS 115A	Statistical Physics
B. Complete one of the following series:	
PHYSICS 7C- 7LC- 7D- 7LD- 7E	Classical Physics and Classical Physics Laboratory and Classical Physics and Classical Physics Laboratory and Classical Physics
or	
PHYSICS 3A- 3B- 3LB- 3C- 3LC	Basic Physics I and Basic Physics II and Basic Physics Laboratory and Basic Physics III and Basic Physics Laboratory
C. Complete one of the following:	
PHYSICS 53	Introduction to Programming and Numerical Analysis
I&C SCI 45C	Programming in C/C++ as a Second Language
MATH 9	Introduction to Programming for Numerical Analysis
EECS 10	Computational Methods in Electrical and Computer Engineering
EECS 12	Introduction to Programming
D. Complete one of the following:	
PHYSICS 60	Thermal Physics
CHEM 1C	General Chemistry
CHEM H2C	Honors General Chemistry
CHEM M3C	Majors Quantitative Analytical Chemistry
ENGRMAE 91	Introduction to Thermodynamics
E. Complete six units of lower-division laboratory using any combination of the following courses:	
PHYSICS 52A- 52B- 52C	Fundamentals of Experimental Physics and Fundamentals of Experimental Physics and Fundamentals of Experimental Physics
CHEM 1LC- 1LD	General Chemistry Laboratory and General Chemistry Laboratory
CHEM H2LA- H2LB	Honors General Chemistry Laboratory and Honors General Chemistry Laboratory
CHEM M2LA- M2LB	Majors General Chemistry Laboratory and Majors General Chemistry Laboratory
CHEM 51LB- 51LC	Organic Chemistry Laboratory and Organic Chemistry Laboratory
CHEM H52LA- H52LB	Honors Organic Chemistry Laboratory and Honors Organic Chemistry Laboratory
CHEM M52LA- M52LB	Majors Organic Chemistry Laboratory and Majors Organic Chemistry Laboratory
ENGR 7A- 7B	Introduction to Engineering I and Introduction to Engineering II
EECS 70LA- 70LB	Network Analysis I Laboratory and Network Analysis II Laboratory
F. Complete eight units of upper-division laboratory using any combination of the following courses:	
PHYSICS 106W	Advanced Data Acquisition, Analysis, and Scientific Writing
PHYSICS 120	Electronics for Scientists
PHYSICS 121W	Advanced Laboratory
PHYSICS 139	Observational Astrophysics
PHYSICS 193	Research Methods
PHYSICS 196C	Thesis in Physics III
or one approved upper-division laboratory course outside of Physics	
G. Complete two units of writing communication from the following courses:	
PHYSICS 194	Research Communication for Physics Majors <sup>1</sup>

PHY SCI 139W	Technical Writing and Communication Skills
EDUC 143BW	Classroom Interactions II
or alternate upper-division writing course with department approval	
H. Complete 32 additional units of coherently-related electives in accord with the following rules:	
- Up to eight units may be lower-division electives in physics such as PHYSICS 20, PHYSICS 61B, or PHYSICS H90	
- Any upper-division physics courses PHYSICS 100-150	
- Any graduate level physics courses PHYSICS 200-299 with approval of the Department Undergraduate Advisor	
- Any combination of physics and non-physics courses pre-approved as a formal Concentration or Specialization	
- Any other combination of physics and non-physics courses approved by the Physics Department Undergraduate Committee.	

- <sup>1</sup> PHYSICS 194 does not satisfy the University's upper-division writing requirement. It is a prerequisite course for PHYSICS 121W, which does satisfy the upper-division writing requirement.

**NOTE:** Students may not double major in Physics and Applied Physics.

## Concentration in Biomedical Physics

The **Biomedical Physics Concentration** in Applied Physics is designed for the student who anticipates a career in physics applied to biology and medicine, such as health physics or radiological physics, or who intends to work in a scholarly field which deals with the physical aspects of biology or medicine, such as molecular biology or physiology. Completion of requirements for the Physics major is required, as are nine quarters of basic courses in biology and chemistry. Students who wish to follow the Biomedical Physics Concentration are advised to seek guidance early in their college careers. The requirements are such that coordination of a program in the second year is essential.

A. Complete the following:

BIO SCI 97	Genetics
BIO SCI 98	Biochemistry
BIO SCI 99	Molecular Biology

B. Select one of the following:

CHEM 1A- 1B- 1C	General Chemistry and General Chemistry and General Chemistry
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or

CHEM H2A- H2B- H2C	Honors General Chemistry and Honors General Chemistry and Honors General Chemistry
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C. Select one of the following:

CHEM 1LC- 1LD	General Chemistry Laboratory and General Chemistry Laboratory
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or

CHEM H2LA- H2LB	Honors General Chemistry Laboratory and Honors General Chemistry Laboratory
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or

CHEM M2LA- M2LB	Majors General Chemistry Laboratory and Majors General Chemistry Laboratory
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D. Select one of the following:

CHEM 51A- 51B	Organic Chemistry and Organic Chemistry
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or

CHEM H52A-CHEM H52B	and
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## Sample Program - Biomedical Physics Concentration in Applied Physics

Freshman		
Fall	Winter	Spring
CHEM 1A	CHEM 1B	CHEM 1C- 1LC
Sophomore		
Fall	Winter	Spring
CHEM 1LD	CHEM 51B	N/A
CHEM 51A		

Junior		
Fall	Winter	Spring
BIO SCI 97	BIO SCI 98	BIO SCI 99

## Concentration in Engineering Physics

The **Engineering Physics Concentration** in Applied Physics is designed to provide appropriate education to students who anticipate a career in industrial or technological research. It combines the fundamental knowledge of physical processes obtained from physics courses with the technical knowledge obtained from engineering courses.

Students in the Engineering Physics Concentration must complete 32 units of coherently related electives, with at least 24 of these units from courses in the Henry Samueli School of Engineering. Students may propose any sequence for approval by the Department Undergraduate Advisor. Pre-approved courses include:

EECS 70A	Network Analysis I
EECS 70B- 70LB	Network Analysis II and Network Analysis II Laboratory
EECS 170A- 170LA	Electronics I and Electronics I Laboratory
EECS 170B- 170LB	Electronics II and Electronics II Laboratory
EECS 170C- 170LC	Electronics III and Electronics III Laboratory
EECS 174	Semiconductor Devices
EECS 188	Optical Electronics
ENGRMAE 120	Heat and Mass Transfer
ENGRMAE 130A	Introduction to Fluid Mechanics
ENGRMAE 147	Vibrations

## Sample Program - Engineering Physics Concentration in Applied Physics

Junior		
Fall	Winter	Spring
N/A	EECS 70A	EECS 70B- 70LB
Senior		
Fall	Winter	Spring
EECS 170A- 170LA	EECS 170B- 170LB EECS 188	PHYSICS 106W EECS 170C- 170LC

The Honors Program in Physics provides an opportunity for selected students majoring in Physics or Applied Physics to pursue advanced work in one of the research areas of the Department. Admission to the program is based on an application normally submitted by the sixth week of the spring quarter of the junior year. Applicants must have an overall grade point average of at least 3.4 and a grade point average in physics courses of 3.5 or better. (Exceptions to these procedures and standards may be granted in unusual circumstances.) In selecting students for the program, the Department considers evidence of ability and interest in research.

Students admitted to the program participate in a year-long course, PHYSICS H196A-PHYSICS H196B-PHYSICS H196C, which includes two quarters of research and a final quarter in which a written thesis is submitted. If this work and the student's final GPA are deemed of honors quality by the program advisor, the student then graduates with Departmental Honors in Physics.

Physics 3 is a one-year course suitable for premedical students, students majoring in Biological Sciences, and nonscience majors. It surveys most of the important branches of physics. Laboratory work accompanies the course. Nonscience majors with some mathematical skill may wish to consider Physics 3 as an alternative to PHYSICS 12 through PHYSICS 21.

A student who decides to major in Physics after completing Physics 3 should meet with the Department Undergraduate Advisor for placement information.

Physics 7 is an intensive three-quarter course for students in Physical Sciences and Engineering who are interested in a more quantitative approach to introductory physics. Two units of laboratory work accompany the course.

Physics courses numbered between 12 and 21 are general education courses intended for nonscience majors. The content and format of PHYSICS 21 may vary from year to year.

The introduction to mathematical methods (MATH 2E, MATH 3A, MATH 3D, and PHYSICS 50), microscopic physics (PHYSICS 61A-PHYSICS 61B), and experimental physics (PHYSICS 52A-PHYSICS 52B-PHYSICS 52C) are normally taken in the sophomore year.

Courses numbered 100 and above are for Physics majors and other qualified students. Courses numbered between 111 and 115 emphasize the mathematical and theoretical structures that have unified our understanding of nature. It should be noted that multi-quarter courses such as 111A-B must be taken and passed in sequential order. Any student who is so inclined may take more than the minimum one quarter of advanced laboratory work. Courses numbered between 133 and 149 introduce active subdisciplines in current research. Independent research (PHYSICS 195, PHYSICS 196) is strongly encouraged. In PHYSICS 194, students learn the basics of writing about science, proper use of references and background material, presentation of research proposals, and more.

Transfer students are specifically advised to seek individual consultation with the Department Undergraduate Advisor before deciding on a program of courses.

All Physics and Applied Physics majors must complete the core courses listed with the sample programs. By the end of the junior year, each student is encouraged to select a concentration or track.

Note that alternatives to Physics major requirements can be approved upon petition to the Department and the Office of the Associate Dean. Furthermore, exceptionally prepared students are allowed to enroll in graduate-level courses; to do so requires the approval of the Department Undergraduate Advisor.

### Sample Program - Physics Graduate School Track

#### Junior

##### Fall

PHYSICS 115A or  
116

#### Senior

##### Fall

PHYSICS 113B  
PHYSICS 115A or  
116

##### Winter

PHYSICS 113C  
Physics Elective

##### Spring

PHYSICS 135  
PHYSICS 125B  
Physics Elective

Students preparing for graduate school in atmospheric science or physical oceanography should complete the minor in Earth and Atmospheric Sciences.

## Physics, B.S.

The goal of the undergraduate majors in Physics and Applied Physics is to develop expert problem solvers with a broad understanding of physical principles. The programs are flexible and prepare students for careers in industrial research, applications programming, education, law, or business, as well as for graduate study in astronomy, biomedical physics, engineering, or physics.

Students choose a major in either pure Physics or Applied Physics. The major in Physics includes a standard track for graduate study in physics, a Specialization in Astrophysics, and Concentrations in Computational Physics, the Philosophy of Physics, and Physics Education. The major in Applied Physics allows students to combine physics courses with courses from overlapping disciplines, such as materials science, electrical engineering, geosciences, biomedical imaging, or other fields. Annual mandatory meetings with faculty advisors assist students in selecting the right program for their aptitudes and interests.

Different sequences of lower-division physics courses are distinguished by their intended audience, their mathematical prerequisites, and the extent to which they offer preparation for more advanced courses. These aspects of the introductory courses are summarized as follows:

**Physics 3:** *Intended audience:* Premedical students, Biological Sciences majors. *Prerequisites:* concurrent enrollment in MATH 2A. *Preparation for advanced courses:* PHYSICS 7D with permission.

**Physics 7:** *Intended audience:* Physical Sciences and Engineering majors. *Prerequisite:* concurrent enrollment in MATH 2B. *Preparation for advanced courses:* PHYSICS 51A or PHYSICS 61A.

**Physics 12-21:** *Intended audience:* Nonscience majors. *Prerequisites:* none. *Preparation for advanced courses:* none.

Students may be admitted to the Physics or Applied Physics majors upon entering the University as freshmen, via change of major, or as transfer students from other colleges and universities. Information about change of major policies is available in the Physical Sciences Student Affairs Office and at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>). For transfer student admission, preference will be given to junior-level applicants with the highest grades overall and who have satisfactorily completed the following required courses: one year of approved calculus and one

year of calculus-based physics with laboratory for engineering and physics majors. Completion of multivariable calculus, linear algebra, and differential equations is recommended.

**All students must meet the University Requirements.**

**School Requirements: None.**

### Departmental Requirements

MATH 2A or MATH 5A	Single-Variable Calculus Calculus for Life Sciences
MATH 2B	Single-Variable Calculus
MATH 2D- 2E	Multivariable Calculus and Multivariable Calculus
MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations
PHYSICS 7C- 7D- 7E	Classical Physics and Classical Physics and Classical Physics
PHYSICS 7LC- 7LD	Classical Physics Laboratory and Classical Physics Laboratory
PHYSICS 50	Introductory Mathematical Physics
PHYSICS 52A- 52B- 52C	Fundamentals of Experimental Physics and Fundamentals of Experimental Physics and Fundamentals of Experimental Physics
PHYSICS 53	Introduction to Programming and Numerical Analysis (or another programming course)
PHYSICS 60	Thermal Physics
PHYSICS 61A	Modern Physics for Majors <sup>1</sup>
PHYSICS 61B or PHYSICS 61C	Modern Physics for Majors Introduction to Astrophysics
PHYSICS 111A- 111B	Classical Mechanics and Classical Mechanics
PHYSICS 112A- 112B	Electromagnetic Theory and Electromagnetic Theory
PHYSICS 113A	Quantum Physics
PHYSICS 115A	Statistical Physics
PHYSICS 121W	Advanced Laboratory
PHYSICS 125A	Mathematical Physics
PHYSICS 194	Research Communication for Physics Majors

And select five additional coherently related four-unit courses. (This requirement is normally satisfied by concentrations, specializations, and tracks, as listed below.)

<sup>1</sup> For students transferring into the major after taking PHYSICS 51A-PHYSICS 51B, PHYSICS 51A-PHYSICS 51B will be accepted in place of PHYSICS 61A-PHYSICS 61B.

*Upper-Division Writing Requirement.* Physics majors are required to satisfy the upper-division writing requirement by completing PHYSICS 194 with a grade of C or better, followed by PHYSICS 121W with a grade of C or better.

### Sample Program — Physics Core Curriculum

Freshman		
Fall	Winter	Spring
MATH 2B	MATH 2D	MATH 2E
PHYSICS 7C- 7LC	PHYSICS 7D- 7LD	PHYSICS 7E
(PHYSICS 99)		
Sophomore		
Fall	Winter	Spring
MATH 3A	MATH 3D	PHYSICS 52C
PHYSICS 52A	PHYSICS 52B	PHYSICS 53

PHYSICS 60	PHYSICS 61A	PHYSICS 61B or 61C
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**Junior**

<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
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PHYSICS 111A	PHYSICS 111B	PHYSICS 112B
PHYSICS 50	PHYSICS 112A	PHYSICS 113A

**Senior**

<b>Fall</b>	<b>Winter</b>
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PHYSICS 115A	PHYSICS 121W
PHYSICS 194	PHYSICS 125A

For a student planning graduate study in physics, additional courses in advanced physics are strongly recommended.

## Concentration in Computational Physics

The **Computational Physics concentration** provides training for positions in software development in a wide variety of high-technology fields. For example, consider medical imaging software for magnetic resonance imaging. To write a first-rate program, one must understand the apparatus and analysis techniques (physics), use appropriate numerical techniques (numerical analysis), and employ a convenient object-oriented interface (computer science). The concentration develops this unique set of skills: physical and mathematical insight through the Physics curriculum, knowledge of modern computer programming techniques, and knowledge of numerical analysis.

**Requirements:**

Three courses in computer science:

I&C SCI 31	Introduction to Programming
I&C SCI 32	Programming with Software Libraries
I&C SCI 33	Intermediate Programming

Two courses in numerical analysis plus the accompanying laboratories:

MATH 105A- 105B	Numerical Analysis I and Numerical Analysis II
MATH 105LA- 105LB	Numerical Analysis Laboratory and Numerical Analysis Laboratory

One advanced computational course and accompanying laboratory:

MATH 107- 107L	Numerical Differential Equations and Numerical Differential Equations Laboratory
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## Sample Program — Computational Physics Concentration

**Junior**

<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
I&C SCI 31	I&C SCI 32	I&C SCI 33

**Senior**

<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 105A- 105LA	MATH 105B- 105LB	MATH 107- 107L

## Concentration in Philosophy of Physics

The **Philosophy of Physics concentration** is concerned with the study of the conceptual history of physics, the method of inquiry that has led to our best physical theories, and the structure and interpretation of the theories themselves. Students take courses in deductive and inductive logic, the philosophy and history of physics, and quantum mechanics. The emphasis on careful argument makes this concentration useful for anyone who wishes to pursue a graduate degree in philosophy or law, or for other careers that employ both verbal and quantitative analysis.

**Requirements:**

Select one from the following:

LPS 40	The Nature of Scientific Inquiry
LPS 60	The Making of Modern Science
SOC SCI H1G	Honors: Critical Issues on the Social Sciences
LPS H125	What Is Time?
LPS H80	Scientific Realism and Instrumentalism

or another approved Campuswide Honors course

Select one of the following:

LPS 30	Introduction to Symbolic Logic
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LPS 104	Introduction to Logic
LPS 105A- 105B- 105C	Elementary Set Theory and Metalogic and Undecidability and Incompleteness
MATH 150	Introduction to Mathematical Logic
Complete:	
LPS 31	Introduction to Inductive Logic
Select one from the following:	
LPS 104	Introduction to Logic
LPS 105A- 105B- 105C	Elementary Set Theory and Metalogic and Undecidability and Incompleteness
LPS 140	Topics in Philosophy of Science
MATH 150	Introduction to Mathematical Logic
Complete:	
PHYSICS 113B	Quantum Physics
Select three from the following:	
LPS 141A	Topics in Philosophy of Physics
LPS 141B	Geometry and Spacetime
LPS 141C	Philosophy of Quantum Mechanics
LPS 141D	Probability and Determinism
or other approved Philosophy of Physics course	

## Concentration in Physics Education

The **Physics Education concentration** is for students who plan a career in secondary education. An Education course, four general science courses, a research methods course, and two quarters of classroom experience complete the requirements for the concentration. Students are encouraged to take PHYSICS 191 (outreach).

### Requirements:

EDUC 55	Knowing and Learning in Mathematics and Science
PHY SCI 5	California Teach 1: Introduction to Science and Mathematics Teaching
PHY SCI 105	California Teach 2: Middle School Science and Mathematics Teaching
PHYSICS 193	Research Methods
Select four courses from the following:	
BIO SCI 1A	Life Sciences
BIO SCI 93	From DNA to Organisms
BIO SCI 94	From Organisms to Ecosystems
CHEM 1A- 1B- 1C	General Chemistry and General Chemistry and General Chemistry
EARTHSS 1	Introduction to Earth System Science
EARTHSS 7	Physical Geology
PHYSICS 20A- 20B	Introduction to Astronomy and Cosmology: Humanity's Place in the Universe

NOTE: With this concentration, a Secondary Teaching Certification option is available.

*Secondary Teaching Certification Option:* With *additional* course work and field experience offered through the UCI Cal Teach program, students who complete the concentration in Physics Education can also earn a California Preliminary Single Subject Teaching Credential. Completing the bachelor's degree, concentration, and teacher certification in four years is possible with careful, early planning. Additional courses required for teacher certification are:

LPS 60	The Making of Modern Science
EDUC 109	Reading and Writing in Mathematics and Science
EDUC 143AW	Classroom Interactions I
EDUC 143BW	Classroom Interactions II

EDUC 148	Complex Pedagogical Design <sup>1</sup>
EDUC 158	Student Teaching Mathematics and Science in Middle/High School (two quarters)

<sup>1</sup> Successful completion of EDUC 143AW-EDUC 143BW and EDUC 148 will be accepted in lieu of PHYSICS 125A and PHYSICS 194 for Cal Teach students.

For additional information about teacher certification requirements and enrollment procedures, see Preparation for Teaching Science and Mathematics. Interested students are strongly encouraged to contact the Cal Teach Resource and Advising Center or the Physical Sciences Student Affairs Office.

### Sample Program — Concentration in Physics Education with Secondary Teaching Certification Option

Freshman		
Fall	Winter	Spring
MATH 2B	MATH 2D	MATH 2E
PHYSICS 7C- 7LC	PHYSICS 7D- 7LD	PHYSICS 7E
General Education	General Education	General Education
(PHYSICS 99)	PHY SCI 5	General Education
Sophomore		
Fall	Winter	Spring
MATH 3A	MATH 3D	PHYSICS 60
PHYSICS 52A	PHYSICS 61A	PHYSICS 61B
PHY SCI 105	PHYSICS 52B	PHYSICS 52C
	PHYSICS 193	LPS 60
Junior		
Fall	Winter	Spring
PHYSICS 50	PHYSICS 111B	PHYSICS 53
PHYSICS 111A	PHYSICS 112A	PHYSICS 112B
General Science	General Science	PHYSICS 113A
General Science	EDUC 143AW	EDUC 148
EDUC 55		
Senior		
Fall	Winter	Spring
PHYSICS 115A	General Education	PHYSICS 121W
General Science	EDUC 109	General Education
EDUC 143BW	EDUC 158	EDUC 158

### Specialization in Astrophysics

The **Astrophysics specialization** is primarily taken by two types of students, those planning on going on to graduate school in astronomy or astrophysics and those planning to work in aeronautics or astrophysics-related industries or government research laboratories after receiving their bachelor's degree. It also is an excellent focus for students who anticipate careers in science journalism, teaching, science administration, or public relations. The course work includes:

A. Complete:

PHYSICS 61C	Introduction to Astrophysics
PHYSICS 139	Observational Astrophysics

B. Select three courses from the following:

PHYSICS 137	Introduction to Cosmology
PHYSICS 138	Astrophysics of Galaxies
PHYSICS 144	Stellar Astrophysics
PHYSICS 145	High-Energy Astrophysics

C. Two or more upper-division Physics courses. Of the Physics electives, students bound for graduate school are strongly advised to include:

PHYSICS 113B	Quantum Physics
PHYSICS 125B	Mathematical Physics

Other recommended electives include:

PHYSICS 116	Relativity and Black Holes
PHYSICS 134A	Physical and Geometrical Optics
PHYSICS 135	Plasma Physics
PHYSICS 136	Introduction to Particle Physics

**Sample Program — Astrophysics Specialization**

<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
PHYSICS 137	PHYSICS 116	PHYSICS 144 or 145
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
PHYSICS 113B	PHYSICS 138	PHYSICS 135
PHYSICS 139		PHYSICS 125B
		PHYSICS 144 or 145

The Honors Program in Physics provides an opportunity for selected students majoring in Physics or Applied Physics to pursue advanced work in one of the research areas of the Department. Admission to the program is based on an application normally submitted by the sixth week of the spring quarter of the junior year. Applicants must have an overall grade point average of at least 3.4 and a grade point average in physics courses of 3.5 or better. (Exceptions to these procedures and standards may be granted in unusual circumstances.) In selecting students for the program, the Department considers evidence of ability and interest in research.

Students admitted to the program participate in a year-long course, PHYSICS H196A-PHYSICS H196B-PHYSICS H196C, which includes two quarters of research and a final quarter in which a written thesis is submitted. If this work and the student's final GPA are deemed of honors quality by the program advisor, the student then graduates with Departmental Honors in Physics.

Physics 3 is a one-year course suitable for premedical students, students majoring in Biological Sciences, and nonscience majors. It surveys most of the important branches of physics. Laboratory work accompanies the course. Nonscience majors with some mathematical skill may wish to consider Physics 3 as an alternative to PHYSICS 12 through PHYSICS 21.

A student who decides to major in Physics after completing Physics 3 should meet with the Department Undergraduate Advisor for placement information.

Physics 7 is an intensive three-quarter course for students in Physical Sciences and Engineering who are interested in a more quantitative approach to introductory physics. Two units of laboratory work accompany the course.

Physics courses numbered between 12 and 21 are general education courses intended for nonscience majors. The content and format of PHYSICS 21 may vary from year to year.

The introduction to mathematical methods (MATH 2E, MATH 3A, MATH 3D, and PHYSICS 50), microscopic physics (PHYSICS 61A-PHYSICS 61B), and experimental physics (PHYSICS 52A-PHYSICS 52B-PHYSICS 52C) are normally taken in the sophomore year.

Courses numbered 100 and above are for Physics majors and other qualified students. Courses numbered between 111 and 115 emphasize the mathematical and theoretical structures that have unified our understanding of nature. It should be noted that multi-quarter courses such as 111A-B must be taken and passed in sequential order. Any student who is so inclined may take more than the minimum one quarter of advanced laboratory work. Courses numbered between 133 and 149 introduce active subdisciplines in current research. Independent research (PHYSICS 195, PHYSICS 196) is strongly encouraged. In PHYSICS 194, students learn the basics of writing about science, proper use of references and background material, presentation of research proposals, and more.

Transfer students are specifically advised to seek individual consultation with the Department Undergraduate Advisor before deciding on a program of courses.

All Physics and Applied Physics majors must complete the core courses listed with the sample programs. By the end of the junior year, each student is encouraged to select a concentration or track.

Note that alternatives to Physics major requirements can be approved upon petition to the Department and the Office of the Associate Dean. Furthermore, exceptionally prepared students are allowed to enroll in graduate-level courses; to do so requires the approval of the Department Undergraduate Advisor.

**Sample Program - Physics Graduate School Track**

<b>Junior</b>		
<b>Fall</b>		
PHYSICS 115A or 116		
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
PHYSICS 113B	PHYSICS 113C	PHYSICS 135

PHYSICS 115A or 116	Physics Elective	PHYSICS 125B
Physics Elective		Physics Elective

Students preparing for graduate school in atmospheric science or physical oceanography should complete the minor in Earth and Atmospheric Sciences.

## Physics, Ph.D.

The Department offers and M.S. and a Ph.D. in Physics. These degrees are awarded in recognition of demonstrated knowledge of the basic facts and theories of physics and of a demonstrated capacity for independent research. Active programs of research are underway in particle physics, nanophysics, biophysics, medical physics, condensed matter physics, low-temperature physics, plasma physics, gravitational physics, astrophysics, and cosmology.

In general, graduate study in the physics Ph.D. program is expected to be a full-time activity. Other proposed arrangements should be approved by the Graduate Committee. The normative time for completion of the Ph.D. is six years of full-time study, and the maximum time permitted is seven years. Students may pursue the M.S. on either a full-time or part-time basis.

Complementing the formal courses, the Department offers regular colloquia and informal seminars. Graduate students are members of an intellectual community and are expected to participate fully in departmental activities. Attendance at colloquia is considered an essential part of graduate study. In addition, there are regular weekly research seminars in condensed matter, particle, and plasma physics, and astrophysics.

Sources of support available to graduate students include teaching assistantships, research assistantships, and fellowships. Students planning to pursue graduate work in Physics should visit the Physics Department website (<http://www.physics.uci.edu/>).

Students admitted into the graduate program in Physics and Astronomy may elect to pursue the M.S. or Ph.D. with a concentration in Chemical and Materials Physics, as described in a later section.

The principal requirements for the Ph.D. are a minimum of six quarters of residence, passage of a written and an oral examination, and successful completion and defense of a dissertation reporting results of original research. In addition, the Ph.D. candidate must complete certain graduate course requirements. There is no foreign language requirement.

### Course Requirements

Students are required to exhibit mastery of the basic sequences—Classical Mechanics, Electromagnetic Theory, Quantum Mechanics, Mathematical Physics, and Statistical Physics.

All courses must be passed with a grade of B or better.

Students who do not have a prior Master's degree (or other equivalent degree) in Physics from UCI or another institution must take a minimum of 11 quarter courses including:

PHYSICS 211	Classical Mechanics
PHYSICS 212A	Mathematical Physics
PHYSICS 213A	Electromagnetic Theory
PHYSICS 213B	Electromagnetic Theory
or PHYSICS 240C	Radiative Processes in Astrophysics
PHYSICS 214A	Statistical Physics
PHYSICS 215A- 215B	Quantum Mechanics and Quantum Mechanics

and select at least two other courses numbered between 200 and 259;

and select two other courses approved by the graduate advisor.

or

Students who have obtained a prior Master's degree (or other equivalent degree) in Physics from UCI or another institution:

Take a minimum of 4 quarter courses including: two courses numbered between 200 and 259 and two other courses approved by the graduate advisor. These students are strongly encouraged to take the qualifying exam in the Fall quarter of entrance.

Students are strongly encouraged to take PHYSICS 211, PHYSICS 212A, PHYSICS 213A, PHYSICS 214A, PHYSICS 215A-PHYSICS 215B, and either PHYSICS 213B or PHYSICS 240C in their first year of study. It is expected that students, having selected a research specialty, will ordinarily take the core courses in that subject in their second year of study. Students pursuing research in elementary particle physics ordinarily complete PHYSICS 234A-PHYSICS 234B-PHYSICS 234C and PHYSICS 235A-PHYSICS 235B during their second year. Students pursuing research in plasma physics ordinarily complete PHYSICS 239A during their first year and PHYSICS 239B-PHYSICS 239C their second year; PHYSICS 249 is also recommended. Students pursuing research in condensed-matter physics ordinarily take PHYSICS 238A-PHYSICS 238B-PHYSICS 238C

during their second year; PHYSICS 133 should be taken in the first year by those students who have not had an equivalent course. Students pursuing research in astrophysics/cosmology ordinarily complete PHYSICS 240A during spring of their first year; PHYSICS 240B, PHYSICS 240C in their second year; and one or more of PHYSICS 241B, PHYSICS 241C, PHYSICS 241D in their second or subsequent years. Students interested in medical imaging should take PHYSICS 233A-PHYSICS 233B-PHYSICS 233C in the second year. Students pursuing research in biological physics should take PHYSICS 230A-PHYSICS 230B in the second year. Students who have earned grades of B or better in equivalent graduate-level courses prior to entering UCI may be exempted from required courses by the graduate advisor. Equivalency will be determined by the instructor of each course for which an exemption is sought.

NOTE: The requirements for the Ph.D. with a concentration in Chemical and Materials Physics (ChAMP) differ from these and are outlined in a later section.

### Comprehensive Examination

Progress toward the degree is assessed by a written comprehensive examination covering a broad range of fundamentals of physics at the graduate and advanced undergraduate levels. It is offered twice a year, and a student is allowed a maximum of three attempts. The first attempt must occur before the end of the fall quarter of the student's second year, and the examination must be passed by the end of spring quarter of the student's second year.

### Advancement to Ph.D. Candidacy

For advancement to Ph.D. candidacy, a student must pass an oral advancement examination. It is typically taken within one year of successful completion of the comprehensive examination. To satisfy normative progress toward the degree, it must be taken by the end of the student's third year. The candidacy committee that administers this examination will contain one or two faculty members from outside the Department. This oral examination will cover material principally related to the broad and general features of the student's dissertation area.

### Teaching Program

Experience in teaching is an integral part of the graduate program, and all Ph.D. students are required to participate in the teaching program for at least one quarter during their graduate careers. All new teaching assistants are required to enroll in PHYSICS 269 and must pass in order to be allowed to TA in future quarters. Students are required to enroll in PHYSICS 399 while serving as a TA. Lab TAs are required to enroll in PHYSICS 395 as well as PHYSICS 399.

Students who are not citizens from countries where English is either the primary or dominant language as approved by the UCI Graduate Council must pass either the Test of Spoken English (TSE) or the UCI SPEAK (Speaking Proficiency English Assessment Kit) examination. One of these tests must be passed before such a student can qualify for a teaching assistantship in order to fulfill the Department's teaching requirement. The Department expects one of these tests to be passed by the end of the student's second year at UCI.

### Dissertation

A dissertation summarizing the results of original research performed by the student under the supervision of a doctoral committee, appointed by the Department Chair on behalf of the Dean of the Graduate Division and the Graduate Council, will be required for the Ph.D. A criterion for the acceptability of a dissertation by the Department is that it be suitable for publication in a scientific journal. The dissertation must not have been submitted to any other institution prior to its submission to the UCI Physics and Astronomy Department.

**Defense of Dissertation.** Upon completion of the dissertation, the student will take an oral examination, open to the public, before the doctoral committee.

### Concentration in Chemical and Materials Physics

This is an interdisciplinary program between condensed matter physics and physical chemistry, which is designed to eliminate the barrier between these two disciplines. Students with a B.S. in Physics, Chemistry, or Materials Science and Engineering, are encouraged to apply to the program. The goal of the concentration in Chemical and Materials Physics (ChAMP) is to provide students with a broad interdisciplinary education in the applied physical sciences that emphasizes modern laboratory and computational skills. The program accepts students for both the M.S. and the Ph.D. Upon admission to the program, students are assigned two faculty advisors, one from the Department of Physics and Astronomy, and one from the Department of Chemistry, to provide guidance on curriculum and career planning.

The curriculum for the M.S. and Ph.D. programs includes a summer session to assimilate students with different undergraduate backgrounds; formal shop, laboratory, and computational courses; a sequence on current topics to bridge the gap between fundamental principles and applied technology; and a course to develop communication skills. The required courses include 10 core courses and three electives (subject to advisor approval) as follows:

#### Core

A. Complete:

PHYSICS 206	Advanced Data Acquisition and Analysis
PHYSICS 207	Applied Physical Chemistry
PHYSICS 266	Current Topics in Chemical, Applied, and Materials Physics

B. Select one course from the following two Quantum Mechanics courses:

CHEM 231A	Fundamentals of Quantum Mechanics
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PHYSICS 215A	Quantum Mechanics
C. Select one course from the following ChaMP Chemistry courses:	
CHEM 231B	Applications of Quantum Mechanics
CHEM 231C	Molecular Spectroscopy
CHEM 247	Current Problems in Analytical Chemistry
CHEM 263	Materials Chemistry
D. Select one course from the following Statistical Mechanics/Thermodynamics courses:	
CHEM 232A	Thermodynamics and Introduction to Statistical Mechanics
CHEM 232B	Advanced Topics in Statistical Mechanics
PHYSICS 214A	Statistical Physics
E. Select one course from the following Electromagnetism courses:	
PHYSICS 228	Electromagnetism
PHYSICS 213A	Electromagnetic Theory
F. Select one course from the following Computation/Machine Learning courses:	
PHYSICS 229A	Computational Methods
PHYSICS 246	Special Topics in Astrophysics
CHEM 250	Computational Chemistry
G. Select one course from the following Communication courses:	
PHYSICS 273	Technical Communication Skills
PHY SCI 220	Science Communication Skills
PHYSICS 250	Physics and Astronomy Communications Skills
H. Select one course from the following ChaMP Physics courses:	
PHYSICS 133	Introduction to Condensed Matter Physics
PHYSICS 238A	Condensed Matter Physics
PHYSICS 239A	Plasma Physics
<b>Electives</b>	
CHEM 213	Chemical Kinetics
CHEM 225	Polymer Chemistry: Synthesis and Characterization of Polymers
CHEM 232C	Non-Equilibrium Statistical Mechanics
CHEM 233	Nuclear and Radiochemistry
CHEM 243	Advanced Instrumental Analysis
CHEM 248	Electrochemistry
CHEM 249	Analytical Spectroscopy
CHEM 267	Photochemistry
EECS 285B	Lasers and Photonics
ENGRMSE 259	Transmission Electron Microscopy
PHYSICS 134A	Physical and Geometrical Optics
PHYSICS 211	Classical Mechanics
PHYSICS 215B	Quantum Mechanics
PHYSICS 222	Continuum Mechanics
PHYSICS 230A	Biophysics of Molecules and Molecular Machines
PHYSICS 230B	Biophysics of Molecules and Molecular Machines
PHYSICS 233A	Principles of Imaging
PHYSICS 233B	Techniques in Medical Imaging I: X-ray, Nuclear, and NMR Imaging
PHYSICS 238B	Condensed Matter Physics
PHYSICS 238C	Condensed Matter Physics
PHYSICS 239B	Plasma Physics
PHYSICS 239C	Plasma Physics
Electives may be chosen from other courses with the approval of the student's research advisor and ChaMP graduate advisor.	

In addition to the required courses, M.S. students complete a master's thesis. Students are required to advance to candidacy for the master's degree at least one quarter prior to filing the master's thesis. There is no examination associated with this advancement, but the thesis committee needs to be

selected and appropriate forms need to be filed. The M.S. program prepares students to compete for high-tech jobs or to begin research toward a Ph.D. The master's thesis requirement is waived for students who complete the requirements for advancement to Ph.D. candidacy.

Successful completion of the M.S. requirements may qualify students for the Ph.D. program. Progress toward the Ph.D. is assessed by a written comprehensive examination that is typically administered in the summer after completion of the first year of study. This examination covers comprehensive knowledge acquired in course work, and the content of the examination depends upon the student's specific area of interest.

Participants in the Ph.D. program take an examination for formal advancement to candidacy. It is typically taken within one year of successful completion of the comprehensive examination. To satisfy normative progress toward the degree, it must be taken by the end of the student's third year. The examination is comprised of two parts: (a) a written report on a topic to be determined in consultation with the research advisor and (b) an oral report on research accomplished and plans for completion of the Ph.D. dissertation.

## Concentration in Astronomy and Astrophysics

This program is focused on astronomical and astrophysical study and research. The course requirements are matched to excel in these disciplines. Students with a B.S. in Physics, Mathematics, Engineering, or other Physical Sciences are encouraged to apply to the program. The goal of the concentration in Astronomy and Astrophysics (A&A) is to provide students with a broad interdisciplinary education in the astronomical sciences that emphasizes modern computational and data analysis skills. The program accepts students for both the M.S. and the Ph.D. studies.

### Requirements for the M.S.

The curriculum includes traditional astronomical courses; computational and data analysis courses; a research writing course to develop skills related to astronomical research and communication. The students are required to exhibit mastery of key concepts and demonstrate a clear understanding of astrophysical concepts.

#### A. Complete:

PHYSICS 215A	Quantum Mechanics
PHYSICS 213A	Electromagnetic Theory
PHYSICS 240C	Radiative Processes in Astrophysics
PHYSICS 242	Astro Fundamentals
PHYSICS 250	Physics and Astronomy Communications Skills

#### B. Select six courses from the following list of electives, with at least two courses from PHYSICS 240A-PHYSICS 241E:

PHYSICS 211	Classical Mechanics
PHYSICS 214A	Statistical Physics
PHYSICS 215B	Quantum Mechanics
PHYSICS 223	Numerical Methods
PHYSICS 234A	Elementary Particle Physics
PHYSICS 234B	Advanced Elementary Particle Physics
PHYSICS 235A	Quantum Field Theory
PHYSICS 235B	Advanced Quantum Field Theory
PHYSICS 239A	Plasma Physics
PHYSICS 240A	Galactic Astrophysics
PHYSICS 240B	Cosmology
PHYSICS 241A	Solar System and Extrasolar Planets
PHYSICS 241B	Stellar Astrophysics
PHYSICS 241C	Extragalactic Astrophysics
PHYSICS 241D	Early Universe Physics
PHYSICS 255	General Relativity

#### C. Select Option A or Option B below:

##### Option A

Research project and written thesis (three quarters)	
PHYSICS 295	Experimental Research
or PHYSICS 296	Theoretical Research

##### Option B

Comprehensive examination in the astronomy and astrophysics concentration

Three quarters of residence are required.



Students interested in astro-particle physics, theoretical cosmology, and early universe physics are advised to take PHYSICS 215B as the first elective during the winter quarter of first year of study. More advanced electives can be chosen in consultation with the Program Director and/or research advisor.

Students interested in observational astronomy and experimental cosmology are advised to take the astronomy series beginning with either PHYSICS 240A and PHYSICS 241C. More advanced electives can be chosen in consultation with the Program Director and/or research advisor.

### Requirements for the Ph.D.

The principal requirements for the Ph.D. are a minimum of six quarter of residence, passage of a written and an oral examination, and successful completion and defense of a dissertation reporting results of original research. In addition, the Ph.D. candidate must complete certain graduate course requirements. There is no foreign language requirement.

Students who do not have a prior Master's degree (or other equivalent degree) in Physics or Astronomy from UCI or another institution must take a minimum of 11 quarter courses. The required courses include five core courses and six electives as follows:

#### A. Complete:

PHYSICS 215A	Quantum Mechanics
PHYSICS 213A	Electromagnetic Theory
PHYSICS 240C	Radiative Processes in Astrophysics
PHYSICS 242	Astro Fundamentals
PHYSICS 250	Physics and Astronomy Communications Skills

#### B. Select six courses from the following, with at least two courses from PHYSICS 240A-PHYSICS 241E

PHYSICS 211	Classical Mechanics
PHYSICS 214A	Statistical Physics
PHYSICS 215B	Quantum Mechanics
PHYSICS 223	Numerical Methods
PHYSICS 234A	Elementary Particle Physics
PHYSICS 234B	Advanced Elementary Particle Physics
PHYSICS 235A	Quantum Field Theory
PHYSICS 235B	Advanced Quantum Field Theory
PHYSICS 239A	Plasma Physics
PHYSICS 240A	Galactic Astrophysics
PHYSICS 240B	Cosmology
PHYSICS 241A	Solar System and Extrasolar Planets
PHYSICS 241B	Stellar Astrophysics
PHYSICS 241C	Extragalactic Astrophysics
PHYSICS 241D	Early Universe Physics
PHYSICS 255	General Relativity

Three quarters of residence are required. All courses must be passed with a B or better.

Students interested in astroparticle physics, theoretical cosmology, and early universe physics are advised to take PHYSICS 215B as the first elective during the winter quarter of the first year of study. More advanced electives can be chosen in consultation with the Program Director and research advisor.

Students interested in observational astronomy and experimental cosmology are advised to take the astronomy series beginning with either PHYSICS 240A or PHYSICS 241C. More advanced electives can be chosen in consultation with the Program Director and research advisor.

Progress toward the Ph.D. is assessed by a comprehensive examination usually taken during the second year of studies. The comprehensive examination covers broad knowledge in astronomy and astrophysics, based on a written project of a topic in astronomy and astrophysics chosen by the Program Director in consultation with the Departmental Committee on Astrophysics Qualifying Exam, and an oral examination of the written document by a committee.

Participants in the Ph.D. program also take an examination for formal advancement to candidacy. It is typically taken within one year of successful completion of the comprehensive examination. To satisfy normative progress toward the degree, it must be taken by the end of the student's third year. The examination is an oral report on research accomplished and plans for completion of the Ph.D. dissertation.

# School of Social Ecology

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- Centers for Research
- In The Community
- Social Ecology Degrees
- Honors, Awards, and Scholarships

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## Nancy Guerra, Dean

5300 Social & Behavioral Sciences Gateway  
 Undergraduate Student Services: 949-824-6861  
 Graduate Student Services: 949-824-5918  
<http://socialecology.uci.edu/>

The School of Social Ecology is an academic unit committed to solving important social and environmental problems through interdisciplinary, community-engaged scholarship. Just as the field of ecology focuses on the relationships between organisms and their environments, social ecology is concerned with the relationships between humans and their environment. A key premise is that complex problems can only be understood by considering how people impact and are impacted by the multiple contexts they navigate. These contexts include families, schools, social networks, the workplace, culture, communities and the environment.

Faculty and students in the School of Social Ecology apply scientific methods to the study of a wide array of pressing issues. These issues cluster into three primary research hubs: Healthy People and Places; Crime Prevention and Social Justice; and Technology and Human Potential. Specific problems addressed cover a broad range of topics including stress and coping, the effects of trauma on children and adults, healthy aging, flood risk management, poverty alleviation, sustainable cities, juvenile justice and correctional reform, eyewitness testimony, jury decision making, youth violence and delinquency prevention, policing, crime mapping, and the impact of social media on children's lives.

The School is home to three academic departments: Criminology, Law and Society; Urban Planning and Public Policy; and Psychological Science; offers five undergraduate and nine graduate degrees; and has approximately 2700 undergraduate majors, 400 graduate students, 77 faculty, and more than 24,000 alumni. Although faculty are affiliated with an academic department, they are trained in a broad range of disciplines including anthropology, criminology, environmental studies, law, political science, psychology, public policy, sociology, and urban planning. Their research and teaching is distinguished by an emphasis on the integration of the concepts and perspectives from these multiple disciplines. This interdisciplinary focus is based on the School's core belief that the analysis and amelioration of complex societal problems requires coordinated efforts from several disciplines.

The School of Social Ecology is a leader in community-engaged scholarship, not only in Southern California, but around the United States and internationally. Undergraduates are afforded opportunities to engage in laboratory-based learning as well as field-based learning through the School's well-established and highly regarded Field Study Program that includes local, regional, national and international placement opportunities. Graduate training in the School of Social Ecology is organized around the study of contemporary problems and their solutions in the social and physical environment. Emphasis is placed upon theory and research that have implications for policy and intervention. Graduate students work closely with faculty in the classroom, in laboratories, and in the field on important projects that enhance their research skills while advancing knowledge and finding solutions to important societal problems.

## Research Facilities

Social Ecology I and II and the nearby Social & Behavioral Sciences Gateway building are wireless environments that feature experimental research facilities for studying social phenomena such as parent-child interaction, prosocial behavior, memory functions, stress and health, social support processes, and mock jury discussions. The School also operates wet laboratory facilities to support innovative research in the field of salivary bioscience, as well as behavioral assessment laboratories. Students take advantage of up-to-date computing facilities and assistance to ensure that their skills prepare them for either advanced study or for the changing needs of today's workplace.

## Centers for Research

The **Institute for Interdisciplinary Salivary Bioscience Research (IISBR)** pushes the cutting edge of knowledge related to the discovery and application of oral fluid (saliva) as a research and diagnostic specimen. Specific aims are to: (a) incorporate the measurement of indicators found in oral fluids into research—developmental, social, behavioral, health, clinical, prevention, and rehabilitative sciences—and determine whether understanding in those areas can be advanced using unique, minimally invasive measurements of biological systems through saliva; (b) open windows of opportunity for researchers in economics, psychology, sociology, anthropology, gerontology, nursing, social work, preventive medicine, medicine, occupational science, sports medicine, psychiatry, and neuroscience among others, and (c) serve as a world stage for investigators to meet, discuss, and refine their ideas

about the role of saliva as a research and diagnostic specimen. Researchers from universities and institutions across the country and internationally collaborate with IISBR. More information is available at the Institute for Interdisciplinary Salivary Bioscience Research website (<https://iisbr.uci.edu/>).

The **Center for Evidence-Based Corrections (CEBC)** has administered millions of dollars in state-funded research on juvenile and adult correctional programs, including research on rehabilitation, parole and reentry programs, monitoring of sex offenders, and correctional options for female offenders. CEBC, which consists primarily of Criminology, Law and Society faculty, is a nexus for policy-oriented research and graduate training. CEBC is also developing close ties with UCI's School of Law. More information is available at the Center for Evidence-Based Corrections website (<http://ucicorrections.seweb.uci.edu/>).

The **Blum Center for Poverty Alleviation** was founded as part of a system-wide consortium that began with the Blum Center for Developing Economies at UC Berkeley, and now includes all ten of the University of California campuses. This federation of Blum Centers is united by the idea that world-class universities must play a leadership role in tackling the world's most daunting challenge – poverty. UCI's Blum Center undertakes collaborative interdisciplinary research focused on understanding and alleviating the contemporary challenges of low-resource communities. It also has developed innovative courses to introduce students to the many dimensions of poverty in the 21st century and to provide them with opportunities to make meaningful contributions to alleviating poverty at home and abroad. The School of Social Ecology works collaboratively with the UCI Division of Teaching & Learning to support Blum Center activities. More information is available at the UCI Blum Center website (<http://blumcenter.uci.edu/>).

The **Newkirk Center for Science and Society** develops and shares research knowledge with the public and policymakers so they can make informed decisions on vital policy issues of law, education, environment, health care, crime, and public infrastructure. The Center carries out its mission in several ways: through workshops, colloquia, town hall meetings, distinguished visitors, and communication programs. One area in which the interests of several faculty members overlap with the focus of the Newkirk Center relates to expert testimony and, more broadly, the use (and misuse) of science in legal proceedings. More information is available at the Newkirk Center for Science and Society website (<http://newkirkcenter.uci.edu/>).

The **Center for Psychology and Law (CPL)** draws together faculty from the Department of Criminology, Law and Society and the Department of Psychological Science. UC Irvine is one of the world's leading centers for research in the field of psychology and law. The Center's primary goals are to foster collaboration and communication among academics, legal professionals, policy makers, and the general public, and to address areas of inquiry where social sciences and legal systems intersect. CPL's mission is to bridge the gap between scientific evidence and public policy. More information is available at the Center for Psychology and Law website (<http://psychlaw.soceco.uci.edu/>).

The **Center in Law, Society and Culture (CLSC)** brings together faculty in the Schools of Social Ecology, Social Sciences, and Humanities who share an interest in the role of social, cultural, and historical factors in the development of law and the importance of social and cultural assumptions in understanding and interpreting law. Law and culture has emerged as an exciting area of legal scholarship and UC Irvine has significant strength in this area. More information is available at the Center in Law, Society, and Culture website (<http://clsc.soceco.uci.edu/>).

**Water UCI** serves as a coordinating vehicle to facilitate seamless collaboration across schools, departments, and existing research centers around questions of fundamental and applied water science, technology, management, and policy. Water UCI builds on existing campus-wide strengths by affording a plan for responding to the many "grand challenges" facing water resources, and for which UCI is well-equipped. More information is available at the Water UCI website (<http://water.uci.edu/>).

## In the Community

**UCI Engage** embodies our campus commitment to being a great partner by supporting campus-community partnerships that align the resources and expertise of our world-class university with the knowledge and strengths of our local communities. It serves as a campuswide hub to support, amplify, and celebrate civic and community engagement and to foster partnerships that are collaborative, empowering, and transformative. Core activities include coordinating and communicating campus engagement activities on- and off-campus, building capacity among campus and community partners to fuel meaningful engagement, and supporting and fostering emerging collaborations. More information is available at the UCI Engage website (<https://engage.uci.edu/>).

The School of Social Ecology was the first school on campus to require community engagement as a key component of undergraduate education through its signature **Field Study** program. Through direct participation in a community organization, Field Study students develop their communication, critical thinking, analytical, methodological, professional, technological, and interpersonal skills. These tools prepare students to be the leaders of tomorrow as they tackle the pressing issues confronting business and community leaders locally, regionally, nationally, and globally. The **Field Study** requirement for students seeking a baccalaureate degree from the School of Social Ecology or in Environmental Science and Policy (ENSP) may be fulfilled in a number of ways including: Traditional Field Study (SOCECOL 195), Field Study Writing Seminar (SOCECOL 195W), a year-long Advanced Field Study (SOCECOL 195A-SOCECOL 195B-SOCECOL 195CW), the UC Capital Intern Programs in Sacramento and Washington DC, and the Blum Center/Living Peace/Social Ecology Global Service Scholars (GSS) program (PSCI 192B, SOCECOL 189 along with an summer international service trip). *Important note for ENSP students: The GSS program is not an option for satisfying the Field Study requirement for ENSP majors. If ENSP students are interested in the program, they are strongly encouraged to meet with an academic counselor to incorporate the program into their academic plan.* More information is available at the Field Study Program website (<https://fieldstudy.soceco.uci.edu/>).

The **Metropolitan Futures Initiative (MFI)** aims to develop an improved understanding of communities and their potential for integrative and collaborative planning and action to ensure a bright future for the region. With initial focus on Orange County and its location within the larger Southern California area, the MFI is a commitment to build communities that are economically vibrant, environmentally sustainable, and socially just by partnering

Social Ecology's world-class, boundary-crossing scholarship with expertise throughout Southern California. More information is available at the Metropolitan Futures Initiative site (<http://socialecology.uci.edu/mfi/>).

## Honors, Awards, and Scholarships

### Social Ecology Honors Program

The Social Ecology Honors Program provides the opportunity for selected School of Social Ecology students to pursue advanced independent study. Students may apply in the spring quarter of their junior year. In order to be considered, a student must have satisfied the following requirements: completion of all lower-division Social Ecology courses required for the major; completion of at least five upper-division Social Ecology courses with a grade point average of at least 3.5 in these courses; and achievement of an overall grade point average at UCI of at least 3.2. Acceptance into the program is based upon evidence of the student's ability, interest in research, proposed thesis project and support from a faculty mentor. Successful completion of the program requires three quarters, including supervised independent work on a thesis research project (SOCECOL H190A-SOCECOL H190B) and written and oral presentation of an honors thesis (SOCECOL H190W).

### Excellence in Research in Social Ecology

High-achieving students majoring in the School of Social Ecology can earn Excellence in Research in Social Ecology by participating in a two-part program consisting of faculty-supervised research in the junior and senior years and courses in methodology and statistics. To be eligible for the program, students must have earned an overall 3.2 UC GPA in their junior year, with grades of B or above in the required methodology and statistics courses (SOCECOL 10, SOCECOL 13, SOCECOL 111W, and SOCECOL 190). Students will work with a faculty mentor during at least one quarter by the end of their junior year in PSCI 196 or SOCECOL 198 or SOCECOL 199. Successful completion of the program also requires faculty-mentored Honors research (SOCECOL H190A-SOCECOL H190B) and completion of a senior research thesis or a report at a research conference (SOCECOL H190W). Students who have successfully completed all requirements may submit applications for the Excellence in Research in Social Ecology distinction in the spring quarter of their senior year.

**Graduation with Latin Honors.** Latin Honors at graduation will be awarded to approximately 16 percent of the graduating seniors based on units completed and GPA. To be eligible, students must have completed at least 72 units at a UC campus by the end of the final quarter prior to graduation. Approximately 2 percent of all majors will graduate summa cum laude, 4 percent magna cum laude, and 10 percent cum laude. The student's cumulative record at the end of the final quarter is the basis for consideration for awarding Latin Honors. For more information about Latin Honors criteria contact the Social Ecology Student Services Office at 949-824-6861 or visit the Social Ecology website (<http://students.soceco.uci.edu/pages/frequently-asked-questions-faqs/>). Other important factors are also considered and can be reviewed at Honors Recognition.

**Dean's Honor List.** Quarterly recognition for students who earned a 3.5 grade point average while carrying a minimum of 12 graded units. Quarterly recognition is noted on the student's transcript.

**Dean's Award for Community Engagement.** This award recognizes highly-engaged students who demonstrate both scholarly achievement and community service participation.

**Fudge Family Foundation Scholarship.** Two scholarships are awarded to outstanding students who have a strong academic record and who have established financial need because they are self-supporting or have other personal hardships that would make it difficult for them to complete their studies without this assistance.

**School Awards.** The School of Social Ecology recognizes the most outstanding undergraduate and graduate students for their academic achievements, contributions to the School, and service to the campus and community.

**Excellence in Undergraduate Research Award in Honor of Gilbert Geis.** This award encourages and supports undergraduate students who excel in research related to Criminology, Law and Society.

**Michelle Smith Pontell Memorial Fellowship.** This award is given annually to a graduate student in the Department of Criminology, Law and Society for excellence in both research and course work.

**Excellence in Field Study.** This award recognizes students who have gone above and beyond in their field study placements or who have completed an exceptional academic project as part of their field study.

**Dean's Award for Exceptional Achievement in Field Study.** This award recognizes the top one or two students who made exceptional contributions to their field study community partner and excelled in the field study course.

**Strauss Scholarship.** This scholarship is awarded to an outstanding junior who has been active in service and is planning for a career in public service.

- Department of Criminology, Law and Society
- Department of Psychological Science
- Department of Urban Planning and Public Policy

## Requirements for the Bachelor's Degree

All students must meet the University Requirements.

### School Requirements

A. Basic knowledge and fundamental concepts of the core disciplines in Social Ecology. This requirement is met by taking an introductory course from each of the disciplines below, three courses total.

1. Criminology, Law and Society - complete:

CRM/LAW C7	Introduction to Criminology, Law and Society
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2. Psychological Science - select one from the following:

PSCI 9	Introduction to Psychology
PSCI 11B	Psychology Fundamentals
PSCI 11C	Psychology Fundamentals

3. Urban Planning and Public Policy - select one from the following:

UPPP 4	Introduction to Urban Studies
UPPP 5	Introduction to Urban Planning and Policy
UPPP 8	Introduction to Environmental Analysis and Design

B. An understanding of fundamental concepts, analytical tools, and methods of Social Ecology - complete:

SOCECOL 10	Research Design <sup>1</sup>
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SOCECOL 13	Statistical Analysis in Social Ecology <sup>2</sup>
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C. An understanding of the complex and multifaceted perspectives and approaches to examining social issues where they occur, coupled with developing interpersonal and professional skills. This is satisfied through completing a minimum of 4 units (100 hours) of field study. Students may select to fulfill this requirement through one of the following:

SOCECOL 195	Field Study
SOCECOL 195W	Field Study Writing Seminar
SOCECOL 195B	Advanced Field Study
SOCECOL 195CW	Advanced Field Study
PUBHLTH 195W	Public Health Practicum and Culminating Experience
UC Washington, D.C. (UCDC) Academic Internship Program (see Field Study website for more information. Specific coursework required)	
UC Center Sacramento Academic Internship Program (see Field Study website for more information. Specific coursework required)	
PSCI 192B-SOCECOL 189	The Science and Practice of Compassion and Global Service Scholars Advanced Seminar (plus confirmed 100 hours of international service)

E. One additional upper-division course

One additional upper-division course (four units) chosen from any department in the School of Social Ecology or an additional four units of SOCECOL 195 or SOCECOL 195W, SOCECOL 195B and SOCECOL 195CW. <sup>3</sup>

<sup>1</sup> The following course is an approved alternative for SOCECOL 10: EDUC 10.

<sup>2</sup> The following statistic courses are approved alternatives for SOCECOL 13: EDUC 15, STATS 7, STATS 8, STATS 67, ENGRCEE 11, MGMT 7, PUBHLTH 7B, ANTHRO 10C, ECON 15B, POL SCI 10C, PSYCH 10C, SOC SCI 10C, SOCIOL 10C.

<sup>3</sup> SOCECOL 198 and SOCECOL 199 may not be used to fulfill this requirement.

### School requirements for Psychological Science majors:

A. Basic knowledge and fundamental concepts of the core disciplines in Social Ecology. This requirement is met by taking an introductory course from each of the disciplines below, three courses total.

1. Criminology, Law and Society - complete:

CRM/LAW C7	Introduction to Criminology, Law and Society
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2. Urban Planning and Public Policy - select one of the following:

UPPP 4	Introduction to Urban Studies
UPPP 5	Introduction to Urban Planning and Policy
UPPP 8	Introduction to Environmental Analysis and Design

B. An understanding of fundamental concepts, analytical tools, and methods of Social Ecology. Two courses total:

SOCECOL 10	Research Design <sup>4</sup>
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SOCECOL 13	Statistical Analysis in Social Ecology <sup>5</sup>
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C. An understanding of the complex and multifaceted perspectives and approaches to examining social issues where they occur, coupled with developing interpersonal and professional skills. This is satisfied through completing a minimum of 4 units (100 hours) of field study. Students may select to fulfill this requirement through one of the following:

SOCECOL 195	Field Study (four units)
SOCECOL 195W	Field Study Writing Seminar
SOCECOL 195B	Advanced Field Study
SOCECOL 195CW	Advanced Field Study
PUBHLTH 195W	Public Health Practicum and Culminating Experience
UC Washington, D.C. (UCDC) Academic Internship Program (see Field Study website for more information. Specific coursework required)	
UC Center Sacramento Academic Internship Program (see Field Study website for more information. Specific coursework required)	
PSCI 192B-SOCECOL 189	The Science and Practice of Compassion and Global Service Scholars Advanced Seminar (plus confirmed 100 hours of international service)

<sup>4</sup> The following course is an approved alternative for SOCECOL 10: EDUC 10.

<sup>5</sup> The following statistic courses are approved alternatives for SOCECOL 13: EDUC 15, STATS 7, STATS 8, STATS 67, ENGRCEE 11, MGMT 7, PUBHLTH 7B, ANTHRO 10C, ECON 15B, POL SCI 10C, PSYCH 10C, SOC SCI 10C, SOCIOL 10C.

### Departmental Requirements: Refer to individual departments.

#### Grade Requirement

A minimum grade average of at least C (2.0) is required (1) overall; (2) in all courses required for the major program, including the School requirements; and (3) in the upper-division courses required for the major.

#### Overlap Restrictions

**Double Majors.** In order to double major within the School of Social Ecology, major requirements must be met for both majors without any overlap of upper-division courses.

**Other Double Majors.** In fulfilling degree requirements for multiple majors, a maximum of two courses may overlap between any two majors.

**Major and Minor Requirements:** In fulfilling minor requirements, a maximum of two courses may overlap between a major and a minor. No course overlap is permitted between minors.

- Criminology, Law and Society, B.A.
- Criminology, Law and Society, Master of Advanced Study
- Criminology, Law and Society, Minor
- Criminology, Law and Society, Ph.D.
- Master of Legal and Forensic Psychology
- Master of Public Policy
- Master of Urban and Regional Planning
- Psychological Science, B.A.
- Psychological Science, Minor
- Psychological Science, Ph.D.
- Race and Justice Studies, Graduate Emphasis
- Social Ecology, B.A.
- Social Ecology, Minor
- Social Ecology, Ph.D.
- Urban and Environmental Planning and Policy, Ph.D.
- Urban and Regional Planning, Minor
- Urban Studies, B.A.
- Urban Studies, Minor

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- Career Opportunities
- Field Study
- Advanced Field Study
- Planning a Program of Study



- Additional Curricular Options
  - Campuswide Honors Collegium
  - School of Education
  - UC Education Abroad Program
  - Interdisciplinary Minors

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## Undergraduate Program

The School of Social Ecology offers either a general interdisciplinary degree in Social Ecology or a more focused course of study through degree programs in Criminology, Law and Society; Environmental Science and Policy; Psychological Science; and Urban Studies.

**Change of Major.** Students who wish to change their major to one offered by the School should contact the Social Ecology Undergraduate Advising Office for information about change-of-major requirements, procedures and policies. Information is also available at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu>).

## Career Opportunities

Graduates of the School of Social Ecology bring a distinctive interdisciplinary perspective to the job market. Students graduate with a wealth of knowledge as well as marketable skills in communication, leadership, critical-thinking, and problem-solving. The School provides an excellent foundation for those students who seek jobs in social services, planning departments, mental health settings, educational institutions, and a variety of community and governmental agencies. Many Social Ecology students find that their interdisciplinary training also is useful for careers in public management, law, consulting, and business.

Through its dynamic courses and signature Field Study program, the School of Social Ecology provides useful preparation for students who wish to apply to graduate and professional schools and programs of law, public policy/public administration, public health, social work, psychology, sociology, criminology, sociolegal studies, environmental studies, and urban planning.

The Division of Career Pathways provides services to students and alumni including career counseling, information about job opportunities, a career library and workshops on resume preparation, job search, and interview techniques.

## Field Study

Field Study is the signature program of the School of Social Ecology. All majors within the School, along with Environmental Science and Policy majors, participate in the program, which is designed to provide students with the opportunity to examine social problems first-hand and apply theories and empirical findings learned in courses, effectively serving our communities and enhancing the value of their education. The Field Study program is a unique experiential learning program and a key element of the School's commitment to fostering civic engagement and training future leaders.

Field Study promotes community engagement to facilitate civic education through field research experience, social intervention and professionalization. This aim is based on evidence that learning is maximized when it is active, when students are engaged and when theories and research are informed by their application to "real world" problems and solutions. Students reflect on how to apply what they have learned in their courses to address societal and global challenges in a seminar led by ladder rank faculty. At the same time, through placements with one or more of the School's 225-plus community partners, students gain pre-professional experience and develop their resume along with their academic and research skills. The settings provided for field study include a wide range of problem-oriented institutions and agencies in the non/not for-profit, public and private sectors.

Within Social Ecology, students may pursue one of three options to meet the Field Study requirement: Field Study (traditional/quarterly), Field Study Writing Seminar (quarterly/also fulfills upper division writing), Advanced Field Study (full academic year), or Global Service Scholars (two academic courses, followed by a global service trip). Environmental Science and Policy majors may choose from either Field Study (traditional/quarterly), Field Study Writing Seminar (quarterly/also fulfills upper division writing), or Advanced Field Study (full academic year)

**Traditional Field Study.** In SOCECOL 195, students participate in day-to-day activities with a community partner selected from those listed and approved by the School of Social Ecology. Students have the opportunity to participate in the ongoing activities of an organization and develop personal, professional, and technical competencies. While completing their 100 hours at a community-based placement, students meet in a small group seminar with a faculty member to discuss the issues in the field and to develop a project to apply and hone their scholarship. Students may opt to fulfill upper-division writing through taking SOCECOL 195W, similar to SOCECOL 195, but with a strong emphasis on developing writing skills.

**Advanced Field Study** ( (<http://catalogue.uci.edu/search/?P=SOCECOL%20195A>)SOCECOL 195A, SOCECOL 195B, SOCECOL 195CW) provides a select number of School of Social Ecology students and Environmental Science and Policy major juniors and seniors with a deeper engaged learning experience over the course of an academic year (three quarters, October - June). During this time they are placed with an agency for 10 hours/week. In addition to working with their agency on day-to-day services and operations, they also engage in variety of activities in collaboration with their agency. These may include conducting research that enhances the work of the organization, developing new activities or programs, working intensively with clients, engaging in outreach and community organization, participating in organizational development and advancement efforts, and more. The third quarter of the AFS year is designated as satisfying the UCI upper division writing requirement for undergraduates. With that in mind, students will, in addition to the work they do with their community partner, produce an analytical and reflective paper that distills the lessons they have learned from their



community placement and, in the process, hones and deepens their writing skills. Students whose work includes original research may be selected to share their work at the UCI Undergraduate Research Symposium held during the spring quarter.

**Global Service Scholars:** Building upon the Field Study program, this multi-part program offers students a unique opportunity to make a difference in the world by learning to approach issues with empathy and compassion. Through classroom work (PSCI 192B and SOCECOL 189) and a service trip abroad, students tackle poverty problems and bring their ingenuity to those in need. When they return to campus, they share their experience through participating in the classroom portion of field study. Funding for this program is provided in large part by the Living Peace Foundation and the UCI Blum Center for Poverty Alleviation. To keep the costs neutral for students, additional funds may be available, based on financial need, to cover airfare, housing expenses and program fees. Not approved for Environmental Science and Policy (ENSP). ENSP students interested in Global Service Scholars are encouraged to meet with an advisor on the field study team to discuss further.

In addition to the school-sponsored programs, students may fulfill the field study requirement through participation in one of the following programs: Public Health Practicum, UCDC Summer and Academic Internship Programs, UC Sacramento Summer and Academic Internship Programs. Students pursuing these programs should seek advising prior to enrolling in the programs.

Field Study embodies the School's commitment to engaged scholarship, developing interdisciplinary approaches to social problems, and improving and making positive and lasting contributions to communities. Unlisted or inappropriate placements, as well as those that could give the appearance of nepotism or preferential treatment, will not be approved. Departmental approval for field study will be determined by the Field Study Director. Further information, including field study sign-up procedures and prerequisites, program applications, and placement opportunities is available at the Field Study Program website (<http://fieldstudy.soceco.uci.edu/>).

## Planning a Program of Study

Because there are many alternative ways to plan a program, some of which may require careful attention to specific major requirements, students should consult with the Social Ecology Undergraduate Advising Office, 143 Social Ecology I, to design an appropriate program of study.

Students who elect one of the majors in the School of Social Ecology in their freshman year might begin by taking the introductory courses required by their major. It is a good idea to take these courses early because they include fundamental concepts that are widely applicable in more advanced courses. In addition, the lower-division writing requirement of the general education requirement (category I) should be completed during the first year. In the sophomore year, the student might complete three courses toward the general education requirement, four courses in their major, and four electives. Students who are planning to go on to graduate school can use their freshman and sophomore years to advantage by taking courses in theory, research methods, statistics and other areas important to graduate study. In the junior and senior years, the student should take courses in the major area and should create an individualized program of study through a combination of courses and course modules that fall in an area of interest. Particular attention should be paid to planning a program of study that will ensure that major requirements are met prior to graduation. In the plan, students should include core courses for their major in their junior or early in their senior year. Students should fully familiarize themselves with the Field Study requirements and options by the middle of their junior year to position themselves to find an opportunity that is best suited to them. Students are encouraged to consider one of the many options for enriching their education through intensive involvement in research and/or community engagement through, for example, the Social Ecology Honors, Excellence in Research, and Field Study Programs.

## Additional Curricular Options

Students in the School of Social Ecology may combine their course work with the following University programs and should consult an academic counselor for further information.

### Campuswide Honors Collegium

The Campuswide Honors Collegium is available to selected high-achieving students from all academic majors from their freshman through senior years. For more information contact the Campuswide Honors Collegium, 1200 Student Services II; 949-824-5461; [honors@uci.edu](mailto:honors@uci.edu); or visit the Campuswide Honors Collegium website (<http://www.honors.uci.edu/>).

### School of Education

Students who plan to obtain a teaching credential or a higher degree in the field of education should consult with counselors in the UCI School of Education early in their college career. Students completing a degree program in the School of Social Ecology may qualify for a waiver of the Single Subject Credential Examination. For additional information about teaching credentials, refer to the School of Education section.

### UC Education Abroad Program

Upper-division students have the opportunity to experience a different culture while making progress toward degree objectives through the UC Education Abroad Program (EAP). UCEAP is an overseas study program which operates in cooperation with host universities and colleges in countries throughout the world. Visit the Study Abroad Program website (<http://www.studyabroad.uci.edu/>) for additional information.

### Interdisciplinary Minors

These minors are available to all UCI students. Information is available in other sections of the *Catalogue*, as noted.

The **minor in Civic and Community Engagement** seeks to provide students with the knowledge, skills, attitudes and values to engage as citizens and active community members in the 21st century. The minor is distinguished both by *what* students learn, and by *how* they learn it. See the Interdisciplinary Studies section for information.

The **minor in Global Sustainability** trains students to understand the changes that need to be made in order for the human population to live in a sustainable relationship with the resources available on this planet. See the Interdisciplinary Studies section for information.

The **minor in Native American Studies** is an interdisciplinary, interschool program which focuses on history, culture, religion and the environment. See the Interdisciplinary Studies section for information.

## Graduate Programs

Graduate training is organized around the strengths of the School of Social Ecology's individual departments (Criminology, Law and Society; Psychological Science; Urban Planning and Public Policy). The graduate curriculum in Social Ecology is distinguished by its interdisciplinary orientation both within and between departments. Students are trained to integrate the knowledge offered by traditional academic fields in order to examine important social, legal, and environmental problems from a perspective of breadth as well as depth. Faculty and graduate students share a commitment to study contemporary problems in the social and physical environments and to pursue empirically-based solutions to these problems. Problems and solutions are investigated from the complementary perspectives of a multidisciplinary faculty that include specialists in social, developmental, clinical, health, and cross-cultural psychology; emotion and memory; urban and regional planning, public policy, environmental planning, design, and sustainability; law and society; criminology; criminal justice policy, and race, social inequality, and justice.

The School offers five master's degree programs. Master's degrees include; the online Master of Advanced Studies (M.A.S.) in Criminology, Law and Society; the online Master of Legal and Forensic Psychology (M.L.F.P.); the Master of Public Policy (M.P.P.), and the accredited Master of Urban and Regional Planning (M.U.R.P.). In addition, many students in our doctoral programs obtain an M.A. in Social Ecology on the way to their Ph.D. The School also offers four Ph.D. degree programs. Doctoral students have the opportunity to earn a Ph.D. in Criminology, Law and Society; Ph.D. in Psychological Science; or a Ph.D. in Urban and Environmental Planning and Policy. Our fourth doctoral program, Ph.D. in Social Ecology-Core, emphasizes interdisciplinarity and encourages students to pursue an individualized course of study.

Social Ecology faculty members apply diverse methods of scientific inquiry to study social, behavioral, and environmental problems. Evaluation research, legal research, questionnaire and survey methods, field research, naturalistic observation, physiological measures, and quasi-experimental techniques receive emphasis along with behavioral laboratory experimentation. Collaborative research with faculty members across the university is an important component of graduate education in the School.

## Admission

To be considered for one of our graduate programs, students should submit their complete application file by the deadline listed on the UCI Graduate Division Admissions website: <https://grad.uci.edu/academics/degree-programs/index.php> (<https://grad.uci.edu/academics/degree-programs/>). For a full description of application requirements and updated deadlines, please refer to the specific program website, which can be found here: <https://grads.soceco.uci.edu>.

## Faculty

Richard Arum, Ph.D. University of California, Berkeley, *Dean of the School of Education and Professor of Education; Criminology, Law and Society; Sociology*

Drew Bailey, Ph.D. University of Missouri, *Associate Professor of Education; Cognitive Sciences; Psychological Science*

Victoria Basolo, Ph.D. University of North Carolina at Chapel Hill, *Professor of Urban Planning and Public Policy*

Hillary Berk, Ph.D. University of California, Berkeley, *Assistant Professor of Teaching of Criminology, Law and Society* (sociology of law/law and society, gender, family, reproduction and surrogacy, law and emotion, civil rights, dispute resolution)

Arnold Binder, Ph.D. Stanford University, *Professor Emeritus of Criminology, Law and Society* (research methodology, juvenile delinquency, police organization and methods)

Scott A. Bollens, Ph.D. University of North Carolina at Chapel Hill, *Drew, Chace and Erin Warmington Chair in the Social Ecology of Peace and International Cooperation and Professor of Urban Planning and Public Policy*

Jessica Borelli, Ph.D. Yale University, *Associate Professor of Psychological Science* (developmental psychopathology, attachment, emotion, prevention on mental health problems in children and adolescents)

Graeme T. Boushey, Ph.D. University of Washington, *Associate Professor of Political Science; Urban Planning and Public Policy* (California politics and statewide elections, American politics, state and federal policy-making, ballot measures and the initiative process)

Tim-Allen Bruckner, Ph.D. University of California, Berkeley, *Associate Professor of Program in Public Health; Urban Planning and Public Policy*

Jan K. Brueckner, Ph.D. Stanford University, *Distinguished Professor of Economics; Urban Planning and Public Policy*

Lee Cabatingan, Ph.D. University of Chicago, *Assistant Professor of Criminology, Law and Society; Anthropology* (Caribbean law and sovereignty; construction of authority at the Caribbean Court of Justice)

Lawrence F. Cahill, Ph.D. University of California, Irvine, *Professor of Neurobiology and Behavior; Psychological Science*

Kitty C. Calavita, Ph.D. University of Delaware, *Professor Emerita of Criminology, Law and Society* (sociology of law, criminology, social deviance, immigration, inequality)

Belinda Campos, Ph.D. University of California, Berkeley, *Associate Professor of Chicano/Latino Studies; Family Medicine; Psychological Science* (culture, relationships, positive emotion, health)

Elizabeth E. Cauffman, Ph.D. Temple University, *Professor of Psychological Science; Criminology, Law and Society; Education; School of Law* (adolescent development, mental health, juvenile justice, legal and social policy)

Susan T. Charles, Ph.D. University of Southern California, *Department Chair and Professor of Psychological Science* (emotional processes across the adult life span, subjective experience and cognitive processes, health and emotion)

Chuansheng Chen, Ph.D. University of Michigan, *UCI Chancellor's Professor of Psychological Science; Education* (cross-cultural psychology, adolescent development, cognitive neuroscience, genes and behavior)

Kenneth S. Chew, Ph.D. University of California, Berkeley, *Professor of Teaching of Urban Planning and Public Policy*

Damon Clark, Ph.D. Oxford University, *Associate Professor of Economics; Urban Planning and Public Policy*

Simon A. Cole, Ph.D. Cornell University, *Professor of Criminology, Law and Society; History; School of Law* (science, technology, law, criminal justice)

Ross F. Conner, Ph.D. Northwestern University, *Professor Emeritus of Urban Planning and Public Policy*

William J. Cooper, Ph.D. University of Miami, *Professor Emeritus of Civil and Environmental Engineering; Urban Planning and Public Policy* (environmental chemistry, advanced oxidation processes for water treatment, aquatic photochemistry of carbon cycling)

N. Edward Coulson, Ph.D. University of California, San Diego, *Professor of Paul Merage School of Business; Economics; Psychological Science*

Susan B. Coutin, Ph.D. Stanford University, *Professor of Criminology, Law and Society; Anthropology; Religious Studies* (law, culture, immigration, human rights, citizenship, political activism, Central America)

Thomas J. Crawford, Ph.D. Harvard University, *Professor of Teaching Emeritus of Psychological Science* (attitude theory and social problems research)

Elliott P. Currie, Ph.D. University of California, Berkeley, *Professor of Criminology, Law and Society* (criminal justice policy in the U.S. and other countries, causes of violent crime, social context of delinquency and youth violence, etiology of drug abuse and assessment of drug policy, race and criminal justice)

Teresa A. Dalton, Ph.D. University of Denver, *Associate Professor of Teaching of Criminology, Law and Society* (quantitative methodology, criminology, law and social sciences)

Eve Darian-Smith, Ph.D. University of Chicago, *Department Chair and Professor of Global and International Studies; Anthropology; Criminology, Law and Society*

Amy Dent, Ph.D. Duke University, *Assistant Professor of Teaching of Psychological Science* (meta- analysis, academic context and consequences of self-regulation, educational and developmental psychology of academic learning)

Joseph DiMento, Ph.D. University of Michigan, *Professor of School of Law; Criminology, Law and Society; Paul Merage School of Business; Urban Planning and Public Policy*

Peter H. Ditto, Ph.D. Princeton University, *Professor of Psychological Science* (social psychology, judgment and decision making, political and moral reasoning)

John D. Dombrink, Ph.D. University of California, Berkeley, *Professor Emeritus of Criminology, Law and Society* (crime and criminal justice, deviance and social control)

C. David Dooley, Ph.D. University of California, Los Angeles, *Professor Emeritus of Psychological Science* (community psychology, epidemiology, economic change)

Greg Duncan, Ph.D. University of Michigan, *UCI Distinguished Professor of Education; Economics; Psychological Science* (economics of education, program evaluation, child development)

Jacquelynne S. Eccles, Ph.D. University of California, Los Angeles, *UCI Distinguished Professor of Education; Psychological Science* (academic motivation and achievement, school and family influences on adolescent development, gender and ethnicity in STEM fields)

David Feldman, Ph.D. University of Missouri-Columbia, *Professor of Urban Planning and Public Policy; Political Science*

Martha S. Feldman, Ph.D. Stanford University, *Roger W. and Janice M. Johnson Chair in Civic Governance and Public Management and Professor of Urban Planning and Public Policy; Paul Merage School of Business; Sociology* (organization theory and behavior, stability and change in organizations, decision-making and information processing, public management, qualitative research methods)

Michelle A. Fortier, Ph.D. University of Nebraska Lincoln, *Associate Professor of Nursing; Nursing; Psychological Science*

Ajay Garde, Ph.D. University of Southern California, *Associate Professor of Urban Planning and Public Policy*

Howard A. Gillman, Ph.D. University of California, Los Angeles, *Chancellor and Professor of Political Science; Criminology, Law and Society; History; School of Law*

David Theo Goldberg, Ph.D. The Graduate Center, City University of New York, *Director of the UC Humanities Research Institute and Professor of Comparative Literature; Anthropology; Criminology, Law and Society* (race, racism, race and the law, political theory, South Africa, digital humanities)

Wendy A. Goldberg, Ph.D. University of Michigan, *Professor Emerita of Psychological Science; Education* (developmental psychology, work and family, infant sleep, transition to parenthood, autism)

Brandon Golob, Ph.D. University of Southern California, *Assistant Professor of Teaching of Criminology, Law and Society* (law-related educational programs; social media and online privacy; inclusive pedagogy; media effects; law and popular culture)

Michele B. Goodwin, J.D. Boston College, *Director, Center for Biotechnology and Global Health Policy and UCI's Chancellor's Professor of School of Law; Criminology, Law and Society; Gender and Sexuality Studies; Program in Public Health*

Michael R. Gottfredson, Ph.D. University at Albany, State University of New York, *Chancellor's Professor of Criminology, Law and Society; School of Law; Sociology* (criminology, juvenile delinquency, crime theory, public policy)

Douglas A. Granger, Ph.D. University of California, Irvine, *Director of the Institute for Interdisciplinary Salivary Bioscience and Professor of Psychological Science* (psychoneuroendocrinology, salivary bioscience, hormone-behavior relationships across the lifespan, in high- and low-risk populations)

Ellen Greenberger, Ph.D. Harvard University, *Professor Emerita of Psychological Science* (developmental psychology, social and cultural influences on adolescent and young adult development, family relationships and consequences throughout the lifespan)

Nancy Guerra, Ed.D. Harvard University, *Dean of the School of Social Ecology and Professor of Psychological Science; Criminology, Law and Society* (children's aggression and behavior problems, prevention of youth violence, promotion of healthy youth development)

Sora Han, Ph.D. University of California, Santa Cruz, *Director of the Graduate Program in Culture and Theory and Associate Professor of Criminology, Law and Society; African American Studies; Culture and Theory; School of Law* (law and popular culture, critical race theory, philosophies of punishment, feminism and psychoanalysis)

Jutta Heckhausen, Ph.D. University of Strathclyde, *Professor of Psychological Science; Education* (life-span developmental psychology, motivation, individual agency and social context)

John R. Hipp, Ph.D. University of North Carolina at Chapel Hill, *Professor of Criminology, Law and Society; Sociology; Urban Planning and Public Policy* (community context of crime, household decisions and neighborhood change, research methods)

Douglas Houston, Ph.D. University of California, Los Angeles, *Associate Professor of Urban Planning and Public Policy*

Michael A. Hoyt, Ph.D. Arizona State University, *Associate Professor of Program in Public Health; Epidemiology; Psychological Science*

Helen Ingram, Ph.D. Columbia University, *Professor Emerita of Urban Planning and Public Policy*

Larry D. Jamner, Ph.D. State University of New York at Stony Brook, *Professor of Psychological Science* (health psychology, psychophysiology, pain, mHealth)

Valerie Jenness, Ph.D. University of California, Santa Barbara, *Distinguished Professor of Criminology, Law and Society; Sociology* (links between deviance and social control [especially law], the politics of crime control and criminalization, social movements and social change, corrections and public policy)

Jae Hong Kim, Ph.D. University of Illinois at Urbana-Champaign, *Assistant Professor of Urban Planning and Public Policy*

J. Zoe Klemfuss, Ph.D. Cornell University, *Assistant Professor of Psychological Science; Language Science* (narrative development, children's autobiographical memory, sociocontextual influences on children's narrative, memory and well-being, children's eyewitness abilities)

Charis E. Kubrin, Ph.D. University of Washington, *Professor of Criminology, Law and Society; Sociology* (crime, neighborhood effects and social processes, race/ethnicity and violence, immigration and crime)

Kate Kuhlman, Ph.D. University of Michigan, *Assistant Professor of Psychological Science* (developmental psychopathology, psychoneuroimmunology, psychoneuroendocrinology, early life stress, and adolescent depression)

Raul P. Lejano, Ph.D. University of California, Los Angeles, *Professor Emeritus of Urban Planning and Public Policy*

Linda J. Levine, Ph.D. University of Chicago, *Professor of Psychological Science* (bias in predicted and remembered emotion, memory and emotion, the development of children's ability to regulate emotion)

Elizabeth F. Loftus, Ph.D. Stanford University, *UCI Distinguished Professor of Psychological Science; Cognitive Sciences; Criminology, Law and Society; School of Law* (cognitive psychology, human memory, psychology and law)

Angela F. Lukowski, Ph.D. University of Minnesota, *Associate Professor of Psychological Science* (contextual influences on cognitive development in infancy and early childhood)

Mona Lynch, Ph.D. University of California, Santa Cruz, *Professor of Criminology, Law and Society; School of Law* (law and society, psychology and law, punishment and society, race and criminal justice)

Salvatore R. Maddi, Ph.D. Harvard University, *Professor Emeritus of Psychological Science* (personality, psychopathology, health psychology, creativity)

Nicholas J. Marantz, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Urban Planning and Public Policy; School of Law*

Elizabeth Martin, Ph.D., University of Missouri, *Assistant Professor of Psychological Science* (adult psychopathology, schizotypy and schizophrenia, social anhedonia, emotional and social dysfunction)

Richard Matthew, Ph.D. Princeton University, *Professor of Urban Planning and Public Policy; Political Science*

William M. Maurer, Ph.D. Stanford University, *Dean of the School of Social Sciences and Professor of Anthropology; Criminology, Law and Society; School of Law* (anthropology of law, globalization, Caribbean, anthropology of money and finance, gender and kinship)

Cheryl Lee Maxson, Ph.D. University of Southern California, *Professor Emerita of Criminology, Law and Society* (crime and delinquency, youth violence, street gangs, juvenile justice system and policing)

Sanjoy Mazumdar, Ph.D. Massachusetts Institute of Technology, *Professor of Urban Planning and Public Policy; Religious Studies*

Richard D. McCleary, Ph.D. Northwestern University, *Professor of Criminology, Law and Society; Urban Planning and Public Policy* (criminal justice, research methodology, statistics)

Michael G. McNally, Ph.D. University of California, Irvine, *Professor of Civil and Environmental Engineering; Urban Planning and Public Policy* (travel behavior, transportation systems analysis)

James W. Meeker, J.D., Ph.D. State University of New York at Buffalo, *Professor Emeritus of Criminology, Law and Society; Sociology* (sociology of law, criminal justice, research methodology, statistics, access to civil justice)

David S. Meyer, Ph.D. Boston University, *Professor of Sociology; Political Science; Urban Planning and Public Policy* (social movements, public policy, peace and war, social justice)

Kristine Molina, Ph.D. University of Michigan, *Associate Professor of Psychological Science* (racism and discrimination, social inequality, health disparities, Latinx health)

Ana Muñiz, Ph.D. University of California, Los Angeles, *Assistant Professor of Criminology, Law and Society* (gang profiling, youth justice, gang injunctions and databases, immigration enforcement, policing, race, state violence)

Sylvia Nam, Ph.D. University of California, Berkeley, *Assistant Professor of Anthropology; Biological Chemistry; Urban Planning and Public Policy* (urban studies, property, transnational expertise, Southeast Asia)

Daniel Nation, Ph.D. University of Miami, *Associate Professor of Psychological Science* (clinical neuropsychology)

Walter Nicholls, Ph.D. University of California, Los Angeles, *Associate Professor of Urban Planning and Public Policy; Sociology* (urban sociology, politics and policy, social movements, immigration, comparative urbanism, theory, planning conflicts)

Raymond W. Novaco, Ph.D. Indiana University, *Professor of Psychological Science* (anger, violence, stress, trauma, and interventions)

Candice Odgers, Ph.D. University of Virginia, *Professor of Psychological Science; Criminology, Law and Society* (developmental and quantitative psychology; social inequalities and child health; new technologies and adolescent development)



Judith Olson, Ph.D. University of Michigan, *Professor Emeritus of Informatics; Paul Merage School of Business; Urban Planning and Public Policy* (interactive and collaborative technology, human-computer interaction, computer-supported cooperative work)

Emily Owens, Ph.D. University of Maryland at College Park, *Professor of Criminology, Law and Society; Economics* (how government policies affect the prevalence of criminal activity as well as how agents within the criminal justice system, particularly police, prosecutors, and judges, respond to policy changes)

Paul Piff, Ph.D. University of California, Berkeley, *Assistant Professor of Psychological Science* (social psychology, group processes, altruism and cooperation, socioeconomic status, inequality, social emotion, moral judgment, ethics, uncertainty)

Seth D. Pipkin, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Urban Planning and Public Policy*

Henry N. Pontell, Ph.D. State University of New York at Stony Brook, *Professor Emeritus of Criminology, Law and Society; Sociology* (white-collar and corporate crime, criminology, criminal justice, deviance and social control, sociology of law)

Joann Prause, Ph.D. University of California, Irvine, *Professor of Teaching Emerita of Psychological Science* (statistics, quantitative epidemiology, employment typology)

Sarah D. Pressman, Ph.D. Carnegie Mellon University, *Associate Professor of Psychological Science* (health psychology, positive emotions, stress physiology, psychosocial effects on physiology and health)

Jodi A. Quas, Ph.D. University of California, Davis, *Professor of Psychological Science* (memory development, children's involvement in the legal system)

Vibhuti Ramachandran, Ph.D. New York University, *Assistant Professor of Global and International Studies; Criminology, Law and Society*

Stephanie Reich, Ph.D. Vanderbilt University, *Associate Professor of Education; Informatics; Psychological Science* (child development, parenting, peer interactions, media, program evaluation)

Keramet Reiter, Ph.D. University of California, Berkeley, *Associate Professor of Criminology, Law and Society; School of Law* (prisons and extreme punishments, legal history, criminal justice policy, criminal and civil rights law, law and society)

Maria G. Rendón, Ph.D. Harvard University, *Assistant Professor of Urban Planning and Public Policy; Sociology* (urban sociology, immigration, race/ethnicity, sociology of education and social policy)

Jenna Riis, Ph.D. Johns Hopkins University, *Assistant Professor of Psychological Science* (early life adversity; stress; salivary bioscience; neuroendocrine-immune relations; program implementation and evaluation)

Jenny K. Rinehart, Ph.D. University of New Mexico, *Assistant Professor of Teaching of Psychological Science* (health psychology, clinical psychology, sexual victimization prevention, risk perception)

Nancy Rodriguez, Ph.D. Washington State University, *Professor of Criminology, Law and Society* (race, crime, and justice; juvenile justice; collateral consequences of imprisonment; criminal justice policy)

Karen S. Rook, Ph.D. University of California, Los Angeles, *Distinguished Professor of Psychological Science* (gerontology, social relationships and health)

Michael Ruane, M.A. University of California, Los Angeles, *Lecturer of Urban Planning and Public Policy*

Ruben G. Rumbaut, Ph.D. Brandeis University, *Distinguished Professor of Sociology; Chicano/Latino Studies; Criminology, Law and Society; Education* (international migration, immigration laws, criminalization, incarceration, social inequality and mobility, race and ethnicity)

Maritza Salazar, Ph.D. New York University, *Assistant Professor of Paul Merage School of Business; Psychological Science* (team science, group dynamics and processes, team-based organizations, global teams, impact of culture on work behavior, international management, management of innovation and learning)

Brett F. Sanders, Ph.D. University of Michigan, *Professor of Civil and Environmental Engineering; Urban Planning and Public Policy* (urban flooding, coastal flooding, dam-break flooding, flood hazard modeling, flood risk management, sediment management, shallow-water hydrodynamics and morphodynamics, computational methods, remote-sensing with drones, translational research for flood modeling targeting community resilience, population health and poverty alleviation)

Jean-Daniel M. Saphores, Ph.D. Cornell University, *Professor of Civil and Environmental Engineering; Economics; Urban Planning and Public Policy* (transportation and environmental systems (with a focus on air pollution and energy use), travel behavior analysis, alternative fuel vehicles, automated vehicles, transit use, sustainable infrastructure management, and decision making under uncertainty using real options)

Sabrina E. Schuck, Ph.D. University of California, Riverside, *Health Sciences Assistant Clinical Professor of Pediatrics; Education; Psychological Science*

Stephen Schueller, Ph.D. University of Pennsylvania, *Assistant Professor of Psychological Science* (clinical psychology, depression, mHealth, technology, implementation science, treatment and prevention, positive psychology)

Nicholas I. Scurich, Ph.D. University of Southern California, *Associate Professor of Psychological Science; Criminology, Law and Society; School of Law* (judgment and decision making, juridical proof, violence risk assessment)

Christopher Seeds, Ph.D. New York University, *Assistant Professor of Criminology, Law and Society* (punishment and social control, law and society, criminal justice, social theory, life sentencing and capital punishment)

Carroll S. Seron, Ph.D. New York University, *Professor Emerita of Criminology, Law and Society; School of Law* (sociology of law, sociology of professions, law and society, sociology of legal profession, methods and police misconduct)

Roxane C. Silver, Ph.D. Northwestern University, *Professor of Psychological Science; Program in Public Health* (coping with traumatic life events (personal losses and collective traumas), stress, social psychology, health psychology)

Charles Smith, Ph.D. University of California, San Diego, *Professor of Political Science; Criminology, Law and Society* (law and legal institutions, comparative and international law)

David A. Smith, Ph.D. University of North Carolina at Chapel Hill, *Professor of Sociology; Urban Planning and Public Policy* (world systems analysis, urbanization, development, comparative-historical sociology, dependent development in east Asia)

David M. Snow, J.D. Loyola Marymount University, *Lecturer of Urban Planning and Public Policy*

Dara H. Sorkin, Ph.D. University of California, Irvine, *Associate Professor in Residence of Medicine; Program in Public Health; Psychological Science*

Ann Southworth, J.D. Stanford University, *Professor of School of Law; Criminology, Law and Society*

Eric Spangenberg, Ph.D. University of Washington, M.B.A. Portland State University, *Dean of The Paul Merage School of Business and Professor of Paul Merage School of Business; Psychological Science* (sensory cues in the retail environment and the effects of self-prediction on behavior)

Mark Steyvers, Ph.D. Indiana University, *Professor of Cognitive Sciences; Computer Science; Psychological Science* (higher-order cognition, cognitive neuroscience, computational modeling, collective intelligence)

Daniel Stokols, Ph.D. University of North Carolina, Chapel Hill, *Professor Emeritus of Psychological Science; Religious Studies; Urban Planning and Public Policy*

Luis Suarez-Villa, Ph.D. Cornell University, *Professor Emeritus of Urban Planning and Public Policy*

Naomi Sugie, Ph.D. Princeton University, *Associate Professor of Criminology, Law and Society; Sociology* (sociology of crime and punishment, inequality, families, demography, methods, new technologies for data collection)

Bryan Sykes, Ph.D. University of California, Berkeley, *Associate Professor of Criminology, Law and Society; Program in Public Health; Sociology* (demography, criminology, research methods, health, social inequality, statistics)

Shauhin A. Talesh, J.D., Ph.D. University of Connecticut, University of California, Berkeley, *Director, Law and Graduate Studies Program and Professor of School of Law; Criminology, Law and Society; Sociology*

Julian F. Thayer, Ph.D. New York University, *Professor of Psychological Science* (health psychology, psychopathology, health disparities, heart rate variability, emotions, stress)

William C. Thompson, Ph.D. Stanford University, *Professor Emeritus of Criminology, Law and Society; Psychological Science; School of Law* (psychology and law, criminal justice, forensic science, expert evidence, human judgment and decision making, use of social science in appellate litigation)

Kara L. Thorsen, Ph.D. University of California, Irvine, *Lecturer of Social Ecology*

George E. Tita, Ph.D. Carnegie Mellon University, *Professor of Criminology, Law and Society; Urban Planning and Public Policy* (criminology, community context of violence, urban youth gangs, homicide studies)

Rodolfo D. Torres, Ph.D. Claremont Graduate University, *Professor of Urban Planning and Public Policy; Political Science*

Susan F. Turner, Ph.D. University of North Carolina at Chapel Hill, *Professor of Criminology, Law and Society* (sentencing and corrections, applied research methods)

Kristin E. Turney, Ph.D. University of Pennsylvania, *Associate Professor of Sociology; Criminology, Law and Society* (social inequality, family demography, population health, incarceration and punishment, intergenerational transmission of disadvantage, child well-being)



Deborah Lowe Vandell, Ph.D. Boston University, *Chancellor's Professor Emerita of Education; Psychological Science* (longitudinal studies of development, early childhood education, after-school programs, summer learning, child development, adolescent development)

Kerry Vandell, Ph.D. Massachusetts Institute of Technology, *Professor Emeritus of Paul Merage School of Business; School of Law; Urban Planning and Public Policy*

James D. Vigil, Ph.D. University of California, Los Angeles, *Professor Emeritus of Criminology, Law and Society* (urban research, urban poverty, culture change, socialization and education, psychological anthropology, street gangs in cross-cultural perspective, Mexico and U.S. southwestern ethnohistory, comparative ethnicity)

Linda T. Vö, Ph.D. University of California, San Diego, *Professor of Asian American Studies; Culture and Theory; Sociology; Urban Planning and Public Policy* (race and ethnic relations, immigrants and refugees, gender relations, community and urban studies)

Kirk Williams, Ph.D. University of Arizona, *Professor of Criminology, Law and Society; Sociology* (family violence, youth violence, homicide studies, risk assessment, violence prevention program evaluation)

Ilona S. Yim, Ph.D. University of Trier, *Associate Professor of Psychological Science* (stress, pregnancy and postpartum depression, biopsychology of stress, developmental psychobiology)

Alyson K. Zalta, Ph.D. University of Pennsylvania, *Assistant Professor of Psychological Science* (clinical psychology, trauma, posttraumatic stress disorder, resilience, prevention, treatment, cognitive behavioral therapy)

Joanne F. Zinger, Ph.D. University of California, Riverside, *Associate Professor of Teaching of Psychological Science* (expressive writing, meta-analysis, positive psychology, health psychology, preventive medicine, educational psychology)

## Criminology, Law and Society Courses

### **CRM/LAW C7. Introduction to Criminology, Law and Society . 4 Units.**

Introduces characteristics of the U.S. criminal justice system, including responses to crime, components of the system, and current challenges to the system. Examines structure and function of police and courts, criminal procedure, and sentencing and incarceration policies.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

(III)

### **CRM/LAW C10. Fundamentals of Criminology, Law and Society . 4 Units.**

Introduces three interdisciplinary literatures: criminology, socio-legal studies, and justice studies. Focuses on theoretical and empirical work addressing law making, law breaking, and legal systems.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

(III)

### **CRM/LAW H80. The Properties of Property. 4 Units.**

Develops an understanding and critique of private property. Draws from interdisciplinary sources to explore the foundations of private property, the institutions that support it over time, and possible alternatives to it.

Restriction: Campuswide Honors Collegium students only.

(III)

### **CRM/LAW C100. Special Topics in Criminology, Law and Society. 4 Units.**

Course content varies with interest of the instructor.

Repeatability: Unlimited as topics vary.

### **CRM/LAW C101. American Law. 4 Units.**

Introduction to substantive and procedural law governing private dispute resolution, including common law (tort, property, contracts), lawsuits (civil procedure), and alternative dispute resolution; emphasis on the socio-legal ramifications of private disputes, particularly the modern tort system and tort reform movement.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C102. Introduction to the Comparative Study of Legal Cultures. 4 Units.**

Traces the anthropological and comparative cultural study of law from the nineteenth century to the present; briefly surveys the diversity of recorded legal cultures and critically examines key concepts which have been used to describe and classify them.

Same as INTL ST 124A.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**CRM/LAW C103. US Legal Thought. 4 Units.**

Evolution of legal thought in socio-historical context from 19th century to present; emphasizes the rise and fall of legal classicism and modern socio-legal critiques, including the law and society movement, critical legal studies, feminist legal theory, and critical race studies.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C104. Sociology of Law. 4 Units.**

Examines law creation and law enforcement in their social and political context. Discusses the major theories of law and the modern state, and presents case studies in order to evaluate the strengths and weaknesses of these theoretical perspectives.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C105. Psychology and the Law. 4 Units.**

Psychological assumptions of the American legal system and mental health aspects of provision of criminal justice services. Civil commitment, insanity defense, competence to stand trial, jury selection, eyewitness identification. Use of police, courts, correctional institutions in prevention of behavior disorder.

Same as PSCI 193E.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment.

**CRM/LAW C106. Crime and Public Policy. 4 Units.**

Explores nature and dimensions of crime in America and uses and limits of various strategies to control it. Topics include growth of imprisonment, the problem of domestic violence, the death penalty, gun control, and the potential of crime prevention programs.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C107. Deviance. 4 Units.**

Perspectives on deviance and criminality in behavior, institution, community, and myth. The suitability of contemporary theories of deviant behavior.

Same as SOCIOL 156, PSYCH 177D.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**CRM/LAW C108. Criminological Theory. 4 Units.**

Explores the question of crime causation from a number of theoretical perspectives in the social sciences. Schools of thought examined include utilitarianism, positivism, human ecology, social structural approaches, social process (learning) theories, labeling, and radical-critical (political) perspectives.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C109. Juvenile Delinquency. 4 Units.**

Patterns of delinquent behavior, theories that explain behavior, current research aimed at enhancing exploratory power. Attempts to prevent and control delinquency are put in historical perspective. Development of the current juvenile justice system and evolution of modern juvenile law.

Same as PSCI 193B.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment.

**CRM/LAW C110. Community Context of Crime. 4 Units.**

Examines the social context of high-crime communities, with special emphasis on the problems of poverty, joblessness, economic inequality, and racial discrimination. Assesses debates on the causes of these problems, and on the most effective policies to combat them.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C111. Theories of Punishment. 4 Units.**

Survey of the various schools of thought regarding formal punishment theory. The purposes of legal sanctions are examined, including those of deterrence, rehabilitation, retribution, and incapacitation. Considers problems in realizing formal goals of punishment in practice.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C112. Legal Sanctions and Social Control. 4 Units.**

Examination of criminal sanctions as mechanisms of social control. Includes the nature, function, and organization of courts as sanction generating institutions, and problems associated with punishing white-collar and corporate illegalities.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C113. Gender and Social Control. 4 Units.**

Examines the legal system's use of sex as an organizing characteristic, focusing particularly on sameness and difference feminism, and tracing the evolution of equal treatment of men and women in the areas of constitutional rights, employment, education, and military service.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C114. Miscarriages of Justice. 4 Units.**

Systematically describes, explains, and analyzes the causes and consequences of the wrongful accusation, prosecution, incarceration, and sometimes even execution, of the innocent in the American criminal justice system.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C115. Prisons, Punishment, and Corrections. 4 Units.**

A review of how the U.S. punishes and rehabilitates convicted law violators. The conflicts among the major purposes of sentencing—rehabilitation, deterrence, incapacitation—are discussed, as well as the effects of different sanctions on public safety, offender rehabilitation, and justice system costs.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C116. Race, Ethnicity, and Social Control. 4 Units.**

Provides a historical and sociological survey of racial and ethnic group relations in contexts of crime control, emphasizing the roles of racial ideology, structural racism, and social movements in shaping these dynamic relations, and their significance to American liberal democracy.

Same as CHC/LAT 152A.

**CRM/LAW C117. Imprisonment and Reentry. 4 Units.**

Offers an overview of imprisonment and reentry in the contemporary United States. Examines the development of the prison in the United States and explores changes in its composition, structure, and purpose over time.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C118. Domestic Violence. 4 Units.**

General perspectives about domestic violence and theoretical accounts about what causes such behavior.

Same as SOCECOL 118.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C119. Violence in Intimate Relationships. 4 Units.**

Responses to various forms of domestic violence, such as intimate partner violence and child abuse. Covers barriers to reporting to the police, and prosecutors and courts. Human services, such as safety planning for victims, treatment programs, and restorative justice approaches.

Corequisite:

Same as SOCECOL 119.

**CRM/LAW C120. Law and Inequality. 4 Units.**

Various aspects of the law as related to three specific areas of inequality: immigration and immigrants, race, and gender. The role of law as a tool of social reform and limitations of the legal system historically in resolving inequality issues.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C122. Constitutional Law. 4 Units.**

Examines the evolution of civil liberties and individual rights in the United States, focusing on how Constitutional Amendments and U.S. Supreme Court decision-making have shaped the ongoing political and legal struggles over issues such as privacy, abortion, and free speech.

Overlaps with POL SCI 174A.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C123. Family Law. 4 Units.**

Examines legal issues surrounding marriage, cohabitation, divorce, child custody and support, adoption, and the rights of parents and children in the family context. The findings of social science research are used to illuminate the legal issues.

Same as PSCI 193F.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C124. Mental Health and the Justice System. 4 Units.**

Covers the history of criminalization of persons with mental illness; challenges and needs; civil and outpatient commitment; law enforcement responses; mentally ill in jails and prisons; community supervision strategies; and reentry strategies for offenders with mental illness.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C127. Hate Crimes. 4 Units.**

Examines the causes, manifestations, and consequences of hate crimes and the larger social context within which they occur. The politics and dynamics of intergroup violence born of bigotry and manifested as discrimination; social policy designed to control bias-motivated violence.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C128. Environmental Law and Policy . 4 Units.**

Environmental law as a combination of traditional legal principles and newly created statutes, rules, and decisions applied to environmental protection. Investigates roles of courts, legislature, executive branch and administrative agencies, and private citizens attempting to regulate environmental quality.

Same as UPPP 133.

Restriction: Criminology, Law and Society Majors only. Planning, Policy, and Design Majors only.

**CRM/LAW C130. Seminar on Gangs. 4 Units.**

An overview of gangs, including the nature and definition of gangs; types of gangs; diversity of membership; theoretical explanations; criminal behavior; drug use and sales; law enforcement responses; gangs in correctional institutions; intervention and prevention strategies; and public policy issues.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C131. Organized Crime and American Society. 4 Units.**

Examination of the phenomenon of American organized crime from a sociological perspective. Explanation of methods by which organized crime is tolerated at various levels of society. Emphasis on ways in which 'underworld' interests interact with legitimate economic and political institutions.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C132. Forensic Science, Law, and Society. 4 Units.**

Examines use of 'forensic science' to resolve issues arising in criminal cases including crime scene analysis, DNA testing, fingerprints, trace evidence comparisons, profiling, lie detectors, other forensic techniques; evaluation, statistical characterization, and legal admissibility of evidence; regulation of forensic laboratories.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C133. Homicide and Suicide. 4 Units.**

Examines similarities and differences among homicide and suicide, two major causes of death.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C134. Victimless Crimes. 4 Units.**

Examines major theoretical, empirical, and policy-oriented research related to the design, implementation, and analysis of government intervention, through the criminal sanction, in the spheres of vice and morality.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C135. Mass Incarceration and Social Inequality in America. 4 Units.**

Explores the origins and consequences of mass incarceration; extraordinarily high incarceration rates within particular demographic groups above and beyond historical levels in the U.S. Theoretical explanations for, and current policy debates around, mass incarceration are covered.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C136. Forensic Psychology: Advanced Seminar. 4 Units.**

Focuses on the psychology of criminal offending, particularly violent behavior. Examines violence, sexual offending, and mental disorder related to crime with regard to clinical assessment and treatment; mental health services within forensic institutions.

Prerequisite: (PSCI 9 or PSCI 11C or PSYCH 7A or PSYCH 9C) and PSCI 102C and (PSCI 178S or CRM/LAW C149)

Same as PSCI 156C, PSYCH 177F.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C139. Police and Change. 4 Units.**

Organizational efforts to modify police conduct are addressed by focusing on the history of policing in the United States including training, education, and the contributions of women.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C140. Surveillance and Society. 4 Units.**

Explores the development and deployment of surveillance technologies in contemporary society. The social and legal impact of surveillance technologies, in such areas as crime control, privacy, trust, community, democracy, and the war on terror.

Restriction: Criminology, Law and Society Majors only.

**CRM/LAW C142. White-Collar Crime. 4 Units.**

Examines criminal activity in business and corporate enterprise, organizations, and the professions. Theories regarding the causes and control of white-collar and corporate crime are covered as well as the numerous definitions of these terms.

Same as SOCIOL 142.

Restriction: Sociology Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C144. Criminal Law. 4 Units.**

Deals specifically with the substantive nature of criminal law and its historical development. Focuses on understanding the development of fundamental doctrinal principles upon which criminal law is based, including mens rea, actus reus, homicide, causation, group criminality, and exculpation.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C145. Government Crime. 4 Units.**

Examines the legal, organizational, and political issues involved in the generation and control of government lawlessness. Readings present historical and theoretical perspectives in the abuse of government authority and the ability of the legal system to control such behavior.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C149. Violence in Society. 4 Units.**

Current theory and research on aggression; anger and violence as problems in individual and social functioning. Process and functions of anger examined with regard to normal behavior and psychopathology. The determinants, prevalence, and implications of violence in society are analyzed.

Prerequisite: PSCI 9 or PSCI 11C or PSYCH 7A or PSYCH 9C

Same as PSCI 178S.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment.

**CRM/LAW C150. The Legal Profession. 4 Units.**

Role of the legal profession in modern society, the diverse professional roles lawyers play, the American legal profession compared with that of other societies. 'Litigation explosion,' ethical problems, interactions between lawyers and other professionals, training and socialization of new lawyers.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C156. Cross-Cultural Research on Urban Gangs. 4 Units.**

Taking an urban policy approach, examines the background and contemporary traditions of gangs in several ethnic groups including African-, Asian-, and Mexican-Americans. Cross-cultural exploration of the varied facets of gang life. The major social-control institutions affecting them.

Same as CHC/LAT 153.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment. Chicano/Latino Studies Majors have first consideration for enrollment.

**(VII)**

**CRM/LAW C160. Forensic Psychology . 4 Units.**

Forensic psychology is the interface between clinical psychology and the law. Emphasizes clinically relevant legal topics (insanity defense; competency to stand trial) and includes critical thinking about issues that arise when psychologists are involved in legal proceedings.

Prerequisite: PSCI 9 or PSCI 11B or PSCI 11C

Same as PSCI 161C.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C162. Crime Hotspots. 4 Units.**

Criminological theories of local public safety hazards or hotspots are introduced. Spatial statistics are developed for different types of hotspots. Hotspot policing theories are introduced and research on the effectiveness of policing strategies is reviewed.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C163. Ethics and Politics of Justice. 4 Units.**

Theoretical perspective on how ethics and politics relate to criminal justice through an introduction to moral philosophy; consideration of specific theories of punishment and justice; and consideration of practical and empirical illustrations of the intersection of ethics, politics, and justice.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C164. Social Control of Delinquency. 4 Units.**

Assumes familiarity with theories of delinquency, the juvenile justice system, and elements of juvenile law. Explores socio-historical origins and evolution of juvenile justice, current research and policy on delinquency prevention and treatment, and future directions of law, policy, and practice.

Prerequisite: Recommended: CRM/LAW C109.

Same as PSCI 193C.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C165. The Death Penalty. 4 Units.**

Examines why the U.S. continues to have a death penalty when so many other countries have abandoned it. Arguments for and against the death penalty are covered.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C167. Crime Measurement. 4 Units.**

The strengths and weaknesses of three crime measures (police reports, victim surveys, and offender self-reports) are illustrated through analyses of research articles. Common measurement problems are analyzed with a focus on reliability and validity.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C168. Extreme Punishment . 4 Units.**

Explores the history and law of America's Eighth Amendment prohibition against cruel and unusual punishment, examining the death penalty, long prison sentences, harsh confinement conditions, and other punishments. Students debate practical, legal, and moral arguments for and against these punishments.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C169W. Advanced Research Methods. 4 Units.**

For students planning to conduct senior research projects or apply to graduate school in social research fields. Topics include reviewing literature, preparing a research proposal, protecting human subjects, citing scholarly work, building measures, estimating sample size, interview and presentation skills.

Prerequisite: SOCECOL 10 and SOCECOL 13. Satisfactory completion of the Lower-Division Writing requirement.

Same as SOCECOL 111W, PSCI 111W, UPPP 114W.

(Ib)

**CRM/LAW C172. Culture Change and the Mexican People. 4 Units.**

Reviews culture contact and colonization, innovation diffusion, acculturation, assimilation, culture conflict and marginality, modernization, urbanization, legal transformations. Mexico and the Southwestern U.S. are reviewed through several centuries to better appreciate the indigenous base of the Mexican people.

Same as CHC/LAT 155.

**CRM/LAW C173. Maritime Piracy, Law and Society. 4 Units.**

Explores the historical and contemporary images and reality of pirates and piracy since the 16th century across the globe through an analysis of primary sources, key historiographical and legal debates, and criminological theories.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C174. Immigration and Crime. 4 Units.**

Examines immigration and crime in the global context, highlighting immigrants as criminals and victims; immigration and crime control; immigrants' perceptions of the criminal justice system; public discourse and public perception on immigration and crime; and human rights issues.

**CRM/LAW C175. Issues in Policing. 4 Units.**

Lectures and readings focus on the history and strategies of policing, measuring the quality of policing, and police misconduct. Strategies for enhancing the quality of policing for controlling misconduct are covered.

**CRM/LAW C176. Classics in Crime Cinema. 4 Units.**

A multidimensional understanding of crime films and how they shape public thinking about crime and criminals.

Restriction: CRM/LAW C176 and CRM/LAW C20 may not be taken for credit.



**CRM/LAW C177. Eyewitness Testimony. 4 Units.**

Faulty eyewitness testimony is a major cause of wrongful convictions. Covers the fast-growing topic of eyewitness testimony and memory for real-world events, both how psychologists study eyewitness capacity, and how the legal system has dealt with eyewitness issues.

Prerequisite: SOCECOL 10

Same as PSCI 193G.

Restriction: Seniors only. Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

Concurrent with CRM/LAW C263.

**CRM/LAW C178. Critical Race Theory. 4 Units.**

Introduction to Critical Race Theory and key American cases on racial inequality. Using this literature, examines the possibilities and pitfalls of legal claims of race, gender, and sexuality discrimination in the age of colorblindness.

Same as AFAM 157.

Restriction: Upper-division students only.

**CRM/LAW C179. Race and Incarceration. 4 Units.**

Examines the racial politics of mass incarceration through historical, empirical, theoretical, and legal frameworks. Focuses on race, gender, and sexual differences to develop a critique on policing, incarceration, and other forms of punishment.

**CRM/LAW C180. Power, Constructions of Deviance, and Social Control . 4 Units.**

Examines the forms and limits of power in the construction of social deviants. Theories of state power are covered to understand the prison system as a contemporary driver of social inequality. The collateral consequences of mass incarceration are discussed.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment.

**CRM/LAW C182. Illegal Economics. 4 Units.**

How illegal firms function in illegal markets, why individuals participate in these groups and markets, and what federal, state, and local governments do to disrupt organized illegal activity.

Same as ECON 146A.

Restriction: Business Economics Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C183. Controversies, Courts, Cultures: The Anthropology of Law. 4 Units.**

Assesses the contributions anthropology has made to legal scholarship, reviewing historical and contemporary themes. Considers both comparative questions of law's norms, structures, and practices around the globe, and the specific insights anthropology offers about contemporary U.S. law.

Same as ANTHRO 127.

(III)

**CRM/LAW C186. Social Media and The Law. 4 Units.**

Examines legal and policy issues raised by the rise of social media. Surveys how social networking platforms and other emerging technologies impact the right to privacy, public perceptions of judicial systems, and the law generally.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C187. Undocumented Immigrant Experiences. 4 Units.**

Examines the experiences of undocumented immigrants and the policies that structure their educational, economic, social, and political participation.

Same as ASIANAM 130, CHC/LAT 164A, SOCIOL 177C.

(III and VII ).

**CRM/LAW C190. Applied Statistics in Social and Behavioral Research. 4 Units.**

Covers statistical techniques used to describe and make generalizations about phenomena represented by data. Hands-on experience in data analysis and interpretation using statistical software (SPSS, STATA) is emphasized. Topics include data visualization, ANOVA, multiple regression, and categorical data analyses.

Prerequisite: SOCECOL 13

Same as PSCI 190, SOCECOL 190, UPPP 190.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**CRM/LAW C191. Law and Modernity. 4 Units.**

The rise and spread of Enlightenment legal traditions, social contract theory, individual rights, ideologies of 'liberty, equality, fraternity'; contradictions of liberal law, its understandings of 'primitive' and 'civilized'; pervasive myths of property, difference, race, and rights. Reading- and writing-intensive.

Same as ANTHRO 127A.

**CRM/LAW C196. Research Seminar in Criminology, Law and Society. 4 Units.**

Special topics research seminar. Content varies with interest of instructor. Capstone research opportunity with Criminology, Law and Society faculty members.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. Anthropology Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C201. Research Methods. 4 Units.**

An introduction to techniques of inductive methodologies, including qualitative interviewing and participant observation, and deductive methodologies, including survey research and experimental and quasi-experimental design. Provides a sound overview of research methodology with tools to pursue specific methods in greater depth.

Restriction: Graduate students only.

**CRM/LAW C202. Research Methods II. 4 Units.**

Covers qualitative approaches (interview strategies, varieties of ethnography, archival and historical methods, etc.) and quantitative approaches (survey methods, experimental designs, secondary data sets, comparative and international data, etc.), and concludes with mixed-method approaches.

Prerequisite: CRM/LAW C201. CRM/LAW C201 with a grade of B or better

Restriction: Graduate students only.

**CRM/LAW C203A. Qualitative Methods Practicum. 4 Units.**

Designed to deepen students' familiarity with qualitative research strategies and to guide them through the initial stages of their Second Year Project requirement, such as the development of an original research proposal and/or a research instrument.

Prerequisite: CRM/LAW C202. CRM/LAW C202 with a grade of B or better

Restriction: Graduate students only.

**CRM/LAW C203B. Quantitative Methods Practicum. 4 Units.**

Deepens familiarity with quantitative research and provides a foundation for the second-year paper, e.g., initial models for data analysis and/or a replication study. Students evaluate what assumptions are necessary for credible inference in different evaluation approaches.

Prerequisite: CRM/LAW C202. CRM/LAW C202 with a grade of B or better

Restriction: Graduate students only.

**CRM/LAW C207. Land-Use Law. 4 Units.**

Investigates legal and institutional frameworks for development control. Review of constitutional issues implicated in land-use regulation. Traces development control historically and analyzes contemporary approaches to land-use control which reflect environmental and economic development concerns.

Same as UPPP 207.

Restriction: Graduate students only.

**CRM/LAW C210. Introduction to Criminology, Law and Society. 4 Units.**

Familiarizes students with the interrelated fields of criminology, law and society studies, and criminal justice studies. Organized around three well-established interdisciplinary literatures: criminology, sociolegal studies, and criminal justice studies.

Restriction: Graduate students only. Criminology, Law and Society Majors only.

**CRM/LAW C211. Legal Institutions and Society. 4 Units.**

Acquaints students with the institutions of U.S. legal system and its operations, as well as with the constitutional framework undergirding this system, and defines the relationship between U.S. citizens and government at a variety of levels.

Restriction: Graduate students only.

**CRM/LAW C212. Police, Courts, and Corrections. 4 Units.**

Focuses on basic policy issues in the administration of the criminal justice system. The key elements of the criminal justice system are police, courts, and corrections. Prepares students for continued study of these organizations.

Restriction: Graduate students only.

**CRM/LAW C213. Crime and Social Deviance. 4 Units.**

Examines the major social scientific perspectives on criminal and deviant behavior. Specific deviant and criminal activities are described and explained using established theoretical frameworks.

Restriction: Graduate students only.

**CRM/LAW C214. Research Methods. 4 Units.**

Structures research methodology, the approach to developing and evaluating knowledge of the sciences for use in criminal justice professional activities. Special emphasis on differentiating scientific approaches from pseudo-science.

Restriction: Graduate students only.

**CRM/LAW C215. Applied Statistics. 4 Units.**

Provides a basis for the use of fundamental statistical analysis techniques for solving public policy and management problems through a series of assignments, examinations, and online discussions and demonstrations.

Restriction: Graduate students only.

**CRM/LAW C216. Public Policy, Crime, and Criminal Justice. 4 Units.**

Increases understanding of crime, violence, and the criminal justice system. Assesses the state of knowledge on key policy issues of our time. Discusses the contribution of communities, schools, employment, drugs, guns, and alcohol to crime and violence.

Restriction: Graduate students only.

**CRM/LAW C217. Leadership. 4 Units.**

Introduces concepts, ideas, and theories about leadership and its operation. Explores leadership concepts through interviews with leaders from the community and fellow classmates.

Restriction: Graduate students only.

**CRM/LAW C218. Social Problems, Law, and Policy. 4 Units.**

Capstone course for M.A.S. program in Criminology, Law and Society. Students choose a social problem related to crime, criminal justice, and law; relate the problem to legal and social issues; and devise a plan of action to research the problem.

Restriction: Graduate students only. Criminology, Law and Society Majors only.

**CRM/LAW C219. Hate Crime. 4 Units.**

Examines the causes, manifestations, and consequences of hate crimes, as well as the larger social context within which they occur, are reacted to, and seem to be proliferating.

Restriction: Graduate students only.

**CRM/LAW C221. Sentencing and Corrections. 4 Units.**

Reviews U.S. attempts to punish and rehabilitate convicted law violators. Conflicts among major purposes of sentencing (rehabilitation, deterrence, incapacitation, and retribution) are discussed, as well as effects of different sanctions on public safety, offender rehabilitation, and justice system costs.

Restriction: Graduate students only.

**CRM/LAW C222. Ethnography. 4 Units.**

Explores the theory and practice of ethnography with a focus on anthropology, the discipline most associated with ethnography. Students are exposed to the theoretical underpinnings of ethnographic work, traditional and innovative practices, and sample ethnographies.

Same as ANTHRO 230F, CHC/LAT 217.

Restriction: Graduate students only.

**CRM/LAW C224. Organizational Perspectives on the Legal System. 4 Units.**

Familiarizes students with organization theory and research as ways to make sense of, navigate, and act on the legal system. Acquaints students with major frameworks in organization theory and their application to the system of legal organizations.

Restriction: Graduate students only.

**CRM/LAW C226. Causal Methods for Policy Analysis. 4 Units.**

Provides students with hands-on experience using existing data to estimate the impact of policy and law on individual behavior or aggregate social outcomes. Covers different econometric strategies used to identify causal effects in the absence of an experiment.

Restriction: Graduate students only.

**CRM/LAW C228. Criminology: Micro Approaches. 4 Units.**

Introduces students to the dominant theories in modern criminology, their theoretical antecedents and extensions, major empirical tests and implications for programs, policy and practice, and focuses on micro-level, individual theories of crime causation. Formerly Criminology, Law and Society C233A.

**CRM/LAW C229. Criminology: Macro Approaches. 4 Units.**

Introduces students to the dominant theories in modern criminology, their theoretical antecedents and extensions, major empirical tests and implications for programs, policy and practices, and addresses macro-level theories of crime causation. Formerly Criminology, Law and Society C233B.

**CRM/LAW C231. Crime and Gender . 4 Units.**

Examines the legal, political, social, economic, and policy implications of making gender (primarily) and race (secondarily) the focus in the study of crime, criminal law, and the criminal justice system.

Restriction: Graduate students only.

**CRM/LAW C232. Juvenile Delinquency. 4 Units.**

Examines the major theoretical perspectives regarding the onset, persistence, and desistance of juvenile delinquency, and examines empirical evidence for each perspective.

Restriction: Graduate students only.

**CRM/LAW C234. Anthropology of Law. 4 Units.**

Law has been a key site of anthropological inquiry since the discipline's nineteenth-century origins. Course introduces and critically assesses the contributions anthropology has made to sociolegal lytic trends.

Restriction: Graduate students only.

**CRM/LAW C238. White-Collar Crime. 4 Units.**

Examines the illegal behavior of individuals who commit crimes in the course of their employment. Special attention will be paid to ways in which power and organizational structure affect the behavior of the white-collar offenders.

Restriction: Graduate students only.

**CRM/LAW C239A. Law and Society I. 4 Units.**

Provides an introduction to the law and society field from its origins in social scientific, legal, and philosophical scholarship during the eighteenth, nineteenth, and early-twentieth centuries. Formerly Criminology, Law, and Society C239.

Restriction: Graduate students only.

**CRM/LAW C239B. Law and Society II. 4 Units.**

Building on Law and Society I, addresses contemporary issues in the field from mid-twentieth century to the present with emphasis on the degree to which the field's foundational assumptions are being challenged, refined, or confirmed through current research.

Prerequisite: CRM/LAW C239A

Restriction: Graduate students only.

**CRM/LAW C240A. Socio-Legal Workshop.**

Designed to foster intellectual discussion, encourage practice and skill-building in providing feedback, and build substantive knowledge of legal scholarship, this workshop is for both law and doctoral students across campus who are interested in interdisciplinary approaches to studying law.

Grading Option: In Progress (Letter Grade with S/U).

Restriction: Graduate students only.

**CRM/LAW C240B. Socio-Legal Workshop.**

Designed to foster intellectual discussion, encourage practice and skill-building in providing feedback, and build substantive knowledge of legal scholarship, this workshop is for both law and doctoral students across campus who are interested in interdisciplinary approaches to studying law.

Prerequisite: CRM/LAW C240A

Grading Option: In Progress (Letter Grade with S/U).

Restriction: Graduate students only.

**CRM/LAW C240C. Socio-Legal Workshop. 4 Units.**

Designed to foster intellectual discussion, encourage practice and skill-building in providing feedback, and build substantive knowledge of legal scholarship, this workshop is for both law and doctoral students across campus who are interested in interdisciplinary approaches to studying law.

Prerequisite: CRM/LAW C240B. CRM/LAW C240B with a grade of B or better

Restriction: Graduate students only.

**CRM/LAW C242. Crime Hotspots. 4 Units.**

Focuses on the criminological theory of hotspots, beginning with the “when, where, and why” questions and ending with the practical policing strategies that have been developed to mitigate hotspot public safety hazards.

Restriction: Graduate students only.

**CRM/LAW C248. Geographic Information Systems. 4 Units.**

Prepares students to become proficient in the basic GIS functionality including visualization, data management, and spatial analysis.

Restriction: Graduate students only.

**CRM/LAW C250. Preventing Errors of Justice. 4 Units.**

Examines the types of errors that are made in the U.S. criminal justice system and how we might prevent these errors, including failures to convict guilty offenders as well as wrongful convictions of the innocent.

Restriction: Graduate students only.

**CRM/LAW C252. Issues in Environmental Law and Policy. 4 Units.**

Treatment of legal and policy strategies for promoting environmental protection and deterring environmental degradation within the context of other societal objectives. Topical approach with a focus on problems of special interest to criminologists and to environmental policy specialists.

Same as UPPP 252.

Restriction: Graduate students only.

**CRM/LAW C253. Cybercrime, Cybersecurity, and Society. 4 Units.**

Introduces students to the world of cybercrime in the age of globally networked digital, and information and communication technologies (ICT). Presents a socio-legal approach to the study of cybercrime, cybersecurity, and how it relates to society.

Restriction: Graduate students only. Criminology, Law and Society M.A.S. students only.

**CRM/LAW C254. Immigration in the US: Economic, Fiscal, and Social Outcomes. 4 Units.**

The changing patterns of immigration in the U.S. and the role that immigrants play in our society. In particular, the economic and social outcomes of immigration, as well as the relationship between immigration, crime, and criminal justice policy.

Restriction: Graduate students only. Criminology, Law and Society Majors only.

**CRM/LAW C255. Public Policy. 4 Units.**

Explores different approaches to public policy analysis, the diverse conceptions of the goals and objectives that should be served by policy, and the appropriate role of the policy analyst. Policy consequences are traced to indirect and subtle incentives and disincentives.

Same as UPPP 221, POL SCI 221A.

Restriction: Graduate students only.

**CRM/LAW C258. Crimmigration. 4 Units.**

Examines the criminalization of immigration, with an emphasis on U.S. enforcement procedures and outcomes. Analyzes the devolution of federal immigration law to local authorities, the rise in immigrant detention and deportation, and the militarization of the U.S.-Mexico border.

Same as CHC/LAT 225, SOCIOL 268.

Restriction: Graduate students only.

**CRM/LAW C260A. Race and Justice Studies Proseminar .**

A year-long proseminar conducted by a team of instructors specializing in race and justice studies. Conceived as a reading and peer mentor group focusing on intellectual and professional development. Required for students pursuing the Race and Justice Studies emphasis.

Grading Option: In Progress (Letter Grade with S/U).

Restriction: Graduate students only.

**CRM/LAW C260B. Race and Justice Studies Proseminar.**

A year-long proseminar conducted by a team of instructors specializing in race and justice studies. Conceived as a reading and peer mentor group focusing on intellectual and professional development. Required for students pursuing the Race and Justice Studies emphasis.

Prerequisite: CRM/LAW C260A

Grading Option: In Progress (Letter Grade with S/U).

Restriction: Graduate students only.

**CRM/LAW C260C. Race and Justice Studies Proseminar. 4 Units.**

A year-long proseminar conducted by a team of instructors specializing in race and justice studies. Conceived as a reading and peer mentor group focusing on intellectual and professional development. Required for students pursuing the Race and Justice Studies emphasis.

Prerequisite: CRM/LAW C260B

Restriction: Graduate students only.

**CRM/LAW C261. Race and Justice Studies Writing Seminar . 4 Units.**

A required writing-intensive seminar conducted by an instructor affiliated with the Race and Justice Studies emphasis. Students with manuscripts on relevant topics will read and critique peer manuscripts, and revise manuscripts toward completion of articles, dissertation chapters, and other publications.

Prerequisite: CRM/LAW C260C

Same as HUMAN 261, SOC SCI 253K.

Restriction: Graduate students only.

**CRM/LAW C262. Special Topics in Race and Justice Studies. 4 Units.**

A seminar focused on special issues in race and justice studies.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**CRM/LAW C263. Eyewitness Testimony. 4 Units.**

Examines the evidence that shows that faulty eyewitness memory is the major cause of wrongful convictions. Explores what the legal system thinks of eyewitness testimony and how the legal system has dealt with eyewitness issues.

Same as PSCI P263.

Restriction: Graduate students only.

**CRM/LAW C265. Memory and the Law. 4 Units.**

Examines the controversial topic of repressed memory, or perception and memory of real-world events.

Same as PSCI P265.

Restriction: Graduate students only.

**CRM/LAW C266. Psychology and the Law. 4 Units.**

Overview of how psychology is applied to the civil and criminal justice systems, how case law shapes this application, and how legal decisions affect the direction of psychological research. Interdisciplinary approach to research in psychology, law, and/or criminology.

Same as PSCI P266.

Restriction: Graduate students only.

**CRM/LAW C268. Contemporary Issues in Crime and Justice. 4 Units.**

Intensive reading and discussion of several recent works that raise critical issues for criminology and criminal justice policy, with a special emphasis on issues of inequality, diversity, and social justice.

Restriction: Graduate students only.

**CRM/LAW C275. Special Topics in Criminology, Law and Society. 4 Units.**

Topics covered vary with interests of instructor.

Repeatability: Unlimited as topics vary.

**CRM/LAW C280A. Professionalization Proseminar.**

Focuses on two areas that are key to scholarly and professional success in graduate school but are rarely discussed in a structured setting: 1) publishing in peer-reviewed academic journals; and 2) preparing for the academic job market.

Grading Option: In Progress (Letter Grade with S/U).

Restriction: Graduate students only.

**CRM/LAW C280B. Professionalization Proseminar.**

Focuses on two areas that are key to scholarly and professional success in graduate school but are rarely discussed in a structured setting: 1) publishing in peer-reviewed academic journals; and 2) preparing for the academic job market.

Prerequisite: CRM/LAW C280A

Grading Option: In Progress (Letter Grade with S/U).

Restriction: Graduate students only.

**CRM/LAW C280C. Professionalization Proseminar. 4 Units.**

Focuses on two areas that are key to scholarly and professional success in graduate school but are rarely discussed in a structured setting: 1) publishing in peer-reviewed academic journals; and 2) preparing for the academic job market.

Prerequisite: CRM/LAW C280B

Restriction: Graduate students only.

**CRM/LAW C296. Doctoral Dissertation Research and Writing. 2-12 Units.**

Dissertation research with Criminology, Law and Society faculty.

Prerequisite: Advancement to candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**CRM/LAW C298. Directed Study. 2-4 Units.**

Directed study with Criminology, Law and Society faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.



**CRM/LAW C299. Independent Study . 2-8 Units.**

Independent research with Criminology, Law and Society faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Planning, Policy, and Design Courses

**PP&D 221. Public Policy . 4 Units.**

Explores different approaches to public policy analysis, the diverse conceptions of the goals and objectives that should be served by policy, and the appropriate role of the policy analyst. Policy consequences are traced to indirect and subtle incentives and disincentives.

Repeatability: May be taken for credit 2 times.

Same as PUB POL 221.

Restriction: Public Policy Majors have first consideration for enrollment.

## Psychological Science Courses

**PSCI 9. Introduction to Psychology. 4 Units.**

Introduction to field of psychology, addressing the application of scientific methods to the study of human development, learning, memory, problem solving, perception, biological mechanisms, emotions and motivation, personality, psychopathology, and effects of diverse social and cultural contexts on human behavior.

Same as PSYC 7A.

Overlaps with PSYC 9A, PSYC 9B, PSYC 9C, PSCI 11A, PSCI 11B.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment. PSCI 9 and PSYCH 7A may not be taken for credit if taken concurrently with or after PSCI 11A, PSCI 11B, PSCI 11C, PSYCH 9A, PSYCH 9B, or PSYCH 9C.

(III)

**PSCI 11A. Psychology Fundamentals. 4 Units.**

Designed to provide freshman with an in-depth survey of general psychology. Topics include biological bases of behavior, sensation, perception, cognition, development, personality, psychopathology, and social psychology.

Same as PSYC 9A.

Restriction: Lower-division students only. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. PSCI 9 and PSYCH 7A may not be taken for credit if taken after PSCI 11A, PSCI 11B, PSCI 11C, PSYCH 9A, PSYCH 9B, or PSYCH 9C.

(III)

**PSCI 11B. Psychology Fundamentals. 4 Units.**

Designed to provide freshmen with an in-depth survey of general psychology. Topics include biological bases of behavior, sensation, perception, cognition, development, personality, psychopathology, and social psychology.

Same as PSYC 9B.

Restriction: Lower-division students only. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

(III)

**PSCI 11C. Psychology Fundamentals. 4 Units.**

Designed to provide freshman with an in-depth survey of general psychology. Topics include biological bases of behavior, sensation, perception, cognition, development, personality, psychopathology, and social psychology.

Same as PSYC 9C.

Restriction: Lower-division students only. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**(III)****PSCI 100. Special Topics in Social Behavior. 4 Units.**

Course content varies with interest of instructor.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Repeatability: Unlimited as topics vary.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 101D. Life Span Developmental Psychology. 4 Units.**

Addresses the major issues, concepts, and methods of life span developmental psychology. The fundamental theories, distinctive methods, and the physical, perceptual, cognitive, social, motivational, and emotional development for each developmental phase of the life course are considered.

Prerequisite: PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment.

**PSCI 102C. Abnormal Psychology. 4 Units.**

Survey of disorders organized by the diagnostic categories of the American Psychiatric Association. Interdisciplinary orientation combines environmental, psychological, and organic perspectives on etiology and treatment.

Prerequisite: (PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C) and SE 10

Overlaps with PSYC 120A.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment.

**PSCI 103H. Health Psychology. 4 Units.**

Theory and research are considered as they contribute to an understanding of the role of psychological processes in health and illness. The distinction between prevention and treatment of illness is established, and a variety of psychosocial interventions are elaborated.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment.

**PSCI 104S. Social Animal: An Introduction to Social Psychology. 4 Units.**

Theories and research exploring social behavior and social influences on behavior. Topics include methods of social research, attitude formation and change, social perception, the social self, stereotypes and prejudice, conformity, obedience, altruism, aggression, interpersonal relationships and love, and group behavior.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment.

**PSCI 110D. Infant Development. 4 Units.**

Study of human development from conception through the first two years of life, covering processes and events in the domains of physical, social, and cognitive development.

Prerequisite: PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 111D. Child Development. 4 Units.**

Examines social, emotional, and intellectual growth and development between the ages of 2 and 12 years.

Prerequisite: PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B

Overlaps with PSYC 120D.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 111W. Advanced Research Methods. 4 Units.**

For students planning to conduct senior research projects or apply to graduate school in social research fields. Topics include reviewing literature, preparing a research proposal, protecting human subjects, citing scholarly work, building measures, estimating sample size, interview and presentation skills.

Prerequisite: SE 10 and SE 13. Satisfactory completion of the Lower-Division Writing requirement.

Same as CLS C169W, SE 111W, UPPP 114W.

**(Ib)****PSCI 112D. Adolescent Development. 4 Units.**

Examines current research on the biological, social, and cultural contexts of adolescent development. Topics include the impacts of puberty, adolescents' decision-making competencies, changes in family and peer relationships, identity development, and psychosocial problems such as depression and problem behavior.

Prerequisite: PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B

Overlaps with PSYC 21A.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 113D. Adult Development. 4 Units.**

Examines why and how we change (with attention to gains as well as losses) from ages 18-65 and the nature and sources of continuity over time. Topics include physical and intellectual functioning, personality, coping strategies, and social roles and relationships.

Prerequisite: PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 115D. Cognitive Development. 4 Units.**

Examines theories on nature of cognitive development. Discusses behaviorist theories on role of the environment including those of Vygotsky and Piaget, and recent evidence from cognitive psychologists stressing the importance of knowledge and skills within specific domains.

Prerequisite: PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 116D. Human Development and Cross-Cultural Perspectives. 4 Units.**

Human development in diverse cultures (e.g., Asian, American, and African). Special emphasis on East-West contrasts and when East meets West (i.e., Asian-American experiences). Topics include parenting, family relations, language and cognition, schooling and academic achievement, and morality.

Prerequisite: (PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B) and SE 10

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 117D. The Psychology of Gender. 4 Units.**

Discussion of gender identity development and examination of gender differences and similarities across the life span. Consideration of the biology and psychology of gender in relation to physical, behavioral, personality, and intellectual capabilities.

Prerequisite: PSCI 9 or PSYC 9B or PSCI 11B or PSYC 7A

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 118D. Human Sexuality. 4 Units.**

A broad survey of human sexuality encompassing genetic factors, physiological and anatomical development, customary and atypical forms of behavior, reproductive processes, and cultural determinants.

Prerequisite: PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 121D. Work and Family. 4 Units.**

Effects of employment and unemployment on mental health and marital quality; effects of work on parenting and child development; corporate and social policies for 'families that work'; young adults' decision-making about work and family.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Upper-division students only. Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 126D. Development of Motivation Across the Lifespan. 4 Units.**

Introduces major concepts in life-span development of motivation and self-regulation, and discusses exemplar empirical findings pertaining to these concepts during the various phases of life. Students participate in discussion, present findings from research articles, and write a paper.

Restriction: Psychological Science Majors only. Psychology and Social Behavior Majors only. Social Ecology Majors only.

**PSCI 127D. Attachment Relationships. 4 Units.**

Students learn about the development of attachment-related needs throughout development, as well as the links between attachment and emotion, psychopathology and treatment. Lectures emphasize classic as well as cutting-edge research and are supplemented by primary source readings.

Prerequisite: PSCI 9 or PSYC 7A or PSCI 11A or PSYC 9A or PSCI 11B or PSYC 9B

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 134H. The Science and Practice of Wellness and Resilience . 4 Units.**

Wellness is a common, but elusive goal. Covers the history, theory, psychology, and behavioral science behind skills for wellness and resilience. Provides opportunities to practice the strategies to help further understanding of the behavioral nature of each of the areas.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors only. Psychology and Social Behavior Majors only. Social Ecology Majors only.

**PSCI 136H. Behavioral Medicine. 4 Units.**

Examines biobehavioral aspects of health and illness, focusing on how stress contributes to or exacerbates disease processes. Background information on psychosomatic medicine and stress models and detailed examination of specific organ systems emphasizing the reactivity of these systems to stress.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 137H. Human Stress. 4 Units.**

Stress as a multidisciplinary topic. Biological, psychological, and sociological approaches to adaptation-related disorders. Effects of acute and chronic stress on emotions, physiology, and behavior. Methods of stress assessment, stress reduction, and intervention.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 138H. Child Health Psychology. 4 Units.**

Exploration of psychological antecedents, concomitants, and consequences of medical illnesses in children. Children's beliefs about health, illness, and medication; the role of stress; coronary-prone behavior; therapeutic adherence and physician-patient interaction; coping with chronic illness; effects of child's illness on family.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 9C or PSYC 7A. Recommended: SE 10.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 139H. Clinical Sport Psychology. 4 Units.**

An interdisciplinary introduction to clinical sport psychology, that includes, among other things, an introduction to psychopathology in sport; plus the use of psychological skills training, including anxiety reduction techniques, visualization, self-efficacy, coping skills, concentration, and goal-setting in sports.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Overlaps with PSYC 124S.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 140H. The Hardiness Approach to Stress Management. 4 Units.**

New development within psychology involving a combination of motivations and skills that extensive research has shown enhances performance, conduct, morale, stamina, and health. Combines study of hardiness research with strategies for improvement of personal hardiness through a series of exercises.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 141H. Clinical Health Psychology. 4 Units.**

Behavioral role in etiology, treatment, and prevention of certain diseases. Behavioral intervention including biofeedback, stress-, pain-management, health habit counseling, and other skills to assist patients make cognitive, emotional, and behavioral changes needed to cope with disease or achieve better health.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Same as PUBH 141.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 142H. Introduction to Interdisciplinary Salivary Bioscience . 4 Units.**

Introduction to the integration of salivary analytes into developmental, social, behavioral, and health sciences. Lectures cover theoretical perspectives; oral fluid as a biological specimen; saliva collection and study design; basics of salivary assay methods; and research findings across multiple fields.

Restriction: Psychological Science Majors only. Psychology and Social Behavior Majors only. Social Ecology Majors only.

**PSCI 150C. Clinical Psychology. 4 Units.**

Overview of theories, assessment techniques, research methodologies, and intervention approaches in clinical psychology. Psychodynamic, behavioral, humanistic, and cognitive perspectives are examined along with ethical and professional issues.

Prerequisite: (PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C) and PSCI 102C

Overlaps with PSYC 122C.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 152C. Clinical Child Psychology. 4 Units.**

Examines research and theory concerning childhood psychopathology behavior disorders. Diagnosis and assessment, early identification of high-risk children, fears and phobias, antisocial behavior, childhood psychoses, autism, depression, attention deficit/hyperactivity disorders, and ethical and policy implications of identifying children who are different.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 153C. Developmental Psychopathology. 4 Units.**

Research and theory of origins, course, and outcomes of disordered behavior. Continuity and change in patterns of behavior; environmental challenges and buffers; stress/competence in children; vulnerable/invincible children; children of mentally ill parents; families at risk; childhood antecedents of adult disorders.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C. Recommended: SE 10.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 154C. Cognitive Behavior Therapy. 4 Units.**

Presentation of principles and procedures of therapeutic interventions based on cognitive-behavior methods. Cognitive factors in learning, emotional arousal, psychological disorder, and psychotherapy reviewed. Introduces the application of cognitive behavioral methods to problems of depression, anxiety, anger, pain, and impulsivity.

Prerequisite: PSCI 9 or (PSCI 11A and PSCI 11C) or PSYC 7A or (PSYC 9A and PSYC 9C)

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 155C. Child Therapies. 4 Units.**

Examines research methodologies, empirical data, and implications of diverse intervention strategies. Primary topics include psychotherapy process and outcome, family therapies, behavioral intervention, cognitive behavior modification, pediatric psychopharmacology, and ethical and social policy implications of intervening in other people's lives.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 156C. Forensic Psychology: Advanced Seminar. 4 Units.**

Focuses on the psychology of criminal offending, particularly violent behavior. Examines violence, sexual offending, and mental disorder related to crime with regard to clinical assessment and treatment; mental health services within forensic institutions.

Prerequisite: (PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C) and PSCI 102C and (PSCI 178S or CLS C149)

Same as CLS C136, PSYC 177F.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 160C. Clinical Neuroscience. 4 Units.**

An introduction to the neuroclinical bases of human behavior, including neuropsychological approaches to mental disorders. Also includes case formulations, research articles, therapeutic approaches, and other discussions related to select psychopathology and other neurobehavioral topics.

Prerequisite: PSCI 9 or PSYC 7A or PSCI 11A or PSYC 9A or BIOL 99

Same as BIOL N170.

Restriction: Psychological Science Majors have first consideration for enrollment. Biological Sciences Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 161C. Forensic Psychology . 4 Units.**

Forensic psychology is the interface between clinical psychology and the law. Emphasizes clinically relevant legal topics (insanity defense; competency to stand trial) and includes critical thinking about issues that arise when psychologists are involved in legal proceedings.

Prerequisite: PSCI 9 or PSCI 11B or PSCI 11C

Same as CLS C160.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 162C. Psychodynamic Studies. 4 Units.**

Introduction to contemporary psychodynamic studies. Emphasis on clinical concepts associated with psychodynamic psychotherapy, including unconscious determinants of behavior, typical defenses, life experiences, and techniques. Exploration of links between psychodynamic-oriented psychotherapy and other disciplines (e.g., psychology, music, medicine, neuroscience, film).

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 163C. Human Neuropsychology. 4 Units.**

A survey of human brain disorders using a clinical case study approach to illustrate fundamental issues in studying brain and behavior. Topics include sensory deficits, attentional neglect, amnesia, cortical organization, clinical psychopathology, and more.

Prerequisite: BIOL N110 or BIOL N115A or PSYC 9A or PSCI 11A

Same as BIOL N173, PSYC 162N.

Restriction: School of Biological Sciences students have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSCI 164C. Addiction. 4 Units.**

Designed for those with an interest in the nature and treatment of addiction. Focuses on the etiology and treatment of addiction, but does not prepare students to treat substance abuse disorders.

Prerequisite: PSCI 11A and PSCI 11B and PSCI 11C and PSCI 102C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 165C. Adult Psychopathology. 4 Units.**

Advanced course in abnormal psychology, focusing on adult psychopathology. Covers historical and fundamental issues about psychiatric disorders, clinical research on disorders of anxiety, PTSD, mood, psychoses, personality, and dementia, and their biopsychosocial features, and attends to assessment and treatment.

Prerequisite: PSCI 102C. Equivalent to PSCI 102C is also accepted.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 166S. Chicano/Latino Families. 4 Units.**

Introduction to the research, literature, and issues surrounding the topic of Chicano/Latino families including cultural history, contemporary issues, organization of family, traditions, lifestyles, values, beliefs, generational differences, gender issues, ethnic identity, evolution of demographic patterns, current economic and political standings.

Same as CHLT 170, SSCI 165, PSYC 174H.



**PSCI 170S. Personality. 4 Units.**

Comparison of the major theories of personality. Provides a frame of reference for understanding lifestyles, development, maturity, and psychopathology. Emerging research themes are used to identify promising lines of personality theorizing.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Overlaps with PSYC 120P.

Restriction: Upper-division students only. Sophomores only. Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 171S. Environmental Psychology. 4 Units.**

Impact of the physical environment on individual and group behavior. Three basic concerns examined: (a) environmental determinants of behavior at the individual and interpersonal level; (b) social planning and urban design; (c) methodological approaches to the study of environmental issues.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 173S. Social Relationships. 4 Units.**

Examines major issues, concepts, and methods in the scientific study of social relationships. Topics include relationship formation and dissolution, friendships and love relationships, loneliness, bereavement, societal influences on close relationships, significance of close relationships for health and well-being.

Prerequisite: (PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C) and SE 10

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 174S. Error and Bias in Social Judgement. 4 Units.**

Examines how people encode, reason about, and remember social information and explores how biases and shortcomings in social perception, judgment, and memory are central to understanding both effective social functioning and many forms of maladaptive behavior and social conflict.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 176S. Motivation. 4 Units.**

History, major theories, methods, and applications of motivational psychology, with emphasis on European approaches. Origins of the field in personality, learning, cognition, and activation research. Recent innovations in motivational and volitional self-recognition. Current approaches, major debates, empirical research programs.

Prerequisite: (PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C) and PSCI 101D and (PSCI 104S or UPPP 151)

Overlaps with PSYC 121M.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 178S. Violence in Society. 4 Units.**

Current theory and research on aggression; anger and violence as problems in individual and social functioning. Process and functions of anger examined with regard to normal behavior and psychopathology. The determinants, prevalence, and implications of violence in society are analyzed.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Same as CLS C149.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment.

**PSCI 179S. Cultural Psychology. 4 Units.**

An examination of culture's influence on human minds. Topics include culture's impact on perception, cognition, motivation, emotion, moral reasoning, communication, and health. Addresses cultural psychology's methods, history, and place within psychology and related fields.

Prerequisite: PSCI 9 or PSCI 11B or PSCI 11C or PSYC 7A or PSYC 9B or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 183S. Social Epidemiology. 4 Units.**

Overviews evidence linking environmental factors to mental and physical disorders including such variables as socioeconomic status, income inequality, work stress, job loss, social capital, location, and other demographic characteristics. Measurement and research design issues of both individual and aggregate levels.

Prerequisite: (PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C) and SE 10 and SE 13

Same as PUBH 102.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 184S. Positive Psychology . 4 Units.**

The field of positive psychology focuses on what is right and positive about people and institutions. Introduces findings associated with human strengths and positive emotions, and provides clinical and personal applications and implications.

Prerequisite: PSCI 9 or PSCI 11C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 185S. Industrial-Organizational Psychology. 4 Units.**

Examines the application of social psychology to organizational settings. Topics include motivation of workers, group decision-making, leadership styles, career management, and organizational development.

Prerequisite: PSCI 9 or PSCI 11A or PSCI 11B or PSCI 11C or PSYC 7A or PSYC 9A or PSYC 9B or PSYC 9C

Overlaps with PSYC 122I.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 187S. Psychology of Inequality. 4 Units.**

Focuses on the psychological dimensions of poverty, wealth, and economic inequality.

Prerequisite: PSCI 104S and PSCI 11C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 188S. Evolutionary Psychology. 4 Units.**

Understanding our evolutionary origins is critical to truly understanding the complexities of human psychology. Explores how Darwinian principles, applied to both genes and culture, can help us understand not just how the mind works, but why.

Prerequisite: PSCI 11C or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 190. Applied Statistics in Social and Behavioral Research. 4 Units.**

Covers statistical techniques used to describe and make generalizations about phenomena represented by data. Hands-on experience in data analysis and interpretation using statistical software (SPSS, STATA) is emphasized. Topics include data visualization, ANOVA, multiple regression, and categorical data analyses.

Prerequisite: SE 13

Same as CLS C190, SE 190, UPPP 190.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**PSCI 192B. The Science and Practice of Compassion. 4 Units.**

Explores the latest scientific research on compassion and its correlates, and considers practical strategies for increasing compassion in everyday life. Students discover how cutting-edge research is yielding insights into kindness, empathy, altruism, and compassion.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 192Q. Chicano/Latino Social Psychology. 4 Units.**

Examines theories, research, and major issues of relevance to understanding social psychological processes in Chicano/Latino populations. Topics include social development, cultural orientations, gender and sexuality, close relationships, happiness and well-being, stereotyping, prejudice and discrimination, and mental and physical health.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as CHLT 168.

Restriction: Psychological Science Majors have first consideration for enrollment. Chicano/Latino Studies Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**(VII)**

**PSCI 192T. Cognition and Learning in Educational Settings. 4 Units.**

Foundational concepts in cognition and development as applied to student learning. Primary topics include historical behaviorism, basic cognitive structure and processes, complex cognition, cognitive development, and motivation.

Same as EDUC 173.

Restriction: Psychological Science Majors have first consideration for enrollment. Education Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 192U. Psychology of Learning, Abilities, and Intelligence. 4 Units.**

Overview of classic positions on the mind, human abilities, and intelligence, especially as related to academic achievement. Contrasting views: psychometric versus information processing; experimental versus correlational research.

Prerequisite: PSYC 7A or PSCI 9 or PSCI 11A or PSCI 11B or PSCI 11C

Same as EDUC 176.

Restriction: Psychological Science Majors have first consideration for enrollment. Education Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 192V. Language and Literacy. 4 Units.**

Addresses the linguistic principles and processes that underlie oral and written language proficiency. Emphasis is on how to use phonology, morphology, orthography, semantics, syntax, and pragmatics to support literacy and oral language development for K-12 students.

Same as EDUC 151, LSCI 182V.

Restriction: Language Science Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Education Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 193B. Juvenile Delinquency. 4 Units.**

Patterns of delinquent behavior, theories that explain behavior, current research aimed at enhancing exploratory power. Attempts to prevent and control delinquency are put in historical perspective. Development of the current juvenile justice system and evolution of modern juvenile law.

Same as CLS C109.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment.

**PSCI 193C. Social Control of Delinquency. 4 Units.**

Assumes familiarity with theories of delinquency, the juvenile justice system, and elements of juvenile law. Explores socio-historical origins and evolution of juvenile justice, current research and policy on delinquency prevention and treatment, and future directions of law, policy, and practice.

Prerequisite: Recommended: CLS C109.

Same as CLS C164.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 193E. Psychology and the Law. 4 Units.**

Psychological assumptions of the American legal system and mental health aspects of provision of criminal justice services. Civil commitment, insanity defense, competence to stand trial, jury selection, eyewitness identification. Use of police, courts, correctional institutions in prevention of behavior disorder.

Same as CLS C105.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment.

**PSCI 193F. Family Law. 4 Units.**

Examines legal issues surrounding marriage, cohabitation, divorce, child custody and support, adoption, and the rights of parents and children in the family context. The findings of social science research are used to illuminate the legal issues.

Same as CLS C123.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 193G. Eyewitness Testimony. 4 Units.**

Faulty eyewitness testimony is a major cause of wrongful convictions. Covers the fast-growing topic of eyewitness testimony and memory for real-world events, both how psychologists study eyewitness capacity, and how the legal system has dealt with eyewitness issues.

Prerequisite: SE 10

Same as CLS C177.

Restriction: Seniors only. Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

Concurrent with CLS C263.

**PSCI 196. Research Seminar in Psychological Science . 4 Units.**

Special topics research seminar. Content varies with interest of instructor. Capstone seminar for students who have conducted research with, or have a background in, the research topics of the PSCI faculty member offering this seminar in a given quarter.

Prerequisite: PSCI 11C

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**PSCI P200. Introduction to Legal and Forensic Psychology . 4 Units.**

Familiarizes students with the interrelated fields of psychology, law, and forensic studies. Emphasizes clinically relevant legal topics (insanity defense; competency to stand trial) and includes critical thinking about issues that arise when psychologists are involved in legal proceedings.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P201. Research Methods in Psychology. 4 Units.**

In-depth examination of the conceptualization of research problems and linkages between theory and the design of appropriate strategies for empirical research in psychological science. Topics include experimental and quasi-experimental designs, reliability and validity of measurement and non-experimental procedures.

Restriction: Graduate students only. Psychological Science Majors only. Psychology and Social Behavior Majors only.

**PSCI P202. Data Analysis and Statistics . 4 Units.**

Statistical techniques to facilitate inferences in psychological research, including fundamentals of statistical inference and methods for analyzing data.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P204. Adolescence. 4 Units.**

Considers pubertal and cognitive changes and their social consequences; the family, peer group, school, and cultural contexts in which adolescence is embedded; and selected psychosocial issues including autonomy, identity, health, and well-being.

Restriction: Graduate students only.

**PSCI P208. Research Methods. 4 Units.**

In-depth examination of issues relevant to designing and evaluating research in psychological science. Topics address casual inference, ethical issues surrounding the responsible conduct of research, experimental and quasi-experimental designs, reliability and validity of measurement, and non-experimental procedures.

Overlaps with PSCI P201.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P209A. Applied Psychological Research. 4 Units.**

Focuses on scientific and professional issues in the field of psychology. Topics include communication skills; intervention approaches; collaboration, consultation, and referral; and ethical issues associated with at-risk populations research.

Restriction: Graduate students only.

**PSCI P214. Seminar in Social Psychology. 4 Units.**

Presents an overview of selected theoretical and empirical topics in social psychology including social influence and conformity, altruism and aggression, persuasion and attitude change, self and social perception, and social cognition.

Restriction: Graduate students only.

**PSCI P215. Psychology and Law . 4 Units.**

An interdisciplinary approach to research in psychology, law, and/or criminology. Examines how psychology is applied to the civil and criminal justice systems, how case law shapes this application, and how legal decisions affect the direction of psychological research.

Overlaps with PSCI P266.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P217. Life-Span Development. 4 Units.**

Introduces the major concepts of life-span development and discusses those with regard to some key topics of developmental psychology. For example, change and continuity, evolutionary and inherited nature, culture, society, and family-based nurture, and their dynamic interaction.

Restriction: Graduate students only.

**PSCI P220. Developmental Psychology: Theories and History. 4 Units.**

Examines key concepts, theories, and the historical and philosophical roots of research in human life span development. Focuses on biological and environmental causation, universalism and cultural relativism, continuity and change.

Restriction: Graduate students only.

**PSCI P222. Forensic Assessment . 4 Units.**

Explores the various ways in which clinical psychology is relevant to the law, and how forensic psychologists can meaningfully contribute to the adjudicatory process. Examines legal, scientific, and ethical issues that arise when psychologists are involved in legal proceedings.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P223. Cross-Cultural Developmental Psychology. 4 Units.**

Examines human development in diverse cultures (e.g., Asian, American, and African). Cultural diversity within the U.S. and acculturation of various ethnic groups is also discussed. Topics include parenting, family relations, language, and cognition, schooling and academic achievement, and morality.

Restriction: Graduate students only.

**PSCI P224. Children and the Law. 4 Units.**

Examines how psychology research and practice can inform several areas of law and social policy affecting children, adolescents, and families. Topics include education, mental health, reproductive rights, and delinquency.

Overlaps with PSCI 120D.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P226. Emotion in Psychology. 4 Units.**

Covers original and recent theories of emotions and how they guide current research. Specific topics include neuroanatomical structure of emotion, life-span emotional development, and health and emotion.

Restriction: Graduate students only.

**PSCI P231. Professional Issues in Psychology. 4 Units.**

Examines a variety of issues related to the professional socialization and development of graduate students in psychology. Topics include the publication process, sources of research funding, alternative employment options, competitiveness on the job market, and the academic career route.

Restriction: Graduate students only.

**PSCI P232. Trauma and Resilience. 4 Units.**

Psychological impact of trauma; biopsychosocial factors affecting development of traumatic stress, treatment, and preventive interventions for traumatic stress; define and measure resilience; moral injury and post traumatic growth; ethics of studying trauma.

Restriction: Graduate students only.

**PSCI P234. Childhood. 4 Units.**

Provides graduate students with an overview of traditional and emerging theories, models, and research designed to understand children's development in the domains of cognitive, social, and emotional functioning.

Restriction: Graduate students only.

**PSCI P238. Child Psychopathology. 4 Units.**

Examination of etiology, classification, and developmental pathways of disorders, as well as risk and resilience factors, during the childhood/adolescent years. Discussion of genetic influences and contextual risk factors as well as internalizing and externalizing disorders.

Restriction: Graduate students only.

**PSCI P242. Legal Reasoning and Jurisprudence. 4 Units.**

Overview of the law and legal process as well as the history and assumptions underlying modern legal reasoning. Issues related to procedure and evidence as well as key jurisprudential perspectives are discussed.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P246. Affective Neuroscience. 4 Units.**

Provides an overview of the emerging field of affective neuroscience. Emphasis is placed on mapping affective experience and behavior to brain function, including cross-level integration of anatomical, chemical, fMRI, and electrical data.

Restriction: Graduate students only.

**PSCI P247. EEG Methods . 4 Units.**

Provides an in-depth training of the electroencephalogram (EEG) methodology with a specific focus on the event-related potential technique. Emphasis is on learning how to use this methodology and how to analyze data, with a focus on emotional stimuli.

Restriction: Graduate students only.

**PSCI P249. Advanced Social Psychology . 4 Units.**

Conveys an appreciation of the flavors of contemporary social psychology, an understanding of empirical approaches to problems in this area, and a sense of the array of theoretical orientations in the field.

Restriction: Graduate students only.

**PSCI P250. Emotion, Reasoning, and Memory. 4 Units.**

Examines research and theory on emotion from the perspective of cognitive psychology. Topics include the effects of emotions on attention, memory, and problem solving; the relations between emotional and cognitive development; flash-bulb memories of intense emotional experiences; eyewitness testimony.

Restriction: Graduate students only.

**PSCI P251. Clinical Interviewing and Treatment in a Forensic Setting. 4 Units.**

Students receive an introduction to clinical interviewing, learn details of strategic, solution-focused therapy, and think critically about issues that come at the interaction of psychology and the law. Students are not 'license-eligible' at end of this course.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P252. Law and Behavior: Compliance and Enforcement. 4 Units.**

Provides sophisticated insight into the different ways through which law shapes behavior. Addresses both the economic amoral rational choice theories, as well as ideas from social psychology, criminology, and sociology about the moral, social, and and unconscious dimensions of compliance.

Restriction: Graduate students only. Psychological Science Majors only. Psychology and Social Behavior Majors only.

**PSCI P253. Master of Legal and Forensic Psychology Capstone. 4 Units.**

Focuses on macro-level writing topics such as developing a meaningful research question, conducting a thorough review of relevant literature, and presenting a clear and convincing research-based argument.

Restriction: Graduate students only.

**PSCI P254. Mental Health and the Law . 4 Units.**

Explores the history of criminalization of persons with mental illness. Topics include challenges and needs of persons with mental illness; civil and outpatient commitment; law enforcement responses to persons with mental illness; and mentally ill offenders in jails and prisons.

Restriction: Master of Legal & Forensic Psy Degree students only. Graduate students only.

**PSCI P255. Violence, Anger, and Psychopathology. 4 Units.**

Overviews the prevalence of violence as a criminal and public health problem. Topics include violence within families and intimate partner relationships, traumatic origins of violence, the development of a violence-prone personality, the association of anger and violence with psychopathology.

Restriction: Master of Legal & Forensic Psy Degree students only. Graduate students only.

**PSCI P256. Family and the Law . 4 Units.**

Examines sociological and legal perspectives on the relationship between family life and law, with a focus on three distinct but sometimes interconnected domains: the child welfare system, the criminal justice system, and the immigration system.

Restriction: Master of Legal & Forensic Psy Degree students only. Graduate students only.

**PSCI P258. Health Psychology. 4 Units.**

Interdisciplinary exploration of emerging fields of health psychology and behavioral medicine. Topics: role of stress in development/treatment of medical problems; sociocognitive determinants of health and illness; interpersonal health transactions; behavioral approaches to medical problems such as diabetes, obesity, hypertension.

Restriction: Graduate students only.

**PSCI P260. Technology and Health. 4 Units.**

Explores the growing intersection of health and technology, including electronic Health ("eHealth"), mobile health ("mHealth"), and digital health and medicine. Specifically, it focuses on the implications and uses of technologies for behavioral and emotional health, and behavioral change.

Restriction: Graduate students only.



**PSCI P261. Intensive Longitudinal Data Analysis. 4 Units.**

Fundamentals of Intensive Longitudinal Study designs, gain first-hand experience collecting ILD using web and/or mobile-based platforms, and learn.

Prerequisite: SE 264A and SE 264B

Restriction: Graduate students only.

**PSCI P262. Interpersonal Processes and Health. 4 Units.**

Examines traditions of research linking interpersonal processes to emotional or physical health. Topics include: role of social support in ameliorating stress, effects of social control on health-compromising behaviors, adverse effects of social relationships on health, causes of deficient social relationships.

Restriction: Graduate students only.

**PSCI P263. Eyewitness Testimony. 4 Units.**

Examines the evidence that shows that faulty eyewitness memory is the major cause of wrongful convictions. Explores what the legal system thinks of eyewitness testimony and how the legal system has dealt with eyewitness issues.

Same as CLS C263.

Restriction: Graduate students only.

**PSCI P265. Memory and the Law. 4 Units.**

Examines the controversial topic of repressed memory, or perception and memory of real-world events.

Same as CLS C265.

Restriction: Graduate students only.

**PSCI P266. Psychology and the Law. 4 Units.**

Overview of how psychology is applied to the civil and criminal justice systems, how case law shapes this application, and how legal decisions affect the direction of psychological research. Interdisciplinary approach to research in psychology, law, and/or criminology.

Same as CLS C266.

Restriction: Graduate students only.

**PSCI P271. Human Evolution and Behavior. 4 Units.**

Covers theories and empirical research concerning the evolutionary origins of human behaviors and their variations. An interdisciplinary course emphasizing both evolutionary psychology (e.g., mating strategies, kinship, and parenting) and molecular evolution (i.e., evolution of genes for various behaviors).

Same as BIOC 217.

Restriction: Graduate students only.

**PSCI P273. Biobehavioral Aspects of Health and Illness. 4 Units.**

Examines the behavior-physiology interactions of some major bodily systems: the nervous, cardiovascular, gastrointestinal, and endocrine systems. Analysis of normal and abnormal states of these systems as they relate to tissue injury, disease, and rehabilitation.

Restriction: Graduate students only.

**PSCI P275. Special Topics in Psychological Science . 4 Units.**

Topics covered vary with interests of instructor.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PSCI P276. Meta Analysis. 4 Units.**

The process of synthesizing results from a number of studies that address a common research question is often referred to as meta-analysis. Explores the meta-analysis process from the coding of retrieved studies to the final research synthesis.

Restriction: Graduate students only.

**PSCI P280A. Interdisciplinary Salivary Bioscience. 4 Units.**

Theory and research on the integration of salivary analytes into developmental, social, behavioral, and health sciences. Topics include oral fluid as biological specimens; practical aspects of sample handling, collection, and study design; basics of laboratory methods used for assaying saliva.

Restriction: Graduate students only.

**PSCI P280B. Interdisciplinary Salivary Bioscience Lab. 4 Units.**

Laboratory sequel to the P280A seminar. Provides laboratory-based hands-on experience integrating salivary analytes into developmental, social, behavioral, and health sciences that also includes supervised training on sample processing.

Prerequisite or corequisite: PCSI P280A. PCSI P280A with a grade of B or better

Restriction: Graduate students only.

**PSCI P281. Race and the Law. 4 Units.**

Explores how race and other markers of social identity shape outcomes within the criminal justice system. Students examine how race, ethnicity, and national origin intersect with rules governing the policing, trials, and punishment.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P282. Salivary Bioscience Data Analysis . 4 Units.**

A salivary bioscience statistical research working group. Students conduct guided data analyses with salivary biomarker data. Special topics related to salivary bioscience analytic strategies and the interpretation and dissemination of research findings are discussed.

Restriction: Graduate students only.

**PSCI P283H. Psychoneuroimmunology. 4 Units.**

Introduces students to the field of psychoneuroimmunology and helps them develop the conceptual and methodological skills necessary for designing and interpreting research on the bidirectional relationship between the immune system and psychological processes.

Restriction: Graduate students only.

**PSCI P284. Health and Emotion. 4 Units.**

Overview of research focused on understanding how emotional processes influence physical health. Provides students with a deeper understanding of how emotions play into the health of others as well.

Restriction: Graduate students only.

**PSCI P285. Anger: A Turbulent Emotion. 4 Units.**

Provides an enriched perspective on anger beginning with its understanding in classical antiquity. Topics include developmental processes and trauma, anger physiology and neuroscience, anger-related physical health impairments, and the involvement of anger in psychopathology and violence.

Restriction: Graduate students only.

**PSCI P286. Motivation. 4 Units.**

Introduces major concepts of motivational psychology, theory, and history. Application of motivational concepts to phenomena from social psychology and affective science. Development of own research proposal in a motivational framework and/or conceptualizing or expanding an ongoing or planned research project.

Restriction: Graduate students only.

**PSCI P288. Human Neuropsychology . 4 Units.**

Focuses on clinical, neuroanatomical, and neuropathological studies that have contributed to our understanding of brain-behavior relationships in the context of normal brain function and disease-associated neuropsychiatric syndromes.

Restriction: Graduate students only.

**PSCI P289. The Teaching of Psychology. 4 Units.**

Provides students with the theory and skills needed to teach undergraduate psychology courses. Covers research on theories and methods of teaching, curriculum design, and evaluation. Students also gain practical experience preparing and presenting material.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Psychological Science Majors only. Psychology and Social Behavior Majors only.

**PSCI P290. Research in Developmental Psychology. 4 Units.**

Introduces graduate students to research conducted by individual faculty members in the area of developmental psychology. This is accomplished by having students involve themselves in the conceptualization, strategy, and implementation of the faculty member's research.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PSCI P291. Research in Health Psychology. 4 Units.**

Introduces graduate students to research conducted by individual faculty members in the area of health psychology. This is accomplished by having students involve themselves in the conceptualization, strategy, and implementation of the faculty member's research.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PSCI P292. Research in Psychopathology and Behavior Disorder. 4 Units.**

Introduces graduate students to research conducted by individual faculty members in the area of psychopathology and behavior disorder. This is accomplished by having students involve themselves in the conceptualization, strategy, and implementation of the faculty member's research.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PSCI P293. Research in Social and Personality Psychology. 4 Units.**

Introduces graduate students to research conducted by individual faculty members in the area of social and personality psychology. This is accomplished by having students involve themselves in the conceptualization, strategy, and implementation of the faculty member's research.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PSCI P294A. Research Directions in Psychological Science I. 2 Units.**

Introduces students to the current research of faculty, graduate students, and visitors to the Department of Psychological Science. Includes examination of contemporary research issues and controversies, as well as issues related to students' development as professionals.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PSCI P294B. Research Directions in Psychological Science II. 2 Units.**

Introduces students to the current research of faculty, graduate students, and visitors to the Department of Psychological Science. Includes examination of contemporary research issues and controversies, as well as issues related to students' development as professionals.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PSCI P294C. Research Directions in Psychological Science III. 2 Units.**

Introduces students to the current research of faculty, graduate students, and visitors to the Department of Psychological Science. Includes examination of contemporary research issues and controversies, as well as issues related to students' development as professionals.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PSCI P295. Research in Psychology and Law. 4 Units.**

Introduces graduate students to research conducted by individual faculty members in the area of psychology and law. This is accomplished by having students involve themselves in the conceptualization, strategy, and implementation of the faculty member's research.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PSCI P296. Doctoral Dissertation Research and Writing. 4-12 Units.**

Dissertation research with Psychological Science faculty.

Prerequisite: Advancement to candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PSCI P298. Directed Studies in Psychological Science. 2-4 Units.**

Directed study with Psychological Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PSCI P299. Independent Studies in Psychological Science. 2-8 Units.**

Independent research with Psychological Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Public Policy Courses

**PUB POL 215. Statistics and Methods for Public Policy. 4 Units.**

Introductory course with focus on gaining a sound understanding of what constitutes credible evidence in support of policy arguments and management decisions.

Restriction: Graduate students only.

**PUB POL 219. Information and Public Policy. 4 Units.**

Evaluates strengths and weaknesses of qualitative and quantitative methods and the data used in making public policy claims. Looks at the bases of certain widely accepted measures of poverty, growth, environmental quality, and the like.

Repeatability: May be taken for credit 2 times.

Restriction: Public Policy Majors have first consideration for enrollment.

**PUB POL 221. Public Policy . 4 Units.**

Explores different approaches to public policy analysis, the diverse conceptions of the goals and objectives that should be served by policy, and the appropriate role of the policy analyst. Policy consequences are traced to indirect and subtle incentives and disincentives.

Repeatability: May be taken for credit 2 times.

Same as PP&D 221.

Restriction: Public Policy Majors have first consideration for enrollment.

**PUB POL 225. Qualitative Methods . 4 Units.**

Fieldwork, data collections techniques, and related issues for anti-positivistic research. Data collection techniques include observation, physical traces, participation, in-depth interview. Data checks include veracity, detail, completeness, rigor.

Repeatability: May be taken for credit 2 times.

Restriction: Public Policy Majors only.

**PUB POL 227. Economics of Government. 4 Units.**

Prepares students to analyze public policy questions with tools from economics. By the end, students should be able to identify important economic issues in public policy debates and consume and critique economic research on these topics.

Same as ECON 275.

**PUB POL 240. Microeconomics and Public Policy. 4 Units.**

Introduces the fundamental principles of microeconomics that are required for applied policy analysis. Provides students with an intuitive understanding of the microeconomic approach, and familiarizes them with concepts used in applied public policy analysis.

Repeatability: May be taken for credit 2 times.

Same as ECON 255.

Restriction: Graduate students only.

**PUB POL 260. Policy and Ethics . 4 Units.**

Examines the challenge of identifying ethical principles that can guide us in formulating and assessing public policy, the public policy process from an ethical perspective, and the ethics of the individual engaged in the public policy arena.

Restriction: Public Policy Majors only.

**PUB POL 283. Collaborative Governance and Public Management. 4 Units.**

Introduction to inclusive management. To make effective use of public resources, public managers are inventing ways of managing that alter relationships within organizations, between organizations, between sectors, and with the public. Requires rethinking fundamentals such as leadership and motivation.

Same as UPPP 283.

Restriction: Public Policy Majors have first consideration for enrollment.

## Social Ecology Courses

**SOCECOL 10. Research Design. 4 Units.**

An introduction to the logic behind and methods of designing and conducting research studies in Social Ecology. Topics include how to measure variables of interest, identifying causal relationships, sampling, survey research methods, experiments, quasi-experimental designs, and ethics in research.

Overlaps with EDUC 10.

Restriction: School of Social Ecology students only. Environmental Science and Policy Majors only.

**SOCECOL 13. Statistical Analysis in Social Ecology. 4 Units.**

Introduction to the techniques of statistical analysis in Social Ecology. Topics include probability, statistical inference, significance testing, univariate descriptive statistics, and multivariate analysis from an interdisciplinary perspective.

Overlaps with PSYCH 10A, SOCIOL 10A, SOC SCI 10A, POL SCI 10A, STATS 7, STATS 8.

Restriction: School of Social Ecology students have first consideration for enrollment. Environmental Science and Policy Majors have first consideration for enrollment. No credit for SOCECOL 13 if taken concurrently with or after PSYCH 10A, SOCIOL 10A, POL SCI 10A, SOC SCI 10A, STATS 7, STATS 8, STATS 67, EDUC 15

(Va)

**SOCECOL H20A. Honors: Critical Issues on the Social Sciences. 6 Units.**

Major themes, methods, and works in the social sciences from an interdisciplinary perspective. Each quarter focuses on a different topic. Weekly seminars emphasizing development of critical thinking skills and quantitative analysis through written work are integral to the course.

Same as SOC SCI H1E.

Restriction: Campuswide Honors Collegium students only.

(III)

**SOCECOL H20B. Honors: Critical Issues on the Social Sciences. 6 Units.**

Major themes, methods, and works in the social sciences from an interdisciplinary perspective. Each quarter focuses on a different topic. Weekly seminars emphasizing development of critical thinking skills and quantitative analysis through written work are integral to the course.

Prerequisite: SOC SCI H1E or SOCECOL H20A

Same as SOC SCI H1F.

Restriction: Campuswide Honors Collegium students only.

**(III)**

**SOCECOL H20C. Honors: Critical Issues on the Social Sciences. 6 Units.**

Major themes, methods, and works in the social sciences from an interdisciplinary perspective. Each quarter focuses on a different topic. Weekly seminars emphasizing development of critical thinking skills and quantitative analysis through written work are integral to the course.

Prerequisite: SOC SCI H1F or SOCECOL H20B

Same as SOC SCI H1G.

Restriction: Campuswide Honors Collegium students only.

**(III)**

**SOCECOL 74A. Moral Development and Just Communities. 4 Units.**

A three-quarter sequence exploring interpersonal, personal, and social issues based on principles of fairness and justice. Both the living environment of a University residence hall and selected institutions of society are analyzed in terms of moral development theory.

Grading Option: Pass/no pass only.

**SOCECOL 74B. Moral Development and Just Communities. 4 Units.**

A three-quarter sequence exploring interpersonal, personal, and social issues based on principles of fairness and justice. Both the living environment of a University residence hall and selected institutions of society are analyzed in terms of moral development theory.

Prerequisite: SOCECOL 74A

Grading Option: Pass/no pass only.

**SOCECOL 74C. Moral Development and Just Communities. 4 Units.**

A three-quarter sequence exploring interpersonal, personal, and social issues based on principles of fairness and justice. Both the living environment of a University residence hall and selected institutions of society are analyzed in terms of moral development theory.

Prerequisite: SOCECOL 74B

Grading Option: Pass/no pass only.

**SOCECOL 100. Special Topics in Social Ecology. 4 Units.**

Special topics courses are offered from time to time. In general they will focus on a topic from interdisciplinary perspectives. Course content varies with the interest of the instructor.

Repeatability: Unlimited as topics vary.

Restriction: School of Social Ecology students only.

**SOCECOL 111W. Advanced Research Methods. 4 Units.**

For students planning to conduct senior research projects or apply to graduate school in social research fields. Topics include reviewing literature, preparing a research proposal, protecting human subjects, citing scholarly work, building measures, estimating sample size, interview and presentation skills.

Prerequisite: SOCECOL 10 and SOCECOL 13. Satisfactory completion of the Lower-Division Writing requirement.

Same as CRM/LAW C169W, PSCI 111W, UPPP 114W.

**(Ib)**

**SOCECOL 118. Domestic Violence. 4 Units.**

General perspectives about domestic violence and theoretical accounts about what causes such behavior.

Same as CRM/LAW C118.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**SOCECOL 119. Violence in Intimate Relationships. 4 Units.**

Responses to various forms of domestic violence, such as intimate partner violence and child abuse. Covers barriers to reporting to the police, and prosecutors and courts. Human services, such as safety planning for victims, treatment programs, and restorative justice approaches.

Corequisite:

Same as CRM/LAW C119.

**SOCECOL E127. Nuclear Environments. 4 Units.**

Understanding the impact of the nuclear age on the environment and human health through interrelated developments of nuclear power and nuclear weapons. The early years of weapon development, catastrophic environmental pollution, perils of nuclear power in the U.S. and Russia.

Same as INTL ST 122, PUBHLTH 168.

**(VIII)****SOCECOL 183A. Global and International Studies Forum. 4 Units.**

A faculty-student forum featuring lectures from a variety of institutions with discussion issues related to Global and International Studies.

Repeatability: May be taken for credit 4 times.

Same as INTL ST 183A, SOC SCI 183A.

**SOCECOL 183B. Seminar in Mediation. 4 Units.**

Student develop mediation skills and refine knowledge in the practice and theory of conflict resolution. Students who complete this course may serve as mediators in the Campus Mediation Program. Course is a prerequisite to completing Indep Study as an intern.

Same as INTL ST 183B, SOC SCI 183B.

Restriction: International Studies Majors have first consideration for enrollment. School of Humanities students have first consideration for enrollment. School of Social Ecology students have first consideration for enrollment. School of Social Sciences students have first consideration for enrollment.

**SOCECOL 183CW. Seminar Conflict Resolution. 4 Units.**

Designed for seniors who are pursuing the minor in Conflict Resolution and/or International Studies major. Provides a forum in which students will refine skills and theory in the study of cooperation and conflict, from local to global arenas.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as SOC SCI 183CW, INTL ST 183CW.

**(Ib)****SOCECOL 186A. Senior Seminar on Global Sustainability I. 2 Units.**

Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum is also required. Seminar utilized to analyze forum presentations. Prepare bibliography.

Same as BIO SCI 191A, EARTHSS 190A.

Restriction: Seniors only. Global Sustainability Minors have first consideration for enrollment.

**SOCECOL 186B. Senior Seminar on Global Sustainability II. 2 Units.**

Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum is also required. Seminar utilized to analyze forum presentations. Prepare research proposal.

Prerequisite: BIO SCI 191A or SOCECOL 186A or EARTHSS 190A

Same as BIO SCI 191B, EARTHSS 190B.

Restriction: Seniors only.



**SOCECOL 186CW. Writing/Senior Seminar on Global Sustainability III. 4 Units.**

Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum also is required. Seminar utilized to analyze Forum presentations and to prepare senior research paper. Prepare/write research paper under direction of faculty member.

Prerequisite: BIO SCI 191B or EARTHSS 190B or SOCECOL 186B. BIO SCI 191B or EARTHSS 190B or SOCECOL 186B. Satisfactory completion of the Lower-Division Writing requirement.

Same as BIO SCI 191CW, EARTHSS 190CW.

Restriction: Seniors only.

**(Ib)**

**SOCECOL 189. Global Service Scholars Advanced Seminar. 4 Units.**

For students who are accepted into the Global Service Scholars Program. Provides advanced training in empathy and compassion, and prepares students for their summer international field experience.

Prerequisite: PSCI 192B

**SOCECOL 190. Applied Statistics in Social and Behavioral Research. 4 Units.**

Covers statistical techniques used to describe and make generalizations about phenomena represented by data. Hands-on experience in data analysis and interpretation using statistical software (SPSS, STATA) is emphasized. Topics include data visualization, ANOVA, multiple regression, and categorical data analyses.

Prerequisite: SOCECOL 13

Same as CRM/LAW C190, PSCI 190, UPPP 190.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**SOCECOL H190A. Honors Research. 4 Units.**

Independent work on an individual research project in addition to participation in a mini proseminar in which faculty discuss their ongoing research. Students prepare a written proposal for a research project.

Restriction: Seniors only.

**SOCECOL H190B. Honors Research. 4 Units.**

Independent work on an individual research project in addition to participation in a mini proseminar in which faculty discuss their ongoing research. Students prepare a written proposal for a research project.

Prerequisite: SOCECOL H190A

Grading Option: Pass/no pass only.

Restriction: Seniors only.

**SOCECOL H190W. Honors Research. 4 Units.**

Students write up their honors research project (H190A-B) and prepare an oral report which is presented at the honors seminar.

Prerequisite: SOCECOL H190B

Restriction: Seniors only.

**(Ib)**

**SOCECOL 194W. Naturalistic Field Research. 4 Units.**

Introduction to alternative models of experiential learning and to various methods of observation, assessment, and evaluation. Introduction to the nature of organizations and ethical issues that emerge from research and intervention in natural settings.

Prerequisite: SOCECOL 10. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: School of Social Ecology students only.

**(Ib)**

**SOCECOL 195. Field Study. 2-8 Units.**

Community engagement to facilitate civic education through field research experience, social intervention, and professionalization. Small group instruction, discussion, writing, and presentations synthesizing students' experiences in the field with theory, paradigms, and ideas learned about in their course work.

Prerequisite: SOCECOL 10

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 12 units.

Restriction: Upper-division students only. School of Social Ecology students only.

**SOCECOL 195A. Advanced Field Study. 4 Units.**

While completing 10 hours of field work per week, students become acquainted with the goals and activities of their placement and will work closely with the placement supervisor and AFS instructor to identify the scope of a research project.

Prerequisite: SOCECOL 10 and SOCECOL 13. Acceptance to Advanced Field Study required.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

Restriction: Upper-division students only. School of Social Ecology students only.

**SOCECOL 195B. Advanced Field Study. 4 Units.**

While completing 10 hours of field work per week, students implement their research project through data collection and observations which allow them to reflect on, apply, and synthesize their academic training through observations and experiences at the placement.

Prerequisite: SOCECOL 195A. Acceptance to Advanced Field Study required.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

Restriction: Upper-division students only. School of Social Ecology students only.

**SOCECOL 195CW. Advanced Field Study. 4 Units.**

While completing 10 hours per week of field work, students write and finalize their AFS Client Project in consultation with the placement and the FS instructor, and make a final written and oral presentation to the placement and invited guests.

Prerequisite: SOCECOL 195B. Acceptance to Advanced Field Study required. Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 2 times.

Restriction: Upper-division students only. School of Social Ecology students only.

**(Ib)****SOCECOL 195W. Field Study Writing Seminar. 4-8 Units.**

Community engagement to promote civic education through field research experience, and the opportunity to study social issues and the environments where they occur. Develop discipline-specific writing and communication skills, methodology, and integrate information from multiple sources. Course may be offered online.

Prerequisite: SOCECOL 10. Cumulative UC GPA of 2.0. Authorization is required. Successful completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit for 8 units.

Restriction: Upper-division students only. Criminology, Law and Society Majors only. Psychology and Social Behavior Majors only. Social Ecology Majors only. Urban Studies Majors only.

**(Ib)**

**SOCECOL 198. Directed Studies. 2-4 Units.**

Directed study with Social Ecology faculty.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**SOCECOL 199. Special Studies. 1-4 Units.**

Special Studies with Social Ecology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**SOCECOL 200. Seminar in Social Ecology. 4 Units.**

Students are introduced to the classic and contemporary literature of human and social ecology and are expected to use the ecological paradigm to analyze social phenomena of interest to the differing subprograms.

Restriction: Graduate students only.

**SOCECOL 261. Strategies of Theory Development. 4 Units.**

Examines key issues and controversies facing the development of social ecological theory, and encourages students to develop their own abilities as theorists. Strategies for enhancing creative hypothesis formation are emphasized.

Restriction: Graduate students only.

**SOCECOL 264A. Data Analysis. 4 Units.**

Provides an appreciation and understanding of statistics necessary to conduct applied research. Topics include approaches to and presentation of data, robust statistics, standardization techniques, multivariate regression, and analysis of variance.

Restriction: Graduate students only.

**SOCECOL 264B. Data Analysis. 4 Units.**

Provides an appreciation and understanding of statistics necessary to conduct applied research. Topics include approaches to and presentation of data, robust statistics, standardization techniques, multivariate regression, and analysis of variance.

Prerequisite: SOCECOL 264A

Restriction: Graduate students only.

**SOCECOL 266D. Analysis of Survival Data. 4 Units.**

Provides an introduction to survival analysis methods for the analysis of change in discrete dependent variables. Focuses on data collection strategies for obtaining longitudinal data and continuous-time hazards models. Communicates the variety and power of multivariate hazard models.

**SOCECOL 272A. Structural Equation Modeling I. 4 Units.**

The general structural equation model is developed including path models, recursive and nonrecursive structural models, multiple indicator models, and confirmatory factor models. Use of LISREL and other software for estimating model parameters is covered.

Prerequisite: SOCECOL 264A and SOCECOL 264B

**SOCECOL 272B. Structural Equation Modeling II: Longitudinal and Advanced Topics. 4 Units.**

Provides hands-on experience with longitudinal and advanced structural equation models and is of interest to students from a range of disciplines. Topics covered include confirmatory factor, latent growth curve, general growth mixture, and multi-level modeling.

Prerequisite: SOCECOL 272A

Restriction: Graduate students only.

**SOCECOL 275. Special Topics in Social Ecology. 2-4 Units.**

Topics covered vary with interests of the instructor.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCECOL 291. Program Evaluation. 4 Units.**

Students are introduced to the use of research techniques and statistical methods in assessing the effectiveness of social programs. Different evaluative models are discussed using examples of actual program evaluations.

Restriction: Graduate students only.

**SOCECOL 295. Masters Thesis Research & Writing. 1-8 Units.**

Independent research with Social Ecology faculty.

Prerequisite: Advancement to candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**SOCECOL 296. Doctoral Dissertation Research & Writing. 1-12 Units.**

Dissertation research with Social Ecology faculty.

Prerequisite: Advancement to Candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**SOCECOL 297. Field Study. 2-4 Units.**

Field studies in Social Ecology.

Restriction: Graduate students only.

**SOCECOL 298. Directed Studies. 2-4 Units.**

Directed study with Social Ecology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**SOCECOL 299. Independent Study. 1-8 Units.**

Independent study with Social Ecology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**SOCECOL 399. University Supervised Teaching. 2-4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Urban Planning and Public Policy Courses

**UPPP 4. Introduction to Urban Studies. 4 Units.**

Introduces the substantive areas, concepts, and tools in the field of urban studies. Acquaints students with physical, environmental, social, economic, and political dimensions of cities. Examines the challenges facing cities, including poverty, sustainability, development, globalization, and others.

Restriction: School of Social Ecology students have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

(III)

**UPPP 5. Introduction to Urban Planning and Policy. 4 Units.**

Introduces students to the basic issues in urban planning and public policy.

(III)

**UPPP 8. Introduction to Environmental Analysis and Design. 4 Units.**

Overview of general concepts, theoretical principles, and analytical techniques for investigating environmental systems. Integrates tools from natural and social sciences to analyze contemporary environmental challenges such as pollution, resource acquisition, facility and ecosystem design, impact assessments, formulation of environmental policy.

(III)

**UPPP H30E. Cities: Focal Point for Sustainability Problems and Solutions I. 4 Units.**

Explores the nature of cities, focusing on the challenges facing cities today, their possible solutions, and the technical and social constraints on those solutions.

Prerequisite: SSCI H30D

Restriction: Campuswide Honors Collegium students only.

(III)

**UPPP H30F. Cities: Focal Point for Sustainability Problems and Solutions II. 4 Units.**

Explores the nature of cities, focusing on the challenges facing cities today, their possible solutions, and the technical and social constraints on those solutions.

Prerequisite: UPPP H30E

Restriction: Campuswide Honors Collegium students only.

(II)

**UPPP 40. Urban Sociology. 4 Units.**

Overview of theoretical, substantive, and policy issues in urban sociology. History of urbanization, the school of human ecology, and recent trends regarding urbanism. Time is devoted to understanding the causes and possible solutions to urban problems.

Overlaps with SOCL 43.

**UPPP 100. Special Topics in Urban Studies. 4 Units.**

Course content varies with interest of the instructor.

Repeatability: Unlimited as topics vary.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 101. History of Cities. 4 Units.**

Surveys the global and historical co-evolution of cities and social institutions, including religion, the economy, governance, the arts, technology, and family life.

**UPPP 102. Urban Inequality. 4 Units.**

Examines structural inequality and the influence that urbanization has in affecting race, ethnic, and class relations. Explores how race/ethnicity, class, urban space, housing, economic development, public education, and land policy intersect in cities, both historically and today.

Restriction: Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 103. Comparative Approaches to Urban Regions. 4 Units.**

An introduction to comparative urbanization in developing countries. Introduces students to the geography, history, and theories of urbanization, and then reviews urban planning, public policy, and governance.

Restriction: Public Health Policy Majors only. Social Ecology Majors only. Urban Studies Majors only.

**UPPP 104. Urban America . 4 Units.**

Students examine the historical, social, political, and economic factors that contributed to the construction of the American urban context, one that is poverty concentrated and racially/ethnically segregated. Students also critically assess the consequence of growing up in America's urban neighborhoods.

Same as CHLT 162A, SSCI 163A.

**UPPP 107. Urban and Regional Planning. 4 Units.**

Important substantive areas, concepts, tools in the field of urban and regional planning. Topics include: forces that have historically guided and are currently guiding U.S. urbanization; land use, economic development, housing and community development, environmental planning; legal, environmental, governmental contexts.

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 108. Cities and Transportation. 4 Units.**

The relationship between urban areas and transportation systems. Economic analysis of cities, transportation and urban form, highway congestion, environmental impacts of transportation, public transit, land use and transportation, and political influences on transportation planning.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 109. Housing and Urban Development Policy. 4 Units.**

Surveys public policy issues and develops analytic techniques in the areas of housing and urban development. Examines a range of policy topics including housing assistance to low- and moderate-income families, housing finance system, incentives for economic development, and neighborhood preservation.

Prerequisite: Recommended: Previous course work in economics.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 110. Urban Economic Development Policy. 4 Units.**

Theoretical and practical perspectives on local economic development policy. Integrates economic, planning, and political perspectives. Overview of economic role of cities and metropolitan areas. Specific development issues include: link between taxes, regulation, job growth; redevelopment planning; evaluation economic development policy.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 111. Climate Solutions. 4 Units.**

Focuses on carbon neutrality and climate stability, addressing.

Same as ESS 179, MAE 119.

Restriction: Upper-division students only.

**UPPP 112. Foundations of Community Health. 4 Units.**

A social ecological framework for understanding community health is presented. Measures of individual and community health are compared, and the influence of personal and environmental factors on individual, group, and population health is examined. Community health promotion strategies are discussed.

Same as PUBH 125.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 113. Poverty and Change in Developing Countries. 4 Units.**

Focuses on poverty in developing countries. Analyzes the magnitude and changing nature of poverty in the global south. Critically examines poverty conceptualized in terms of economic deprivation, well-being, and social exclusion.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 114W. Advanced Research Methods. 4 Units.**

For students planning to conduct senior research projects or apply to graduate school in social research fields. Topics include reviewing literature, preparing a research proposal, protecting human subjects, citing scholarly work, building measures, estimating sample size, interview and presentation skills.

Prerequisite: SE 10 and SE 13. Satisfactory completion of the Lower-Division Writing requirement.

Same as CLS C169W, PSCI 111W, SE 111W.

**(Ib)**

**UPPP 115. Global Poverty and Inequality in the 21st Century. 4 Units.**

Explores a multidisciplinary understanding of poverty and inequality in the 21st century and assesses impact of education, health, technology, and other interventions. Course offered online only.

Same as IS 115.

**UPPP 117. Environmental Justice. 4 Units.**

Engages students to critically analyze and evaluate environmental problems, environmental responses, and planning and policy debates regarding 'environmental justice' - essentially the race, class, and equity implications of environmental problems and policies.

**UPPP 118. Gentrification. 4 Units.**

Gentrification is a complex process that changes the makeup of neighborhoods and fuels political and policy conflicts. Students are provided with tools to understand the process and conceive of policies to ensure more inclusive and equitable cities.

**UPPP 120. Introduction to GIS for Planning and Policy. 4 Units.**

Provides hands-on experience creating, visualizing, and interpreting spatial data, with a focus on Geographic Information Systems (GIS) applications for urban planning and public policy.

**UPPP 129. American Public Policy. 4 Units.**

Focuses on the development and implementation of public policy in the United States. Lectures cover theoretical models of the policy process as well as significant problems facing contemporary American decision-makers.

Same as PUBH 132, SSCI 152C, PLSC 121G.

**UPPP 130. Cities and Food . 4 Units.**

Explores the role of cities in transforming global diets: how urbanization has shaped what and how we eat, and what the co-evolution of diets and city life portend for the future.

**UPPP 131. Environmental Sustainability I. 4 Units.**

Provides an introduction to sustainability from different points of view; historical, scientific, political, ethical, and economic.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 132. Environmental Sustainability II. 4 Units.**

Investigates how sustainability can be implemented in a variety of contexts including water, energy, non-renewable resources, biodiversity, and urban policy, and also how it could be measured.

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 133. Environmental Law and Policy . 4 Units.**

Environmental law as a combination of traditional legal principles and newly created statutes, rules, and decisions applied to environmental protection. Investigates roles of courts, legislature, executive branch and administrative agencies, and private citizens attempting to regulate environmental quality.

Same as CLS C128.

Restriction: Criminology, Law and Society Majors only. Planning, Policy, and Design Majors only.

**UPPP 139. Water Resource Policy. 4 Units.**

Examination of contemporary water problems worldwide, with particular attention to the competing water demands in the western U.S., and water demand by the poor in developing countries. History and analysis of U.S. water policies at local, state, and federal levels.

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.



**UPPP 142. Environmental Hazards in an Urbanizing World. 4 Units.**

Development patterns, including urbanization, can contribute to environmental hazard severity. Humans can plan, mitigate, and prepare to reduce costly hazard losses. Students learn about environmental hazards and human response to these threats.

(III)

**UPPP 145. Environmental Governance. 4 Units.**

How should the environment be managed and who should be responsible? What is effective environmental management, and for whom? These questions are answered by exploring traditional and emerging theoretical frameworks and applying them to real world environmental challenges.

**UPPP 146. Principles of Economics for Planning and Policy. 4 Units.**

Provides an introduction into economics for planning and policy students.

**UPPP 152. Cultural Ecology and Environmental Design. 4 Units.**

Introduction to cultural ecology and environmental and architectural design. Addresses the understanding of people's relationships with their built environments, the basic elements of architecture, architectural analysis, and cultural analysis are covered. Examines values in design and design for multicultural societies.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 153. Elements of Environmental Design. 4 Units.**

Basic elements of environmental design such as scale, proportion, rhythm, color, sound, lighting, surfaces, texture, architectural definition of spaces, volumes, massing volumetric analysis, solids and voids, and cultural aspects of design. Excitement and creativity in design, imageability.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 155. Urban Design Principles. 4 Units.**

Introduction to principles of urban design and its applications. Study of contemporary and traditional theories of urban design formulated to improve physical characteristics of built environment to facilitate an enhanced quality of life. A variety of case studies are discussed.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 166. Urban Politics and Policy . 4 Units.**

Examines why and how urban policies are enacted and carried out in contemporary U.S. cities and regions. Topics include evolution and organization of city governments and policymaking over the past century; who directs public policy and controls how cities develop.

(III)

**UPPP 167. Public Policy and Management. 4 Units.**

Exposes students to best management practices that assure effective planning and implementation of policies and programs in government, business, and nonprofit sectors. Includes guest lecturers who are proven leaders in four principal institutions of community: business, education, government, and nonprofit.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 170. Health Policy. 4 Units.**

Considers social and economic aspects of health and disease in the United States. What are the proper roles of the individual, community, and government in improving health and health care? International comparisons will be made wherever possible.

Same as PUBH 122.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 172. Latino Metropolis. 4 Units.**

Explores the processes of Latino urbanization in the United States and the spatialization of Latino identities, particularly in the context of Southern California with selected comparisons drawing from other cities.

Same as CHLT 154.

(VII)

**UPPP 177. Chicano Movement. 4 Units.**

Explores the history of Mexicans in the U.S. with particular attention paid to their integration into the U.S. capitalist economy. Examines this economic history and the Chicano movement, 'El Movimiento,' within the wide context of socio-economic change.

Same as CHLT 166.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 178. International Divided Cities. 4 Units.**

Investigates urban divisions in international cities where deep-seated nationalistic ethnic differences create pressures for intergroup conflicts, autonomy, or territorial separation, and can incite violence. Urban political polarization as it is manifest in the urban setting.

Same as PLSC 157B, SOCL 176.

**UPPP 190. Applied Statistics in Social and Behavioral Research. 4 Units.**

Covers statistical techniques used to describe and make generalizations about phenomena represented by data. Hands-on experience in data analysis and interpretation using statistical software (SPSS, STATA) is emphasized. Topics include data visualization, ANOVA, multiple regression, and categorical data analyses.

Prerequisite: SE 13

Same as CLS C190, SE 190, PSCI 190.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 202. History of Urban Planning. 4 Units.**

Introduction to the historical roots and fundamental perspectives of urban and regional planning. Exploration of the significant historical phases and personalities which have shaped the profession. The roles and responsibilities, the limitations and potential, of urban planning.

Restriction: Graduate students only.

**UPPP 203. Theoretical Foundations of Planning. 4 Units.**

Intellectual excursion into central themes in policy and planning, including philosophy of the market, institutionalization of space, hypostatizations of policy, constructions of communities, logics of spatial analysis. Objective is engagement of the professional in thoughtful reflections on practice and institutions.

Restriction: Graduate students only.

**UPPP 204. Plan Development and Communication . 4 Units.**

Graphic representation and communication of physical place characteristics, design and physical planning ideas, and concepts using a variety of graphic techniques of free hand drawing, sketching, orthographic representations, scale drawings, 3D representations, maps, photo-documentation, and various media.

Restriction: Urban and Regional Planning Majors only.

**UPPP 205. Environmental Economics and Policy. 4 Units.**

Provides a broad introduction to environmental economics and to environmental policy. Environmental problems facing the United States and Europe are analyzed, and whenever possible, the environmental problems facing developing countries.

Restriction: Graduate students only.

**UPPP 206. Microeconomic Analysis for Urban Planning. 4 Units.**

Provides students with a working knowledge of basic microeconomic concepts. Emphasizes applications related to urban planning and policy analysis. Topics covered include demand analysis, firm behavior, market structure, public goods, externalities, and the role of economics in land markets.

Restriction: Graduate students only.

**UPPP 207. Land-Use Law. 4 Units.**

Investigates legal and institutional frameworks for development control. Review of constitutional issues implicated in land-use regulation. Traces development control historically and analyzes contemporary approaches to land-use control which reflect environmental and economic development concerns.

Same as CLS C207.

Restriction: Graduate students only.

**UPPP 209. Qualitative Research Methods: Overview. 4 Units.**

Introduction to fundamentals of "qualitative" research and non-positivistic inquiry. Formulation of research questions, selection of method, data collection techniques, and analysis (briefly). Overview of selected methods from ethnography, naturalistic field research, phenomenology, ethnoarchaeology, critical approaches, and others.

Restriction: Graduate students only.

**UPPP 210. Practice Experience . 4 Units.**

Provides Master of Urban and Regional Planning students an opportunity to link classroom knowledge with real planning situations through a 10-week unpaid practice experience.

Restriction: Urban and Regional Planning Majors only.

**UPPP 212. Transportation Planning and Policy. 4 Units.**

Introduces current topics in transportation planning. Includes an analysis of the economic role of transportation in urban areas, land-use impacts of transportation projects, traffic congestion, air quality, alternatives to the automobile, and other transportation topics.

Restriction: Graduate students only.

**UPPP 213. Advanced Qualitative Methods: Analyzing Qualitative Data. 4 Units.**

Introduction to the theory and practice of analyzing qualitative data. Students must have already learned about data collection and research design for qualitative research and must have qualitative data they can analyze.

Same as MPHD 297K, PLSC 273A.

Restriction: Graduate students only.

**UPPP 214. Quantitative Analysis for Planners. 4 Units.**

Introduces students to the basic statistical concepts used to address issues of public concern. Prepares students to perform, interpret, and evaluate quantitative data analyses commonly used in professional studies.

Restriction: Graduate students only.

**UPPP 215. Analytical Methods for Planning. 4 Units.**

Emphasizes the development of analytical techniques proven useful in the fields of management and administration. Topics include multiple regression, cost-benefit analysis and discounting, decision trees, and other techniques useful for the purposes of community analysis and planning.

Restriction: Graduate students only.

**UPPP 220. Qualitative Methods: Fieldwork and Data Collection. 4 Units.**

Covers fieldwork, data collections techniques, and related issues for anti-positivistic research. Data collection techniques include observation, physical traces, participation, in-depth interview. Data checks include veracity, detail, completeness, rigor.

Restriction: Graduate students only.

**UPPP 221. Public Policy. 4 Units.**

Explores different approaches to public policy analysis, the diverse conceptions of the goals and objectives that should be served by policy, and the appropriate role of the policy analyst. Policy consequences are traced to indirect and subtle incentives and disincentives.

Same as CLS C255, PLSC 221A.

Restriction: Graduate students only.

**UPPP 224. Environmental Politics and Policy. 4 Units.**

Reviews and critiques literature on discussion topics including: the nature and effectiveness of environmental movements and policies; the role of science and technology; the use of economic incentives in policy; decentralization of decision making; and creating arenas for public involvement.

Restriction: Graduate students only.

**UPPP 228. Demographics for Planning and Policy. 4 Units.**

Provides planning and policy practitioners with a condensed, nonspecialist orientation to the sources, applications, and interpretation of population statistics, and conveys the steps used in constructing local-area population forecasts and projections.

Restriction: Graduate students only.

**UPPP 231. Transportation and Environmental Health. 4 Units.**

Critically evaluates how transportation can promote sustainable, healthy, and equitable cities. Examines the interaction of transportation systems with urban form, land use, community health, and environmental quality.

Restriction: Graduate students only.

**UPPP 235. Geographic Information Systems (GIS) Problem Solving in Planning. 4 Units.**

Explores the application of geographic information systems (GIS) in urban planning. Steps through a GIS-based planning procedure that balances housing, jobs, tax base, utilities, transportation, and the natural environment.

Restriction: Graduate students only.

**UPPP 237. Introduction to Geographic Information Systems. 4 Units.**

Application of Geographic Information Systems (GIS) to the field of urban and regional planning. Emphasizes current issues that occur in actual implementation settings. Lecture/discussion followed by laboratory demonstrating the area of GIS discussed. Offers 'hands-on' student usage of GIS software.

**UPPP 239. Urban Design Theories and Applications. 4 Units.**

Introduction to contemporary and traditional theories of urban design and their applications. Organized around one question: How might planning and design of built environment contribute to making a good city? National and international case studies are introduced.

Restriction: Graduate students only.

**UPPP 243. Health Policy and Management. 4 Units.**

Multidisciplinary inquiry into theory and practice concerned with delivery, quantity, costs of health care for individuals and populations. Explores managerial and policy concerns regarding structure, process, outcomes of health services including the costs, financing, organization, outcomes, and accessibility of care.

Same as PUBH 222.

Restriction: Master of Public Health Degree students have first consideration for enrollment. Master of Public Policy Degree students have first consideration for enrollment. Graduate students only. Public Health Majors have first consideration for enrollment. Urban and Regional Planning Majors have first consideration for enrollment.

**UPPP 244. Land-Use Policy. 4 Units.**

Examination of the role of public policy in guiding growth and development in urban and suburban environments. Description of a wide-ranging set of growth policies, the rationales underlying their use, controversies and legal constraints, and evaluation of their effectiveness.

Restriction: Graduate students only.

**UPPP 246. Housing Policy. 4 Units.**

Examines theories and practices of housing policy and the relationship of housing to larger neighborhood, community, and regional development issues. Considers the roles of private for-profit and not-for-profit developers, lenders, and all levels of government in the provision of housing.

Prerequisite: Familiarity with basic statistics is required.

**UPPP 251. Poverty and Development . 4 Units.**

Examines competing conceptualizations, methods of measurement, and poverty alleviation strategies widely used in developing countries. Focuses on poverty conceptualized as economic deprivation, well-being, vulnerability, and social exclusion.

Same as SOCL 235.

Restriction: Graduate students only.

**UPPP 252. Issues in Environmental Law and Policy. 4 Units.**

Treatment of legal and policy strategies for promoting environmental protection and deterring environmental degradation within the context of other societal objectives. Topical approach with a focus on problems of special interest to criminologists and to environmental policy specialists.

Same as CLS C252.

Restriction: Graduate students only.

**UPPP 266. Economic Democracy . 4 Units.**

Explores a wide range of radical democratic and egalitarian visions (including but not limited to the Marxist tradition) for a more sane, just, and sustainable future.

Restriction: Graduate students only.

**UPPP 273. Global Urbanization. 4 Units.**

Examines the spread of cities worldwide in the 20th century. What are the political and economic causes of this process? What are the social-cultural, political, and economic effects? How is contemporary urbanization linked to global restructuring of other kinds.

Same as SOCL 252A.

Restriction: Graduate students only.

**UPPP 275. Special Topics in Urban Planning. 4 Units.**

Special topics in urban and regional planning are offered from time to time, but not on a regular basis. Course content varies with interest of the instructor.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**UPPP 279. Theories of Power and Empowerment. 4 Units.**

Studies different ways of thinking about power and its uses. Explores theories of power that inform various notions of empowerment, including resistance, participatory democracy, and workplace empowerment.

Same as MPPH 297R, PLSC 223A.

Restriction: Graduate students only.

**UPPP 281. Advanced Theory. 4 Units.**

Provides urban planning and public policy students with an introduction to advanced theory. Addresses broad theoretical approaches that cut across disciplinary and topical boundaries. Designed primarily for Ph.D. students.

**UPPP 282. Urban Design Studio for Planners: An Introduction. 4 Units.**

Introductory urban design for planners. Organized around a variety of assignments to encourage learning by design in a studio setting. Students work on design projects and drawing assignments to learn practical aspects of urban design.

Restriction: Graduate students only.

**UPPP 283. Collaborative Governance and Public Management. 4 Units.**

Introduction to inclusive management. To make effective use of public resources, public managers are inventing ways of managing that alter relationships within organizations, between organizations, between sectors, and with the public. Requires rethinking fundamentals such as leadership and motivation.

Same as PPOL 283.

Restriction: Public Policy Majors have first consideration for enrollment.

**UPPP 292. Professional Report. 4 Units.**

Workshop designed to assist M.U.R.P. students in conducting their professional reports. Students select topics, design projects, conduct professional investigations, and write up reports.

**UPPP 294A. Urban Planning Practicum I. 4 Units.**

Engages students in practical planning projects in the community under a central theme within Planning. Students take a problem-solving approach and employ and further develop data gathering, analysis, graphic and oral communication, public engagement, and report writing skills.

Restriction: Graduate students only.

**UPPP 294B. Urban Planning Practicum II. 4 Units.**

Engages students in practical planning projects in the community under a central theme within Planning. Students take a problem-solving approach and employ and further develop data gathering, analysis, graphic and oral communication, public engagement, and report writing skills.

Prerequisite: PPD 294A

Restriction: Graduate students only.

**UPPP 296. Doctoral Dissertation Research and Writing. 2-12 Units.**

Dissertation research with Urban Planning and Public Policy faculty.

Prerequisite: Advancement to candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**UPPP 297. Research Design. 4 Units.**

Provides training in research design and methods. Students learn how to evaluate the strength of research findings based on the methods used by a researcher and learn to use lessons from the course to develop a research proposal.

Restriction: Graduate students only.

**UPPP 298. Directed Studies in Urban Planning. 2-4 Units.**

Directed studies in Urban Planning.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**UPPP 299. Independent Study in Urban Planning. 2-8 Units.**

Independent Study in Urban Planning.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

## Department of Criminology, Law and Society

**Mona Lynch, Department Chair**

2340 Social Ecology II

949-824-0047

<http://cls.soceco.uci.edu/>

The Department of Criminology, Law and Society focuses on the problem of crime and on understanding the social, cultural, political, and economic forces that interact with the law. Basic courses present overviews of American legal systems with particular emphasis on criminal and juvenile justice, forms of criminal behavior, the role of law in understanding social and psychological phenomena, and the applications of sociological theory in understanding law and legal systems. Subsequent course work provides a deeper understanding of the causes and consequences of crime, criminal justice policy, and socio-legal theory, including how legal institutions can both address problems of inequality and exacerbate those problems.

Students are provided with opportunities to become acquainted with the varieties of behavior that society chooses to control or regulate, the methods and institutions used to achieve that control or regulation, and the approaches aimed specifically at altering behavior deemed unacceptable. In addition, there is provision for students to use their increasing knowledge of the law, its procedures, and institutions to enhance their understanding of the social sciences.

The course of study provides excellent preparation for law school and for graduate study in sociology, criminology, and criminal justice. Careers for students who terminate their University education at the baccalaureate level may be developed through placements in criminal justice and regulatory agencies, in organizations determining public policy, and in programs that deliver services to people who have difficulties with some aspect of the legal system.

Field study placements are available in police departments, public defenders' offices, probation and parole agencies, the Orange County District Attorney's Office, the State juvenile detention system, the Orange County Victim/Witness Assistance Program, juvenile shelters, legislative offices, and in private legal firms.

- Criminology, Law and Society, B.A.
- Criminology, Law and Society, Master of Advanced Study
- Criminology, Law and Society, Minor
- Criminology, Law and Society, Ph.D.
- Master of Legal and Forensic Psychology
- Race and Justice Studies, Graduate Emphasis

## Faculty

Hillary Berk, Ph.D. University of California, Berkeley, *Assistant Professor of Teaching of Criminology, Law and Society* (sociology of law/law and society, gender, family, reproduction and surrogacy, law and emotion, civil rights, dispute resolution)

Arnold Binder, Ph.D. Stanford University, *Professor Emeritus of Criminology, Law and Society* (research methodology, juvenile delinquency, police organization and methods)

Lee Cabatingan, Ph.D. University of Chicago, *Assistant Professor of Criminology, Law and Society; Anthropology* (Caribbean law and sovereignty; construction of authority at the Caribbean Court of Justice)

Kitty C. Calavita, Ph.D. University of Delaware, *Professor Emerita of Criminology, Law and Society* (sociology of law, criminology, social deviance, immigration, inequality)

Simon A. Cole, Ph.D. Cornell University, *Professor of Criminology, Law and Society; History; School of Law* (science, technology, law, criminal justice)

Susan B. Coutin, Ph.D. Stanford University, *Professor of Criminology, Law and Society; Anthropology; Religious Studies* (law, culture, immigration, human rights, citizenship, political activism, Central America)

Elliott P. Currie, Ph.D. University of California, Berkeley, *Professor of Criminology, Law and Society* (criminal justice policy in the U.S. and other countries, causes of violent crime, social context of delinquency and youth violence, etiology of drug abuse and assessment of drug policy, race and criminal justice)

Teresa A. Dalton, Ph.D. University of Denver, *Associate Professor of Teaching of Criminology, Law and Society* (quantitative methodology, criminology, law and social sciences)

John D. Dombrink, Ph.D. University of California, Berkeley, *Professor Emeritus of Criminology, Law and Society* (crime and criminal justice, deviance and social control)

Brandon Golob, Ph.D. University of Southern California, *Assistant Professor of Teaching of Criminology, Law and Society* (law-related educational programs; social media and online privacy; inclusive pedagogy; media effects; law and popular culture)

Michael R. Gottfredson, Ph.D. University at Albany, State University of New York, *Chancellor's Professor of Criminology, Law and Society; School of Law; Sociology* (criminology, juvenile delinquency, crime theory, public policy)

Sora Han, Ph.D. University of California, Santa Cruz, *Director of the Graduate Program in Culture and Theory and Associate Professor of Criminology, Law and Society; African American Studies; Culture and Theory; School of Law* (law and popular culture, critical race theory, philosophies of punishment, feminism and psychoanalysis)

John R. Hipp, Ph.D. University of North Carolina at Chapel Hill, *Professor of Criminology, Law and Society; Sociology; Urban Planning and Public Policy* (community context of crime, household decisions and neighborhood change, research methods)

Valerie Jenness, Ph.D. University of California, Santa Barbara, *Distinguished Professor of Criminology, Law and Society; Sociology* (links between deviance and social control [especially law], the politics of crime control and criminalization, social movements and social change, corrections and public policy)

Charis E. Kubrin, Ph.D. University of Washington, *Professor of Criminology, Law and Society; Sociology* (crime, neighborhood effects and social processes, race/ethnicity and violence, immigration and crime)

Elizabeth F. Loftus, Ph.D. Stanford University, *UCI Distinguished Professor of Psychological Science; Cognitive Sciences; Criminology, Law and Society; School of Law* (cognitive psychology, human memory, psychology and law)

Mona Lynch, Ph.D. University of California, Santa Cruz, *Professor of Criminology, Law and Society; School of Law* (law and society, psychology and law, punishment and society, race and criminal justice)

Cheryl Lee Maxson, Ph.D. University of Southern California, *Professor Emerita of Criminology, Law and Society* (crime and delinquency, youth violence, street gangs, juvenile justice system and policing)

Richard D. McCleary, Ph.D. Northwestern University, *Professor of Criminology, Law and Society; Urban Planning and Public Policy* (criminal justice, research methodology, statistics)

James W. Meeker, J.D., Ph.D. State University of New York at Buffalo, *Professor Emeritus of Criminology, Law and Society; Sociology* (sociology of law, criminal justice, research methodology, statistics, access to civil justice)

Ana Muñoz, Ph.D. University of California, Los Angeles, *Assistant Professor of Criminology, Law and Society* (gang profiling, youth justice, gang injunctions and databases, immigration enforcement, policing, race, state violence)



Emily Owens, Ph.D. University of Maryland at College Park, *Professor of Criminology, Law and Society; Economics* (how government policies affect the prevalence of criminal activity as well as how agents within the criminal justice system, particularly police, prosecutors, and judges, respond to policy changes)

Henry N. Pontell, Ph.D. State University of New York at Stony Brook, *Professor Emeritus of Criminology, Law and Society; Sociology* (white-collar and corporate crime, criminology, criminal justice, deviance and social control, sociology of law)

Keramet Reiter, Ph.D. University of California, Berkeley, *Associate Professor of Criminology, Law and Society; School of Law* (prisons and extreme punishments, legal history, criminal justice policy, criminal and civil rights law, law and society)

Nancy Rodriguez, Ph.D. Washington State University, *Professor of Criminology, Law and Society* (race, crime, and justice; juvenile justice; collateral consequences of imprisonment; criminal justice policy)

Nicholas I. Scurich, Ph.D. University of Southern California, *Associate Professor of Psychological Science; Criminology, Law and Society; School of Law* (judgment and decision making, juridical proof, violence risk assessment)

Christopher Seeds, Ph.D. New York University, *Assistant Professor of Criminology, Law and Society* (punishment and social control, law and society, criminal justice, social theory, life sentencing and capital punishment)

Carroll S. Seron, Ph.D. New York University, *Professor Emerita of Criminology, Law and Society; School of Law* (sociology of law, sociology of professions, law and society, sociology of legal profession, methods and police misconduct)

Naomi Sugie, Ph.D. Princeton University, *Associate Professor of Criminology, Law and Society; Sociology* (sociology of crime and punishment, inequality, families, demography, methods, new technologies for data collection)

Bryan Sykes, Ph.D. University of California, Berkeley, *Associate Professor of Criminology, Law and Society; Program in Public Health; Sociology* (demography, criminology, research methods, health, social inequality, statistics)

William C. Thompson, Ph.D. Stanford University, *Professor Emeritus of Criminology, Law and Society; Psychological Science; School of Law* (psychology and law, criminal justice, forensic science, expert evidence, human judgment and decision making, use of social science in appellate litigation)

George E. Tita, Ph.D. Carnegie Mellon University, *Professor of Criminology, Law and Society; Urban Planning and Public Policy* (criminology, community context of violence, urban youth gangs, homicide studies)

Susan F. Turner, Ph.D. University of North Carolina at Chapel Hill, *Professor of Criminology, Law and Society* (sentencing and corrections, applied research methods)

James D. Vigil, Ph.D. University of California, Los Angeles, *Professor Emeritus of Criminology, Law and Society* (urban research, urban poverty, culture change, socialization and education, psychological anthropology, street gangs in cross-cultural perspective, Mexico and U.S. southwestern ethnohistory, comparative ethnicity)

Kirk Williams, Ph.D. University of Arizona, *Professor of Criminology, Law and Society; Sociology* (family violence, youth violence, homicide studies, risk assessment, violence prevention program evaluation)

## Affiliate Faculty

Richard Arum, Ph.D. University of California, Berkeley, *Dean of the School of Education and Professor of Education; Criminology, Law and Society; Sociology*

Elizabeth E. Cauffman, Ph.D. Temple University, *Professor of Psychological Science; Criminology, Law and Society; Education; School of Law* (adolescent development, mental health, juvenile justice, legal and social policy)

Eve Darian-Smith, Ph.D. University of Chicago, *Department Chair and Professor of Global and International Studies; Anthropology; Criminology, Law and Society*

Joseph DiMento, Ph.D. University of Michigan, *Professor of School of Law; Criminology, Law and Society; Paul Merage School of Business; Urban Planning and Public Policy*

Howard A. Gillman, Ph.D. University of California, Los Angeles, *Chancellor and Professor of Political Science; Criminology, Law and Society; History; School of Law*

David Theo Goldberg, Ph.D. The Graduate Center, City University of New York, *Director of the UC Humanities Research Institute and Professor of Comparative Literature; Anthropology; Criminology, Law and Society* (race, racism, race and the law, political theory, South Africa, digital humanities)

Michele B. Goodwin, J.D. Boston College, *Director, Center for Biotechnology and Global Health Policy and UCI's Chancellor's Professor of School of Law; Criminology, Law and Society; Gender and Sexuality Studies; Program in Public Health*

Nancy Guerra, Ed.D. Harvard University, *Dean of the School of Social Ecology and Professor of Psychological Science; Criminology, Law and Society* (childrens' aggression and behavior problems, prevention of youth violence, promotion of healthy youth development)

William M. Maurer, Ph.D. Stanford University, *Dean of the School of Social Sciences and Professor of Anthropology; Criminology, Law and Society; School of Law* (anthropology of law, globalization, Caribbean, anthropology of money and finance, gender and kinship)

Candice Odgers, Ph.D. University of Virginia, *Professor of Psychological Science; Criminology, Law and Society* (developmental and quantitative psychology; social inequalities and child health; new technologies and adolescent development)

Vibhuti Ramachandran, Ph.D. New York University, *Assistant Professor of Global and International Studies; Criminology, Law and Society*

Ruben G. Rumbaut, Ph.D. Brandeis University, *Distinguished Professor of Sociology; Chicano/Latino Studies; Criminology, Law and Society; Education* (international migration, immigration laws, criminalization, incarceration, social inequality and mobility, race and ethnicity)

Charles Smith, Ph.D. University of California, San Diego, *Professor of Political Science; Criminology, Law and Society* (law and legal institutions, comparative and international law)

Ann Southworth, J.D. Stanford University, *Professor of School of Law; Criminology, Law and Society*

Shauhin A. Talesh, J.D., Ph.D. University of Connecticut, University of California, Berkeley, *Director, Law and Graduate Studies Program and Professor of School of Law; Criminology, Law and Society; Sociology*

Kristin E. Turney, Ph.D. University of Pennsylvania, *Associate Professor of Sociology; Criminology, Law and Society* (social inequality, family demography, population health, incarceration and punishment, intergenerational transmission of disadvantage, child well-being)

## Courses

### **CRM/LAW C7. Introduction to Criminology, Law and Society . 4 Units.**

Introduces characteristics of the U.S. criminal justice system, including responses to crime, components of the system, and current challenges to the system. Examines structure and function of police and courts, criminal procedure, and sentencing and incarceration policies.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

(III)

### **CRM/LAW C10. Fundamentals of Criminology, Law and Society . 4 Units.**

Introduces three interdisciplinary literatures: criminology, socio-legal studies, and justice studies. Focuses on theoretical and empirical work addressing law making, law breaking, and legal systems.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

(III)

### **CRM/LAW H80. The Properties of Property. 4 Units.**

Develops an understanding and critique of private property. Draws from interdisciplinary sources to explore the foundations of private property, the institutions that support it over time, and possible alternatives to it.

Restriction: Campuswide Honors Collegium students only.

(III)

### **CRM/LAW C100. Special Topics in Criminology, Law and Society. 4 Units.**

Course content varies with interest of the instructor.

Repeatability: Unlimited as topics vary.

### **CRM/LAW C101. American Law. 4 Units.**

Introduction to substantive and procedural law governing private dispute resolution, including common law (tort, property, contracts), lawsuits (civil procedure), and alternative dispute resolution; emphasis on the socio-legal ramifications of private disputes, particularly the modern tort system and tort reform movement.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C102. Introduction to the Comparative Study of Legal Cultures. 4 Units.**

Traces the anthropological and comparative cultural study of law from the nineteenth century to the present; briefly surveys the diversity of recorded legal cultures and critically examines key concepts which have been used to describe and classify them.

Same as INTL ST 124A.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**CRM/LAW C103. US Legal Thought. 4 Units.**

Evolution of legal thought in socio-historical context from 19th century to present; emphasizes the rise and fall of legal classicism and modern socio-legal critiques, including the law and society movement, critical legal studies, feminist legal theory, and critical race studies.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C104. Sociology of Law. 4 Units.**

Examines law creation and law enforcement in their social and political context. Discusses the major theories of law and the modern state, and presents case studies in order to evaluate the strengths and weaknesses of these theoretical perspectives.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C105. Psychology and the Law. 4 Units.**

Psychological assumptions of the American legal system and mental health aspects of provision of criminal justice services. Civil commitment, insanity defense, competence to stand trial, jury selection, eyewitness identification. Use of police, courts, correctional institutions in prevention of behavior disorder.

Same as PSCI 193E.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment.

**CRM/LAW C106. Crime and Public Policy. 4 Units.**

Explores nature and dimensions of crime in America and uses and limits of various strategies to control it. Topics include growth of imprisonment, the problem of domestic violence, the death penalty, gun control, and the potential of crime prevention programs.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C107. Deviance. 4 Units.**

Perspectives on deviance and criminality in behavior, institution, community, and myth. The suitability of contemporary theories of deviant behavior.

Same as SOCIOL 156, PSYCH 177D.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**CRM/LAW C108. Criminological Theory. 4 Units.**

Explores the question of crime causation from a number of theoretical perspectives in the social sciences. Schools of thought examined include utilitarianism, positivism, human ecology, social structural approaches, social process (learning) theories, labeling, and radical-critical (political) perspectives.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C109. Juvenile Delinquency. 4 Units.**

Patterns of delinquent behavior, theories that explain behavior, current research aimed at enhancing exploratory power. Attempts to prevent and control delinquency are put in historical perspective. Development of the current juvenile justice system and evolution of modern juvenile law.

Same as PSCI 193B.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment.

**CRM/LAW C110. Community Context of Crime. 4 Units.**

Examines the social context of high-crime communities, with special emphasis on the problems of poverty, joblessness, economic inequality, and racial discrimination. Assesses debates on the causes of these problems, and on the most effective policies to combat them.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C111. Theories of Punishment. 4 Units.**

Survey of the various schools of thought regarding formal punishment theory. The purposes of legal sanctions are examined, including those of deterrence, rehabilitation, retribution, and incapacitation. Considers problems in realizing formal goals of punishment in practice.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C112. Legal Sanctions and Social Control. 4 Units.**

Examination of criminal sanctions as mechanisms of social control. Includes the nature, function, and organization of courts as sanction generating institutions, and problems associated with punishing white-collar and corporate illegalities.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C113. Gender and Social Control. 4 Units.**

Examines the legal system's use of sex as an organizing characteristic, focusing particularly on sameness and difference feminism, and tracing the evolution of equal treatment of men and women in the areas of constitutional rights, employment, education, and military service.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C114. Miscarriages of Justice. 4 Units.**

Systematically describes, explains, and analyzes the causes and consequences of the wrongful accusation, prosecution, incarceration, and sometimes even execution, of the innocent in the American criminal justice system.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C115. Prisons, Punishment, and Corrections. 4 Units.**

A review of how the U.S. punishes and rehabilitates convicted law violators. The conflicts among the major purposes of sentencing—rehabilitation, deterrence, incapacitation—are discussed, as well as the effects of different sanctions on public safety, offender rehabilitation, and justice system costs.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C116. Race, Ethnicity, and Social Control. 4 Units.**

Provides a historical and sociological survey of racial and ethnic group relations in contexts of crime control, emphasizing the roles of racial ideology, structural racism, and social movements in shaping these dynamic relations, and their significance to American liberal democracy.

Same as CHC/LAT 152A.

**CRM/LAW C117. Imprisonment and Reentry. 4 Units.**

Offers an overview of imprisonment and reentry in the contemporary United States. Examines the development of the prison in the United States and explores changes in its composition, structure, and purpose over time.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C118. Domestic Violence. 4 Units.**

General perspectives about domestic violence and theoretical accounts about what causes such behavior.

Same as SOCECOL 118.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C119. Violence in Intimate Relationships. 4 Units.**

Responses to various forms of domestic violence, such as intimate partner violence and child abuse. Covers barriers to reporting to the police, and prosecutors and courts. Human services, such as safety planning for victims, treatment programs, and restorative justice approaches.

Corequisite:

Same as SOCECOL 119.

**CRM/LAW C120. Law and Inequality. 4 Units.**

Various aspects of the law as related to three specific areas of inequality: immigration and immigrants, race, and gender. The role of law as a tool of social reform and limitations of the legal system historically in resolving inequality issues.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C122. Constitutional Law. 4 Units.**

Examines the evolution of civil liberties and individual rights in the United States, focusing on how Constitutional Amendments and U.S. Supreme Court decision-making have shaped the ongoing political and legal struggles over issues such as privacy, abortion, and free speech.

Overlaps with POL SCI 174A.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C123. Family Law. 4 Units.**

Examines legal issues surrounding marriage, cohabitation, divorce, child custody and support, adoption, and the rights of parents and children in the family context. The findings of social science research are used to illuminate the legal issues.

Same as PSCI 193F.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C124. Mental Health and the Justice System. 4 Units.**

Covers the history of criminalization of persons with mental illness; challenges and needs; civil and outpatient commitment; law enforcement responses; mentally ill in jails and prisons; community supervision strategies; and reentry strategies for offenders with mental illness.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C127. Hate Crimes. 4 Units.**

Examines the causes, manifestations, and consequences of hate crimes and the larger social context within which they occur. The politics and dynamics of intergroup violence born of bigotry and manifested as discrimination; social policy designed to control bias-motivated violence.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C128. Environmental Law and Policy . 4 Units.**

Environmental law as a combination of traditional legal principles and newly created statutes, rules, and decisions applied to environmental protection. Investigates roles of courts, legislature, executive branch and administrative agencies, and private citizens attempting to regulate environmental quality.

Same as UPPP 133.

Restriction: Criminology, Law and Society Majors only. Planning, Policy, and Design Majors only.

**CRM/LAW C130. Seminar on Gangs. 4 Units.**

An overview of gangs, including the nature and definition of gangs; types of gangs; diversity of membership; theoretical explanations; criminal behavior; drug use and sales; law enforcement responses; gangs in correctional institutions; intervention and prevention strategies; and public policy issues.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C131. Organized Crime and American Society. 4 Units.**

Examination of the phenomenon of American organized crime from a sociological perspective. Explanation of methods by which organized crime is tolerated at various levels of society. Emphasis on ways in which 'underworld' interests interact with legitimate economic and political institutions.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C132. Forensic Science, Law, and Society. 4 Units.**

Examines use of 'forensic science' to resolve issues arising in criminal cases including crime scene analysis, DNA testing, fingerprints, trace evidence comparisons, profiling, lie detectors, other forensic techniques; evaluation, statistical characterization, and legal admissibility of evidence; regulation of forensic laboratories.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C133. Homicide and Suicide. 4 Units.**

Examines similarities and differences among homicide and suicide, two major causes of death.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C134. Victimless Crimes. 4 Units.**

Examines major theoretical, empirical, and policy-oriented research related to the design, implementation, and analysis of government intervention, through the criminal sanction, in the spheres of vice and morality.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C135. Mass Incarceration and Social Inequality in America. 4 Units.**

Explores the origins and consequences of mass incarceration; extraordinarily high incarceration rates within particular demographic groups above and beyond historical levels in the U.S. Theoretical explanations for, and current policy debates around, mass incarceration are covered.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C136. Forensic Psychology: Advanced Seminar. 4 Units.**

Focuses on the psychology of criminal offending, particularly violent behavior. Examines violence, sexual offending, and mental disorder related to crime with regard to clinical assessment and treatment; mental health services within forensic institutions.

Prerequisite: (PSCI 9 or PSCI 11C or PSYCH 7A or PSYCH 9C) and PSCI 102C and (PSCI 178S or CRM/LAW C149)

Same as PSCI 156C, PSYCH 177F.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C139. Police and Change. 4 Units.**

Organizational efforts to modify police conduct are addressed by focusing on the history of policing in the United States including training, education, and the contributions of women.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C140. Surveillance and Society. 4 Units.**

Explores the development and deployment of surveillance technologies in contemporary society. The social and legal impact of surveillance technologies, in such areas as crime control, privacy, trust, community, democracy, and the war on terror.

Restriction: Criminology, Law and Society Majors only.

**CRM/LAW C142. White-Collar Crime. 4 Units.**

Examines criminal activity in business and corporate enterprise, organizations, and the professions. Theories regarding the causes and control of white-collar and corporate crime are covered as well as the numerous definitions of these terms.

Same as SOCIOL 142.

Restriction: Sociology Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C144. Criminal Law. 4 Units.**

Deals specifically with the substantive nature of criminal law and its historical development. Focuses on understanding the development of fundamental doctrinal principles upon which criminal law is based, including mens rea, actus reus, homicide, causation, group criminality, and exculpation.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C145. Government Crime. 4 Units.**

Examines the legal, organizational, and political issues involved in the generation and control of government lawlessness. Readings present historical and theoretical perspectives in the abuse of government authority and the ability of the legal system to control such behavior.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.



**CRM/LAW C149. Violence in Society. 4 Units.**

Current theory and research on aggression; anger and violence as problems in individual and social functioning. Process and functions of anger examined with regard to normal behavior and psychopathology. The determinants, prevalence, and implications of violence in society are analyzed.

Prerequisite: PSCI 9 or PSCI 11C or PSYCH 7A or PSYCH 9C

Same as PSCI 178S.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment.

**CRM/LAW C150. The Legal Profession. 4 Units.**

Role of the legal profession in modern society, the diverse professional roles lawyers play, the American legal profession compared with that of other societies. 'Litigation explosion,' ethical problems, interactions between lawyers and other professionals, training and socialization of new lawyers.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C156. Cross-Cultural Research on Urban Gangs. 4 Units.**

Taking an urban policy approach, examines the background and contemporary traditions of gangs in several ethnic groups including African-, Asian-, and Mexican-Americans. Cross-cultural exploration of the varied facets of gang life. The major social-control institutions affecting them.

Same as CHC/LAT 153.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment. Chicano/Latino Studies Majors have first consideration for enrollment.

**(VII)**

**CRM/LAW C160. Forensic Psychology . 4 Units.**

Forensic psychology is the interface between clinical psychology and the law. Emphasizes clinically relevant legal topics (insanity defense; competency to stand trial) and includes critical thinking about issues that arise when psychologists are involved in legal proceedings.

Prerequisite: PSCI 9 or PSCI 11B or PSCI 11C

Same as PSCI 161C.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C162. Crime Hotspots. 4 Units.**

Criminological theories of local public safety hazards or hotspots are introduced. Spatial statistics are developed for different types of hotspots. Hotspot policing theories are introduced and research on the effectiveness of policing strategies is reviewed.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C163. Ethics and Politics of Justice. 4 Units.**

Theoretical perspective on how ethics and politics relate to criminal justice through an introduction to moral philosophy; consideration of specific theories of punishment and justice; and consideration of practical and empirical illustrations of the intersection of ethics, politics, and justice.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C164. Social Control of Delinquency. 4 Units.**

Assumes familiarity with theories of delinquency, the juvenile justice system, and elements of juvenile law. Explores socio-historical origins and evolution of juvenile justice, current research and policy on delinquency prevention and treatment, and future directions of law, policy, and practice.

Prerequisite: Recommended: CRM/LAW C109.

Same as PSCI 193C.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.



**CRM/LAW C165. The Death Penalty. 4 Units.**

Examines why the U.S. continues to have a death penalty when so many other countries have abandoned it. Arguments for and against the death penalty are covered.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C167. Crime Measurement. 4 Units.**

The strengths and weaknesses of three crime measures (police reports, victim surveys, and offender self-reports) are illustrated through analyses of research articles. Common measurement problems are analyzed with a focus on reliability and validity.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C168. Extreme Punishment . 4 Units.**

Explores the history and law of America's Eighth Amendment prohibition against cruel and unusual punishment, examining the death penalty, long prison sentences, harsh confinement conditions, and other punishments. Students debate practical, legal, and moral arguments for and against these punishments.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C169W. Advanced Research Methods. 4 Units.**

For students planning to conduct senior research projects or apply to graduate school in social research fields. Topics include reviewing literature, preparing a research proposal, protecting human subjects, citing scholarly work, building measures, estimating sample size, interview and presentation skills.

Prerequisite: SOCECOL 10 and SOCECOL 13. Satisfactory completion of the Lower-Division Writing requirement.

Same as SOCECOL 111W, PSCI 111W, UPPP 114W.

(Ib)

**CRM/LAW C172. Culture Change and the Mexican People. 4 Units.**

Reviews culture contact and colonization, innovation diffusion, acculturation, assimilation, culture conflict and marginality, modernization, urbanization, legal transformations. Mexico and the Southwestern U.S. are reviewed through several centuries to better appreciate the indigenous base of the Mexican people.

Same as CHC/LAT 155.

**CRM/LAW C173. Maritime Piracy, Law and Society. 4 Units.**

Explores the historical and contemporary images and reality of pirates and piracy since the 16th century across the globe through an analysis of primary sources, key historiographical and legal debates, and criminological theories.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C174. Immigration and Crime. 4 Units.**

Examines immigration and crime in the global context, highlighting immigrants as criminals and victims; immigration and crime control; immigrants' perceptions of the criminal justice system; public discourse and public perception on immigration and crime; and human rights issues.

**CRM/LAW C175. Issues in Policing. 4 Units.**

Lectures and readings focus on the history and strategies of policing, measuring the quality of policing, and police misconduct. Strategies for enhancing the quality of policing for controlling misconduct are covered.

**CRM/LAW C176. Classics in Crime Cinema. 4 Units.**

A multidimensional understanding of crime films and how they shape public thinking about crime and criminals.

Restriction: CRM/LAW C176 and CRM/LAW C20 may not be taken for credit.

**CRM/LAW C177. Eyewitness Testimony. 4 Units.**

Faulty eyewitness testimony is a major cause of wrongful convictions. Covers the fast-growing topic of eyewitness testimony and memory for real-world events, both how psychologists study eyewitness capacity, and how the legal system has dealt with eyewitness issues.

Prerequisite: SOCECOL 10

Same as PSCI 193G.

Restriction: Seniors only. Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

Concurrent with CRM/LAW C263.

**CRM/LAW C178. Critical Race Theory. 4 Units.**

Introduction to Critical Race Theory and key American cases on racial inequality. Using this literature, examines the possibilities and pitfalls of legal claims of race, gender, and sexuality discrimination in the age of colorblindness.

Same as AFAM 157.

Restriction: Upper-division students only.

**CRM/LAW C179. Race and Incarceration. 4 Units.**

Examines the racial politics of mass incarceration through historical, empirical, theoretical, and legal frameworks. Focuses on race, gender, and sexual differences to develop a critique on policing, incarceration, and other forms of punishment.

**CRM/LAW C180. Power, Constructions of Deviance, and Social Control . 4 Units.**

Examines the forms and limits of power in the construction of social deviants. Theories of state power are covered to understand the prison system as a contemporary driver of social inequality. The collateral consequences of mass incarceration are discussed.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment.

**CRM/LAW C182. Illegal Economics. 4 Units.**

How illegal firms function in illegal markets, why individuals participate in these groups and markets, and what federal, state, and local governments do to disrupt organized illegal activity.

Same as ECON 146A.

Restriction: Business Economics Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C183. Controversies, Courts, Cultures: The Anthropology of Law. 4 Units.**

Assesses the contributions anthropology has made to legal scholarship, reviewing historical and contemporary themes. Considers both comparative questions of law's norms, structures, and practices around the globe, and the specific insights anthropology offers about contemporary U.S. law.

Same as ANTHRO 127.

(III)

**CRM/LAW C186. Social Media and The Law. 4 Units.**

Examines legal and policy issues raised by the rise of social media. Surveys how social networking platforms and other emerging technologies impact the right to privacy, public perceptions of judicial systems, and the law generally.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C187. Undocumented Immigrant Experiences. 4 Units.**

Examines the experiences of undocumented immigrants and the policies that structure their educational, economic, social, and political participation.

Same as ASIANAM 130, CHC/LAT 164A, SOCIOL 177C.

(III and VII ).

**CRM/LAW C190. Applied Statistics in Social and Behavioral Research. 4 Units.**

Covers statistical techniques used to describe and make generalizations about phenomena represented by data. Hands-on experience in data analysis and interpretation using statistical software (SPSS, STATA) is emphasized. Topics include data visualization, ANOVA, multiple regression, and categorical data analyses.

Prerequisite: SOCECOL 13

Same as PSCI 190, SOCECOL 190, UPPP 190.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**CRM/LAW C191. Law and Modernity. 4 Units.**

The rise and spread of Enlightenment legal traditions, social contract theory, individual rights, ideologies of 'liberty, equality, fraternity'; contradictions of liberal law, its understandings of 'primitive' and 'civilized'; pervasive myths of property, difference, race, and rights. Reading- and writing-intensive.

Same as ANTHRO 127A.

**CRM/LAW C196. Research Seminar in Criminology, Law and Society. 4 Units.**

Special topics research seminar. Content varies with interest of instructor. Capstone research opportunity with Criminology, Law and Society faculty members.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only. Anthropology Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**CRM/LAW C201. Research Methods. 4 Units.**

An introduction to techniques of inductive methodologies, including qualitative interviewing and participant observation, and deductive methodologies, including survey research and experimental and quasi-experimental design. Provides a sound overview of research methodology with tools to pursue specific methods in greater depth.

Restriction: Graduate students only.

**CRM/LAW C202. Research Methods II. 4 Units.**

Covers qualitative approaches (interview strategies, varieties of ethnography, archival and historical methods, etc.) and quantitative approaches (survey methods, experimental designs, secondary data sets, comparative and international data, etc.), and concludes with mixed-method approaches.

Prerequisite: CRM/LAW C201. CRM/LAW C201 with a grade of B or better

Restriction: Graduate students only.

**CRM/LAW C203A. Qualitative Methods Practicum. 4 Units.**

Designed to deepen students' familiarity with qualitative research strategies and to guide them through the initial stages of their Second Year Project requirement, such as the development of an original research proposal and/or a research instrument.

Prerequisite: CRM/LAW C202. CRM/LAW C202 with a grade of B or better

Restriction: Graduate students only.

**CRM/LAW C203B. Quantitative Methods Practicum. 4 Units.**

Deepens familiarity with quantitative research and provides a foundation for the second-year paper, e.g., initial models for data analysis and/or a replication study. Students evaluate what assumptions are necessary for credible inference in different evaluation approaches.

Prerequisite: CRM/LAW C202. CRM/LAW C202 with a grade of B or better

Restriction: Graduate students only.

**CRM/LAW C207. Land-Use Law. 4 Units.**

Investigates legal and institutional frameworks for development control. Review of constitutional issues implicated in land-use regulation. Traces development control historically and analyzes contemporary approaches to land-use control which reflect environmental and economic development concerns.

Same as UPPP 207.

Restriction: Graduate students only.

**CRM/LAW C210. Introduction to Criminology, Law and Society. 4 Units.**

Familiarizes students with the interrelated fields of criminology, law and society studies, and criminal justice studies. Organized around three well-established interdisciplinary literatures: criminology, sociolegal studies, and criminal justice studies.

Restriction: Graduate students only. Criminology, Law and Society Majors only.

**CRM/LAW C211. Legal Institutions and Society. 4 Units.**

Acquaints students with the institutions of U.S. legal system and its operations, as well as with the constitutional framework undergirding this system, and defines the relationship between U.S. citizens and government at a variety of levels.

Restriction: Graduate students only.

**CRM/LAW C212. Police, Courts, and Corrections. 4 Units.**

Focuses on basic policy issues in the administration of the criminal justice system. The key elements of the criminal justice system are police, courts, and corrections. Prepares students for continued study of these organizations.

Restriction: Graduate students only.

**CRM/LAW C213. Crime and Social Deviance. 4 Units.**

Examines the major social scientific perspectives on criminal and deviant behavior. Specific deviant and criminal activities are described and explained using established theoretical frameworks.

Restriction: Graduate students only.

**CRM/LAW C214. Research Methods. 4 Units.**

Structures research methodology, the approach to developing and evaluating knowledge of the sciences for use in criminal justice professional activities. Special emphasis on differentiating scientific approaches from pseudo-science.

Restriction: Graduate students only.

**CRM/LAW C215. Applied Statistics. 4 Units.**

Provides a basis for the use of fundamental statistical analysis techniques for solving public policy and management problems through a series of assignments, examinations, and online discussions and demonstrations.

Restriction: Graduate students only.

**CRM/LAW C216. Public Policy, Crime, and Criminal Justice. 4 Units.**

Increases understanding of crime, violence, and the criminal justice system. Assesses the state of knowledge on key policy issues of our time. Discusses the contribution of communities, schools, employment, drugs, guns, and alcohol to crime and violence.

Restriction: Graduate students only.

**CRM/LAW C217. Leadership. 4 Units.**

Introduces concepts, ideas, and theories about leadership and its operation. Explores leadership concepts through interviews with leaders from the community and fellow classmates.

Restriction: Graduate students only.

**CRM/LAW C218. Social Problems, Law, and Policy. 4 Units.**

Capstone course for M.A.S. program in Criminology, Law and Society. Students choose a social problem related to crime, criminal justice, and law; relate the problem to legal and social issues; and devise a plan of action to research the problem.

Restriction: Graduate students only. Criminology, Law and Society Majors only.

**CRM/LAW C219. Hate Crime. 4 Units.**

Examines the causes, manifestations, and consequences of hate crimes, as well as the larger social context within which they occur, are reacted to, and seem to be proliferating.

Restriction: Graduate students only.

**CRM/LAW C221. Sentencing and Corrections. 4 Units.**

Reviews U.S. attempts to punish and rehabilitate convicted law violators. Conflicts among major purposes of sentencing (rehabilitation, deterrence, incapacitation, and retribution) are discussed, as well as effects of different sanctions on public safety, offender rehabilitation, and justice system costs.

Restriction: Graduate students only.

**CRM/LAW C222. Ethnography. 4 Units.**

Explores the theory and practice of ethnography with a focus on anthropology, the discipline most associated with ethnography. Students are exposed to the theoretical underpinnings of ethnographic work, traditional and innovative practices, and sample ethnographies.

Same as ANTHRO 230F, CHC/LAT 217.

Restriction: Graduate students only.

**CRM/LAW C224. Organizational Perspectives on the Legal System. 4 Units.**

Familiarizes students with organization theory and research as ways to make sense of, navigate, and act on the legal system. Acquaints students with major frameworks in organization theory and their application to the system of legal organizations.

Restriction: Graduate students only.

**CRM/LAW C226. Causal Methods for Policy Analysis. 4 Units.**

Provides students with hands-on experience using existing data to estimate the impact of policy and law on individual behavior or aggregate social outcomes. Covers different econometric strategies used to identify causal effects in the absence of an experiment.

Restriction: Graduate students only.

**CRM/LAW C228. Criminology: Micro Approaches. 4 Units.**

Introduces students to the dominant theories in modern criminology, their theoretical antecedents and extensions, major empirical tests and implications for programs, policy and practice, and focuses on micro-level, individual theories of crime causation. Formerly Criminology, Law and Society C233A.

**CRM/LAW C229. Criminology: Macro Approaches. 4 Units.**

Introduces students to the dominant theories in modern criminology, their theoretical antecedents and extensions, major empirical tests and implications for programs, policy and practices, and addresses macro-level theories of crime causation. Formerly Criminology, Law and Society C233B.

**CRM/LAW C231. Crime and Gender . 4 Units.**

Examines the legal, political, social, economic, and policy implications of making gender (primarily) and race (secondarily) the focus in the study of crime, criminal law, and the criminal justice system.

Restriction: Graduate students only.

**CRM/LAW C232. Juvenile Delinquency. 4 Units.**

Examines the major theoretical perspectives regarding the onset, persistence, and desistance of juvenile delinquency, and examines empirical evidence for each perspective.

Restriction: Graduate students only.

**CRM/LAW C234. Anthropology of Law. 4 Units.**

Law has been a key site of anthropological inquiry since the discipline's nineteenth-century origins. Course introduces and critically assesses the contributions anthropology has made to sociolegal lytic trends.

Restriction: Graduate students only.

**CRM/LAW C238. White-Collar Crime. 4 Units.**

Examines the illegal behavior of individuals who commit crimes in the course of their employment. Special attention will be paid to ways in which power and organizational structure affect the behavior of the white-collar offenders.

Restriction: Graduate students only.

**CRM/LAW C239A. Law and Society I. 4 Units.**

Provides an introduction to the law and society field from its origins in social scientific, legal, and philosophical scholarship during the eighteenth, nineteenth, and early-twentieth centuries. Formerly Criminology, Law, and Society C239.

Restriction: Graduate students only.

**CRM/LAW C239B. Law and Society II. 4 Units.**

Building on Law and Society I, addresses contemporary issues in the field from mid-twentieth century to the present with emphasis on the degree to which the field's foundational assumptions are being challenged, refined, or confirmed through current research.

Prerequisite: CRM/LAW C239A

Restriction: Graduate students only.

**CRM/LAW C240A. Socio-Legal Workshop.**

Designed to foster intellectual discussion, encourage practice and skill-building in providing feedback, and build substantive knowledge of legal scholarship, this workshop is for both law and doctoral students across campus who are interested in interdisciplinary approaches to studying law.

Grading Option: In Progress (Letter Grade with S/U).

Restriction: Graduate students only.

**CRM/LAW C240B. Socio-Legal Workshop.**

Designed to foster intellectual discussion, encourage practice and skill-building in providing feedback, and build substantive knowledge of legal scholarship, this workshop is for both law and doctoral students across campus who are interested in interdisciplinary approaches to studying law.

Prerequisite: CRM/LAW C240A

Grading Option: In Progress (Letter Grade with S/U).

Restriction: Graduate students only.

**CRM/LAW C240C. Socio-Legal Workshop. 4 Units.**

Designed to foster intellectual discussion, encourage practice and skill-building in providing feedback, and build substantive knowledge of legal scholarship, this workshop is for both law and doctoral students across campus who are interested in interdisciplinary approaches to studying law.

Prerequisite: CRM/LAW C240B. CRM/LAW C240B with a grade of B or better

Restriction: Graduate students only.

**CRM/LAW C242. Crime Hotspots. 4 Units.**

Focuses on the criminological theory of hotspots, beginning with the “when, where, and why” questions and ending with the practical policing strategies that have been developed to mitigate hotspot public safety hazards.

Restriction: Graduate students only.

**CRM/LAW C248. Geographic Information Systems. 4 Units.**

Prepares students to become proficient in the basic GIS functionality including visualization, data management, and spatial analysis.

Restriction: Graduate students only.

**CRM/LAW C250. Preventing Errors of Justice. 4 Units.**

Examines the types of errors that are made in the U.S. criminal justice system and how we might prevent these errors, including failures to convict guilty offenders as well as wrongful convictions of the innocent.

Restriction: Graduate students only.

**CRM/LAW C252. Issues in Environmental Law and Policy. 4 Units.**

Treatment of legal and policy strategies for promoting environmental protection and deterring environmental degradation within the context of other societal objectives. Topical approach with a focus on problems of special interest to criminologists and to environmental policy specialists.

Same as UPPP 252.

Restriction: Graduate students only.

**CRM/LAW C253. Cybercrime, Cybersecurity, and Society. 4 Units.**

Introduces students to the world of cybercrime in the age of globally networked digital, and information and communication technologies (ICT). Presents a socio-legal approach to the study of cybercrime, cybersecurity, and how it relates to society.

Restriction: Graduate students only. Criminology, Law and Society M.A.S. students only.

**CRM/LAW C254. Immigration in the US: Economic, Fiscal, and Social Outcomes. 4 Units.**

The changing patterns of immigration in the U.S. and the role that immigrants play in our society. In particular, the economic and social outcomes of immigration, as well as the relationship between immigration, crime, and criminal justice policy.

Restriction: Graduate students only. Criminology, Law and Society Majors only.

**CRM/LAW C255. Public Policy. 4 Units.**

Explores different approaches to public policy analysis, the diverse conceptions of the goals and objectives that should be served by policy, and the appropriate role of the policy analyst. Policy consequences are traced to indirect and subtle incentives and disincentives.

Same as UPPP 221, POL SCI 221A.

Restriction: Graduate students only.

**CRM/LAW C258. Crimmigration. 4 Units.**

Examines the criminalization of immigration, with an emphasis on U.S. enforcement procedures and outcomes. Analyzes the devolution of federal immigration law to local authorities, the rise in immigrant detention and deportation, and the militarization of the U.S.-Mexico border.

Same as CHC/LAT 225, SOCIOL 268.

Restriction: Graduate students only.

**CRM/LAW C260A. Race and Justice Studies Proseminar .**

A year-long proseminar conducted by a team of instructors specializing in race and justice studies. Conceived as a reading and peer mentor group focusing on intellectual and professional development. Required for students pursuing the Race and Justice Studies emphasis.

Grading Option: In Progress (Letter Grade with S/U).

Restriction: Graduate students only.

**CRM/LAW C260B. Race and Justice Studies Proseminar.**

A year-long proseminar conducted by a team of instructors specializing in race and justice studies. Conceived as a reading and peer mentor group focusing on intellectual and professional development. Required for students pursuing the Race and Justice Studies emphasis.

Prerequisite: CRM/LAW C260A

Grading Option: In Progress (Letter Grade with S/U).

Restriction: Graduate students only.

**CRM/LAW C260C. Race and Justice Studies Proseminar. 4 Units.**

A year-long proseminar conducted by a team of instructors specializing in race and justice studies. Conceived as a reading and peer mentor group focusing on intellectual and professional development. Required for students pursuing the Race and Justice Studies emphasis.

Prerequisite: CRM/LAW C260B

Restriction: Graduate students only.

**CRM/LAW C261. Race and Justice Studies Writing Seminar . 4 Units.**

A required writing-intensive seminar conducted by an instructor affiliated with the Race and Justice Studies emphasis. Students with manuscripts on relevant topics will read and critique peer manuscripts, and revise manuscripts toward completion of articles, dissertation chapters, and other publications.

Prerequisite: CRM/LAW C260C

Same as HUMAN 261, SOC SCI 253K.

Restriction: Graduate students only.

**CRM/LAW C262. Special Topics in Race and Justice Studies. 4 Units.**

A seminar focused on special issues in race and justice studies.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**CRM/LAW C263. Eyewitness Testimony. 4 Units.**

Examines the evidence that shows that faulty eyewitness memory is the major cause of wrongful convictions. Explores what the legal system thinks of eyewitness testimony and how the legal system has dealt with eyewitness issues.

Same as PSCI P263.

Restriction: Graduate students only.



**CRM/LAW C265. Memory and the Law. 4 Units.**

Examines the controversial topic of repressed memory, or perception and memory of real-world events.

Same as PSCI P265.

Restriction: Graduate students only.

**CRM/LAW C266. Psychology and the Law. 4 Units.**

Overview of how psychology is applied to the civil and criminal justice systems, how case law shapes this application, and how legal decisions affect the direction of psychological research. Interdisciplinary approach to research in psychology, law, and/or criminology.

Same as PSCI P266.

Restriction: Graduate students only.

**CRM/LAW C268. Contemporary Issues in Crime and Justice. 4 Units.**

Intensive reading and discussion of several recent works that raise critical issues for criminology and criminal justice policy, with a special emphasis on issues of inequality, diversity, and social justice.

Restriction: Graduate students only.

**CRM/LAW C275. Special Topics in Criminology, Law and Society. 4 Units.**

Topics covered vary with interests of instructor.

Repeatability: Unlimited as topics vary.

**CRM/LAW C280A. Professionalization Proseminar.**

Focuses on two areas that are key to scholarly and professional success in graduate school but are rarely discussed in a structured setting: 1) publishing in peer-reviewed academic journals; and 2) preparing for the academic job market.

Grading Option: In Progress (Letter Grade with S/U).

Restriction: Graduate students only.

**CRM/LAW C280B. Professionalization Proseminar.**

Focuses on two areas that are key to scholarly and professional success in graduate school but are rarely discussed in a structured setting: 1) publishing in peer-reviewed academic journals; and 2) preparing for the academic job market.

Prerequisite: CRM/LAW C280A

Grading Option: In Progress (Letter Grade with S/U).

Restriction: Graduate students only.

**CRM/LAW C280C. Professionalization Proseminar. 4 Units.**

Focuses on two areas that are key to scholarly and professional success in graduate school but are rarely discussed in a structured setting: 1) publishing in peer-reviewed academic journals; and 2) preparing for the academic job market.

Prerequisite: CRM/LAW C280B

Restriction: Graduate students only.

**CRM/LAW C296. Doctoral Dissertation Research and Writing. 2-12 Units.**

Dissertation research with Criminology, Law and Society faculty.

Prerequisite: Advancement to candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**CRM/LAW C298. Directed Study. 2-4 Units.**

Directed study with Criminology, Law and Society faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CRM/LAW C299. Independent Study . 2-8 Units.**

Independent research with Criminology, Law and Society faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Criminology, Law and Society, B.A.

The major in Criminology, Law and Society is designed to provide students with an overview of the American legal system and in-depth focus on the regulation of behavior, the problem of crime, and responses to crime within this system. Students explore these topics through multiple disciplinary perspectives, including anthropological, economic, historical, political, and sociological approaches to the study of law, behavior, and institutions of social control. In addition to learning to apply social science techniques to analyzing social problems, students in this course of study will be especially well-prepared for careers in criminal justice and regulatory agencies, public policy organizations, and direct service provision to people involved with the legal system as well as for pursuing graduate studies in law, sociology, criminology, and criminal justice.

### Undergraduate Program

#### Requirements for the B.A. in Criminology, Law and Society

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

#### Departmental Requirements

Eleven courses (44 units) as specified below:

A. Complete one lower-division gateway course:

CRM/LAW C10	Fundamentals of Criminology, Law and Society
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B. Select one course from each of the following four groups:

<b>(1) The Legal System, Law and Society</b>	
CRM/LAW C101	American Law
CRM/LAW C102	Introduction to the Comparative Study of Legal Cultures
CRM/LAW C103	US Legal Thought
CRM/LAW C104	Sociology of Law
CRM/LAW C105	Psychology and the Law
CRM/LAW C122	Constitutional Law
CRM/LAW C123	Family Law
<b>(2) Crime and Criminology</b>	
CRM/LAW C106	Crime and Public Policy
CRM/LAW C107	Deviance
CRM/LAW C108	Criminological Theory
CRM/LAW C109	Juvenile Delinquency
CRM/LAW C110	Community Context of Crime
CRM/LAW C134	Victimless Crimes
<b>(3) Formal Institutions of Social Control</b>	
CRM/LAW C111	Theories of Punishment
CRM/LAW C112	Legal Sanctions and Social Control
CRM/LAW C114	Miscarriages of Justice
CRM/LAW C115	Prisons, Punishment, and Corrections
CRM/LAW C124	Mental Health and the Justice System
CRM/LAW C139	Police and Change
CRM/LAW C164	Social Control of Delinquency
CRM/LAW C180	Power, Constructions of Deviance, and Social Control
<b>(4) Justice and Inequalities</b>	
CRM/LAW C113	Gender and Social Control
CRM/LAW C116	Race, Ethnicity, and Social Control
CRM/LAW C120	Law and Inequality
CRM/LAW C127	Hate Crimes

CRM/LAW C135	Mass Incarceration and Social Inequality in America
CRM/LAW C178	Critical Race Theory
CRM/LAW C174	Immigration and Crime

**C. Six upper-division elective courses (24 units).<sup>1</sup>**

Select from courses numbered CRM/LAW C100–C191.

<sup>1</sup> Courses taken to satisfy requirement B may not also be used to satisfy requirement C.

## Criminology, Law and Society, Master of Advanced Study

The Master of Advanced Study (M.A.S.) in Criminology, Law and Society, the first online degree program at the University of California, prepares professionals for leadership positions in criminal justice and the legal professions. The curriculum emphasizes theoretical and practical applications central to crime and its control, social policy, and the law. In keeping with one of the main tenets of the School of Social Ecology, students approach topics from a multidisciplinary perspective.

### Program Details

This program is ideally suited for professionals interested in obtaining positions in or currently working in the criminal justice or legal fields and who are seeking a graduate degree for career advancement. The program consists of 52 units of course work which is completed sequentially in two years (6 quarters). An optional one-week in-residence introductory course is scheduled right before fall quarter. In lieu of a thesis, students are required to take a capstone course. In addition to the capstone course, students take two other required courses (CRM/LAW C214 and CRM/LAW C215) and choose from elective courses to fulfill the remaining 40 units. The M.A.S. is awarded upon completion of 13 courses (52 units).

### Course Requirements

A. Complete:

CRM/LAW C214	Research Methods
CRM/LAW C215	Applied Statistics
CRM/LAW C218	Social Problems, Law, and Policy

B. Complete 40 units of electives, selected from:

CRM/LAW C210	Introduction to Criminology, Law and Society
CRM/LAW C211	Legal Institutions and Society
CRM/LAW C212	Police, Courts, and Corrections
CRM/LAW C213	Crime and Social Deviance
CRM/LAW C216	Public Policy, Crime, and Criminal Justice
CRM/LAW C217	Leadership
CRM/LAW C219	Hate Crime
CRM/LAW C221	Sentencing and Corrections
CRM/LAW C224	Organizational Perspectives on the Legal System
CRM/LAW C238	White-Collar Crime
CRM/LAW C242	Crime Hotspots
CRM/LAW C250	Preventing Errors of Justice
CRM/LAW C253	Cybercrime, Cybersecurity, and Society
CRM/LAW C254	Immigration in the US: Economic, Fiscal, and Social Outcomes

## Criminology, Law and Society, Minor

The minor in Criminology, Law and Society is designed to provide students with an overview of the American legal system and in-depth focus on the regulation of behavior, the problem of crime, and responses to crime within this system. Students explore these topics through multiple disciplinary perspectives, including anthropological, economic, historical, political, and sociological approaches to the study of law, behavior, and institutions of social control. In addition to learning to apply social science techniques to analyzing social problems, students in this course of study will be especially well-prepared for careers in criminal justice and regulatory agencies, public policy organizations, and direct service provision to people involved with the legal system as well as for pursuing graduate studies in law, sociology, criminology, and criminal justice.

### Minor Requirements

Eight courses (32 units) as specified below:

A. Complete the following:

CRM/LAW C7	Introduction to Criminology, Law and Society
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CRM/LAW C10

Fundamentals of Criminology, Law and Society

and six upper-division courses selected from CRM/LAW C100–C191.

NOTE: SOCECOL 198 and SOCECOL 199 may not be applied toward the minor.

## Criminology, Law and Society, Ph.D.

The study of crime, institutional responses to illegal behavior, and the interaction of law and society are the foci of the doctoral program in Criminology, Law and Society. Students examine issues related to the etiology of crime, the process of changing criminal behavior, social regulation, the civil justice system, and the social and cultural context of law.

Students gain familiarity with a number of subjects including sentencing; crime rates; modes of modifying criminal behavior; police behavior; policies against hate crimes; race and social inequality; behavior of courts, juries, and regulatory agencies; immigration lawmaking and application; and the interaction among law, culture, and identity. In general, students are introduced to the leading classical and contemporary issues in criminology, law and society and to ways of understanding them through interdisciplinary research. The program aims to develop theoretical sophistication and to prepare the graduate student for faculty positions at major universities; and for research and administrative work in institutions in the legal system, the criminal justice system, and related organizations.

### Requirements

#### A. Complete:

CRM/LAW C201	Research Methods
CRM/LAW C202	Research Methods II
SOCECOL 264A	Data Analysis
SOCECOL 264B	Data Analysis

#### B. One additional graduate research methods course, selected from the following:

CRM/LAW C203A	Qualitative Methods Practicum
CRM/LAW C203B	Quantitative Methods Practicum

#### C. Students in the Criminology, Law and Society program must additionally complete:

CRM/LAW C228	Criminology: Micro Approaches
CRM/LAW C229	Criminology: Macro Approaches
CRM/LAW C239A	Law and Society I
CRM/LAW C239B	Law and Society II

#### D. Four elective courses in Criminology, Law and Society.<sup>1</sup>

<sup>1</sup> One of these elective courses can be the opposing CRM/LAW C203A or CRM/LAW C203B not taken as part of the three-course methods sequence. These elective courses should be chosen according to a plan that best meets the needs of the individual student, as determined in consultation with the student's faculty advisor. Students should satisfy the elective requirement with regularly scheduled courses (with rare exceptions).

(NOTE: An initial faculty advisor for each new Criminology, Law and Society student is assigned by the Criminology, Law and Society Associate Director. Students, however, are free to change their faculty advisor during their first year of study (or later) based on research interests. Students must notify the Criminology, Law and Society Faculty Graduate Director and the Departmental Graduate Coordinator of any changes in advisors.)

Students become involved in research activities from the earliest stages of their training and complete an independent, supervised research project during the second year of graduate study.

### Advancement and Completion

Students complete a written comprehensive examination during year three, which requires them to demonstrate mastery of major issues in criminology, and law and society. The normative time for advancement to candidacy is four years (three years for students who entered with a master's degree). Students are required to advance to candidacy by the end of fall quarter of their fifth year of study, adjusted for any approved leaves of absence. The fourth and, possibly, fifth years of study are devoted to developing and defending a dissertation proposal and completing dissertation research. The normative time for completion of the Ph.D. is six years, and the maximum time permitted is seven years. (For students who have waived two required courses and the second-year project based upon master's-level work completed at another institution, the time to degree is five years, with a maximum of six years.) All Ph.D. students in the Criminology, Law and Society program are required to pass a final oral defense of the dissertation.

### Program in Law and Graduate Studies (J.D./Ph.D.)

Highly qualified students interested in combining the study of law and graduate qualifications in Criminology, Law and Society are invited to undertake concurrent degree study under the auspices of UC Irvine's Program in Law and Graduate Studies (PLGS). Students in this program pursue a coordinated curriculum leading to a J.D. degree from the School of Law in conjunction with a Ph.D. degree in Criminology, Law and Society. Additional information is available from the PLGS Director's office, 949-824-4158, or by email at [plgs@law.uci.edu](mailto:plgs@law.uci.edu). A full description of the program, with links

to all relevant application information, can be found at the School of Law Concurrent Degree Programs website (<http://www.law.uci.edu/academics/interdisciplinary-studies/concurrent-degrees.html>).

## Race and Justice Studies, Graduate Emphasis

Students from any UCI state-supported graduate or professional program, including J.D., Master's, and M.F.A. students, are eligible to apply to the Emphasis in Race and Justice Studies, housed in the Department of Criminology, Law and Society. The Emphasis in Race and Justice Studies is comprised of three interconnected components that promote inclusive excellence: 1) A first-year mentorship proseminar; 2) Interdisciplinary coursework and writing that emphasizes cross-departmental interests and perspectives on critical studies of race, crime, and law; 3) Engagement with diverse audiences through traditional and innovative forms of research presentation.

Students may apply for admission into the Emphasis upon completion of CRM/LAW C260A-CRM/LAW C260B-CRM/LAW C260C, Race and Justice Studies Proseminar. Admitted students who satisfactorily complete program requirements (see below) will be awarded a letter signed by the Director noting that the student has incorporated Race and Justice studies into their research and professional activities. Each student will be assigned a peer and faculty mentor to discuss the student's ongoing research and the value of inclusive excellence.

The following is needed to apply for admission

1. Satisfactory completion of CRM/LAW C260A-CRM/LAW C260B-CRM/LAW C260C, the first-year mentorship proseminar.
2. A statement of interest.
3. An unofficial transcript.
4. One faculty reference letter that speaks to the student's capabilities.
5. Endorsement of the student's application by the student's advisor. The student's advisor may provide the reference letter. The deadline for this application is week 10 of the spring quarter of the student's first year of graduate study.

### Requirements

1. CRM/LAW C260A-CRM/LAW C260B-CRM/LAW C260C, Race and Justice Studies Proseminar, a first-year mentorship proseminar, consisting of 10 workshops, discussions, and presentations offered over three quarters. Students will receive a grade for this proseminar in the spring quarter.
2. CRM/LAW C262, Special Topics in Race and Justice Studies, or other emphasis-approved seminars on race and justice. Students should consult with the Director about approved courses.
3. CRM/LAW C261, Race and Justice Studies Writing Seminar in which a paper developed through Race and Justice Studies coursework and programming will be workshopped and revised toward publication.
4. A public presentation which translates the student's Race and Justice Studies-influenced research for an interdisciplinary audience, which can include but is not limited to those found through professional associate conferences, small symposia and colloquia, social media publications, community-based collaborations, program and policy consultations, and artistic or alternative media formats.

### Admission

The following is needed to apply for admission

1. Satisfactory completion of the first-year mentorship proseminar.
2. A statement of interest.
3. An unofficial transcript.
4. One faculty reference letter that speaks to the student's capabilities.
5. Endorsement of the student's application by the student's advisor. The student's advisor may provide the reference letter. The deadline for this application is week 10 of the spring quarter of the student's first year of graduate study.

### Petition for Formal Letter of Completion

A transcript showing satisfactory completion of coursework, a writing seminar paper, and a one-page report of public presentation is required for the petition for a formal letter of completion. The deadline for this petition is week 10 of the spring quarter of the student's third year of graduate study.

For students admitted to graduate study before fall 2016, prerequisites must be fulfilled between fall 2016 and spring 2019 and requirements must be fulfilled between fall 2016 and spring 2021. Upon approval by the Director, students may use prior coursework to satisfy one of the requirements of the Emphasis.

## Department of Psychological Science

**Susan Charles, Department Chair**

4201 Social & Behavioral Sciences Gateway

949-824-5574

<https://ps.sococo.uci.edu/>

The Department of Psychological Science emphasizes the investigation of human behavior as it develops across the life span in diverse contexts. The faculty share a strong commitment to interdisciplinary research aimed at advancing our understanding of the determinants of human health, well-being, and functioning in a broad range of developmental, social, cultural, and environmental contexts. The faculty are also dedicated to research that has the potential to address important societal problems. Undergraduate students begin with basic course work in developmental psychology, health and preclinical (abnormal) psychology, and social psychology. Subsequent courses cover such topics as social, emotional, and cognitive development in children, adolescents, adults, and the elderly; behavioral disorders and developmental psychopathology; counseling and therapy; cultural, social, and personality influences on behavior; attitude formation and change; cognition and emotion; health psychology; stress and coping; environmental psychology; and psychology and the law. Opportunities are available to work with faculty members on research in these and other areas. Obtaining research experience as an undergraduate also provides a valuable background for entry into many graduate programs.

Students receive a foundation that will enable them to pursue graduate work in psychology, public health, health services, social work, counseling, law, education, and related fields, or to work after graduation in both the private and public sectors. Field study opportunities exist in hospitals, community health clinics, counseling centers, legal settings, environmental programs, social service agencies, schools and after-school programs, child care settings, and a wide variety of other community programs that offer a broad range of services.

Students should be aware that psychology courses are offered in several different departments and programs at UCI. Students interested in developmental, clinical, social, emotional, health, cross-cultural, or environmental psychology, or in psychology and the law, are advised to consult the course listings for the Department of Psychological Science. These courses offer students a solid foundation in general psychology. Students interested in perception, sensorimotor integration, and mathematical psychology are advised to consult course listings for the Department of Cognitive Sciences.

- Master of Legal and Forensic Psychology
- Psychological Science, B.A.
- Psychological Science, Minor
- Psychological Science, Ph.D.

## Faculty

Jessica Borelli, Ph.D. Yale University, *Associate Professor of Psychological Science* (developmental psychopathology, attachment, emotion, prevention on mental health problems in children and adolescents)

Elizabeth E. Cauffman, Ph.D. Temple University, *Professor of Psychological Science; Criminology, Law and Society; Education; School of Law* (adolescent development, mental health, juvenile justice, legal and social policy)

Susan T. Charles, Ph.D. University of Southern California, *Department Chair and Professor of Psychological Science* (emotional processes across the adult life span, subjective experience and cognitive processes, health and emotion)

Chuansheng Chen, Ph.D. University of Michigan, *UCI Chancellor's Professor of Psychological Science; Education* (cross-cultural psychology, adolescent development, cognitive neuroscience, genes and behavior)

Thomas J. Crawford, Ph.D. Harvard University, *Professor of Teaching Emeritus of Psychological Science* (attitude theory and social problems research)

Amy Dent, Ph.D. Duke University, *Assistant Professor of Teaching of Psychological Science* (meta-analysis, academic context and consequences of self-regulation, educational and developmental psychology of academic learning)

Peter H. Ditto, Ph.D. Princeton University, *Professor of Psychological Science* (social psychology, judgment and decision making, political and moral reasoning)

C. David Dooley, Ph.D. University of California, Los Angeles, *Professor Emeritus of Psychological Science* (community psychology, epidemiology, economic change)

Wendy A. Goldberg, Ph.D. University of Michigan, *Professor Emerita of Psychological Science; Education* (developmental psychology, work and family, infant sleep, transition to parenthood, autism)

Douglas A. Granger, Ph.D. University of California, Irvine, *Director of the Institute for Interdisciplinary Salivary Bioscience and Professor of Psychological Science* (psychoneuroendocrinology, salivary bioscience, hormone-behavior relationships across the lifespan, in high- and low-risk populations)

Ellen Greenberger, Ph.D. Harvard University, *Professor Emerita of Psychological Science* (developmental psychology, social and cultural influences on adolescent and young adult development, family relationships and consequences throughout the lifespan)

Nancy Guerra, Ed.D. Harvard University, *Dean of the School of Social Ecology and Professor of Psychological Science; Criminology, Law and Society* (children's aggression and behavior problems, prevention of youth violence, promotion of healthy youth development)

Jutta Heckhausen, Ph.D. University of Strathclyde, *Professor of Psychological Science; Education* (life-span developmental psychology, motivation, individual agency and social context)



Larry D. Jamner, Ph.D. State University of New York at Stony Brook, *Professor of Psychological Science* (health psychology, psychophysiology, pain, mHealth)

J. Zoe Klemfuss, Ph.D. Cornell University, *Assistant Professor of Psychological Science; Language Science* (narrative development, children's autobiographical memory, sociocontextual influences on children's narrative, memory and well-being, children's eyewitness abilities)

Kate Kuhlman, Ph.D. University of Michigan, *Assistant Professor of Psychological Science* (developmental psychopathology, psychoneuroimmunology, psychoneuroendocrinology, early life stress, and adolescent depression)

Linda J. Levine, Ph.D. University of Chicago, *Professor of Psychological Science* (bias in predicted and remembered emotion, memory and emotion, the development of children's ability to regulate emotion)

Elizabeth F. Loftus, Ph.D. Stanford University, *UCI Distinguished Professor of Psychological Science; Cognitive Sciences; Criminology, Law and Society; School of Law* (cognitive psychology, human memory, psychology and law)

Angela F. Lukowski, Ph.D. University of Minnesota, *Associate Professor of Psychological Science* (contextual influences on cognitive development in infancy and early childhood)

Salvatore R. Maddi, Ph.D. Harvard University, *Professor Emeritus of Psychological Science* (personality, psychopathology, health psychology, creativity)

Elizabeth Martin, Ph.D., University of Missouri, *Assistant Professor of Psychological Science* (adult psychopathology, schizotypy and schizophrenia, social anhedonia, emotional and social dysfunction)

Kristine Molina, Ph.D. University of Michigan, *Associate Professor of Psychological Science* (racism and discrimination, social inequality, health disparities, Latinx health)

Daniel Nation, Ph.D. University of Miami, *Associate Professor of Psychological Science* (clinical neuropsychology)

Raymond W. Novaco, Ph.D. Indiana University, *Professor of Psychological Science* (anger, violence, stress, trauma, and interventions)

Candice Odgers, Ph.D. University of Virginia, *Professor of Psychological Science; Criminology, Law and Society* (developmental and quantitative psychology; social inequalities and child health; new technologies and adolescent development)

Paul Piff, Ph.D. University of California, Berkeley, *Assistant Professor of Psychological Science* (social psychology, group processes, altruism and cooperation, socioeconomic status, inequality, social emotion, moral judgment, ethics, uncertainty)

Joann Prause, Ph.D. University of California, Irvine, *Professor of Teaching Emerita of Psychological Science* (statistics, quantitative epidemiology, employment typology)

Sarah D. Pressman, Ph.D. Carnegie Mellon University, *Associate Professor of Psychological Science* (health psychology, positive emotions, stress physiology, psychosocial effects on physiology and health)

Jodi A. Quas, Ph.D. University of California, Davis, *Professor of Psychological Science* (memory development, children's involvement in the legal system)

Jenna Riis, Ph.D. Johns Hopkins University, *Assistant Professor of Psychological Science* (early life adversity; stress; salivary bioscience; neuroendocrine-immune relations; program implementation and evaluation)

Jenny K. Rinehart, Ph.D. University of New Mexico, *Assistant Professor of Teaching of Psychological Science* (health psychology, clinical psychology, sexual victimization prevention, risk perception)

Karen S. Rook, Ph.D. University of California, Los Angeles, *Distinguished Professor of Psychological Science* (gerontology, social relationships and health)

Stephen Schueller, Ph.D. University of Pennsylvania, *Assistant Professor of Psychological Science* (clinical psychology, depression, mHealth, technology, implementation science, treatment and prevention, positive psychology)

Nicholas I. Scurich, Ph.D. University of Southern California, *Associate Professor of Psychological Science; Criminology, Law and Society; School of Law* (judgment and decision making, juridical proof, violence risk assessment)

Roxane C. Silver, Ph.D. Northwestern University, *Professor of Psychological Science; Program in Public Health* (coping with traumatic life events (personal losses and collective traumas), stress, social psychology, health psychology)

Daniel Stokols, Ph.D. University of North Carolina, Chapel Hill, *Professor Emeritus of Psychological Science; Religious Studies; Urban Planning and Public Policy*



Julian F. Thayer, Ph.D. New York University, *Professor of Psychological Science* (health psychology, psychopathology, health disparities, heart rate variability, emotions, stress)

Ilona S. Yim, Ph.D. University of Trier, *Associate Professor of Psychological Science* (stress, pregnancy and postpartum depression, biopsychology of stress, developmental psychobiology)

Alyson K. Zalta, Ph.D. University of Pennsylvania, *Assistant Professor of Psychological Science* (clinical psychology, trauma, posttraumatic stress disorder, resilience, prevention, treatment, cognitive behavioral therapy)

Joanne F. Zinger, Ph.D. University of California, Riverside, *Associate Professor of Teaching of Psychological Science* (expressive writing, meta-analysis, positive psychology, health psychology, preventive medicine, educational psychology)

## Affiliate Faculty

Drew Bailey, Ph.D. University of Missouri, *Associate Professor of Education; Cognitive Sciences; Psychological Science*

Lawrence F. Cahill, Ph.D. University of California, Irvine, *Professor of Neurobiology and Behavior; Psychological Science*

Belinda Campos, Ph.D. University of California, Berkeley, *Associate Professor of Chicano/Latino Studies; Family Medicine; Psychological Science* (culture, relationships, positive emotion, health)

N. Edward Coulson, Ph.D. University of California, San Diego, *Professor of Paul Merage School of Business; Economics; Psychological Science*

Greg Duncan, Ph.D. University of Michigan, *UCI Distinguished Professor of Education; Economics; Psychological Science* (economics of education, program evaluation, child development)

Jacquelynne S. Eccles, Ph.D. University of California, Los Angeles, *UCI Distinguished Professor of Education; Psychological Science* (academic motivation and achievement, school and family influences on adolescent development, gender and ethnicity in STEM fields)

Michelle A. Fortier, Ph.D. University of Nebraska Lincoln, *Associate Professor of Nursing; Nursing; Psychological Science*

Michael A. Hoyt, Ph.D. Arizona State University, *Associate Professor of Program in Public Health; Epidemiology; Psychological Science*

Stephanie Reich, Ph.D. Vanderbilt University, *Associate Professor of Education; Informatics; Psychological Science* (child development, parenting, peer interactions, media, program evaluation)

Maritza Salazar, Ph.D. New York University, *Assistant Professor of Paul Merage School of Business; Psychological Science* (team science, group dynamics and processes, team-based organizations, global teams, impact of culture on work behavior, international management, management of innovation and learning)

Sabrina E. Schuck, Ph.D. University of California, Riverside, *Health Sciences Assistant Clinical Professor of Pediatrics; Education; Psychological Science*

Dara H. Sorkin, Ph.D. University of California, Irvine, *Associate Professor in Residence of Medicine; Program in Public Health; Psychological Science*

Eric Spangenberg, Ph.D. University of Washington, M.B.A. Portland State University, *Dean of The Paul Merage School of Business and Professor of Paul Merage School of Business; Psychological Science* (sensory cues in the retail environment and the effects of self-prediction on behavior)

Mark Steyvers, Ph.D. Indiana University, *Professor of Cognitive Sciences; Computer Science; Psychological Science* (higher-order cognition, cognitive neuroscience, computational modeling, collective intelligence)

William C. Thompson, Ph.D. Stanford University, *Professor Emeritus of Criminology, Law and Society; Psychological Science; School of Law* (psychology and law, criminal justice, forensic science, expert evidence, human judgment and decision making, use of social science in appellate litigation)

Deborah Lowe Vandell, Ph.D. Boston University, *Chancellor's Professor Emerita of Education; Psychological Science* (longitudinal studies of development, early childhood education, after-school programs, summer learning, child development, adolescent development)

## Courses

### **PSCI 9. Introduction to Psychology. 4 Units.**

Introduction to field of psychology, addressing the application of scientific methods to the study of human development, learning, memory, problem solving, perception, biological mechanisms, emotions and motivation, personality, psychopathology, and effects of diverse social and cultural contexts on human behavior.

Same as PSYC 7A.

Overlaps with PSYC 9A, PSYC 9B, PSYC 9C, PSCI 11A, PSCI 11B.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment. PSCI 9 and PSYCH 7A may not be taken for credit if taken concurrently with or after PSCI 11A, PSCI 11B, PSCI 11C, PSYCH 9A, PSYCH 9B, or PSYCH 9C.

(III)

### **PSCI 11A. Psychology Fundamentals. 4 Units.**

Designed to provide freshman with an in-depth survey of general psychology. Topics include biological bases of behavior, sensation, perception, cognition, development, personality, psychopathology, and social psychology.

Same as PSYC 9A.

Restriction: Lower-division students only. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. PSCI 9 and PSYCH 7A may not be taken for credit if taken after PSCI 11A, PSCI 11B, PSCI 11C, PSYCH 9A, PSYCH 9B, or PSYCH 9C.

(III)

### **PSCI 11B. Psychology Fundamentals. 4 Units.**

Designed to provide freshmen with an in-depth survey of general psychology. Topics include biological bases of behavior, sensation, perception, cognition, development, personality, psychopathology, and social psychology.

Same as PSYC 9B.

Restriction: Lower-division students only. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

(III)

### **PSCI 11C. Psychology Fundamentals. 4 Units.**

Designed to provide freshman with an in-depth survey of general psychology. Topics include biological bases of behavior, sensation, perception, cognition, development, personality, psychopathology, and social psychology.

Same as PSYC 9C.

Restriction: Lower-division students only. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

(III)

### **PSCI 100. Special Topics in Social Behavior. 4 Units.**

Course content varies with interest of instructor.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Repeatability: Unlimited as topics vary.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 101D. Life Span Developmental Psychology. 4 Units.**

Addresses the major issues, concepts, and methods of life span developmental psychology. The fundamental theories, distinctive methods, and the physical, perceptual, cognitive, social, motivational, and emotional development for each developmental phase of the life course are considered.

Prerequisite: PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment.

**PSCI 102C. Abnormal Psychology. 4 Units.**

Survey of disorders organized by the diagnostic categories of the American Psychiatric Association. Interdisciplinary orientation combines environmental, psychological, and organic perspectives on etiology and treatment.

Prerequisite: (PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C) and SE 10

Overlaps with PSYC 120A.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment.

**PSCI 103H. Health Psychology. 4 Units.**

Theory and research are considered as they contribute to an understanding of the role of psychological processes in health and illness. The distinction between prevention and treatment of illness is established, and a variety of psychosocial interventions are elaborated.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment.

**PSCI 104S. Social Animal: An Introduction to Social Psychology. 4 Units.**

Theories and research exploring social behavior and social influences on behavior. Topics include methods of social research, attitude formation and change, social perception, the social self, stereotypes and prejudice, conformity, obedience, altruism, aggression, interpersonal relationships and love, and group behavior.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment.

**PSCI 110D. Infant Development. 4 Units.**

Study of human development from conception through the first two years of life, covering processes and events in the domains of physical, social, and cognitive development.

Prerequisite: PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 111D. Child Development. 4 Units.**

Examines social, emotional, and intellectual growth and development between the ages of 2 and 12 years.

Prerequisite: PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B

Overlaps with PSYC 120D.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 111W. Advanced Research Methods. 4 Units.**

For students planning to conduct senior research projects or apply to graduate school in social research fields. Topics include reviewing literature, preparing a research proposal, protecting human subjects, citing scholarly work, building measures, estimating sample size, interview and presentation skills.

Prerequisite: SE 10 and SE 13. Satisfactory completion of the Lower-Division Writing requirement.

Same as CLS C169W, SE 111W, UPPP 114W.

**(Ib)****PSCI 112D. Adolescent Development. 4 Units.**

Examines current research on the biological, social, and cultural contexts of adolescent development. Topics include the impacts of puberty, adolescents' decision-making competencies, changes in family and peer relationships, identity development, and psychosocial problems such as depression and problem behavior.

Prerequisite: PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B

Overlaps with PSYC 21A.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 113D. Adult Development. 4 Units.**

Examines why and how we change (with attention to gains as well as losses) from ages 18-65 and the nature and sources of continuity over time. Topics include physical and intellectual functioning, personality, coping strategies, and social roles and relationships.

Prerequisite: PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 115D. Cognitive Development. 4 Units.**

Examines theories on nature of cognitive development. Discusses behaviorist theories on role of the environment including those of Vygotsky and Piaget, and recent evidence from cognitive psychologists stressing the importance of knowledge and skills within specific domains.

Prerequisite: PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 116D. Human Development and Cross-Cultural Perspectives. 4 Units.**

Human development in diverse cultures (e.g., Asian, American, and African). Special emphasis on East-West contrasts and when East meets West (i.e., Asian-American experiences). Topics include parenting, family relations, language and cognition, schooling and academic achievement, and morality.

Prerequisite: (PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B) and SE 10

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 117D. The Psychology of Gender. 4 Units.**

Discussion of gender identity development and examination of gender differences and similarities across the life span. Consideration of the biology and psychology of gender in relation to physical, behavioral, personality, and intellectual capabilities.

Prerequisite: PSCI 9 or PSYC 9B or PSCI 11B or PSYC 7A

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 118D. Human Sexuality. 4 Units.**

A broad survey of human sexuality encompassing genetic factors, physiological and anatomical development, customary and atypical forms of behavior, reproductive processes, and cultural determinants.

Prerequisite: PSCI 9 or PSCI 11B or PSYC 7A or PSYC 9B

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 121D. Work and Family. 4 Units.**

Effects of employment and unemployment on mental health and marital quality; effects of work on parenting and child development; corporate and social policies for 'families that work'; young adults' decision-making about work and family.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Upper-division students only. Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 126D. Development of Motivation Across the Lifespan. 4 Units.**

Introduces major concepts in life-span development of motivation and self-regulation, and discusses exemplar empirical findings pertaining to these concepts during the various phases of life. Students participate in discussion, present findings from research articles, and write a paper.

Restriction: Psychological Science Majors only. Psychology and Social Behavior Majors only. Social Ecology Majors only.

**PSCI 127D. Attachment Relationships. 4 Units.**

Students learn about the development of attachment-related needs throughout development, as well as the links between attachment and emotion, psychopathology and treatment. Lectures emphasize classic as well as cutting-edge research and are supplemented by primary source readings.

Prerequisite: PSCI 9 or PSYC 7A or PSCI 11A or PSYC 9A or PSCI 11B or PSYC 9B

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 134H. The Science and Practice of Wellness and Resilience . 4 Units.**

Wellness is a common, but elusive goal. Covers the history, theory, psychology, and behavioral science behind skills for wellness and resilience. Provides opportunities to practice the strategies to help further understanding of the behavioral nature of each of the areas.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors only. Psychology and Social Behavior Majors only. Social Ecology Majors only.

**PSCI 136H. Behavioral Medicine. 4 Units.**

Examines biobehavioral aspects of health and illness, focusing on how stress contributes to or exacerbates disease processes. Background information on psychosomatic medicine and stress models and detailed examination of specific organ systems emphasizing the reactivity of these systems to stress.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 137H. Human Stress. 4 Units.**

Stress as a multidisciplinary topic. Biological, psychological, and sociological approaches to adaptation-related disorders. Effects of acute and chronic stress on emotions, physiology, and behavior. Methods of stress assessment, stress reduction, and intervention.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 138H. Child Health Psychology. 4 Units.**

Exploration of psychological antecedents, concomitants, and consequences of medical illnesses in children. Children's beliefs about health, illness, and medication; the role of stress; coronary-prone behavior; therapeutic adherence and physician-patient interaction; coping with chronic illness; effects of child's illness on family.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 9C or PSYC 7A. Recommended: SE 10.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 139H. Clinical Sport Psychology. 4 Units.**

An interdisciplinary introduction to clinical sport psychology, that includes, among other things, an introduction to psychopathology in sport; plus the use of psychological skills training, including anxiety reduction techniques, visualization, self-efficacy, coping skills, concentration, and goal-setting in sports.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Overlaps with PSYC 124S.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 140H. The Hardiness Approach to Stress Management. 4 Units.**

New development within psychology involving a combination of motivations and skills that extensive research has shown enhances performance, conduct, morale, stamina, and health. Combines study of hardiness research with strategies for improvement of personal hardiness through a series of exercises.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 141H. Clinical Health Psychology. 4 Units.**

Behavioral role in etiology, treatment, and prevention of certain diseases. Behavioral intervention including biofeedback, stress-, pain-management, health habit counseling, and other skills to assist patients make cognitive, emotional, and behavioral changes needed to cope with disease or achieve better health.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Same as PUBH 141.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 142H. Introduction to Interdisciplinary Salivary Bioscience . 4 Units.**

Introduction to the integration of salivary analytes into developmental, social, behavioral, and health sciences. Lectures cover theoretical perspectives; oral fluid as a biological specimen; saliva collection and study design; basics of salivary assay methods; and research findings across multiple fields.

Restriction: Psychological Science Majors only. Psychology and Social Behavior Majors only. Social Ecology Majors only.

**PSCI 150C. Clinical Psychology. 4 Units.**

Overview of theories, assessment techniques, research methodologies, and intervention approaches in clinical psychology. Psychodynamic, behavioral, humanistic, and cognitive perspectives are examined along with ethical and professional issues.

Prerequisite: (PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C) and PSCI 102C

Overlaps with PSYC 122C.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 152C. Clinical Child Psychology. 4 Units.**

Examines research and theory concerning childhood psychopathology behavior disorders. Diagnosis and assessment, early identification of high-risk children, fears and phobias, antisocial behavior, childhood psychoses, autism, depression, attention deficit/hyperactivity disorders, and ethical and policy implications of identifying children who are different.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 153C. Developmental Psychopathology. 4 Units.**

Research and theory of origins, course, and outcomes of disordered behavior. Continuity and change in patterns of behavior; environmental challenges and buffers; stress/competence in children; vulnerable/invincible children; children of mentally ill parents; families at risk; childhood antecedents of adult disorders.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C. Recommended: SE 10.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 154C. Cognitive Behavior Therapy. 4 Units.**

Presentation of principles and procedures of therapeutic interventions based on cognitive-behavior methods. Cognitive factors in learning, emotional arousal, psychological disorder, and psychotherapy reviewed. Introduces the application of cognitive behavioral methods to problems of depression, anxiety, anger, pain, and impulsivity.

Prerequisite: PSCI 9 or (PSCI 11A and PSCI 11C) or PSYC 7A or (PSYC 9A and PSYC 9C)

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 155C. Child Therapies. 4 Units.**

Examines research methodologies, empirical data, and implications of diverse intervention strategies. Primary topics include psychotherapy process and outcome, family therapies, behavioral intervention, cognitive behavior modification, pediatric psychopharmacology, and ethical and social policy implications of intervening in other people's lives.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 156C. Forensic Psychology: Advanced Seminar. 4 Units.**

Focuses on the psychology of criminal offending, particularly violent behavior. Examines violence, sexual offending, and mental disorder related to crime with regard to clinical assessment and treatment; mental health services within forensic institutions.

Prerequisite: (PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C) and PSCI 102C and (PSCI 178S or CLS C149)

Same as CLS C136, PSYC 177F.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 160C. Clinical Neuroscience. 4 Units.**

An introduction to the neuroclinical bases of human behavior, including neuropsychological approaches to mental disorders. Also includes case formulations, research articles, therapeutic approaches, and other discussions related to select psychopathology and other neurobehavioral topics.

Prerequisite: PSCI 9 or PSYC 7A or PSCI 11A or PSYC 9A or BIOL 99

Same as BIOL N170.

Restriction: Psychological Science Majors have first consideration for enrollment. Biological Sciences Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 161C. Forensic Psychology . 4 Units.**

Forensic psychology is the interface between clinical psychology and the law. Emphasizes clinically relevant legal topics (insanity defense; competency to stand trial) and includes critical thinking about issues that arise when psychologists are involved in legal proceedings.

Prerequisite: PSCI 9 or PSCI 11B or PSCI 11C

Same as CLS C160.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.



**PSCI 162C. Psychodynamic Studies. 4 Units.**

Introduction to contemporary psychodynamic studies. Emphasis on clinical concepts associated with psychodynamic psychotherapy, including unconscious determinants of behavior, typical defenses, life experiences, and techniques. Exploration of links between psychodynamic-oriented psychotherapy and other disciplines (e.g., psychology, music, medicine, neuroscience, film).

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 163C. Human Neuropsychology. 4 Units.**

A survey of human brain disorders using a clinical case study approach to illustrate fundamental issues in studying brain and behavior. Topics include sensory deficits, attentional neglect, amnesia, cortical organization, clinical psychopathology, and more.

Prerequisite: BIOL N110 or BIOL N115A or PSYC 9A or PSCI 11A

Same as BIOL N173, PSYC 162N.

Restriction: School of Biological Sciences students have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSCI 164C. Addiction. 4 Units.**

Designed for those with an interest in the nature and treatment of addiction. Focuses on the etiology and treatment of addiction, but does not prepare students to treat substance abuse disorders.

Prerequisite: PSCI 11A and PSCI 11B and PSCI 11C and PSCI 102C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 165C. Adult Psychopathology. 4 Units.**

Advanced course in abnormal psychology, focusing on adult psychopathology. Covers historical and fundamental issues about psychiatric disorders, clinical research on disorders of anxiety, PTSD, mood, psychoses, personality, and dementia, and their biopsychosocial features, and attends to assessment and treatment.

Prerequisite: PSCI 102C. Equivalent to PSCI 102C is also accepted.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 166S. Chicano/Latino Families. 4 Units.**

Introduction to the research, literature, and issues surrounding the topic of Chicano/Latino families including cultural history, contemporary issues, organization of family, traditions, lifestyles, values, beliefs, generational differences, gender issues, ethnic identity, evolution of demographic patterns, current economic and political standings.

Same as CHLT 170, SSCI 165, PSYC 174H.

**PSCI 170S. Personality. 4 Units.**

Comparison of the major theories of personality. Provides a frame of reference for understanding lifestyles, development, maturity, and psychopathology. Emerging research themes are used to identify promising lines of personality theorizing.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Overlaps with PSYC 120P.

Restriction: Upper-division students only. Sophomores only. Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 171S. Environmental Psychology. 4 Units.**

Impact of the physical environment on individual and group behavior. Three basic concerns examined: (a) environmental determinants of behavior at the individual and interpersonal level; (b) social planning and urban design; (c) methodological approaches to the study of environmental issues.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 173S. Social Relationships. 4 Units.**

Examines major issues, concepts, and methods in the scientific study of social relationships. Topics include relationship formation and dissolution, friendships and love relationships, loneliness, bereavement, societal influences on close relationships, significance of close relationships for health and well-being.

Prerequisite: (PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C) and SE 10

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 174S. Error and Bias in Social Judgement. 4 Units.**

Examines how people encode, reason about, and remember social information and explores how biases and shortcomings in social perception, judgment, and memory are central to understanding both effective social functioning and many forms of maladaptive behavior and social conflict.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 176S. Motivation. 4 Units.**

History, major theories, methods, and applications of motivational psychology, with emphasis on European approaches. Origins of the field in personality, learning, cognition, and activation research. Recent innovations in motivational and volitional self-recognition. Current approaches, major debates, empirical research programs.

Prerequisite: (PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C) and PSCI 101D and (PSCI 104S or UPPP 151)

Overlaps with PSYC 121M.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 178S. Violence in Society. 4 Units.**

Current theory and research on aggression; anger and violence as problems in individual and social functioning. Process and functions of anger examined with regard to normal behavior and psychopathology. The determinants, prevalence, and implications of violence in society are analyzed.

Prerequisite: PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C

Same as CLS C149.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment.

**PSCI 179S. Cultural Psychology. 4 Units.**

An examination of culture's influence on human minds. Topics include culture's impact on perception, cognition, motivation, emotion, moral reasoning, communication, and health. Addresses cultural psychology's methods, history, and place within psychology and related fields.

Prerequisite: PSCI 9 or PSCI 11B or PSCI 11C or PSYC 7A or PSYC 9B or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 183S. Social Epidemiology. 4 Units.**

Overviews evidence linking environmental factors to mental and physical disorders including such variables as socioeconomic status, income inequality, work stress, job loss, social capital, location, and other demographic characteristics. Measurement and research design issues of both individual and aggregate levels.

Prerequisite: (PSCI 9 or PSCI 11C or PSYC 7A or PSYC 9C) and SE 10 and SE 13

Same as PUBH 102.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 184S. Positive Psychology . 4 Units.**

The field of positive psychology focuses on what is right and positive about people and institutions. Introduces findings associated with human strengths and positive emotions, and provides clinical and personal applications and implications.

Prerequisite: PSCI 9 or PSCI 11C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 185S. Industrial-Organizational Psychology. 4 Units.**

Examines the application of social psychology to organizational settings. Topics include motivation of workers, group decision-making, leadership styles, career management, and organizational development.

Prerequisite: PSCI 9 or PSCI 11A or PSCI 11B or PSCI 11C or PSYC 7A or PSYC 9A or PSYC 9B or PSYC 9C

Overlaps with PSYC 122I.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 187S. Psychology of Inequality. 4 Units.**

Focuses on the psychological dimensions of poverty, wealth, and economic inequality.

Prerequisite: PSCI 104S and PSCI 11C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 188S. Evolutionary Psychology. 4 Units.**

Understanding our evolutionary origins is critical to truly understanding the complexities of human psychology. Explores how Darwinian principles, applied to both genes and culture, can help us understand not just how the mind works, but why.

Prerequisite: PSCI 11C or PSYC 9C

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 190. Applied Statistics in Social and Behavioral Research. 4 Units.**

Covers statistical techniques used to describe and make generalizations about phenomena represented by data. Hands-on experience in data analysis and interpretation using statistical software (SPSS, STATA) is emphasized. Topics include data visualization, ANOVA, multiple regression, and categorical data analyses.

Prerequisite: SE 13

Same as CLS C190, SE 190, UPPP 190.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**PSCI 192B. The Science and Practice of Compassion. 4 Units.**

Explores the latest scientific research on compassion and its correlates, and considers practical strategies for increasing compassion in everyday life. Students discover how cutting-edge research is yielding insights into kindness, empathy, altruism, and compassion.

Restriction: Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 192Q. Chicano/Latino Social Psychology. 4 Units.**

Examines theories, research, and major issues of relevance to understanding social psychological processes in Chicano/Latino populations. Topics include social development, cultural orientations, gender and sexuality, close relationships, happiness and well-being, stereotyping, prejudice and discrimination, and mental and physical health.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as CHLT 168.

Restriction: Psychological Science Majors have first consideration for enrollment. Chicano/Latino Studies Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**(VII)****PSCI 192T. Cognition and Learning in Educational Settings. 4 Units.**

Foundational concepts in cognition and development as applied to student learning. Primary topics include historical behaviorism, basic cognitive structure and processes, complex cognition, cognitive development, and motivation.

Same as EDUC 173.

Restriction: Psychological Science Majors have first consideration for enrollment. Education Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 192U. Psychology of Learning, Abilities, and Intelligence. 4 Units.**

Overview of classic positions on the mind, human abilities, and intelligence, especially as related to academic achievement. Contrasting views: psychometric versus information processing; experimental versus correlational research.

Prerequisite: PSYC 7A or PSCI 9 or PSCI 11A or PSCI 11B or PSCI 11C

Same as EDUC 176.

Restriction: Psychological Science Majors have first consideration for enrollment. Education Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 192V. Language and Literacy. 4 Units.**

Addresses the linguistic principles and processes that underlie oral and written language proficiency. Emphasis is on how to use phonology, morphology, orthography, semantics, syntax, and pragmatics to support literacy and oral language development for K-12 students.

Same as EDUC 151, LSCI 182V.

Restriction: Language Science Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Education Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 193B. Juvenile Delinquency. 4 Units.**

Patterns of delinquent behavior, theories that explain behavior, current research aimed at enhancing exploratory power. Attempts to prevent and control delinquency are put in historical perspective. Development of the current juvenile justice system and evolution of modern juvenile law.

Same as CLS C109.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment.

**PSCI 193C. Social Control of Delinquency. 4 Units.**

Assumes familiarity with theories of delinquency, the juvenile justice system, and elements of juvenile law. Explores socio-historical origins and evolution of juvenile justice, current research and policy on delinquency prevention and treatment, and future directions of law, policy, and practice.

Prerequisite: Recommended: CLS C109.

Same as CLS C164.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 193E. Psychology and the Law. 4 Units.**

Psychological assumptions of the American legal system and mental health aspects of provision of criminal justice services. Civil commitment, insanity defense, competence to stand trial, jury selection, eyewitness identification. Use of police, courts, correctional institutions in prevention of behavior disorder.

Same as CLS C105.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment.

**PSCI 193F. Family Law. 4 Units.**

Examines legal issues surrounding marriage, cohabitation, divorce, child custody and support, adoption, and the rights of parents and children in the family context. The findings of social science research are used to illuminate the legal issues.

Same as CLS C123.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSCI 193G. Eyewitness Testimony. 4 Units.**

Faulty eyewitness testimony is a major cause of wrongful convictions. Covers the fast-growing topic of eyewitness testimony and memory for real-world events, both how psychologists study eyewitness capacity, and how the legal system has dealt with eyewitness issues.

Prerequisite: SE 10

Same as CLS C177.

Restriction: Seniors only. Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

Concurrent with CLS C263.

**PSCI 196. Research Seminar in Psychological Science . 4 Units.**

Special topics research seminar. Content varies with interest of instructor. Capstone seminar for students who have conducted research with, or have a background in, the research topics of the PSCI faculty member offering this seminar in a given quarter.

Prerequisite: PSCI 11C

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**PSCI P200. Introduction to Legal and Forensic Psychology . 4 Units.**

Familiarizes students with the interrelated fields of psychology, law, and forensic studies. Emphasizes clinically relevant legal topics (insanity defense; competency to stand trial) and includes critical thinking about issues that arise when psychologists are involved in legal proceedings.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P201. Research Methods in Psychology. 4 Units.**

In-depth examination of the conceptualization of research problems and linkages between theory and the design of appropriate strategies for empirical research in psychological science. Topics include experimental and quasi-experimental designs, reliability and validity of measurement and non-experimental procedures.

Restriction: Graduate students only. Psychological Science Majors only. Psychology and Social Behavior Majors only.

**PSCI P202. Data Analysis and Statistics . 4 Units.**

Statistical techniques to facilitate inferences in psychological research, including fundamentals of statistical inference and methods for analyzing data.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P204. Adolescence. 4 Units.**

Considers pubertal and cognitive changes and their social consequences; the family, peer group, school, and cultural contexts in which adolescence is embedded; and selected psychosocial issues including autonomy, identity, health, and well-being.

Restriction: Graduate students only.

**PSCI P208. Research Methods. 4 Units.**

In-depth examination of issues relevant to designing and evaluating research in psychological science. Topics address casual inference, ethical issues surrounding the responsible conduct of research, experimental and quasi-experimental designs, reliability and validity of measurement, and non-experimental procedures.

Overlaps with PSCI P201.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P209A. Applied Psychological Research. 4 Units.**

Focuses on scientific and professional issues in the field of psychology. Topics include communication skills; intervention approaches; collaboration, consultation, and referral; and ethical issues associated with at-risk populations research.

Restriction: Graduate students only.

**PSCI P214. Seminar in Social Psychology. 4 Units.**

Presents an overview of selected theoretical and empirical topics in social psychology including social influence and conformity, altruism and aggression, persuasion and attitude change, self and social perception, and social cognition.

Restriction: Graduate students only.

**PSCI P215. Psychology and Law . 4 Units.**

An interdisciplinary approach to research in psychology, law, and/or criminology. Examines how psychology is applied to the civil and criminal justice systems, how case law shapes this application, and how legal decisions affect the direction of psychological research.

Overlaps with PSCI P266.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P217. Life-Span Development. 4 Units.**

Introduces the major concepts of life-span development and discusses those with regard to some key topics of developmental psychology. For example, change and continuity, evolutionary and inherited nature, culture, society, and family-based nurture, and their dynamic interaction.

Restriction: Graduate students only.

**PSCI P220. Developmental Psychology: Theories and History. 4 Units.**

Examines key concepts, theories, and the historical and philosophical roots of research in human life span development. Focuses on biological and environmental causation, universalism and cultural relativism, continuity and change.

Restriction: Graduate students only.

**PSCI P222. Forensic Assessment . 4 Units.**

Explores the various ways in which clinical psychology is relevant to the law, and how forensic psychologists can meaningfully contribute to the adjudicatory process. Examines legal, scientific, and ethical issues that arise when psychologists are involved in legal proceedings.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P223. Cross-Cultural Developmental Psychology. 4 Units.**

Examines human development in diverse cultures (e.g., Asian, American, and African). Cultural diversity within the U.S. and acculturation of various ethnic groups is also discussed. Topics include parenting, family relations, language, and cognition, schooling and academic achievement, and morality.

Restriction: Graduate students only.

**PSCI P224. Children and the Law. 4 Units.**

Examines how psychology research and practice can inform several areas of law and social policy affecting children, adolescents, and families. Topics include education, mental health, reproductive rights, and delinquency.

Overlaps with PSCI 120D.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P226. Emotion in Psychology. 4 Units.**

Covers original and recent theories of emotions and how they guide current research. Specific topics include neuroanatomical structure of emotion, life-span emotional development, and health and emotion.

Restriction: Graduate students only.

**PSCI P231. Professional Issues in Psychology. 4 Units.**

Examines a variety of issues related to the professional socialization and development of graduate students in psychology. Topics include the publication process, sources of research funding, alternative employment options, competitiveness on the job market, and the academic career route.

Restriction: Graduate students only.

**PSCI P232. Trauma and Resilience. 4 Units.**

Psychological impact of trauma; biopsychosocial factors affecting development of traumatic stress, treatment, and preventive interventions for traumatic stress; define and measure resilience; moral injury and post traumatic growth; ethics of studying trauma.

Restriction: Graduate students only.

**PSCI P234. Childhood. 4 Units.**

Provides graduate students with an overview of traditional and emerging theories, models, and research designed to understand children's development in the domains of cognitive, social, and emotional functioning.

Restriction: Graduate students only.

**PSCI P238. Child Psychopathology. 4 Units.**

Examination of etiology, classification, and developmental pathways of disorders, as well as risk and resilience factors, during the childhood/adolescent years. Discussion of genetic influences and contextual risk factors as well as internalizing and externalizing disorders.

Restriction: Graduate students only.

**PSCI P242. Legal Reasoning and Jurisprudence. 4 Units.**

Overview of the law and legal process as well as the history and assumptions underlying modern legal reasoning. Issues related to procedure and evidence as well as key jurisprudential perspectives are discussed.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P246. Affective Neuroscience. 4 Units.**

Provides an overview of the emerging field of affective neuroscience. Emphasis is placed on mapping affective experience and behavior to brain function, including cross-level integration of anatomical, chemical, fMRI, and electrical data.

Restriction: Graduate students only.

**PSCI P247. EEG Methods . 4 Units.**

Provides an in-depth training of the electroencephalogram (EEG) methodology with a specific focus on the event-related potential technique. Emphasis is on learning how to use this methodology and how to analyze data, with a focus on emotional stimuli.

Restriction: Graduate students only.

**PSCI P249. Advanced Social Psychology . 4 Units.**

Conveys an appreciation of the flavors of contemporary social psychology, an understanding of empirical approaches to problems in this area, and a sense of the array of theoretical orientations in the field.

Restriction: Graduate students only.

**PSCI P250. Emotion, Reasoning, and Memory. 4 Units.**

Examines research and theory on emotion from the perspective of cognitive psychology. Topics include the effects of emotions on attention, memory, and problem solving; the relations between emotional and cognitive development; flash-bulb memories of intense emotional experiences; eyewitness testimony.

Restriction: Graduate students only.

**PSCI P251. Clinical Interviewing and Treatment in a Forensic Setting. 4 Units.**

Students receive an introduction to clinical interviewing, learn details of strategic, solution-focused therapy, and think critically about issues that come at the interaction of psychology and the law. Students are not 'license-eligible' at end of this course.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P252. Law and Behavior: Compliance and Enforcement. 4 Units.**

Provides sophisticated insight into the different ways through which law shapes behavior. Addresses both the economic amoral rational choice theories, as well as ideas from social psychology, criminology, and sociology about the moral, social, and and unconscious dimensions of compliance.

Restriction: Graduate students only. Psychological Science Majors only. Psychology and Social Behavior Majors only.



**PSCI P253. Master of Legal and Forensic Psychology Capstone. 4 Units.**

Focuses on macro-level writing topics such as developing a meaningful research question, conducting a thorough review of relevant literature, and presenting a clear and convincing research-based argument.

Restriction: Graduate students only.

**PSCI P254. Mental Health and the Law . 4 Units.**

Explores the history of criminalization of persons with mental illness. Topics include challenges and needs of persons with mental illness; civil and outpatient commitment; law enforcement responses to persons with mental illness; and mentally ill offenders in jails and prisons.

Restriction: Master of Legal & Forensic Psy Degree students only. Graduate students only.

**PSCI P255. Violence, Anger, and Psychopathology. 4 Units.**

Overviews the prevalence of violence as a criminal and public health problem. Topics include violence within families and intimate partner relationships, traumatic origins of violence, the development of a violence-prone personality, the association of anger and violence with psychopathology.

Restriction: Master of Legal & Forensic Psy Degree students only. Graduate students only.

**PSCI P256. Family and the Law . 4 Units.**

Examines sociological and legal perspectives on the relationship between family life and law, with a focus on three distinct but sometimes interconnected domains: the child welfare system, the criminal justice system, and the immigration system.

Restriction: Master of Legal & Forensic Psy Degree students only. Graduate students only.

**PSCI P258. Health Psychology. 4 Units.**

Interdisciplinary exploration of emerging fields of health psychology and behavioral medicine. Topics: role of stress in development/treatment of medical problems; sociocognitive determinants of health and illness; interpersonal health transactions; behavioral approaches to medical problems such as diabetes, obesity, hypertension.

Restriction: Graduate students only.

**PSCI P260. Technology and Health. 4 Units.**

Explores the growing intersection of health and technology, including electronic Health ("eHealth"), mobile health ("mHealth"), and digital health and medicine. Specifically, it focuses on the implications and uses of technologies for behavioral and emotional health, and behavioral change.

Restriction: Graduate students only.

**PSCI P261. Intensive Longitudinal Data Analysis. 4 Units.**

Fundamentals of Intensive Longitudinal Study designs, gain first-hand experience collecting ILD using web and/or mobile-based platforms, and learn.

Prerequisite: SE 264A and SE 264B

Restriction: Graduate students only.

**PSCI P262. Interpersonal Processes and Health. 4 Units.**

Examines traditions of research linking interpersonal processes to emotional or physical health. Topics include: role of social support in ameliorating stress, effects of social control on health-compromising behaviors, adverse effects of social relationships on health, causes of deficient social relationships.

Restriction: Graduate students only.

**PSCI P263. Eyewitness Testimony. 4 Units.**

Examines the evidence that shows that faulty eyewitness memory is the major cause of wrongful convictions. Explores what the legal system thinks of eyewitness testimony and how the legal system has dealt with eyewitness issues.

Same as CLS C263.

Restriction: Graduate students only.

**PSCI P265. Memory and the Law. 4 Units.**

Examines the controversial topic of repressed memory, or perception and memory of real-world events.

Same as CLS C265.

Restriction: Graduate students only.

**PSCI P266. Psychology and the Law. 4 Units.**

Overview of how psychology is applied to the civil and criminal justice systems, how case law shapes this application, and how legal decisions affect the direction of psychological research. Interdisciplinary approach to research in psychology, law, and/or criminology.

Same as CLS C266.

Restriction: Graduate students only.

**PSCI P271. Human Evolution and Behavior. 4 Units.**

Covers theories and empirical research concerning the evolutionary origins of human behaviors and their variations. An interdisciplinary course emphasizing both evolutionary psychology (e.g., mating strategies, kinship, and parenting) and molecular evolution (i.e., evolution of genes for various behaviors).

Same as BIOC 217.

Restriction: Graduate students only.

**PSCI P273. Biobehavioral Aspects of Health and Illness. 4 Units.**

Examines the behavior-physiology interactions of some major bodily systems: the nervous, cardiovascular, gastrointestinal, and endocrine systems. Analysis of normal and abnormal states of these systems as they relate to tissue injury, disease, and rehabilitation.

Restriction: Graduate students only.

**PSCI P275. Special Topics in Psychological Science . 4 Units.**

Topics covered vary with interests of instructor.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PSCI P276. Meta Analysis. 4 Units.**

The process of synthesizing results from a number of studies that address a common research question is often referred to as meta-analysis. Explores the meta-analysis process from the coding of retrieved studies to the final research synthesis.

Restriction: Graduate students only.

**PSCI P280A. Interdisciplinary Salivary Bioscience. 4 Units.**

Theory and research on the integration of salivary analytes into developmental, social, behavioral, and health sciences. Topics include oral fluid as biological specimens; practical aspects of sample handling, collection, and study design; basics of laboratory methods used for assaying saliva.

Restriction: Graduate students only.

**PSCI P280B. Interdisciplinary Salivary Bioscience Lab. 4 Units.**

Laboratory sequel to the P280A seminar. Provides laboratory-based hands-on experience integrating salivary analytes into developmental, social, behavioral, and health sciences that also includes supervised training on sample processing.

Prerequisite or corequisite: PCSI P280A. PCSI P280A with a grade of B or better

Restriction: Graduate students only.

**PSCI P281. Race and the Law. 4 Units.**

Explores how race and other markers of social identity shape outcomes within the criminal justice system. Students examine how race, ethnicity, and national origin intersect with rules governing the policing, trials, and punishment.

Restriction: Master of Legal & Forensic Psy Degree students only.

**PSCI P282. Salivary Bioscience Data Analysis . 4 Units.**

A salivary bioscience statistical research working group. Students conduct guided data analyses with salivary biomarker data. Special topics related to salivary bioscience analytic strategies and the interpretation and dissemination of research findings are discussed.

Restriction: Graduate students only.

**PSCI P283H. Psychoneuroimmunology. 4 Units.**

Introduces students to the field of psychoneuroimmunology and helps them develop the conceptual and methodological skills necessary for designing and interpreting research on the bidirectional relationship between the immune system and psychological processes.

Restriction: Graduate students only.

**PSCI P284. Health and Emotion. 4 Units.**

Overview of research focused on understanding how emotional processes influence physical health. Provides students with a deeper understanding of how emotions play into the health of others as well.

Restriction: Graduate students only.

**PSCI P285. Anger: A Turbulent Emotion. 4 Units.**

Provides an enriched perspective on anger beginning with its understanding in classical antiquity. Topics include developmental processes and trauma, anger physiology and neuroscience, anger-related physical health impairments, and the involvement of anger in psychopathology and violence.

Restriction: Graduate students only.

**PSCI P286. Motivation. 4 Units.**

Introduces major concepts of motivational psychology, theory, and history. Application of motivational concepts to phenomena from social psychology and affective science. Development of own research proposal in a motivational framework and/or conceptualizing or expanding an ongoing or planned research project.

Restriction: Graduate students only.

**PSCI P288. Human Neuropsychology . 4 Units.**

Focuses on clinical, neuroanatomical, and neuropathological studies that have contributed to our understanding of brain-behavior relationships in the context of normal brain function and disease-associated neuropsychiatric syndromes.

Restriction: Graduate students only.

**PSCI P289. The Teaching of Psychology. 4 Units.**

Provides students with the theory and skills needed to teach undergraduate psychology courses. Covers research on theories and methods of teaching, curriculum design, and evaluation. Students also gain practical experience preparing and presenting material.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Psychological Science Majors only. Psychology and Social Behavior Majors only.

**PSCI P290. Research in Developmental Psychology. 4 Units.**

Introduces graduate students to research conducted by individual faculty members in the area of developmental psychology. This is accomplished by having students involve themselves in the conceptualization, strategy, and implementation of the faculty member's research.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PSCI P291. Research in Health Psychology. 4 Units.**

Introduces graduate students to research conducted by individual faculty members in the area of health psychology. This is accomplished by having students involve themselves in the conceptualization, strategy, and implementation of the faculty member's research.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PSCI P292. Research in Psychopathology and Behavior Disorder. 4 Units.**

Introduces graduate students to research conducted by individual faculty members in the area of psychopathology and behavior disorder. This is accomplished by having students involve themselves in the conceptualization, strategy, and implementation of the faculty member's research.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PSCI P293. Research in Social and Personality Psychology. 4 Units.**

Introduces graduate students to research conducted by individual faculty members in the area of social and personality psychology. This is accomplished by having students involve themselves in the conceptualization, strategy, and implementation of the faculty member's research.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PSCI P294A. Research Directions in Psychological Science I. 2 Units.**

Introduces students to the current research of faculty, graduate students, and visitors to the Department of Psychological Science. Includes examination of contemporary research issues and controversies, as well as issues related to students' development as professionals.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PSCI P294B. Research Directions in Psychological Science II. 2 Units.**

Introduces students to the current research of faculty, graduate students, and visitors to the Department of Psychological Science. Includes examination of contemporary research issues and controversies, as well as issues related to students' development as professionals.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PSCI P294C. Research Directions in Psychological Science III. 2 Units.**

Introduces students to the current research of faculty, graduate students, and visitors to the Department of Psychological Science. Includes examination of contemporary research issues and controversies, as well as issues related to students' development as professionals.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**PSCI P295. Research in Psychology and Law. 4 Units.**

Introduces graduate students to research conducted by individual faculty members in the area of psychology and law. This is accomplished by having students involve themselves in the conceptualization, strategy, and implementation of the faculty member's research.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PSCI P296. Doctoral Dissertation Research and Writing. 4-12 Units.**

Dissertation research with Psychological Science faculty.

Prerequisite: Advancement to candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PSCI P298. Directed Studies in Psychological Science. 2-4 Units.**

Directed study with Psychological Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**PSCI P299. Independent Studies in Psychological Science. 2-8 Units.**

Independent research with Psychological Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Master of Legal and Forensic Psychology

The Master of Legal and Forensic Psychology is designed for professionals or recent graduates who wish to further their education and gain skills that will help them obtain careers in the field of legal and forensic psychology. Students will be immersed in an interdisciplinary field devoted to advancing scholarship, testing theories, and engaging in public service relevant to individuals' participation and experiences in legal contexts. For example, students will learn about interpretation of scientific evidence and psychological assessment, protection of child witnesses, the accuracy of human memory, assessment and treatment of juvenile offenders, and the role of human and organizational factors associated with miscarriages of justice.

## Program Details

To achieve this goal, the program consists of six quarters (total of two years) and students are required to complete a 13-course curriculum (two online courses per quarter during the regular academic year and one mandatory week-long introductory in-residence course).

## Course Requirements

A. Complete:

PSCI P200	Introduction to Legal and Forensic Psychology
PSCI P202	Data Analysis and Statistics
PSCI P208	Research Methods
PSCI P215	Psychology and Law
PSCI P222	Forensic Assessment
PSCI P242	Legal Reasoning and Jurisprudence
PSCI P253	Master of Legal and Forensic Psychology Capstone

B. Complete six electives

In lieu of a thesis, students complete a capstone project, where they are required to synthesize the knowledge they obtained over the course of their studies and analyze an area where psychology can inform legal policy and/or practice. Graduates from the program will be well-prepared for careers as jury consultants, court liaisons, victims' advocates, probation officers, law enforcement advocates, case managers, and program directors; able to secure employment in a wide range of settings, including correctional institutions, psychiatric facilities, community-based agencies, jury consulting agencies, mental health centers, child welfare agencies, social service agencies, and law enforcement; and, once employed, well-suited to advance in an array of related fields such that they ultimately become leaders in the field of law and psychology.

For more information, visit the Master of Legal and Forensic Psychology website. (<http://mlfp.soccco.uci.edu/>)

## Psychological Science, B.A.

The Psychological Science major provides students a foundation to pursue graduate work in psychology, or to find employment after graduation in the areas of public health, health services, human resources, marketing, social work, counseling, law, education, and related fields. The major focuses on determinants of human health, well-being, and functioning in a broad range of developmental, social, cultural, and environmental contexts. Undergraduate students begin with basic course work in developmental psychology, health and preclinical (abnormal) psychology, and social psychology. Subsequent courses cover such topics as social, emotional, and cognitive development in children, adolescents, adults; behavioral disorders and developmental psychopathology; counseling and therapy; cultural, social, and personality influences on behavior; attitude formation and change; health psychology; stress and coping; and psychology and the law. Opportunities are available to work with faculty members on research in these and other areas. Undergraduate research experience provides a valuable background for entry into many graduate programs.

Field study opportunities exist in hospitals, community health clinics, counseling centers, legal settings, environmental programs, social service agencies, schools and after-school programs, child care settings, and a wide variety of other community programs that offer a broad range of services.

Students should be aware that psychology courses are offered in several different departments and programs at UCI. Students interested in developmental, clinical, social, emotional, health, cross-cultural, or environmental psychology, or in psychology and the law, are advised to consult the course listings for the Department of Psychological Science.

These courses offer students a solid foundation in general psychology.

Students interested in perception, sensorimotor integration, and mathematical psychology are advised to consult course listings for the Department of Cognitive Sciences.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Departmental Requirements

Thirteen courses (52 units) as specified below:

#### A. Psychology Fundamentals (12 units):

PSCI 11A	Psychology Fundamentals
PSCI 11B	Psychology Fundamentals
PSCI 11C	Psychology Fundamentals

#### B. Four upper-division core courses (16 units):

PSCI 101D	Life Span Developmental Psychology
PSCI 102C	Abnormal Psychology
PSCI 103H	Health Psychology

PSCI 104S

Social Animal: An Introduction to Social Psychology

**C. Six upper-division courses (24 units) chosen from the following:****C-1. Choose one course from three different groups:**

Group 1: Developmental Psychology (PSCI 110D–134D)

Group 2: Health Psychology (PSCI 118D, 135H–149H)

Group 3: Pre-Clinical/Psychopathology (PSCI 139H, 150C–169C)

Group 4: Social, Personality, and Environmental Psychology (PSCI 170S–189S)

**C-2. Three additional upper-division courses chosen from the specialty areas in C-1 above or from: <sup>1</sup>**

PSCI 100 Special Topics in Social Behavior

PSCI 190A–193Z

PSCI 196 Research Seminar in Psychological Science

SOCECOL 190 Applied Statistics in Social and Behavioral Research

SOCECOL H190A Honors Research

SOCECOL H190W Honors Research

<sup>1</sup> Three additional upper-division courses chosen from the specialty areas in C-1 above or from courses numbered PSCI 100, 190-193Z, 196, Social Ecology H190A, and H190W. NOTE: Courses used to satisfy requirement C-1 cannot be used to satisfy C-2; a maximum of two courses from 192A-Z and one 196 course may be counted toward the major.

## Psychological Science, Minor

The minor in Psychological Science focuses on determinants of human health, well-being, and functioning in a broad range of developmental, social, cultural, and environmental contexts. Students begin with basic course work in developmental psychology, health psychology, clinical/abnormal psychology, and social psychology. Subsequent courses cover such topics as social, emotional, and cognitive development in children, adolescents, adults; behavioral disorders and developmental psychopathology; counseling and therapy; cultural, social, and personality influences on behavior; attitude formation and change; health psychology; stress and coping; and psychology and the law.

### Minor Requirements

The minor in Psychological Science is met by completing eight courses (32 units). Students have the option of choosing between two versions of the minor as specified below:

#### Version 1:

PSCI 11A Psychology Fundamentals

PSCI 11B Psychology Fundamentals

PSCI 11C Psychology Fundamentals

SOCECOL 10 Research Design

Select four courses from PSCI 100–193Z.

or

#### Version 2:

PSCI 9 Introduction to Psychology

SOCECOL 10 Research Design

Select six courses from PSCI 100–193Z.

**Residence Requirement for the Minor:** Six courses required for the minor must be completed successfully at UCI.

## Psychological Science, Ph.D.

The Department of Psychological Science offers a Ph.D. program in Psychological Science. The main goal of this program is to train behavioral scientists to apply theory and methods in psychology, together with perspectives and knowledge from allied disciplines, to the analysis of human behavior and health across the life span and in diverse sociocultural contexts. This program values both basic and applied research that is relevant to the improvement of individual, community, and societal functioning. Emphasis is placed on the integration of knowledge from several subspecialties in psychology in order to understand the antecedents and developmental course of adaptive or maladaptive behavior and on the conduct of research that has implications for social policies, programs, and interventions.

## Program Requirements

All students take seven required core courses:

PSCI P201	Research Methods in Psychology
SOCECOL 264A	Data Analysis
SOCECOL 264B	Data Analysis
SOCECOL 200	Seminar in Social Ecology
An additional research methods/data analysis course from an approved list	
PSCI P209A	Applied Psychological Research
PSCI P294A- P294B- P294C	Research Directions in Psychological Science I and Research Directions in Psychological Science II and Research Directions in Psychological Science III

The course on Applied Research PSCI P209A introduces students to the scientific, professional, and ethical issues involved in conducting and translating psychological research in a variety of applied settings. The three-quarter course Research Directions in Psychological Science (PSCI P294A-PSCI P294B-PSCI P294C) allows students to increase their breadth of knowledge regarding contemporary issues and controversies in psychology by participating in the Department's weekly colloquium series and interacting with visiting scholars and other speakers.

Students must select one of four core specialization areas in which to further focus their graduate training. Additional course requirements vary across each specialization.

### Health Psychology Specialization

PSCI P258	Health Psychology
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and three additional courses from approved health electives

### Social and Personality Specialization

PSCI P214 or PSCI P233	Seminar in Social Psychology
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and three additional courses from an approved list

### Affective Science Specialization

PSCI P226 or PSCI P250	Emotion in Psychology Emotion, Reasoning, and Memory
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and three additional courses from an approved list of Affective Science electives

### Developmental Psychology Specialization

PSCI P220	Developmental Psychology: Theories and History
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and three additional courses from approved developmental electives

In addition to selecting a core specialization area, students are also required to select a minor specialization and complete one required specialization course and one elective course in this area. The minor specialization and elective courses should be chosen according to the plan that best meets the needs of the individual student, as determined in consultation with the student's faculty advisor and the departmental graduate advisor. In addition to courses offered by the Department of Psychological Science and the School of Social Ecology, students may take courses offered by other departments in other schools such as the Departments of Cognitive Science, Anthropology, and Sociology in the School of Social Sciences and the Department of Neurobiology and Behavior in the School of Biological Sciences. Approval from instructors is required to enroll in these courses.

Students who are interested can pursue an optional training track in psychology and law. This track is supplemental to the requirements associated with the required specializations and supplemental to the required minor. That is, all students must complete the above-listed requirements for their specialization and minor. Then, if the student decides to complete the training track in psychology and law, this training is in addition to the requirements listed above. For the training track, a total of four courses must be taken, one required (PSCI P266) and three electives. The electives must be approved by the student's faculty mentor and departmental advisor and can be a course in PS, or in the School of Social Ecology or School of Law, with instructor and school approval.

Training in this program emphasizes four core areas of psychology. The specialization in **Developmental Psychology** focuses on the development of individuals at various periods in the life course and the effects of varying social and cultural contexts on cognitive, social, and health outcomes. **Health Psychology** focuses on identifying, evaluating, and enhancing the psychosocial and behavioral factors that promote mental and physical health, prevent disease, and optimize medical treatments. The specialization in **Affective Science** focuses on the effects of emotion, motivation, and values on human reasoning, behavior, and health in typical and atypical populations, across the life span, and across cultures. **Social and Personality Psychology** focuses on the interrelations among attitudes, perceptions, motives, emotions, and personality characteristics as they affect individual functioning, interpersonal processes, and intergroup relations. In addition, several faculty offer courses and conduct research in the area of **Psychology and Law**,



dealing with such issues as the malleability of memory processes, the ability of jurors to understand scientific evidence, the impact on children and adolescents of contact with the legal system, and the response of the legal system to individuals with severe personality disorders.

Students will learn to understand human behavior from a social ecological, contextual perspective. They will be exposed to the major theories in each specialization and learn various social science research methods. All students are encouraged to become actively involved in research from the earliest stage of their training. Through close association with faculty members and participation in the faculty's research projects, students learn to conduct methodologically sophisticated research that addresses contemporary psychological and social issues. Current research teams are investigating stress, coping, and social support; biobehavioral mechanisms of cardiovascular reactivity; psychobiology of stress; personality factors that increase resilience to health threats; parent-child relations; work and family; transitions across the life course; adaptive aging; end-of-life medical decision making; culture and adolescent psychosocial development; cultural influences on social judgment; relations between cognitive and emotional development; emotion regulation; memory and eyewitness testimony; violence and anger management; the development of health-risking and health-protecting behaviors during childhood and adolescence; economic stress and psychopathology/behavioral disorders; health impacts of environmental stressors; mental health and psychopathy; juvenile and criminal justice; positive psychology; and person-environment fit.

### **Program in Law and Graduate Studies (J.D./Ph.D.)**

Highly qualified students interested in combining the study of law with graduate research and/or research qualifications in cognate disciplines are invited to undertake concurrent degree study under the auspices of UC Irvine's Program in Law and Graduate Studies (PLGS). Students approved for this concurrent degree program may pursue a coordinated curriculum leading to a J.D. from the School of Law in conjunction with a Ph.D. in Psychological Science. The objective of the program is to promote interdisciplinary study of law while also enabling students to obtain both a J.D. and a graduate degree in less time than would be required to acquire both degrees separately. The normative time for completion is seven years for the J.D./Ph.D. combination.

Applicants must submit separate applications for admission to the School of Law and to Psychological Science. Once admitted for study into both components of their program, concurrent degree students will work with the PLGS director and the PS graduate advisor to develop a program of study that will permit efficient pursuit of both degrees. Ordinarily, students will commence their studies in PS and begin their first year of law school instruction after one or more years of graduate program training. Upon completion of the first year of law instruction, students will pursue a coordinated curriculum of upper-level law study and PS graduate program courses and research. Concurrent degree students' law enrollments will include a required 1-unit "Graduate Legal Studies" colloquium and 3-unit "Interdisciplinary Perspectives on Law" course. Concurrent degree students will be eligible for financial support through PS while pursuing the Ph.D. and through the law school while pursuing law studies.

## **Department of Urban Planning and Public Policy**

**Virginia L. Parks, Department Chair**

300 Social Ecology I

949-824-0563

<https://uppp.sococo.uci.edu/>

The Department of Urban Planning and Public Policy utilizes an interdisciplinary approach to the study of urban and regional planning, public policy issues, and the built environment. The Department faculty devote their scholarly and teaching efforts to theory-driven and empirically oriented urban research and their interests include urban and community development, environmental policy, health promotion and policy, and urban design and behavior. The faculty focuses on education in urban, social, public policy, and environmental problems.

The Department offers the B.A. in Urban Studies; undergraduate minors in Urban Studies and Urban and Regional Planning; the Ph.D. in Urban and Environmental Planning and Policy; the Master of Public Policy; and the Master of Urban and Regional Planning professional degree (fully accredited by the national Planning Accreditation Board). The Department's graduate degree programs feature innovative teaching often involving students in community projects, and a significant degree of accessibility by students to faculty members.

The faculty members in the Department are productive and influential scholars. The Department's teaching, research, and graduate training utilize UCI's proximity to both urban centers and planned communities, as well as the University's location within the dynamic and multicultural Southern California and Pacific Rim regions. Collaborative academic and research ties are maintained with UCI's Blum Center for Poverty Alleviation, Metropolitan Future Initiatives, Institute of Transportation Studies, Center for Global Peace and Conflict Studies, Newkirk Center for Science and Society, Environment Institute, Center for Unconventional Security Affairs, Center for Organizational Research, and Water UCI.

The common mission linking the Department's undergraduate, master's, and doctorate-level instruction and faculty research efforts is to bring applied research to the cause of bettering individuals, neighborhoods, communities, and regions. Southern California has grown dramatically over the past four decades and will soon become the nation's largest urban corridor. The challenges to maintain the quality of life, provide employment opportunities, and reduce the deep socioeconomic disparities of this bi-national and multicultural metropolitan region are enormous. Extremely diverse, multiethnic communities face the necessity of solving their problems in ways that are acceptable to their populations. Older central city areas that are vital to the region face issues of social and economic sustainability. The need to create employment opportunities, through the application of new technologies in industries and services, will be a constant feature of an urban region undergoing such population increases. At the same time, urban growth and transportation will have to meet increasingly stringent environmental regulations that can safeguard the population's health and quality of the diverse

natural environments. The urban design and landscape of most communities stand to be reshaped as never before, as the building stock ages and the need to redevelop intensifies.

Faculty members and students who study urban and community development examine contemporary planning approaches to managing local, community, and regional development and explore the spatial dynamics of urbanization in diverse settings and how public policy can guide urban and regional growth to balance environmental and economic concerns. Faculty members and students engaged in design-behavior research investigate the interrelationships of people and their socio-physical environments at all scales, from micro to macro, with emphasis on urban design and community-scale issues. Faculty members and students who examine environmental policy focus on the environment and natural resources as important policy and planning issues and provide a clear understanding about how politics, economics, ethics, and institutions affect planning and policy choices. Finally, faculty members and students who study health promotion and policy examine the public welfare, psychological, and health implications of social and physical planning, and the techniques and goals of public health policy making.

- Environmental Science and Policy, B.A.
- Master of Public Policy
- Master of Urban and Regional Planning
- Urban and Environmental Planning and Policy, Ph.D.
- Urban and Regional Planning, Minor
- Urban Studies, B.A.
- Urban Studies, Minor

## Faculty

Victoria Basolo, Ph.D. University of North Carolina at Chapel Hill, *Professor of Urban Planning and Public Policy*

Scott A. Bollens, Ph.D. University of North Carolina at Chapel Hill, *Drew, Chace and Erin Warmington Chair in the Social Ecology of Peace and International Cooperation and Professor of Urban Planning and Public Policy*

Kenneth S. Chew, Ph.D. University of California, Berkeley, *Professor of Teaching of Urban Planning and Public Policy*

Ross F. Conner, Ph.D. Northwestern University, *Professor Emeritus of Urban Planning and Public Policy*

William J. Cooper, Ph.D. University of Miami, *Professor Emeritus of Civil and Environmental Engineering; Urban Planning and Public Policy* (environmental chemistry, advanced oxidation processes for water treatment, aquatic photochemistry of carbon cycling)

David Feldman, Ph.D. University of Missouri-Columbia, *Professor of Urban Planning and Public Policy; Political Science*

Martha S. Feldman, Ph.D. Stanford University, *Roger W. and Janice M. Johnson Chair in Civic Governance and Public Management and Professor of Urban Planning and Public Policy; Paul Merage School of Business; Sociology* (organization theory and behavior, stability and change in organizations, decision-making and information processing, public management, qualitative research methods)

Ajay Garde, Ph.D. University of Southern California, *Associate Professor of Urban Planning and Public Policy*

Douglas Houston, Ph.D. University of California, Los Angeles, *Associate Professor of Urban Planning and Public Policy*

Helen Ingram, Ph.D. Columbia University, *Professor Emerita of Urban Planning and Public Policy*

Jae Hong Kim, Ph.D. University of Illinois at Urbana-Champaign, *Assistant Professor of Urban Planning and Public Policy*

Raul P. Lejano, Ph.D. University of California, Los Angeles, *Professor Emeritus of Urban Planning and Public Policy*

Nicholas J. Marantz, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Urban Planning and Public Policy; School of Law*

Richard Matthew, Ph.D. Princeton University, *Professor of Urban Planning and Public Policy; Political Science*

Sanjoy Mazumdar, Ph.D. Massachusetts Institute of Technology, *Professor of Urban Planning and Public Policy; Religious Studies*

Walter Nicholls, Ph.D. University of California, Los Angeles, *Associate Professor of Urban Planning and Public Policy; Sociology* (urban sociology, politics and policy, social movements, immigration, comparative urbanism, theory, planning conflicts)

Judith Olson, Ph.D. University of Michigan, *Professor Emeritus of Informatics; Paul Merage School of Business; Urban Planning and Public Policy* (interactive and collaborative technology, human-computer interaction, computer-supported cooperative work)

Seth D. Pipkin, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Urban Planning and Public Policy*

Maria G. Rendón, Ph.D. Harvard University, *Assistant Professor of Urban Planning and Public Policy; Sociology* (urban sociology, immigration, race/ethnicity, sociology of education and social policy)

Michael Ruane, M.A. University of California, Los Angeles, *Lecturer of Urban Planning and Public Policy*

David M. Snow, J.D. Loyola Marymount University, *Lecturer of Urban Planning and Public Policy*

Daniel Stokols, Ph.D. University of North Carolina, Chapel Hill, *Professor Emeritus of Psychological Science; Religious Studies; Urban Planning and Public Policy*

Luis Suarez-Villa, Ph.D. Cornell University, *Professor Emeritus of Urban Planning and Public Policy*

Rodolfo D. Torres, Ph.D. Claremont Graduate University, *Professor of Urban Planning and Public Policy; Political Science*

## **Affiliate Faculty**

Graeme T. Boushey, Ph.D. University of Washington, *Associate Professor of Political Science; Urban Planning and Public Policy* (California politics and statewide elections, American politics, state and federal policy-making, ballot measures and the initiative process)

Tim-Allen Bruckner, Ph.D. University of California, Berkeley, *Associate Professor of Program in Public Health; Urban Planning and Public Policy*

Jan K. Brueckner, Ph.D. Stanford University, *Distinguished Professor of Economics; Urban Planning and Public Policy*

Damon Clark, Ph.D. Oxford University, *Associate Professor of Economics; Urban Planning and Public Policy*

Joseph DiMento, Ph.D. University of Michigan, *Professor of School of Law; Criminology, Law and Society; Paul Merage School of Business; Urban Planning and Public Policy*

John R. Hipp, Ph.D. University of North Carolina at Chapel Hill, *Professor of Criminology, Law and Society; Sociology; Urban Planning and Public Policy* (community context of crime, household decisions and neighborhood change, research methods)

Richard D. McCleary, Ph.D. Northwestern University, *Professor of Criminology, Law and Society; Urban Planning and Public Policy* (criminal justice, research methodology, statistics)

Michael G. McNally, Ph.D. University of California, Irvine, *Professor of Civil and Environmental Engineering; Urban Planning and Public Policy* (travel behavior, transportation systems analysis)

David S. Meyer, Ph.D. Boston University, *Professor of Sociology; Political Science; Urban Planning and Public Policy* (social movements, public policy, peace and war, social justice)

Sylvia Nam, Ph.D. University of California, Berkeley, *Assistant Professor of Anthropology; Biological Chemistry; Urban Planning and Public Policy* (urban studies, property, transnational expertise, Southeast Asia)

Brett F. Sanders, Ph.D. University of Michigan, *Professor of Civil and Environmental Engineering; Urban Planning and Public Policy* (urban flooding, coastal flooding, dam-break flooding, flood hazard modeling, flood risk management, sediment management, shallow-water hydrodynamics and morphodynamics, computational methods, remote-sensing with drones, translational research for flood modeling targeting community resilience, population health and poverty alleviation)

Jean-Daniel M. Saphores, Ph.D. Cornell University, *Professor of Civil and Environmental Engineering; Economics; Urban Planning and Public Policy* (transportation and environmental systems (with a focus on air pollution and energy use), travel behavior analysis, alternative fuel vehicles, automated vehicles, transit use, sustainable infrastructure management, and decision making under uncertainty using real options)

David A. Smith, Ph.D. University of North Carolina at Chapel Hill, *Professor of Sociology; Urban Planning and Public Policy* (world systems analysis, urbanization, development, comparative-historical sociology, dependent development in east Asia)

George E. Tita, Ph.D. Carnegie Mellon University, *Professor of Criminology, Law and Society; Urban Planning and Public Policy* (criminology, community context of violence, urban youth gangs, homicide studies)

Kerry Vandell, Ph.D. Massachusetts Institute of Technology, *Professor Emeritus of Paul Merage School of Business; School of Law; Urban Planning and Public Policy*

Linda T. Vö, Ph.D. University of California, San Diego, *Professor of Asian American Studies; Culture and Theory; Sociology; Urban Planning and Public Policy* (race and ethnic relations, immigrants and refugees, gender relations, community and urban studies)

## Public Policy Courses

### **PUB POL 215. Statistics and Methods for Public Policy. 4 Units.**

Introductory course with focus on gaining a sound understanding of what constitutes credible evidence in support of policy arguments and management decisions.

Restriction: Graduate students only.

### **PUB POL 219. Information and Public Policy. 4 Units.**

Evaluates strengths and weaknesses of qualitative and quantitative methods and the data used in making public policy claims. Looks at the bases of certain widely accepted measures of poverty, growth, environmental quality, and the like.

Repeatability: May be taken for credit 2 times.

Restriction: Public Policy Majors have first consideration for enrollment.

### **PUB POL 221. Public Policy . 4 Units.**

Explores different approaches to public policy analysis, the diverse conceptions of the goals and objectives that should be served by policy, and the appropriate role of the policy analyst. Policy consequences are traced to indirect and subtle incentives and disincentives.

Repeatability: May be taken for credit 2 times.

Same as PP&D 221.

Restriction: Public Policy Majors have first consideration for enrollment.

### **PUB POL 225. Qualitative Methods . 4 Units.**

Fieldwork, data collections techniques, and related issues for anti-positivistic research. Data collection techniques include observation, physical traces, participation, in-depth interview. Data checks include veracity, detail, completeness, rigor.

Repeatability: May be taken for credit 2 times.

Restriction: Public Policy Majors only.

### **PUB POL 227. Economics of Government. 4 Units.**

Prepares students to analyze public policy questions with tools from economics. By the end, students should be able to identify important economic issues in public policy debates and consume and critique economic research on these topics.

Same as ECON 275.

### **PUB POL 240. Microeconomics and Public Policy. 4 Units.**

Introduces the fundamental principles of microeconomics that are required for applied policy analysis. Provides students with an intuitive understanding of the microeconomic approach, and familiarizes them with concepts used in applied public policy analysis.

Repeatability: May be taken for credit 2 times.

Same as ECON 255.

Restriction: Graduate students only.

### **PUB POL 260. Policy and Ethics . 4 Units.**

Examines the challenge of identifying ethical principles that can guide us in formulating and assessing public policy, the public policy process from an ethical perspective, and the ethics of the individual engaged in the public policy arena.

Restriction: Public Policy Majors only.

### **PUB POL 283. Collaborative Governance and Public Management. 4 Units.**

Introduction to inclusive management. To make effective use of public resources, public managers are inventing ways of managing that alter relationships within organizations, between organizations, between sectors, and with the public. Requires rethinking fundamentals such as leadership and motivation.

Same as UPPP 283.

Restriction: Public Policy Majors have first consideration for enrollment.

## Urban Planning and Public Policy Courses

### **UPPP 4. Introduction to Urban Studies. 4 Units.**

Introduces the substantive areas, concepts, and tools in the field of urban studies. Acquaints students with physical, environmental, social, economic, and political dimensions of cities. Examines the challenges facing cities, including poverty, sustainability, development, globalization, and others.

Restriction: School of Social Ecology students have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

(III)

### **UPPP 5. Introduction to Urban Planning and Policy. 4 Units.**

Introduces students to the basic issues in urban planning and public policy.

(III)

### **UPPP 8. Introduction to Environmental Analysis and Design. 4 Units.**

Overview of general concepts, theoretical principles, and analytical techniques for investigating environmental systems. Integrates tools from natural and social sciences to analyze contemporary environmental challenges such as pollution, resource acquisition, facility and ecosystem design, impact assessments, formulation of environmental policy.

(III)

### **UPPP H30E. Cities: Focal Point for Sustainability Problems and Solutions I. 4 Units.**

Explores the nature of cities, focusing on the challenges facing cities today, their possible solutions, and the technical and social constraints on those solutions.

Prerequisite: SSCI H30D

Restriction: Campuswide Honors Collegium students only.

(III)

### **UPPP H30F. Cities: Focal Point for Sustainability Problems and Solutions II. 4 Units.**

Explores the nature of cities, focusing on the challenges facing cities today, their possible solutions, and the technical and social constraints on those solutions.

Prerequisite: UPPP H30E

Restriction: Campuswide Honors Collegium students only.

(II)

### **UPPP 40. Urban Sociology. 4 Units.**

Overview of theoretical, substantive, and policy issues in urban sociology. History of urbanization, the school of human ecology, and recent trends regarding urbanism. Time is devoted to understanding the causes and possible solutions to urban problems.

Overlaps with SOCL 43.

### **UPPP 100. Special Topics in Urban Studies. 4 Units.**

Course content varies with interest of the instructor.

Repeatability: Unlimited as topics vary.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

### **UPPP 101. History of Cities. 4 Units.**

Surveys the global and historical co-evolution of cities and social institutions, including religion, the economy, governance, the arts, technology, and family life.

### **UPPP 102. Urban Inequality. 4 Units.**

Examines structural inequality and the influence that urbanization has in affecting race, ethnic, and class relations. Explores how race/ethnicity, class, urban space, housing, economic development, public education, and land policy intersect in cities, both historically and today.

Restriction: Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 103. Comparative Approaches to Urban Regions. 4 Units.**

An introduction to comparative urbanization in developing countries. Introduces students to the geography, history, and theories of urbanization, and then reviews urban planning, public policy, and governance.

Restriction: Public Health Policy Majors only. Social Ecology Majors only. Urban Studies Majors only.

**UPPP 104. Urban America . 4 Units.**

Students examine the historical, social, political, and economic factors that contributed to the construction of the American urban context, one that is poverty concentrated and racially/ethnically segregated. Students also critically assess the consequence of growing up in America's urban neighborhoods.

Same as CHLT 162A, SSCI 163A.

**UPPP 107. Urban and Regional Planning. 4 Units.**

Important substantive areas, concepts, tools in the field of urban and regional planning. Topics include: forces that have historically guided and are currently guiding U.S. urbanization; land use, economic development, housing and community development, environmental planning; legal, environmental, governmental contexts.

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 108. Cities and Transportation. 4 Units.**

The relationship between urban areas and transportation systems. Economic analysis of cities, transportation and urban form, highway congestion, environmental impacts of transportation, public transit, land use and transportation, and political influences on transportation planning.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 109. Housing and Urban Development Policy. 4 Units.**

Surveys public policy issues and develops analytic techniques in the areas of housing and urban development. Examines a range of policy topics including housing assistance to low- and moderate-income families, housing finance system, incentives for economic development, and neighborhood preservation.

Prerequisite: Recommended: Previous course work in economics.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 110. Urban Economic Development Policy. 4 Units.**

Theoretical and practical perspectives on local economic development policy. Integrates economic, planning, and political perspectives. Overview of economic role of cities and metropolitan areas. Specific development issues include: link between taxes, regulation, job growth; redevelopment planning; evaluation economic development policy.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 111. Climate Solutions. 4 Units.**

Focuses on carbon neutrality and climate stability, addressing.

Same as ESS 179, MAE 119.

Restriction: Upper-division students only.

**UPPP 112. Foundations of Community Health. 4 Units.**

A social ecological framework for understanding community health is presented. Measures of individual and community health are compared, and the influence of personal and environmental factors on individual, group, and population health is examined. Community health promotion strategies are discussed.

Same as PUBH 125.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 113. Poverty and Change in Developing Countries. 4 Units.**

Focuses on poverty in developing countries. Analyzes the magnitude and changing nature of poverty in the global south. Critically examines poverty conceptualized in terms of economic deprivation, well-being, and social exclusion.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.



**UPPP 114W. Advanced Research Methods. 4 Units.**

For students planning to conduct senior research projects or apply to graduate school in social research fields. Topics include reviewing literature, preparing a research proposal, protecting human subjects, citing scholarly work, building measures, estimating sample size, interview and presentation skills.

Prerequisite: SE 10 and SE 13. Satisfactory completion of the Lower-Division Writing requirement.

Same as CLS C169W, PSCI 111W, SE 111W.

**(Ib)**

**UPPP 115. Global Poverty and Inequality in the 21st Century. 4 Units.**

Explores a multidisciplinary understanding of poverty and inequality in the 21st century and assesses impact of education, health, technology, and other interventions. Course offered online only.

Same as IS 115.

**UPPP 117. Environmental Justice. 4 Units.**

Engages students to critically analyze and evaluate environmental problems, environmental responses, and planning and policy debates regarding 'environmental justice' - essentially the race, class, and equity implications of environmental problems and policies.

**UPPP 118. Gentrification. 4 Units.**

Gentrification is a complex process that changes the makeup of neighborhoods and fuels political and policy conflicts. Students are provided with tools to understand the process and conceive of policies to ensure more inclusive and equitable cities.

**UPPP 120. Introduction to GIS for Planning and Policy. 4 Units.**

Provides hands-on experience creating, visualizing, and interpreting spatial data, with a focus on Geographic Information Systems (GIS) applications for urban planning and public policy.

**UPPP 129. American Public Policy. 4 Units.**

Focuses on the development and implementation of public policy in the United States. Lectures cover theoretical models of the policy process as well as significant problems facing contemporary American decision-makers.

Same as PUBH 132, SSCI 152C, PLSC 121G.

**UPPP 130. Cities and Food . 4 Units.**

Explores the role of cities in transforming global diets: how urbanization has shaped what and how we eat, and what the co-evolution of diets and city life portend for the future.

**UPPP 131. Environmental Sustainability I. 4 Units.**

Provides an introduction to sustainability from different points of view; historical, scientific, political, ethical, and economic.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 132. Environmental Sustainability II. 4 Units.**

Investigates how sustainability can be implemented in a variety of contexts including water, energy, non-renewable resources, biodiversity, and urban policy, and also how it could be measured.

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 133. Environmental Law and Policy . 4 Units.**

Environmental law as a combination of traditional legal principles and newly created statutes, rules, and decisions applied to environmental protection. Investigates roles of courts, legislature, executive branch and administrative agencies, and private citizens attempting to regulate environmental quality.

Same as CLS C128.

Restriction: Criminology, Law and Society Majors only. Planning, Policy, and Design Majors only.

**UPPP 139. Water Resource Policy. 4 Units.**

Examination of contemporary water problems worldwide, with particular attention to the competing water demands in the western U.S., and water demand by the poor in developing countries. History and analysis of U.S. water policies at local, state, and federal levels.

Restriction: Environmental Science Majors have first consideration for enrollment. Earth System Science Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.



**UPPP 142. Environmental Hazards in an Urbanizing World. 4 Units.**

Development patterns, including urbanization, can contribute to environmental hazard severity. Humans can plan, mitigate, and prepare to reduce costly hazard losses. Students learn about environmental hazards and human response to these threats.

(III)

**UPPP 145. Environmental Governance. 4 Units.**

How should the environment be managed and who should be responsible? What is effective environmental management, and for whom? These questions are answered by exploring traditional and emerging theoretical frameworks and applying them to real world environmental challenges.

**UPPP 146. Principles of Economics for Planning and Policy. 4 Units.**

Provides an introduction into economics for planning and policy students.

**UPPP 152. Cultural Ecology and Environmental Design. 4 Units.**

Introduction to cultural ecology and environmental and architectural design. Addresses the understanding of people's relationships with their built environments, the basic elements of architecture, architectural analysis, and cultural analysis are covered. Examines values in design and design for multicultural societies.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 153. Elements of Environmental Design. 4 Units.**

Basic elements of environmental design such as scale, proportion, rhythm, color, sound, lighting, surfaces, texture, architectural definition of spaces, volumes, massing volumetric analysis, solids and voids, and cultural aspects of design. Excitement and creativity in design, imageability.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 155. Urban Design Principles. 4 Units.**

Introduction to principles of urban design and its applications. Study of contemporary and traditional theories of urban design formulated to improve physical characteristics of built environment to facilitate an enhanced quality of life. A variety of case studies are discussed.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 166. Urban Politics and Policy . 4 Units.**

Examines why and how urban policies are enacted and carried out in contemporary U.S. cities and regions. Topics include evolution and organization of city governments and policymaking over the past century; who directs public policy and controls how cities develop.

(III)

**UPPP 167. Public Policy and Management. 4 Units.**

Exposes students to best management practices that assure effective planning and implementation of policies and programs in government, business, and nonprofit sectors. Includes guest lecturers who are proven leaders in four principal institutions of community: business, education, government, and nonprofit.

Restriction: Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 170. Health Policy. 4 Units.**

Considers social and economic aspects of health and disease in the United States. What are the proper roles of the individual, community, and government in improving health and health care? International comparisons will be made wherever possible.

Same as PUBH 122.

Restriction: Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 172. Latino Metropolis. 4 Units.**

Explores the processes of Latino urbanization in the United States and the spatialization of Latino identities, particularly in the context of Southern California with selected comparisons drawing from other cities.

Same as CHLT 154.

(VII)

**UPPP 177. Chicano Movement. 4 Units.**

Explores the history of Mexicans in the U.S. with particular attention paid to their integration into the U.S. capitalist economy. Examines this economic history and the Chicano movement, 'El Movimiento,' within the wide context of socio-economic change.

Same as CHLT 166.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 178. International Divided Cities. 4 Units.**

Investigates urban divisions in international cities where deep-seated nationalistic ethnic differences create pressures for intergroup conflicts, autonomy, or territorial separation, and can incite violence. Urban political polarization as it is manifest in the urban setting.

Same as PLSC 157B, SOCL 176.

**UPPP 190. Applied Statistics in Social and Behavioral Research. 4 Units.**

Covers statistical techniques used to describe and make generalizations about phenomena represented by data. Hands-on experience in data analysis and interpretation using statistical software (SPSS, STATA) is emphasized. Topics include data visualization, ANOVA, multiple regression, and categorical data analyses.

Prerequisite: SE 13

Same as CLS C190, SE 190, PSCI 190.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**UPPP 202. History of Urban Planning. 4 Units.**

Introduction to the historical roots and fundamental perspectives of urban and regional planning. Exploration of the significant historical phases and personalities which have shaped the profession. The roles and responsibilities, the limitations and potential, of urban planning.

Restriction: Graduate students only.

**UPPP 203. Theoretical Foundations of Planning. 4 Units.**

Intellectual excursion into central themes in policy and planning, including philosophy of the market, institutionalization of space, hypostatizations of policy, constructions of communities, logics of spatial analysis. Objective is engagement of the professional in thoughtful reflections on practice and institutions.

Restriction: Graduate students only.

**UPPP 204. Plan Development and Communication . 4 Units.**

Graphic representation and communication of physical place characteristics, design and physical planning ideas, and concepts using a variety of graphic techniques of free hand drawing, sketching, orthographic representations, scale drawings, 3D representations, maps, photo-documentation, and various media.

Restriction: Urban and Regional Planning Majors only.

**UPPP 205. Environmental Economics and Policy. 4 Units.**

Provides a broad introduction to environmental economics and to environmental policy. Environmental problems facing the United States and Europe are analyzed, and whenever possible, the environmental problems facing developing countries.

Restriction: Graduate students only.

**UPPP 206. Microeconomic Analysis for Urban Planning. 4 Units.**

Provides students with a working knowledge of basic microeconomic concepts. Emphasizes applications related to urban planning and policy analysis. Topics covered include demand analysis, firm behavior, market structure, public goods, externalities, and the role of economics in land markets.

Restriction: Graduate students only.

**UPPP 207. Land-Use Law. 4 Units.**

Investigates legal and institutional frameworks for development control. Review of constitutional issues implicated in land-use regulation. Traces development control historically and analyzes contemporary approaches to land-use control which reflect environmental and economic development concerns.

Same as CLS C207.

Restriction: Graduate students only.

**UPPP 209. Qualitative Research Methods: Overview. 4 Units.**

Introduction to fundamentals of "qualitative" research and non-positivistic inquiry. Formulation of research questions, selection of method, data collection techniques, and analysis (briefly). Overview of selected methods from ethnography, naturalistic field research, phenomenology, ethnoarchaeology, critical approaches, and others.

Restriction: Graduate students only.

**UPPP 210. Practice Experience . 4 Units.**

Provides Master of Urban and Regional Planning students an opportunity to link classroom knowledge with real planning situations through a 10-week unpaid practice experience.

Restriction: Urban and Regional Planning Majors only.

**UPPP 212. Transportation Planning and Policy. 4 Units.**

Introduces current topics in transportation planning. Includes an analysis of the economic role of transportation in urban areas, land-use impacts of transportation projects, traffic congestion, air quality, alternatives to the automobile, and other transportation topics.

Restriction: Graduate students only.

**UPPP 213. Advanced Qualitative Methods: Analyzing Qualitative Data. 4 Units.**

Introduction to the theory and practice of analyzing qualitative data. Students must have already learned about data collection and research design for qualitative research and must have qualitative data they can analyze.

Same as MPHD 297K, PLSC 273A.

Restriction: Graduate students only.

**UPPP 214. Quantitative Analysis for Planners. 4 Units.**

Introduces students to the basic statistical concepts used to address issues of public concern. Prepares students to perform, interpret, and evaluate quantitative data analyses commonly used in professional studies.

Restriction: Graduate students only.

**UPPP 215. Analytical Methods for Planning. 4 Units.**

Emphasizes the development of analytical techniques proven useful in the fields of management and administration. Topics include multiple regression, cost-benefit analysis and discounting, decision trees, and other techniques useful for the purposes of community analysis and planning.

Restriction: Graduate students only.

**UPPP 220. Qualitative Methods: Fieldwork and Data Collection. 4 Units.**

Covers fieldwork, data collections techniques, and related issues for anti-positivistic research. Data collection techniques include observation, physical traces, participation, in-depth interview. Data checks include veracity, detail, completeness, rigor.

Restriction: Graduate students only.

**UPPP 221. Public Policy. 4 Units.**

Explores different approaches to public policy analysis, the diverse conceptions of the goals and objectives that should be served by policy, and the appropriate role of the policy analyst. Policy consequences are traced to indirect and subtle incentives and disincentives.

Same as CLS C255, PLSC 221A.

Restriction: Graduate students only.

**UPPP 224. Environmental Politics and Policy. 4 Units.**

Reviews and critiques literature on discussion topics including: the nature and effectiveness of environmental movements and policies; the role of science and technology; the use of economic incentives in policy; decentralization of decision making; and creating arenas for public involvement.

Restriction: Graduate students only.

**UPPP 228. Demographics for Planning and Policy. 4 Units.**

Provides planning and policy practitioners with a condensed, nonspecialist orientation to the sources, applications, and interpretation of population statistics, and conveys the steps used in constructing local-area population forecasts and projections.

Restriction: Graduate students only.

**UPPP 231. Transportation and Environmental Health. 4 Units.**

Critically evaluates how transportation can promote sustainable, healthy, and equitable cities. Examines the interaction of transportation systems with urban form, land use, community health, and environmental quality.

Restriction: Graduate students only.

**UPPP 235. Geographic Information Systems (GIS) Problem Solving in Planning. 4 Units.**

Explores the application of geographic information systems (GIS) in urban planning. Steps through a GIS-based planning procedure that balances housing, jobs, tax base, utilities, transportation, and the natural environment.

Restriction: Graduate students only.

**UPPP 237. Introduction to Geographic Information Systems. 4 Units.**

Application of Geographic Information Systems (GIS) to the field of urban and regional planning. Emphasizes current issues that occur in actual implementation settings. Lecture/discussion followed by laboratory demonstrating the area of GIS discussed. Offers 'hands-on' student usage of GIS software.

**UPPP 239. Urban Design Theories and Applications. 4 Units.**

Introduction to contemporary and traditional theories of urban design and their applications. Organized around one question: How might planning and design of built environment contribute to making a good city? National and international case studies are introduced.

Restriction: Graduate students only.

**UPPP 243. Health Policy and Management. 4 Units.**

Multidisciplinary inquiry into theory and practice concerned with delivery, quantity, costs of health care for individuals and populations. Explores managerial and policy concerns regarding structure, process, outcomes of health services including the costs, financing, organization, outcomes, and accessibility of care.

Same as PUBH 222.

Restriction: Master of Public Health Degree students have first consideration for enrollment. Master of Public Policy Degree students have first consideration for enrollment. Graduate students only. Public Health Majors have first consideration for enrollment. Urban and Regional Planning Majors have first consideration for enrollment.

**UPPP 244. Land-Use Policy. 4 Units.**

Examination of the role of public policy in guiding growth and development in urban and suburban environments. Description of a wide-ranging set of growth policies, the rationales underlying their use, controversies and legal constraints, and evaluation of their effectiveness.

Restriction: Graduate students only.

**UPPP 246. Housing Policy. 4 Units.**

Examines theories and practices of housing policy and the relationship of housing to larger neighborhood, community, and regional development issues. Considers the roles of private for-profit and not-for-profit developers, lenders, and all levels of government in the provision of housing.

Prerequisite: Familiarity with basic statistics is required.

**UPPP 251. Poverty and Development . 4 Units.**

Examines competing conceptualizations, methods of measurement, and poverty alleviation strategies widely used in developing countries. Focuses on poverty conceptualized as economic deprivation, well-being, vulnerability, and social exclusion.

Same as SOCL 235.

Restriction: Graduate students only.

**UPPP 252. Issues in Environmental Law and Policy. 4 Units.**

Treatment of legal and policy strategies for promoting environmental protection and deterring environmental degradation within the context of other societal objectives. Topical approach with a focus on problems of special interest to criminologists and to environmental policy specialists.

Same as CLS C252.

Restriction: Graduate students only.

**UPPP 266. Economic Democracy . 4 Units.**

Explores a wide range of radical democratic and egalitarian visions (including but not limited to the Marxist tradition) for a more sane, just, and sustainable future.

Restriction: Graduate students only.

**UPPP 273. Global Urbanization. 4 Units.**

Examines the spread of cities worldwide in the 20th century. What are the political and economic causes of this process? What are the social-cultural, political, and economic effects? How is contemporary urbanization linked to global restructuring of other kinds.

Same as SOCL 252A.

Restriction: Graduate students only.

**UPPP 275. Special Topics in Urban Planning. 4 Units.**

Special topics in urban and regional planning are offered from time to time, but not on a regular basis. Course content varies with interest of the instructor.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**UPPP 279. Theories of Power and Empowerment. 4 Units.**

Studies different ways of thinking about power and its uses. Explores theories of power that inform various notions of empowerment, including resistance, participatory democracy, and workplace empowerment.

Same as MPPH 297R, PLSC 223A.

Restriction: Graduate students only.

**UPPP 281. Advanced Theory. 4 Units.**

Provides urban planning and public policy students with an introduction to advanced theory. Addresses broad theoretical approaches that cut across disciplinary and topical boundaries. Designed primarily for Ph.D. students.

**UPPP 282. Urban Design Studio for Planners: An Introduction. 4 Units.**

Introductory urban design for planners. Organized around a variety of assignments to encourage learning by design in a studio setting. Students work on design projects and drawing assignments to learn practical aspects of urban design.

Restriction: Graduate students only.

**UPPP 283. Collaborative Governance and Public Management. 4 Units.**

Introduction to inclusive management. To make effective use of public resources, public managers are inventing ways of managing that alter relationships within organizations, between organizations, between sectors, and with the public. Requires rethinking fundamentals such as leadership and motivation.

Same as PPOL 283.

Restriction: Public Policy Majors have first consideration for enrollment.

**UPPP 292. Professional Report. 4 Units.**

Workshop designed to assist M.U.R.P. students in conducting their professional reports. Students select topics, design projects, conduct professional investigations, and write up reports.

**UPPP 294A. Urban Planning Practicum I. 4 Units.**

Engages students in practical planning projects in the community under a central theme within Planning. Students take a problem-solving approach and employ and further develop data gathering, analysis, graphic and oral communication, public engagement, and report writing skills.

Restriction: Graduate students only.

**UPPP 294B. Urban Planning Practicum II. 4 Units.**

Engages students in practical planning projects in the community under a central theme within Planning. Students take a problem-solving approach and employ and further develop data gathering, analysis, graphic and oral communication, public engagement, and report writing skills.

Prerequisite: PPD 294A

Restriction: Graduate students only.

**UPPP 296. Doctoral Dissertation Research and Writing. 2-12 Units.**

Dissertation research with Urban Planning and Public Policy faculty.

Prerequisite: Advancement to candidacy.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**UPPP 297. Research Design. 4 Units.**

Provides training in research design and methods. Students learn how to evaluate the strength of research findings based on the methods used by a researcher and learn to use lessons from the course to develop a research proposal.

Restriction: Graduate students only.

**UPPP 298. Directed Studies in Urban Planning. 2-4 Units.**

Directed studies in Urban Planning.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**UPPP 299. Independent Study in Urban Planning. 2-8 Units.**

Independent Study in Urban Planning.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

## Concurrent Master's Degree Program with Civil and Environmental Engineering

*This concurrent degree program is temporarily suspended and is not currently admitting students. Please check the upcoming 2021-22 Catalogue for additional information.*

The Department of Urban Planning and Public Policy (UPPP) in the School of Social Ecology and the Department of Civil and Environmental Engineering (CEE) in The Henry Samueli School of Engineering offer a concurrent degree program that allows students to earn both a master of Urban and Regional Planning (M.U.R.P.) and a master of Civil Engineering (M.S.) in less than the three years required if the degrees were pursued sequentially. Students in the concurrent degree program must meet a minimum of twice with the UPPP graduate coordinator and/or MURP faculty program director. The first meeting is at the start of the student's concurrent program to review current requirements and devise a plan of study for the MURP. The second meeting is the start of the third quarter of the first year of the concurrent program to assess progress toward the MURP, identify the student's Capstone choice, and review the plan for completion of MURP course work.

### Requirements

The concurrent degree program involves a course plan that fulfills requirements in both programs. The engineering focus of the concurrent degree program requires 48 units and is organized around two tracks: (1) Transportation Systems, and (2) Hydrology and Water Resources Systems. The course load for both CEE and M.U.R.P. is the same for both tracks. For the CEE track, two plans are available: Thesis option and Course Work option. The plan of study for both options must be developed in consultation with a Faculty Advisor and approved by the Program Graduate Advisor. There may be no redundancy of courses between the CEE and M.U.R.P. tracks.

### Plan I: Thesis Option

Thesis option requires the completion of 48 units of study of which a maximum of 10 units can be taken for study in conjunction with the thesis research topic. Upon approval of the Program Graduate Advisor, the maximum of 10 units of thesis research can be extended to 16 units. Thesis research includes the completion of an original research project; the writing of the thesis describing it; and a review by a thesis committee. Of the 48 units, a minimum of 28 units must be in non-research, graduate-level approved engineering or related courses (numbered 200-291) with at least 16 of 28 units from the CEE Department. The remaining units may be earned as graduate-level course work, individual research, or upper-division undergraduate units (maximum 10 units).

### Plan II: Course Work Option

Course Work option requires the completion of 48 units of study, at least 40 of which must be in non-research graduate-level approved engineering or related courses (numbered 200-291) with at least 28 of 40 units from the CEE Department. The remaining eight units may be earned as graduate-level course work, individual research, or upper-division undergraduate units. Undergraduates seeking admission to the concurrent master's degree program should have a strong record of course work in disciplines related to civil and environmental engineering and urban planning, and they must meet the requirements for admission in both departments. For more information about these requirements, visit the CEE Graduate Admissions (<http://>

[engineering.uci.edu/dept/cee/graduate/admission-requirements/](https://engineering.uci.edu/dept/cee/graduate/admission-requirements/)) and MURP Graduate Admissions (<https://uppp.soceco.uci.edu/murp/admissions/>) websites.

## Master of Public Policy

The Master of Public Policy (M.P.P.) program is a two-year professional degree program administered by the School of Social Ecology. The program provides training for highly motivated and talented individuals to become leaders at the local, state, national, and international level in the development and management of policies that lead to a more effective public sector, a more productive private sector, and more vibrant communities.

### Requirements

Students are required to complete 72 units of graduate courses. In the first year, students will attend an introductory conference, participate in a workshop, and take seven core courses and two elective courses. In the summer after the first year, students will participate in a policy-relevant internship in an appropriate government, business, or nonprofit setting. In the second year, students take three core courses and five elective courses.

A part-time option is available for students. Part-time students take two courses per quarter over the span of three years. These students have the choice of completing the required summer internship in the summer after year one, or the summer after year two. The required capstone project takes place during the winter and spring quarters of year three.

### Course Requirements

#### Year One

##### A. Complete:

PUB POL 215	Statistics and Methods for Public Policy
PUB POL 219	Information and Public Policy
PUB POL 221	Public Policy
PUB POL 225	Qualitative Methods
PUB POL 240	Microeconomics and Public Policy
PUB POL 283	Collaborative Governance and Public Management
SOCIOL 249	Special Topics: Political Sociology and Social Movements

##### B. Select two electives

#### Year Two

##### C. Complete:

PUB POL 227	Economics of Government
PUB POL 260	Policy and Ethics

Two quarters of Capstone research and briefing

##### D. Select five electives

Additional information is available at the Master of Public Policy website (<http://mpp.web.uci.edu/>).

## Master of Urban and Regional Planning

The Master of Urban and Regional Planning (M.U.R.P.) provides students with a rigorous intellectual foundation and critical analytical skills that prepare them to work in public, private, and non-governmental planning and related fields. The program is fully accredited by the national Planning Accreditation Board and has more than a dozen full-time core faculty. Students gain knowledge of planning problems and practices through a series of courses related to the environmental, economic, and social challenges in Southern California, and the United States, as well as other national contexts.

### Requirements

A total of 72 graduate units are necessary to satisfy the master's degree requirements—including 32 units of core courses and successful completion of a capstone project, thesis, or comprehensive examination. A normal course load is 12 units per quarter (three courses), which enables students to complete the degree in two years.

### Course Requirements

#### A. Complete:

UPPP 202	History of Urban Planning
UPPP 203	Theoretical Foundations of Planning
UPPP 204	Plan Development and Communication
UPPP 206	Microeconomic Analysis for Urban Planning
UPPP 214	Quantitative Analysis for Planners

B. Select three additional core courses from a menu of courses in the subject areas of methods, law, and urban settlements.



C. Select eight elective courses. Possible elective course topics include; housing and community development, international development planning, environmental planning, transportation planning, health and social service planning, economic development, regional growth management, state and municipal governance, and urban design. Students work with faculty members to define their concentration and identify appropriate electives. Elective courses are selected from within as well as outside the Department of Urban Planning and Public Policy.

The curriculum culminates with a capstone requirement that may be fulfilled through one of the following options:

1. Completion of a Professional Report (PR), which provides students an opportunity to prepare an independent planning project for a planning organization. This entails a two-quarter course sequence: UPPP 292, and four units of UPPP 299 with a PR faculty advisor;
2. Completion of a Planning Practicum, which is a team-based course taught by a planning practitioner and conducted in conjunction with planning organizations. This entails a two-quarter course sequence: UPPP 294A and UPPP 294B;
3. Completion of a master's thesis, which is an independent academic research project. Students must apply in writing for the thesis option. If approved by the MURP faculty program director, thesis students must complete a two-quarter sequence of four units of UPPP 299 with a thesis faculty advisor.
4. A comprehensive examination.

The program supports a diverse set of educational opportunities for master's students including events and workshops sponsored by the department, student organizations, and the MURP Alumni Council. In addition, several students each year incorporate an international educational experience as part of their degree either through the University of California's Education Abroad Program (UCEAP) or the Network for European and U.S. Regional Urban Studies program (NEURUS). Practical experience in planning in the form of part-time planning internships is also strongly encouraged.

The range of employment opportunities for planners in the public, private, and non-governmental sectors is expanding due to rapid urbanization, rising concerns over environmental issues, and increases in social inequality. Career paths exist in public entities dealing with urban planning, economic development, transportation, community development, regional growth management, air quality, water treatment, community health, community revitalization, and public infrastructure. Employment possibilities also exist with private firms that specialize in transportation, general plans, economic development, environmental planning, emergency management, and residential, commercial, and industrial development. Finally, planners are increasingly pursuing meaningful careers in the growing non-governmental sector. These career opportunities include working with affordable housing developers, environmental and conservation organizations, community-based organizations, advocacy groups, and labor unions.

### **Concurrent Master's Degree Program with Law and Graduate Studies**

Highly-qualified students interested in combining the study of law with graduate qualifications in Urban and Regional Planning are invited to undertake concurrent degree study under the auspices of UC Irvine's Program in Law and Graduate Studies (PLGS).

Students in this program pursue a coordinated curriculum leading to a J.D. degree from the School of Law in conjunction with a Master's degree in Urban and Regional Planning. Contact the PLGS Director's office for additional information at 949-824-4158, or by email to [plgs@law.uci.edu](mailto:plgs@law.uci.edu). A full description of the program, with links to all relevant application information, can be found at the School of Law Concurrent Degree Program website (<http://www.law.uci.edu/academics/interdisciplinary-studies/concurrent-degrees.html>) and in the Law School section of the *Catalogue*.

## **Urban and Environmental Planning and Policy, Ph.D.**

Today's complex urban, social, and environmental issues can best be understood by researchers who can work across disciplinary boundaries, and who understand the relationship of research to action. For example, efforts to control transportation problems by building neighborhoods that encourage alternatives to the automobile require an understanding of travel behavior and human interactions with the built environment. Understanding how to reduce tobacco use requires an appreciation of how behavior is shaped by programmatic interventions, community settings and norms, and policy tools. Environmental cooperation across national borders often requires understanding of political processes, infrastructure systems, and metropolitan structure and governance in regions, such as the U.S.-Mexico border, where population is concentrated in urban settlements that span the border. And, issues of public safety are increasingly related to the design of public and private spaces, and how those spaces are used and regulated.

In all of these areas, public and private officials are increasingly working on topics that span the boundaries of several traditional academic disciplines. The Urban and Environmental Planning and Policy (UEPP) doctoral program at the University of California, Irvine trains scholars for national and international prominence in the analysis of social problems related to the built, natural, and institutional environments. Faculty members and students combine perspectives from urban planning, public policy, and design behavior. The Urban and Environmental Planning and Policy Ph.D. is based on the Department's internationally prominent research and teaching strengths, including design-behavior research, environmental policy, health promotion and policy, and urban and community development. Students in the Ph.D. program take a common core of classes, and then specialize in study related to their research interests. Students may design their own specialization or may follow the guidelines provided to specialize in Policy and/or Urban and Regional Planning. In either case, the elective courses must be approved by the student's faculty advisory committee.

### **Program Details**

The Ph.D. program consists of four components: course work, comprehensive exams, advancing to candidacy, and dissertation research, writing, and defense. Each component is described below. A typical pattern for completion of requirements is the following:

*Years 1 and 2:* Take required departmental courses supplemented by electives.

*September after year 2:* Take comprehensive exams.

*Year 3:* Finish required course work, write and defend dissertation prospectus, advance to candidacy.

*Years 4–6:* Dissertation research and writing (students are expected to complete and defend their dissertations within nine quarters of advancing to candidacy).

Students must also TA for at least one quarter. The normative time for completion of the Ph.D. in Urban and Environmental Planning and Policy is six years, and the maximum time permitted in seven years.

## Requirements

The following courses are required of all students and must be completed before advancement to candidacy:

A. Complete the following:

UPPP 297	Research Design
SOCECOL 200	Seminar in Social Ecology
UPPP 209	Qualitative Research Methods: Overview
SOCECOL 264A	Data Analysis (or equivalent)

B. Complete one advanced research methods course

C. Two courses providing disciplinary/theoretical orientation

D. Two quarters of UPPP 298 or UPPP 299

E. Nine electives

Graduates with a doctorate degree in Urban and Environmental Planning and Policy are employed in a wide array of activities, ranging from university teaching and research, to administrative and research—oriented positions in governmental agencies, international organizations, nonprofit organizations, and private consulting practices.

## Urban and Regional Planning, Minor

The Urban and Regional Planning minor focuses on urban planning issues and offers opportunities to students to learn about the planning and development problems in our cities that we already face and those that we are likely to face in the next few decades. Students explore a number of ways to make our cities more equitable, inclusive, sustainable, and livable. Courses in the department provide important insights into the social, political, economic, historical, and cultural forces shaping urban areas. In addition, these courses offer students an excellent opportunity to prepare for graduate programs in related fields, including architecture, landscape architecture, urban and regional planning, public policy, law, business, public administration, public health, and social services.

The minor in Urban and Regional Planning requires two courses (UPPP 4: Introduction to Urban Studies; UPPP 107: Urban and Regional Planning) and seven upper-division UPPP courses.

Why should you consider minor in Urban Studies or in Urban and Regional Planning? You can learn more about the design and development of urban areas including the planning and design of sustainable neighborhoods, urban environmental problems, inequities in access to urban amenities, housing affordability crisis and transportation, climate change. Students could draw their own conclusions on how to address different types of urban problems from a variety of themes and perspectives including those that involve class, gender, and race.

Nine courses (36 units):

A. Complete:

UPPP 4	Introduction to Urban Studies
or UPPP 5	Introduction to Urban Planning and Policy
UPPP 107	Urban and Regional Planning

B. Select six of the following:

UPPP 102	Urban Inequality
UPPP 108	Cities and Transportation
UPPP 109	Housing and Urban Development Policy
UPPP 120	Introduction to GIS for Planning and Policy
UPPP 133	Environmental Law and Policy
UPPP 139	Water Resource Policy
UPPP 155	Urban Design Principles
UPPP 166	Urban Politics and Policy

## Urban Studies, B.A.

Undergraduate students who major in Urban Studies will become acquainted with the global challenges of urbanization and the analytical skills needed for addressing them. Students will acquire the background for entering graduate study in related fields, including urban planning, community and economic development, and transportation, to name only a few, or for seeking entry-level positions in fields that address urban problems, including urban planning, community development, transportation, and housing.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Departmental Requirements

Twelve courses (48 units) as specified below:

A. Three lower-division courses:

UPPP 4	Introduction to Urban Studies
UPPP 5	Introduction to Urban Planning and Policy
UPPP 40	Urban Sociology

B. Three of the following core upper-division courses:

UPPP 101	History of Cities
UPPP 107	Urban and Regional Planning
UPPP 113	Poverty and Change in Developing Countries
UPPP 131	Environmental Sustainability I
UPPP 146	Principles of Economics for Planning and Policy
UPPP 155	Urban Design Principles
UPPP 166	Urban Politics and Policy

C. Six additional upper-division electives from UPPP 100-177 or ECON 144A-ECON 144B.

### Optional Geographic Information Systems (GIS) Specialization

A. Complete:

UPPP 120	Introduction to GIS for Planning and Policy
UPPP 100	Special Topics in Urban Studies (GIS Capstone)

<sup>1</sup> Integrative course.

## Urban Studies, Minor

The Urban Studies minor focuses on urban issues and offers opportunities to students to learn about a variety of urban problems from a variety of perspectives including those that involve class, gender, and race. Students explore different approaches to make our cities more equitable, inclusive, sustainable, and livable. Courses in the department provide important insights into the social, political, economic, historical, and cultural forces shaping our cities. In addition, these courses offer students an excellent opportunity to prepare for graduate programs in related fields, including urban and regional planning, public policy, law, business, public administration, geography, sociology, public health, and social services.

The minor in Urban Studies consists of one required course (UPPP 4: Introduction to Urban Studies) and seven upper-division UPPP courses.

Why should you consider minor in Urban Studies? You can learn more about the urban issues and environmental problems, inequities in access to urban amenities, housing affordability crisis and transportation, climate change.

Eight courses (32 units):

UPPP 4	Introduction to Urban Studies
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Select any seven upper-division UPPP courses.

## Social Ecology, B.A.

The major in Social Ecology embraces the unique and interdisciplinary spirit of the School of Social Ecology. Students take courses from all three of the school's departments: Criminology, Law & Society, Psychological Science, and Urban Planning and Public Policy. Students graduate with a well-rounded understanding of how these disciplines intersect and inform an understanding of social, psychological, environmental, and legal problems. Students also learn how research can address these problems with the intent of finding solutions.

**Learning objectives** for this major include:

1. Develop an understanding, both theoretical and empirical, of social, psychological, environmental, and legal problems and the settings in which they occur, ranging from the interpersonal to the societal/global.
2. Develop the ability to examine these problems through the application of social scientific and naturalistic research methods.
3. Develop an awareness of the challenges inherent in translating research findings to inform policies and practices to mitigate these problems.
4. Develop skills and knowledge in preparation for the needs of today's workplace.

## Requirements for the B.A. in Social Ecology

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Requirements for the Major

Ten 4-unit upper-division courses (40 units) as specified below:

A. Three courses (12 units)—one course (numbered 100–193) selected from each of the three departments—Criminology, Law and Society; Urban Planning and Public Policy; and Psychological Science

B. Seven additional courses (28 units - numbered 100-193) selected from Social Ecology or the departments of Criminology, Law and Society; Urban Planning and Public Policy; and Psychological Science. Course prerequisites established by the individual departments must be satisfied.

Students may petition to have two SOCECOL 199 courses (total of 8 units) count toward upper-division major credit, provided that the courses (1) were taken for a letter grade; (2) required a written term paper or research presentation at an academic conference; and (3) were taught by a Social Ecology faculty member whose name appears on a list maintained in the Social Ecology Student Services Office. Students may also petition graduate courses (numbered 200–209) to fulfill upper-division major requirements. A maximum of one PSCI 196 course may be counted toward the major. A maximum of one CRM/LAW C196 course may be counted toward the major.

## Social Ecology, Minor

The minor in Social Ecology embraces the unique and interdisciplinary spirit of the School of Social Ecology. Students take courses from all three of the school's departments: Criminology, Law & Society, Psychological Science, and Urban Planning and Public Policy. Students graduate with a well-rounded understanding of how these disciplines intersect and inform an understanding of social, psychological, environmental, and legal problems. Students also learn how research can address these problems with the intent of finding solutions.

**Learning objectives** for this minor include:

1. Develop an understanding, both theoretical and empirical, of social, psychological, environmental, and legal problems and the settings in which they occur, ranging from the interpersonal to the societal/global.
2. Develop the ability to examine these problems through the application of social scientific and naturalistic research methods.
3. Develop an awareness of the challenges inherent in translating research findings to inform policies and practices to mitigate these problems.
4. Develop skills and knowledge in preparation for the needs of today's workplace.

### A. Three lower-division courses (12 units)

CRM/LAW C7	Introduction to Criminology, Law and Society
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SOCECOL E8

or

UPPP 4

Introduction to Urban Studies

Select one of the following courses:

PSCI 9

Introduction to Psychology

PSCI 11B

Psychology Fundamentals

PSCI 11C

Psychology Fundamentals

### B. Six upper-division courses (24 units):

Three courses (12 units). One upper-division course (numbered 100-196) selected from each of the three departments-Criminology, Law and Society; Urban Planning and Public Policy; and Psychological Science.

Three additional courses (12 units). Selected from Social Ecology or the departments of Criminology, Law, and Society; Urban Planning and Public Policy; and Psychological Science. Course prerequisites established by the individual departments must be satisfied.

NOTE: Students pursuing a major in the School of Social Ecology may not use upper-division coursework for both school major or minor requirements. No overlap is permitted. SOCECOL 198 and SOCECOL 199 may not be applied toward the minor.

## Social Ecology, Ph.D.

For more detailed catalogue information regarding doctoral programs in the School of Social Ecology, please select the appropriate department for which the program is offered.

The training program that leads to the Ph.D. in Social Ecology allows students to develop a tailored course of graduate study that draws upon the knowledge of several traditional academic disciplines. The emphases of this training program are in keeping with the academic mission of the School, namely, its emphases on an interdisciplinary approach to theory and research, and the application of research to policy and intervention. Students are encouraged to integrate the diverse theoretical and methodological insights of several disciplines to analyze important social and environmental problems from a perspective of breadth as well as depth.

### Course Requirements

The following **five core courses** are required:

A. Complete:

SOCECOL 200	Seminar in Social Ecology
SOCECOL 264A	Data Analysis
SOCECOL 264B	Data Analysis

B. Select one of the following:

CRM/LAW C201	Research Methods
UPPP 297	Research Design
PSCI P201	Research Methods in Psychology

B. Complete one additional approved graduate research methods or statistics course.

C. In addition, students must take a minimum of six elective courses, chosen in consultation with their faculty advisor.

### Second Year Research Project Requirement

Students are strongly encouraged to become involved in research very early in their graduate careers by participating in the research projects of the faculty. Students complete a supervised research project before they begin work on their doctoral dissertation. Research is broadly construed to include experimental methods, questionnaire and interview studies, systematic field observation, secondary analyses, legal analyses, etc. Students should begin work on this **second year research project** during their first year and should complete the project during the second year in residence (preferably by the end of the winter quarter of the second year). The research project must be evaluated and approved by a committee of three Social Ecology faculty members. Normally, one faculty member will serve as the chair of the committee and the major advisor for the research, but students should consult with all three members of the committee about their research plans. [Note: Students who wish to submit the written report of their research as a thesis in partial fulfillment of the requirements for the M.A. must have the membership of their thesis committee approved by the Associate Dean of the School acting on behalf of the Dean of the School and must be advanced to M.A. candidacy the previous quarter. Please see information on M.A. in Social Ecology]. Please contact the Assistant Director of Graduate Affairs if you have any questions.

A written report of the research must be prepared for evaluation by the members of the committee. The report typically will be comparable in scope and format to articles that appear in leading journals in the social and behavioral sciences. Approval of the student's research project must be certified by obtaining the signature of each committee member on a form that is available by contacting the Assistant Director of Graduate Affairs.

### Breadth Requirement

Students complete the **Breadth Requirement** during their **third** year of study, through which they demonstrate mastery of theory, research, policy, and practice on two social or environmental problems relevant to Social Ecology, or two papers on a single problem provided the two papers are clearly distinct (e.g., a review of research literature on the problem and a separate empirical analysis bearing on the problem). Writing one paper for each of the two problems selected, or the two papers on a single problem, meaning a total of two papers written, satisfies the Breadth Requirement. The papers should be different from the second-year research project and demonstrate an interdisciplinary understanding of relevant research bearing on these two problems and show how that research can inform policies, programs, or practices designed to solve or mitigate these problems. Each student's plans for completing the Breadth Requirement are developed in consultation with a committee of three Social Ecology faculty members and the Faculty Graduate Advisor. Students are encouraged to assemble and meet with this committee as early as possible during their graduate career, and are required to do so by no later than the third quarter of their second year of study. Please contact the Assistant Director of Graduate Affairs for details.

Once the student's plans have been approved and implemented, the committee will review the student's work to evaluate whether the Breadth Requirement has been fulfilled and to recommend additional work if it is deemed necessary. The Breadth Requirement must be completed before the student can advance to candidacy for the Ph.D.

### Advancement/Prospectus Requirement

The fourth year of study is devoted to developing and defending a dissertation proposal and conducting dissertation research. The normative time for advancement to candidacy is four years. Students complete the dissertation in their fourth or fifth year. See additional information under Advancement

and Dissertation. Please take special note of the School of Social Ecology deadline that requires students to advance to candidacy for the Ph.D. by the end of their fifth year of study.

## **Dissertation**

The final years of doctoral study are devoted to developing and defending a dissertation proposal and conducting dissertation research. Students should strive to complete all requirements for the Ph.D. in Social Ecology by their fifth year of study, but those requirements must be completed no later than their seventh year of study, adjusted for any approved leaves of absence that the student may have taken. Failure to complete all degree requirements by the end of the seventh year may result in initiation of steps to terminate the student's status as a doctoral student.

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# School of Social Sciences

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## Bill Maurer, Dean

Social & Behavioral Sciences Gateway

Undergraduate Student Affairs: 949-824-6803

Graduate Student Affairs: 949-824-4074

<http://www.socsci.uci.edu>

Boundaryless. Google the term – coined by former GE CEO Jack Welch – and you'll learn that it's most often applied in business to explain an organization that throws caution to the wind, scrapping boundaries, and bureaucracies in order to tap the internal power of its people to directly enact change.

For more than 50 years, the School of Social Sciences has been putting this approach into practice, breaking down traditional barriers to create change in society, economies, and human well-being. But never has this boundaryless-mindset been more important than today.

The 21st century has brought on profound and previously unthinkable social change. We live longer and face new social, economic, and health challenges brought on by an aging population. Political, ethical, and environmental challenges are marked by ever-increasing uncertainty and, paradoxically, the easy availability of more and more data about us.

These challenges know no boundaries – they stop at no border and they aren't limited to one discipline.

That's why social scientists at the University of California, Irvine are facing them head on, together.

Our students, who comprise nearly 20 percent of the entire UCI student body, are in the conflict zones of the Middle East and teaching global awareness in Orange County high schools. They are in our groundbreaking behavioral economics labs, testing new methods to reduce traffic congestion, create better online marketplaces, and prevent the spread of disease. They are in our brain, behavior, and cognitive robotics labs – mapping the structure of the human brain to understand how speech works in order to help restore it in victims of stroke, and building interactive robots aimed at improving social engagement in children with ADHD and autism. Our students are doing fieldwork in India, Africa, China – indeed, everywhere on the planet, exploring fundamental issues of peace, politics, population, migration, and cross-cultural communication.

Our faculty are breaking with convention to forge connections with computer science, engineering, the arts and the humanities. Interdisciplinary work with law, medicine, and environmental science helps our researchers educate policy makers on the social, cultural, and psychological factors impacting regulation and policy adoption, health and human behavior.

Our maverick spirit and openness to new approaches and unexpected collaborations has kept us nimble and at the cutting-edge in a number of fields as different as transportation economics, cultural anthropology, the philosophy of physics and biology, and the sociology of mass movements.

Our world-class professors in our seven top-ranking departments are experts in their fields, consistently sought by national media to provide perspective on innovative discoveries and pressing social problems. Our faculty are teaching courses within the most popular majors on campus and leading more students to successful graduation than any other academic unit at UCI.

Our alumni – numbering more than 50,000 strong – are taking their world-class education from our Irvine classrooms to the halls of justice in D.C. and international relations work in capitals around the world, to entrepreneurial endeavors from Northgate to Northern Africa, to courtrooms across the nation, boardrooms in some of the world's top companies, and classrooms around the globe where they're training our next generation of leaders.

And we're just getting started.

Learn more within these pages about our degree programs, research centers, student programs, and opportunities. Involvement in any one of our endeavors helps us in our continuing effort to push the limits in traditional social sciences work because we believe that solutions to some of society's greatest challenges lie in our ability to break the mold, to be boundaryless.

Join us in our pursuit. –*Dean Maurer*



## Special Facilities

The school maintains several special facilities for research and education.

The **Social Sciences Research Laboratory**, used for both faculty and student research, occupies the entire fourth floor of the Social Sciences Laboratory Building. The facility contains 40 experiment and control rooms and several specialized facilities including a virtual reality facility and cognition laboratory.

Three **Computer Laboratories** provide access to networked systems, where students can work on assignments using full-featured word-processing, database, graphics, and statistical packages. In addition, these computers provide students with access to e-mail and Internet services. The Social Science Plaza facility contains state-of-the-art, high-tech lecture halls and is fully Internet accessible.

The **Social Sciences Academic Resource Center (SSARC)** was created over a decade ago to help School of Social Sciences students obtain the appropriate information to select a career and/or graduate school program, generate professional contacts, and learn how to gain a competitive edge during their undergraduate years. Centered around the five educational pillars (academics, research, practical experience, leadership, and community service), the SSARC offers valuable services, programming, and resources ranging from resume consultation, internship opportunities, and graduate school guidance, to research and leadership training. Through one-on-one consultations and various co-curricular programs, staff assist students with developing an educational blueprint that will ensure a quality educational experience while developing a strong educational portfolio and transforming each student into successful leaders within their chosen careers. Visit the Social Sciences Academic Resource Center website (<http://www.ssarc.socsci.uci.edu/>) for more information.

**Social Sciences Undergraduate Student Affairs (SSUSA)** provides general and detailed information about UCI, the School of Social Sciences, and specific requirements exclusive to the majors and minors in the school to students, faculty, administrators, and the general public. SSUSA is fully staffed with academic advisors who speak one-on-one with students regarding their UCI academic career as well as opportunities beyond the classroom. There are also eight peer academic advisors available to undergraduates for walk-in advising regarding requirements and classes. Visit the Social Sciences Undergraduate Student Affairs website ([http://www.undergrad.socsci.uci.edu/ugs\\_usa/](http://www.undergrad.socsci.uci.edu/ugs_usa/)) for more information.

The **Experimental Social Science Laboratory**, launched in fall 2011, is dedicated to experimental studies on individual and interactive decision making in the social sciences. The facility is available to researchers in all social science disciplines and can accommodate up to 40 research subjects at a time for computer-based studies of human behavior. Researchers interested in using the facility, and students interested in participating in paid studies, should visit Experimental Social Science Laboratory website (<http://www.essl.socsci.uci.edu/>) or email [essl@ss.uci.edu](mailto:essl@ss.uci.edu).

The **School of Social Sciences Anechoic Research Facility** opened in fall 2011 as a shared school resource for use by all faculty who have an interest in auditory research. The facility includes a large (12.5' x 12.5' x 7' interior) acoustically isolated RF-shielded chamber for free-field research and a second smaller RF-shielded steel booth for research using headphones. The facility has access to state-of-the-art equipment including a harmonizer, function generators, oscilloscopes, mixers/equalizers, amplifiers, ABR setup (auditory brainstem recording), and research-quality vocal microphones and headphones. To learn more about the facility, or to request time for use, visit the School of Social Sciences Anechoic Research Facility website (<http://faculty.sites.uci.edu/anechoic/>).

Part of the campuswide strategic initiative to assume leadership in brain imaging and analysis, the Facility for Imaging & Brain Research (FIBRE) (<http://imaging.uci.edu/fibre/>) joins the Neuroscience Imaging Center and Preclinical and Translational Imaging Facility under the auspices of the Campus Center for Neuroimaging to make UCI the place where tomorrow's technologies for studying the human brain take flight. Housed in the Social and Behavioral Sciences Gateway, FIBRE is the newest imaging facility on campus and provides researchers access to the latest technology in structural MRI, fMRI, MRS and diffusion imaging. The facility is a collaborative endeavor of the School of Biological Sciences, School of Social Sciences, School of Medicine, School of Education, School of Engineering, School of Social Ecology, Health Affairs, and Office of Research.

## Centers for Research

The UC Irvine branch of the **California Census Research Data Center** is a partnership between the School of Social Sciences and the U.S. Census Bureau. The on-campus site allows UCI researchers access to confidential Census data that is central to high quality research in economics, sociology, health services, public health, transportation, law, and business. With these data, researchers can link information about the policy environment at a detailed geographic level with micro level data on public health, transportation, labor, crime, education and other highly relevant public policy-oriented outcomes. The result? Studies that address pressing policy needs – like how crime impacts local businesses, or how educational attainment effects labor earnings at local and national levels. Data accessible through the center includes U.S. Census records as well as datasets from the National Center for Health Statistics and Agency for Healthcare Research and Quality and others. Learn more at Census Research Data Center website (<http://www.ccrdc.uci.edu/>).

The **Center for Administrative Data Analysis (CADA)** partners with organizations to help better utilize data to answer core questions and advance scientific understanding. The center believes that substantial progress on important issues can be made by making better-informed decisions. Center data infrastructure and faculty expertise enable analyses that address questions that are vital to society. Research affiliates believe that important societal questions deserve answers, and they seek to help schools, clinics, and others serving the public good get the evidence they need to do so more effectively. Learn more at the CADA website (<https://www.cada.socsci.uci.edu/>).

The **Center for the Advancement of Logic, its Philosophy, History and Applications (C-ALPHA)** provides a formal structure that strengthens extant cross-disciplinary connections while fostering new ones. Modern logic is the science of valid inference. Not being restricted to any particular subject matter, it applies to all human endeavors that aspire to an understanding of rationality, the discovery of proofs, the assessment of evidence,

or the establishing of truths - including the physical sciences, the formal sciences like mathematics and legal theory, as well as the social sciences, whether they follow quantitative or qualitative research paradigms. Learn more at the Center for the Advancement of Logic, its Philosophy, History and Applications website (<http://www.calpha.socsci.uci.edu/>).

The **Center for Asian Studies** at the University of California, Irvine is comprised of more than 40 interdisciplinary faculty members who study China, Japan, Korea, India, and Southeast Asia and enhance the study of the many countries and cultures of Asia. Housed in the School of Social Sciences, the Center provides a forum for discussions across geographic and disciplinary boundaries both on campus and within the community. Learn more at the Center of Asian Studies website (<http://www.asianstudies.uci.edu/>).

The **Center for Citizen Peacebuilding** at UCI is a distinctive international clearinghouse for research, education, and action on public peace processes. The program focuses on how citizens participate in these activities to prevent violent conflict and, if violence occurs, to promote reconciliation, and sustainable peace. The purpose is to significantly contribute to the theory and practice of conflict resolution. Learn more at the Center for Citizen Peacebuilding website (<http://www.peacebuilding.uci.edu/>).

The **Center for Cognitive Neuroscience and Engineering (CENCE)** is a multidisciplinary research center aimed at understanding the relation between cognitive abilities and neural systems through brain imaging, brain mapping, computational modeling, informatics, and engineering techniques. The center's research focus in cognitive neuroscience and engineering spans a wide range of methods involving human and animal work, and engineering techniques, such as BCI, BMI, biorobotics, computational neuroscience, neuroinformatics, neuromorphic engineering, neurorobotics, signal processing, image analysis, and mathematical models of brain data. Learn more at Center for Cognitive Neuroscience and Engineering website (<http://www.cence.socsci.uci.edu/>).

The **Center for Decision Analysis**, located in the **Institute for Mathematical Behavioral Sciences (IMBS)** in the School of Social Sciences, is a specialized research center where the objective is to facilitate interaction and common research goals among scientists whose purpose is to formulate precisely and test theories of human behavior. This is to be interpreted in a wide sense as manifested by the membership which spans the following areas: anthropology, cognitive science, economics, engineering, logic and philosophy of science, mathematics, political science, and sociology. Additional faculty come from management science and psychobiology. To describe the focus, consider the fruitful symbiotic relationship that has existed for millennia between mathematics and the physical sciences. A goal of IMBS is to generate a similar relationship between mathematics and the behavioral and social sciences. With high-power social scientists (several are members of the National Academy) providing insights about the field and working with the mathematicians who are involved, new mathematical approaches to analyze these issues are being developed and new kinds of mathematical questions are being raised. For more information, visit the Institute for Mathematical Behavioral Sciences website (<http://www.imbs.uci.edu/>).

The **Center for Demographic and Social Analysis (C-DASA)** advances population science by bridging academic units to identify common research interests and exchange new conceptual approaches and analytic methods. Serving 50 UCI faculty members in a dozen departments, as well as their graduate and postgraduate trainees, the Center is committed to research on the critical issues shaping the well-being of local, national, and global populations. Faculty affiliates are recognized for award-winning research, ranging from China's one-child policy to global influenza epidemics, from programs to raise school achievement to social networks that link local neighborhoods. C-DASA promotes innovative research by fostering multidisciplinary exchange, supporting collaboration, and building the advanced infrastructure essential for demographic research and training in the 21st century. For additional information, including upcoming seminars, visit the Center for Demographic and Social Analysis website (<http://www.cdasa.socsci.uci.edu/>).

Established in 2016 with generous funding from the Laura and John Arnold Foundation, as well as the UCI School of Social Sciences and community members, UCI's **Economic Self-Sufficiency Policy Research Institute (ESSPRI)** spearheads original and cutting edge research on the effectiveness of policies and programs designed to support economic self-sufficiency. Learn more at the ESSPRI website (<http://esspri.uci.edu/>).

Established in 2006, the **Center for Ethnography** works to develop a series of sustained theoretical and methodological conversations about ethnographic research practices across the disciplines. It supports innovative collaborative ethnographic research as well as research on the theoretical and methodological refashioning of ethnography for contemporary cultural, social, and technological transformations. Learn more at the Center for Ethnography website (<http://www.ethnography.uci.edu/>).

The **Center for Global Peace and Conflict Studies (CGPACS)** is a multidisciplinary research unit housed in the School of Social Sciences. The mission of CGPACS is to promote research on international problems and processes. Current research emphases include weapons of mass destruction, especially biological weapons; international governance, focusing on the evolution of international norms and institutions; citizen peace building; international environmental cooperation; and religion in international affairs. CGPACS also sponsors research conferences and public colloquia on topics of current significance. The Center's Margolis Lecture brings to UCI high-profile speakers who have played active roles in international affairs. Recent Margolis Lectures have featured Justice Louise Arbour, former chief prosecutor for the International Criminal Tribunals; Chinese democracy activist Wei Jinsheng; Congressman Christopher Cox; former Secretary of State Warren Christopher; and former Secretary of Defense William Perry. Visit the Center for Global Peace and Conflict Studies website (<http://www.cgpac.uci.edu/>) for more information.

The **Center for Language Science** is a multidisciplinary, interactive research community aimed at understanding how language is organized in the human mind, how this system of knowledge is learned, how is it understood and expressed, and how it is represented and processed by the brain. This effort spans a wide range of scientific research areas, from basic and clinical hearing research to computational and psychological models of the structure and processing of linguistic knowledge to detailed neuroanatomical models hearing, comprehending, and speaking derived from advanced neuroimaging and clinical-based methods. Accordingly, Center faculty are drawn from several departments and schools at UCI including Cognitive

Sciences, Psychological Science, Anthropology, Computer Science, Logic and Philosophy of Science, Mathematics, Education, Humanities, Biological Sciences, and Medicine. The Center for Language Science has three specific aims: (1) to promote an integrated, multidisciplinary research program on language from the unique and diverse perspective afforded by UCI's faculty; (2) to promote and guide training in the field of language science; and (3) to inform and guide the development of new clinical applications for hearing, speech, and language disorders that impact millions of people worldwide. Learn more at the Center for Language Science website (<http://www.languagescience.socsci.uci.edu/>).

The purpose of the **UCI Center for Research on Immigration, Population, and Public Policy** is to foster and conduct basic and policy-relevant research on international migration and other population processes, with a main focus on U.S. immigration. In order to encourage multi-investigator, multidisciplinary, and interdisciplinary research projects, the Center organizes informal discussions of ideas for future research projects, "brainstorming" sessions about research funding opportunities, "brown-bag" presentations of research findings, and workshops and conferences. Much of the Center's research focuses on the multigenerational incorporation experiences of immigrant groups in the United States, especially those occurring in diverse contexts such as Southern California. Investigations of this type often devote as much attention to what happens to the children and grandchildren of immigrants as to what happens to immigrants themselves. For more information, visit the UCI Center for Research on Immigration, Population, and Public Policy website (<http://www.immigrationresearch.uci.edu/>).

The **Jack W. Peltason Center for the Study of Democracy (CSD)** continues the work of the UCI Focused Research Program on Democratization that was founded in 1991 and sponsors research and training on the process of democratic transition and the expansion of the democratic process in already established democracies. CSD includes a multidisciplinary faculty from four UC campuses. CSD's activities are focused on three areas. First, faculty administer a graduate training program on empirical democratic theory. The National Science Foundation selected UCI in 1995 as a national center for the training of doctoral students in democratization issues; the five-year NSF grant provides funding for graduate fellowships and other training activities. Second, the democracy research program aims at improving the democratic process in the United States and other established democracies as we enter the next century. The program focuses on reforms to increase the ability of citizens to express their preferences and have these preferences represented within the democratic process. Third, CSD supports research on the development of sustainable democracies in Eastern Europe, East Asia, and other new democracies. The New Democracies Initiative contributes to the promotion of democracy in these formerly authoritarian systems. For more information visit the Center for the Study of Democracy website (<http://www.democracy.uci.edu/>).

The **Institute for International, Global and Regional Studies (IGARS)** was created to be a hub for research and teaching at UCI on the interactions of politics, economics, societies, cultures, and history in global and international affairs. It provides a calendar of events, hosts the bi-weekly International Studies Public Forum and monthly research seminars, collaborates with over 17 other campus centers, and promotes seed funding for collaborative research activities on international and global issues. Faculty associated with IGARS participate in the international studies undergraduate major and honors program and the minor in conflict resolution. Learn more at the Institute for International, Global and Regional Studies website (<http://www.internationalstudies.socsci.uci.edu/>).

The **Institute for Money, Technology and Financial Inclusion (IMTFI)** was formed in 2008. Its mission is to support research on money and technology among the world's poorest people: those who live on less than \$1 per day. IMTFI seeks to create a community of practice and inquiry into the everyday uses and meanings of money, as well as the technological infrastructures being developed as carriers of mainstream and alternative currencies worldwide. Learn more at the Institute for Money, Technology and Financial Inclusion website (<http://www.imtfi.uci.edu/>).

The **UCI Interdisciplinary Center for the Scientific Study of Ethics and Morality** was established in 2003 by a group of scholars interested in recent scientific research that yields insight on the origins and causes of morality. In creating the center, UCI faculty both address a topic that is becoming one of the new frontiers in science and reflect critically on the moral implications of this new frontier. The center focuses on the etiology of ethical behavior and differs in several important ways from existing centers dedicated to the discussion of ethics. Traditional academic approaches tend to originate in philosophical, foundational, or religious discussions of ethics. They tend to be humanistic in orientation and emphasize abstract, theoretical considerations of what constitutes ethics and morality. The center complements this traditional approach and explores the scientific and/or the empirically verifiable factors that influence morality, using a variety of methodologies that examine factors contributing to and driving moral action in a variety of social, psychological, and biological contexts. The center encourages ties between scholars interested in ethics in humanities and the sciences—including social science, social ecology, biological sciences, and medicine—building on the interdisciplinary tradition at UCI, complementing, rather than duplicating, existing efforts. Visit UCI Interdisciplinary Center for the Scientific Study of Ethics and Morality website (<http://www.ethicscenter.uci.edu/>) for more information.

## Honors

Graduation with Honors. No more than 16 percent of the graduating seniors, who have completed at least 72 units in the University of California will receive honors: approximately 2 percent *summa cum laude*, 4 percent *magna cum laude*, and 10 percent *cum laude*. The student's cumulative record at the end of the final quarter is the basis for consideration for awarding Latin Honors. To be eligible for consideration for honors at graduation, the student must, before the end of winter quarter of the senior year, have submitted an Application for Graduation; be officially declared as a major within the School of Social Sciences; have all corrections to the academic record processed by the Registrar's Office; if completing the Language Other Than English general education requirement with a language exemption test, pass the test by the end of winter quarter; and be able to verify completion of all course work by the end of the spring quarter of the senior year. Other factors are listed in the Honors Recognition section.

**Dean's Honor List.** The quarterly Dean's Honor List is composed of students who have received a 3.5 grade point average while carrying a minimum of 12 graded units.

**Departmental Honors Programs.** Most departments in the School of Social Sciences offer an honors program (refer to the departmental information). Upon successful completion of the honors program, students graduate with honors in their respective majors and their transcripts note that they were in the honors program.

**Honor Societies.** Several departments in the School of Social Sciences belong to a national honor society. Eligibility is based on satisfying the requirements of the specific honor society. In the School of Social Sciences, these national honor societies include Lambda Alpha Kappa (Anthropology), Omicron Delta Epsilon (Economics), Pi Omicron of Pi Sigma Alpha (Political Science), Psi Chi (Psychology), Pi Gamma Mu (Social Sciences), Sigma Iota Rho (International Studies), and Alpha Kappa Delta (Sociology).

**Order of Merit.** The Dean of the School of Social Sciences' Order of Merit award recognizes the most outstanding graduating undergraduates and graduate students for their academic achievements, contributions to the School, and service to the campus and community.

**Kathy Alberti Award for Graduate Student Excellence.** This award recognizes a graduate student who holds truly outstanding promise as a future professor or teacher.

**Alumni Academic Excellence Scholarship.** This scholarship recognizes an undergraduate for outstanding academic performance and service to the School, campus, and community.

**The Ruth Fulton Benedict Prize.** This prize recognizes outstanding writing in anthropology by an undergraduate.

**Steve Borowski Scholarship.** This scholarship is awarded to an exemplary School of Social Sciences student athlete. The award winner is selected from among a pool of Social Sciences student athletes based on academic merit and extracurricular involvement. Coaches may also nominate outstanding Social Sciences student athletes. Athletes interested in being considered should contact their coaches. Administered by Athletics. Award varies.

**The Boukai Family Foundation Middle East Studies Student Initiative Research Award.** This award recognizes MESSI students for academic excellence. Applicants must be full-time MESSI students with a 3.0 GPA or higher.

**James N. Danziger Award for Teaching Excellence.** This award recognizes a Political Science graduate student who has advanced to candidacy for teaching excellence.

**David Easton Award.** This award is given for the outstanding qualifying paper written by a Political Science graduate student during the preceding academic year.

**Harry Eckstein Award for the Outstanding Undergraduate Honors Thesis.** This award is given annually for the best honors thesis written by a Political Science major.

**Harry Eckstein Memorial Fund.** The Harry Eckstein Memorial Fund is presented annually to Political Science graduate students conducting research toward the completion of the Ph.D. in Political Science at UCI. Recipients of the award are designated as Eckstein Scholars.

**Jean-Claude Falmagne Research Award.** This award is given to a Cognitive Sciences graduate student who has advanced to candidacy for the Ph.D. The award is to support the student's summer research activity.

**Jeff Garcilazo Scholarship.** This award, established in honor and memory of the late Chicano/Latino Studies and History professor Jeff Garcilazo, is awarded annually to the undergraduate student author(s) of the best research paper(s) in Chicano/Latino Studies, to provide opportunities for students to examine the historical and contemporary experiences of Latino communities.

**Sheen T. Kassouf Endowed Fellowship.** The fellowship is awarded to a student enrolled in the UCI Economics doctoral program. Graduate students in all areas of economics are eligible, with the major criteria for the award being excellence in course work and research.

**The Justine Lambert Prize in Foundations of Science.** This award is given every other year to the best submitted graduate paper on the foundations of logic, mathematics, and the empirical sciences. The competition is open to all graduate students at UCI, regardless of department or school affiliation.

**Charles A. Lave Paper Prize for Creative Modeling in Social Sciences.** The prize is awarded to any UCI undergraduate or graduate student and may be in any social or behavioral science discipline, or interdisciplinary. It may be qualitative (with words only) or quantitative (with mathematical expressions). The prize will be awarded to a paper that displays creative modeling; points to or includes data that permits model evaluation; and exhibits the clear writing and brevity that Charles Lave valued.

**Alice B. Macy Outstanding Undergraduate Paper Award.** This award is given to a Social Sciences undergraduate student in any discipline for a paper that demonstrates original research.

**The Malinowski Prize for Undergraduate Research.** This award recognizes outstanding original research in the area of anthropology.

**Thomas W. McGillin Scholarship.** This scholarship is given to an undergraduate who is a first-generation citizen of this country with at least one foreign-born parent.



**Outstanding Legal Scholar Scholarship.** This scholarship is given to an undergraduate who has achieved outstanding academic achievement as well as contributing to the UCI Law Forum program.

**Outstanding Transfer Student Scholarship.** This scholarship is given to an outstanding community college transfer student in the School of Social Sciences.

**Sanli Pastore & Hill, Inc. Excellence in Economics Writing Award.** The Institute for Mathematical Behavioral Sciences (IMBS) awards this paper prize for the top graduate student paper in economics or decision analysis. Students who have written papers in game theory, economic theory, mathematical economics, decision analysis, and related areas are encouraged to submit them for consideration.

**Jack and Suzie Peltason Scholarship.** This award is given at the discretion of the department chair to support and facilitate the education of undergraduate Political Science majors. All undergraduate political science majors are eligible to apply.

**Pi Omicron Award for Outstanding Political Science Major.** This award is given annually by UCI's Pi Omicron Chapter of Pi Sigma Alpha to a graduating senior Political Science major who best exemplifies a commitment to academic excellence and public service.

**A. Kimball Romney Outstanding Graduate Paper Award.** This award is given to a Social Sciences graduate student in any discipline for a paper that demonstrates original research.

**David and Kristen Rosten International and Community Service Scholarship.** This scholarship is awarded to an undergraduate who is planning a career in public service in either the domestic or international community.

**Vicki Ruiz Award.** This award is given to graduating seniors in Chicano/Latino Studies who have achieved scholarly excellence and service. Nomination by faculty in the Department of Chicano/Latino Studies is required for this award.

**Elena B. and William R. Schonfeld Scholarship.** This scholarship is awarded annually in the School of Social Sciences to the outstanding undergraduate who combines excellence in scholarship with dedication to the University community and the highest level of achievement in other fields. The award is available to students with one year remaining prior to graduation.

**School of Social Sciences Outstanding Graduate Scholarship Award.** This award is for high intellectual achievement by a Social Sciences graduate student.

**School of Social Sciences Outstanding Graduate Student Service Award.** This award is for contributions to the Social Science community, including the intellectual growth of others.

**School of Social Sciences Outstanding Undergraduate Honors Thesis Award.** This award is for the outstanding undergraduate honors thesis.

**School of Social Sciences Student Athlete Award.** This award is given to a Social Sciences student who has demonstrated outstanding academic achievement as well as significant contributions to the UCI Athletics Department.

**Gary Singer Scholar Athlete Award.** This award is for a student athlete who has outstanding academic achievement as well as contributions to their sport.

**Robin M. Williams Award.** This award is given to an undergraduate student and a graduate student for the best research paper in the field of sociology.

**John I. Yellot Scholar Award.** This award is given to a Cognitive Sciences graduate student who has not yet advanced to candidacy for the Ph.D. The award is to support the student's summer research activity.

## Community Outreach

The **Ambassador's Council** has been created to promote and enrich the school by supporting new and existing school-wide/department projects. It collectively acts as an official student in discussing program development with administrators and department chairs and other faculty.

**Global Connect** is a university led curriculum program through which UCI social sciences faculty, undergraduate and graduate students bring their knowledge of international issues into high school classrooms in order to better prepare students to become informed global citizens. UCI faculty and students develop global issue-focused lesson plans on topics such as UN millennium development goals, mass media and technology, and the purpose of NGOs – areas of study in which UCI experts are known internationally, but subjects which are not part of the current California state education standards. Lessons are team-taught by UCI students and faculty alongside high school educators in Newport Mesa and Saddleback School Districts. The real-time course content, updated annually, reflects the continually changing global landscape while bringing new and updated university research directly to high school teachers - a challenge that traditional textbook publishing schedules are unable to keep up with.

**HABLA** is a broad-spectrum Latino-focused educational outreach program based in the School of Social Sciences and created by Professor Virginia Mann in 2000 with the support of the Orange County Children and Families Commission. Its purpose is to increase the school readiness of disadvantaged children ages two–four years, by uniting faculty and students at UCI with the Santa Ana Unified School System, local Families Resource Center, Americorp/VISTA, FACT, and the national Parent Child Home Program (PCHP).

**Jumpstart** was established on the UCI campus by Professor Virginia Mann in 2003. Students involved as Jumpstart members are paired with children participating in pre-school programs in the local Orange County area. The purpose is to help young students develop language, literacy, and social skills. Social Sciences undergraduates usually serve with Jumpstart for a full school year. The UCI Jumpstart program recruits, trains, and supervises UCI students to work with Head Start and other early-childhood programs in low-income communities of Orange County.

- Department of Anthropology
- Department of Chicano/Latino Studies
- Department of Cognitive Sciences
- Department of Economics
- Department of Global and International Studies
- Department of Language Science
- Department of Logic and Philosophy of Science
- Department of Political Science
- Department of Sociology

## Requirements for the Bachelor's Degree

**All students must meet the University Requirements.**

### School Requirements

1. Familiarity with basic mathematical, computational, and statistical tools underlying modern social sciences. This requirement is met by passing a three-course sequence in mathematics selected from the following: ANTHRO 10A-ANTHRO 10B-ANTHRO 10C; MATH 2A-MATH 2B and either STATS 7 or MGMT 7 or PUBHLTH 7A; POL SCI 10A-POL SCI 10B-POL SCI 10C; PSYCH 10A-PSYCH 10B-PSYCH 10C; SOC SCI 10A-SOC SCI 10B-SOC SCI 10C; or SOCIO 10A-SOCIO 10B-SOCIO 10C. (NOTE: School of Social Sciences majors may not take SOC SCI 9A-B-C to fulfill the mathematics requirement.) Computer education is essential for a complete social science education. This requirement can be satisfied by passing I&C SCI 31, PSYCH 114M, or SOC SCI 3A. Departments may have preferences for specific courses. Students should see their major department for acceptable courses. This course requirement should be taken during the student's first year.
2. An understanding of the fundamental concepts, analytical tools, and methods of social science. This requirement is met by taking two four-unit introductory courses in the School of Social Sciences. (Such courses include ANTHRO 2A, ANTHRO 2B, ANTHRO 2C, ANTHRO 2D, ECON 1, INTL ST 1, LSCI 3, POL SCI 11A, POL SCI 11B, POL SCI 11C, PSYCH 7A, SOC SCI 1A, SOC SCI 5A, SOC SCI 5B, SOC SCI 5D, SOCIO 1, SOCIO 2, SOCIO 3). These courses normally should be taken during the student's first year. For students majoring in Cognitive Sciences, the requirements are waived due to the academic rigor of the B.S. curriculum.
3. An understanding of important advanced areas in social science. This requirement is met by passing satisfactorily nine four-unit upper-division courses in the School of Social Sciences, where at least three of these courses comprise core courses or a module.
4. Four additional four-unit social science courses from any level.
5. No more than two courses numbered 198-199 may be used towards a degree requirement (excluding majors in the Department of Cognitive Sciences and Economics which allow three such numbered courses).

Students are reminded that the Pass/Not Pass option is not applicable to course requirements 1 through 5 above or to any additional requirements listed for specific major programs. However, I&C SCI 31, PSYCH 114M, or SOC SCI 3A are exceptions to this rule and may be taken Pass/Not Pass, except for those whose majors are B.S. in Cognitive Sciences and/or B.A. in Social Policy and Public Service as I&C SCI 31 or PSYCH 114M or SOC SCI 3A are major requirements.

Courses used to meet requirements 2 through 5 above are included in the computation of the grade point average in courses required in the major program.

**Maximum Overlap Between Major and Minor Requirements:** Students completing both a major and a minor within the School of Social Sciences may count courses taken to fulfill the School's mathematics and computer science requirement toward satisfaction of both the major and the minor. No other course overlap is allowed. For students completing a major within the School of Social Sciences and a minor outside of the School of Social Sciences, a maximum of two courses may overlap between a major and a minor. For students pursuing a minor in Mathematics, Psychological Science, or Statistics, a total of three courses may overlap. No course overlap is permitted between minors.

- Anthropology, B.A.
- Anthropology, Minor
- Anthropology, Ph.D.
- Business Economics, B.A.
- Chicano/Latino Studies, B.A.
- Chicano/Latino Studies, Graduate Emphasis
- Chicano/Latino Studies, Minor
- Cognitive Sciences, B.S.

- Cognitive Sciences, Ph.D.
- Economics, B.A.
- Economics, Minor
- Economics, Ph.D.
- Global Studies, Graduate Emphasis
- Global Studies, Ph.D.
- Hearing and Speech Sciences, Minor
- International Studies, B.A.
- International Studies, Minor
- Language Science, B.A.
- Language Science, Ph.D.
- Linguistics, Minor
- Medical Anthropology, Minor
- Philosophy, Ph.D. (School of Social Sciences)
- Philosophy, Political Science, and Economics, M.A. (4+1)
- Political Science, B.A.
- Political Science, Minor
- Political Science, Ph.D.
- Psychology, B.A.
- Psychology, B.S.
- Psychology, Minor
- Quantitative Economics, B.A.
- Social Policy and Public Service, B.A.
- Social Science, M.A.
- Social Science, Ph.D.
- Sociology, B.A.
- Sociology, Minor
- Sociology, Ph.D.
- The Curriculum in Geography

## Undergraduate Programs

### Planning a Program of Study

Since there are many alternative ways to plan a program, some of which may require careful attention to specific major requirements, students should consult with the School of Social Sciences Undergraduate Student Affairs to design an appropriate program of study.

Students who select one of the School majors in their freshman year might begin by taking the one-digit courses required by their major and one of the mathematics sequences listed under Part A of the School requirements. It is a good idea to take these courses early since they include fundamental concepts that will be widely applicable in more advanced courses. In addition, the lower-division writing requirement of the general education requirement (category I) should be completed during the first year. In the sophomore year, the student might complete the course on computing, three courses toward the general education requirement, four courses in the social sciences, and four electives. Students who are planning to go on to graduate school can use their freshman and sophomore years to advantage by taking courses in theory, research methods, mathematics, and other areas important to graduate study. In the junior and senior years, the student should take courses in the major area and should create an individualized program of study through a combination of courses and course modules which fall in an area of interest. Particular attention should be paid to planning a program of study that will ensure that major requirements are met prior to graduation.

**Change of Major.** Students who wish to change their major to one offered by the school should contact the Social Sciences Undergraduate Student Affairs Office for information about change-of-major requirements, procedures, and policies. Information is also available at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>).

### Double Majors within Social Sciences

In fulfilling degree requirements for multiple majors, a maximum of two lower-division courses may overlap between any two majors.



## Other Double Majors

In fulfilling degree requirements for multiple majors, a maximum of two courses may overlap between any two majors. For students pursuing a major in Psychology and Social Behavior, a total of three courses (PSYCH 9A- PSYCH 9B-PSYCH 9C, same as PSCI 11A-PSCI 11B-PSCI 11C) may be overlapped.

## Mathematics and Social Sciences

The mathematics requirement stems from the nature of modern social science. The concepts and terms of mathematics, statistics, and computers are an important part of the social scientist's vocabulary. Basic knowledge of these tools is necessary to an understanding of current literature in the social sciences, to the analysis of data, and to an intelligent use of social science models. Each candidate for a degree in the School of Social Sciences is expected to have a basic knowledge of probability, statistics, and computing. In addition, for students who are preparing for graduate school in an area of social science, it will be important to supplement the minimal mathematics requirements with additional courses related to mathematics and social science methodology. The particular courses which would be recommended are not specified here, however, since they are highly dependent on the major emphasis of the student. Students who are preparing for graduate study should consult their advisors to determine a program of study which will give them the research skills necessary for successful graduate work.

## Transfer Study Recommendations

The School recommends that students wishing to transfer to UCI do the following:

1. Complete the Intersegmental General Education Transfer Curriculum (IGETC) prior to transfer to UCI.
2. Refer to the ASSIST website (<http://www.assist.org/web-assist/welcome.html>) for information about community college courses that will fulfill UCI lower-division major requirements.

Specific course recommendations:

Prospective **Quantitative Economics majors**: complete the equivalent of UCI's MATH 2D at a community college (in addition to the courses required for transfer student admission; see the Department of Economics section).

Prospective **International Studies majors**: complete two semesters of foreign language at the intermediate level.

Prospective **Psychology majors**: complete a three-course sequence in introductory, physiological, and either social or abnormal psychology.

## Transfer Students

**Freshmen and Sophomores**: Students transferring to UCI as freshmen or sophomores will fulfill the regular requirements of the four-year program either through work at UCI or through transfer credit for comparable work elsewhere.

**Juniors**: Following review by the School of Social Sciences, it may be determined that junior transfer students electing to major in one of the School's degree programs, who have good records at other accredited colleges and universities, have satisfied School requirement 2 and the University requirements. However, all transfer students must fulfill the upper-division writing general education requirement (category I) while at UCI. Students anticipating transfer to UCI in their junior year should plan their curriculum so as to anticipate the special mathematics requirement (School requirement 1). Every effort will be made to accommodate individual variation in background, provided students are prepared to commit themselves to intensive work in areas of deficiency. Ordinarily, the typical two-year program for junior transfers is simply the last two years of the regular four-year program, except that students who have not satisfied the mathematics requirements of the School should plan to do so in the junior year and must do so before graduation.

**Seniors**: Students wishing to graduate with a degree in the School by transferring to UCI in their senior year should plan their work carefully to ensure that the requirements can be met in one year of residence. In general, differences between the program at UCI and programs elsewhere make senior transfers difficult.

## Service Learning, Community Service, and Internships

Service learning is a meaningful educational activity that integrates community service within the curriculum. It is an opportunity for students to make positive contributions to underserved and marginalized communities through academic courses, field studies, and internships.

Service learning provides out-of-class experiences to reinforce understanding of academic theory while addressing serious community concerns. When combined with a structured curriculum that includes research components, students can explore the role of the social scientist while seeking solutions to problems affecting society. The School of Social Sciences' philosophy is to practice research, service, and good citizenship.

The School actively supports service learning through its philosophy of enhancing the learning process by motivating, inspiring, and teaching students how to recognize and accept their civic responsibilities. The goal is to educate students about social issues and provide them with the necessary tools to solve the difficult problems society faces. Under the guidance and supervision of faculty and staff, students are offered the opportunity to experience personal, professional, social, and intellectual growth through the following School of Social Sciences programs: public- and private-sector internships, community service, field studies, and the major in Social Policy and Public Service.

## Undergraduate Programs in K–12 Education

Undergraduate students who wish to pursue a career in the field of K–12 education are well-served in the School of Social Sciences and the School of Education. The following interrelated programs provide opportunities for students to gain knowledge and experience in this important area.

### Minor in Educational Studies

The minor in Educational Studies allows students to explore a broad range of issues in the field of education and provides a strong foundation for K-12 teaching. Both introductory and advanced courses are included, giving students a solid preparation for later teacher credential programs and many related occupations. NOTE: A Statement of Intent is required of all students wishing to enroll in this minor. See the School of Education section of the *Catalogue* for more information.

### School of Education Programs

The School of Education provides many other opportunities for prospective educators, including a mentoring program which provides students with valuable experience while they work with credentialed teachers; UC Links, a program in which undergraduates tutor K–8 students in after-school settings; and advising services provided by counselors who assist students in planning future careers in education. Further information about these programs is available from the School of Education counselors at 2001 Berkeley Place.

Students interested in obtaining a teaching credential should see the School of Education section of the *Catalogue* for information.

## Special Programs

### Campuswide Honors Collegium

The Campuswide Honors Collegium is available to selected high-achieving students from all academic majors from their freshman through senior years. For more information contact the Campuswide Honors Collegium, 1200 Student Services II; 949-824-5461; [honors@uci.edu](mailto:honors@uci.edu); or visit the Campuswide Honors Collegium website (<http://honors.uci.edu/>).

### UC Education Abroad Program

Upper-division students have the opportunity to experience a different culture while making progress toward degree objectives through the University's Education Abroad Program (EAP). UCEAP is an overseas study program which operates in cooperation with host universities and colleges throughout the world. Visit the Study Abroad Center website (<http://www.studyabroad.uci.edu/>) for additional information.

### Interdisciplinary Minors

A variety of interdisciplinary minors are available to all UCI students. The minor in Chicano/Latino Studies, offered by the School of Social Sciences, is designed to provide an awareness, knowledge, and appreciation of the language, history, culture, literature, sociology, anthropology, politics, social ecology, health, medicine, and creative (art, dance, film, drama, music) accomplishments of Chicano/Latino communities.

The **minor in Conflict Resolution**, sponsored by the International Studies program in the School of Social Sciences, provides skills in conflict analysis and resolution and a useful understanding of integrative institutions at the local, regional, and international levels. The curriculum includes training that students may apply toward State of California certification as a mediator.

Information about the following minors is available in the Interdisciplinary Studies section of the *Catalogue*.

The **minor in Civic and Community Engagement** seeks to provide students with the knowledge, skills, attitudes, and values to engage as citizens and active community members in the 21st century. The minor is distinguished both by *what* students learn, and by *how* they learn it.

The **minor in Global Sustainability** trains students to understand the changes that need to be made in order for the human population to live in a sustainable relationship with the resources available on this planet.

The **minor in the History and Philosophy of Science** explores how science is actually done and how it has influenced history, and is concerned with determining what science and mathematics are, accounting for their apparent successes, and resolving problems of philosophical interest that arise in the sciences.

The **minor in Native American Studies** focuses on history, culture, religion, and the environment. The three core courses serve as an introduction to the Native American experience from the perspective of different historical periods and frameworks of analysis.

Information about the following interdisciplinary minors is available in the School of Humanities section.

The **minor in African American Studies** offers undergraduate students an opportunity to study those societies and cultures established by the people of the African diaspora and to investigate the African American experience from a variety of disciplinary perspectives and theoretical approaches.

The **minor in Archaeology** introduces students to modern archaeological theory and practice, to different approaches and theoretical frameworks used in the reconstruction of cultures based on their material remains, and the use of such approaches and frameworks in a comparative context that emphasizes one geographic area.

The **minor in Asian American Studies** examines the historical and contemporary experiences of Asians after their arrival in the United States and seeks to provide an awareness of the history, culture (e.g., literary and creative art accomplishments), psychology, and social organization of Asian American communities.

The **minor in Asian Studies** creates opportunities for students to explore Asian topics in a variety of fields, to develop advanced language skills, and to acquire broader perspectives.

The **minor in Latin American Studies** is designed to develop in students an awareness, knowledge, and appreciation of Latin American issues in the areas of language, history, culture, literary studies, sociology, anthropology, political science, health, folk medicine, and creative (art, dance, film, drama, music) accomplishments.

The **minor in Religious Studies** focuses on the comparative study of religions in various cultural settings around the world and seeks to provide a wide-ranging academic understanding and knowledge of the religious experience in society.

The **minor in Gender and Sexuality Studies** fosters critical and creative analysis of the various disciplinary perspectives—historical, political, economic, representational, technological, and scientific—that have (or have not) constituted women, gender, and sexuality as objects of study. Department of Gender and Sexuality Studies also offers a minor in Queer Studies.

## Careers in Social Sciences

Business and industry often look to social science graduates to fill positions in management, finance, marketing and advertising, personnel, production supervision, and general administration. In the public sector, a wide variety of opportunities are available in city, county, state, and federal government. Teaching is a frequently chosen career at all levels from elementary school teacher to professor. In addition, many graduates enter professional practice, becoming lawyers, psychologists, researchers, or consultants in various fields.

Because all degrees offered by the School of Social Sciences involve an educational program that is interdisciplinary and that prepares students to understand quantitative methods of data analysis, graduates are well-positioned for research and analysis careers at all levels of government and in private firms. Their solid grounding in contemporary social science methods and their familiarity with a broad spectrum of social scientific thinking gives them an excellent foundation for the pursuit of further training in graduate and professional programs.

The UCI Career Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. Additional information is available in the Career Center section.

The School of Social Sciences offers graduate training in the following areas: Anthropology (Ph.D. in Anthropology), Cognitive Sciences (Ph.D. in Cognitive Sciences), Economics (Ph.D. in Economics), Logic and Philosophy of Science (Ph.D. in Philosophy), Mathematical Behavioral Sciences (Ph.D. in Social Science), Politics and Society (Ph.D. in Political Science), and Sociology (Ph.D. in Sociology).

In addition, an interdisciplinary concentration in Public Choice is offered within the programs in Economics and Political Science, a concentration in Cognitive Neuroscience is offered within the program in Cognitive Sciences, a specialized concentration in Transportation Economics is offered within the program in Economics, an emphasis in Social Networks is offered within the Mathematical Behavioral Sciences concentration, and an emphasis in Global Studies is offered within the program in Global and International Studies. When an applicant's interests lie outside of or across these areas, the Associate Dean of Graduate Studies, School of Social Sciences, may, on rare occasions, appoint a three-member faculty committee to guide an independent course of study for the Ph.D. degree in Social Science.

The M.A. in Anthropology, Economics, Philosophy, Political Science, Psychology, Social Science, or Sociology may be conferred upon students in Ph.D. programs after completion of the necessary requirements.

Additionally, the M.A. degree program in Social Science with a concentration in Demographic and Social Analysis is supervised by faculty from the Schools of Social Sciences and Social Ecology. Students may apply directly to this M.A. program.

A concentration in Medicine, Science, and Technology Studies is available within the M.A. degree in Social Science.

A Master of Public Policy (M.P.P.) program is also available and is jointly supervised by faculty from the Schools of Social Sciences and Social Ecology. Students may apply directly to this program.

In cooperation with the UCI School of Education, students enrolled in a School of Social Sciences graduate program may choose to pursue a teaching credential while working toward their degree. After completion of requirements for an M.A. degree, students may apply for admission into the credential program administered by the School of Education. As required by law, the applicant must pass the California Basic Educational Skills Test (CBEST), obtain a Certification of Clearance, and successfully complete the appropriate subject area examination or an approved subject-matter program. A detailed description of the program may be obtained from the Social Sciences Graduate Office or the School of Education.

## Admission

Potential graduate students should apply by January 15 to receive fullest consideration for financial aid. Applicants should indicate the title of the degree sought (Anthropology, Economics, Political Science, Psychology, or Social Science), and the academic area of concentration (see above). All applicants

are required to submit Graduate Record Examination General Test scores. Letters of recommendation and the applicant's statement of interest are important factors in the admission decision.

In addition to the University admission requirements described in the Graduate Division section, individual graduate programs may prescribe special requirements or expectations of applicants, subject to the approval of the Graduate Council. Such requirements are minimum standards only; successful applicants typically must exceed them by a substantial margin.

## Financial Support

Many students receive financial support in the form of fellowships, teaching assistantships, or research assistantships available under grants to individual faculty. Before accepting an offer of admission with financial support for the first year, applicants should inquire about the likelihood of such support in future years. Occasionally, a newly admitted student may receive a multiyear commitment of some specified financial support, but this is not the rule. Students are also advised to seek aid from sources external to the University. NOTE: Teaching assistantships do not include remission of fees, tuition, or nonresident supplemental tuition.

## Length of Study and Residence

The normative time for completion of the Ph.D. degree is either five, six, or seven years, depending upon the specific program. See the department sections for information.

Students admitted to the M.A. concentration in Demographic and Social Analysis should be able to earn the M.A. within one to two years.

Because the intellectual training offered by the School requires full-time study and constant contact with the faculty, the School does not accept part-time students.

## Master of Arts Degree

The M.A. degree is awarded to UCI Ph.D. students who complete necessary requirements or to students currently enrolled in a Ph.D. program (or equivalent) at another institution who are directly admitted for graduate study leading only to the master's degree at UCI. Such applicants must provide evidence that their Ph.D. program agrees to this one-year arrangement. Requirements include the submission of a petition to the Graduate Committee along with a proposed plan of study consisting of 36 units of relevant Mathematical Behavioral Science courses, normally including the core requirement in mathematical statistics, and the satisfactory completion of a comprehensive examination.

## Faculty

Neerja Aggarwal, Ph.D. University of California, Irvine, *Lecturer of Economics*

Samar Al-Bulushi, Ph.D. Yale University, *Assistant Professor of Anthropology* (surveillance, policing, and militarized urbanisms; Islam, Africa, and the racialized geopolitics of the war on terror; elites, diplomacy, and transnational governance)

Yousuf Al-Bulushi, Ph.D. University of North Carolina at Chapel Hill, *Assistant Professor of Global and International Studies*

Nurudeen O. Alao, Ph.D. Northwestern University, *Lecturer of Social Sciences*

Edwin Amenta, Ph.D. University of Chicago, *Professor of Sociology; Political Science* (political sociology, historical and comparative sociology, social movements, social policy)

Vellore Arthi, Ph.D. University of Oxford, *Assistant Professor of Economics*

Richard Arum, Ph.D. University of California, Berkeley, *Dean of the School of Education and Professor of Education; Criminology, Law and Society; Sociology*

Drew Bailey, Ph.D. University of Missouri, *Associate Professor of Education; Cognitive Sciences; Psychological Science*

Stanley Bailey, Ph.D. University of California, Los Angeles, *Professor of Sociology; Religious Studies* (race and ethnicity, religion, immigration, Latin America)

Nina Bandelj, Ph.D. Princeton University, *Professor of Sociology* (economic sociology, culture, organizations, social networks, political economy, globalization, social change, central and eastern Europe)

Jeffrey A. Barrett, Ph.D. Columbia University, *Professor of Logic and Philosophy of Science; Philosophy*

Frank D. Bean, Ph.D. Duke University, *UCI Distinguished Professor of Sociology; Economics; Education* (international migration, demography, Mexican immigration, racial and ethnic relations, economic sociology, family)

Matthew N. Beckmann, Ph.D. University of Michigan, *Associate Professor of Political Science* (presidency, congress, interest groups, mass media, and politics)

D. Bell, Ph.D. University of California, Berkeley, *Professor Emeritus of Economics*

Bruce G. Berg, Ph.D. Indiana University, *Associate Professor of Cognitive Sciences* (audition, auditory attention, psychophysics of complex sounds, computational models of hearing)

Victoria Bernal, Ph.D. Northwestern University, *Professor of Anthropology; Culture and Theory; Gender and Sexuality Studies; Religious Studies* (gender, war, cyberspace, Islam, transnationalism, Africa)

Thomas D. Boellstorff, Ph.D. Stanford University, *Professor of Anthropology* (virtual worlds, sexuality, postcoloniality, HIV/AIDS, mass media and popular culture, language and culture, Indonesia, Southeast Asia)

Daniel E. Bogart, Ph.D. University of California, Los Angeles, *Professor of Economics*

Catherine I. Bolzendahl, Ph.D. Indiana University, *Associate Professor of Sociology* (gender, gender and sexuality studies, the welfare state, political sociology, comparative sociology, family, quantitative methodology)

Aaron Bornstein, Ph.D. New York University, *Assistant Professor of Cognitive Sciences* (memory, decision-making, reinforcement learning, neuroimaging, computational cognitive neuroscience)

Graeme T. Boushey, Ph.D. University of Washington, *Associate Professor of Political Science; Urban Planning and Public Policy* (California politics and statewide elections, American politics, state and federal policy-making, ballot measures and the initiative process)

John P. Boyd, Ph.D. University of Michigan, *Professor Emeritus of Anthropology*

William A. Branch, Ph.D. University of Oregon, *Department Chair and Professor of Economics*

Alyssa Brewer, Ph.D. Stanford University, *Associate Professor of Cognitive Sciences; Language Science* (neuroimaging of visual perception, visual deficits, neurological disorders)

Susan K. Brown, Ph.D. University of Washington, *Professor of Sociology; Religious Studies* (immigration, inequality, urban sociology)

David Brownstone, Ph.D. University of California, Berkeley, *Professor Emeritus of Economics*

Jan K. Brueckner, Ph.D. Stanford University, *Distinguished Professor of Economics; Urban Planning and Public Policy*

Daniel R. Brunstetter, Ph.D. University of California, Davis, *Associate Professor of Political Science; European Languages and Studies* (political theory, international relations, French political thought)

Long T. Bui, Ph.D. University of California, San Diego, *Assistant Professor of Global and International Studies*

Michael L. Burton, Ph.D. Stanford University, *Professor Emeritus of Anthropology*

Carter Butts, Ph.D. Carnegie Mellon University, *Professor of Sociology; Computer Science; Electrical Engineering and Computer Science; Statistics* (mathematical sociology, social networks, quantitative methodology, human judgment and decision making, economic sociology)

Lee Cabatingan, Ph.D. University of Chicago, *Assistant Professor of Criminology, Law and Society; Anthropology* (Caribbean law and sovereignty; construction of authority at the Caribbean Court of Justice)

Alejandro E. Camacho, J.D., LL.M. Harvard University, Georgetown University, *Professor of School of Law; Political Science*

Belinda Campos, Ph.D. University of California, Berkeley, *Associate Professor of Chicano/Latino Studies; Family Medicine; Psychological Science* (culture, relationships, positive emotion, health)

Francis A. Cancian, Ph.D. Harvard University, *Professor Emeritus of Anthropology*

David O. Carter, J.D. University of California, Los Angeles, *Lecturer of Political Science*

Jean-Paul Carvalho, Ph.D. Oxford University, *Associate Professor of Economics; Logic and Philosophy of Science; Religious Studies*

Anita Casavantes Bradford, Ph.D. University of California, San Diego, *Associate Professor of Chicano/Latino Studies; Asian American Studies; History* (20th century U.S., U.S. in the world, Cuba and the Caribbean; history of childhood; history of immigration, race and ethnicity; transnational and comparative Latina/o history; religion, politics and social movements)

Jeanett Castellanos, Ph.D. Washington State University, *Associate Professor of Teaching of Social Sciences*

Simone Chambers, Ph.D. Columbia University, *Professor of Political Science* (democratic theory, ethics, secularism, rhetoric, civility, and the public sphere)



Leo Chavez, Ph.D. Stanford University, *Distinguished Professor of Anthropology* (migration, media, discourse analysis, visual semiotics, medicine)

Jiawei Chen, Ph.D. Johns Hopkins University, *Associate Professor of Economics*

Nadia Chernyak, Ph.D. Cornell University, *Assistant Professor of Cognitive Sciences* (cognitive development, social cognition, prosocial behavior, moral cognition, agency and free will, conceptual development)

Natalia Chernyshoff, Ph.D. University of California, Davis, *Lecturer of Economics*

Michael Choi, Ph.D. University of Wisconsin, Madison, *Assistant Professor of Economics*

Damon Clark, Ph.D. Oxford University, *Associate Professor of Economics; Urban Planning and Public Policy*

Benjamin N. Colby, Ph.D. Harvard University, *Professor Emeritus of Anthropology*

Gilberto Q. Conchas, Ph.D. University of Michigan, *Professor of Education; Asian American Studies; Sociology* (urban education, sociology of education, comparative race and ethnicity)

N. Edward Coulson, Ph.D. University of California, San Diego, *Professor of Paul Merage School of Business; Economics; Psychological Science*

Susan B. Coutin, Ph.D. Stanford University, *Professor of Criminology, Law and Society; Anthropology; Religious Studies* (law, culture, immigration, human rights, citizenship, political activism, Central America)

Thomas M. D'Zmura, Ph.D. University of Rochester, *Professor of Cognitive Sciences* (vision, hearing, language, brain-computer interfaces)

James N. Danziger, Ph.D. Stanford University, *Professor Emeritus of Political Science*

Eve Darian-Smith, Ph.D. University of Chicago, *Department Chair and Professor of Global and International Studies; Anthropology; Criminology, Law and Society*

Arthur S. De Vany, Ph.D. University of California, Los Angeles, *Professor Emeritus of Economics*

Louis DeSipio, Ph.D. University of Texas at Austin, *Professor of Chicano/Latino Studies; Political Science* (ethnic politics, Latino politics, immigration, naturalization, U.S. electoral politics)

Yingying Dong, Ph.D. Boston College, *Associate Professor of Economics*

Barbara A. Doshier, Ph.D. University of Oregon, *UCI Distinguished Professor of Cognitive Sciences* (human information processing, memory retrieval, attention, visual perception)

John Duffy, Ph.D. University of California, Los Angeles, *Professor of Economics*

Greg Duncan, Ph.D. University of Michigan, *UCI Distinguished Professor of Education; Economics; Psychological Science* (economics of education, program evaluation, child development)

Nikil D. Dutt, Ph.D. University of Illinois at Urbana-Champaign, *UCI Chancellor's Professor of Computer Science; Cognitive Sciences; Electrical Engineering and Computer Science* (embedded systems, computer architecture, electronic design automation, software systems, brain-inspired architectures and computing)

Laura Enriquez, Ph.D. University of California, Los Angeles, *Assistant Professor of Chicano/Latino Studies; Asian American Studies; Sociology* (undocumented 1.5 generation young adults, immigration, citizenship, Latino families)

George Farkas, Ph.D. Cornell University, *UCI Distinguished Professor of Education; Sociology* (educational achievement gaps, interventions, educational policy)

Katherine Faust, Ph.D. University of California, Irvine, *Professor of Sociology* (social networks, animal social organization, population processes and social networks, research methods)

David Feldman, Ph.D. University of Missouri-Columbia, *Professor of Urban Planning and Public Policy; Political Science*

Martha S. Feldman, Ph.D. Stanford University, *Roger W. and Janice M. Johnson Chair in Civic Governance and Public Management and Professor of Urban Planning and Public Policy; Paul Merage School of Business; Sociology* (organization theory and behavior, stability and change in organizations, decision-making and information processing, public management, qualitative research methods)

Raúl A. Fernández, Ph.D. Claremont Graduate University, *Executive Secretary of the UC-Cuba Academic Initiative and Professor Emeritus of Chicano/Latino Studies; Social Sciences*

Gordon J. Fielding, Ph.D. University of California, Los Angeles, *Professor Emeritus of Economics*

Mark J. Fisher, M.D. University of Cincinnati, *Professor of Neurology; Anatomy and Neurobiology; Political Science*

Glenda M. Flores, Ph.D. University of Southern California, *Associate Professor of Chicano/Latino Studies; Sociology* (Latina/o sociology, gender and work, middle-class minorities, education, urban ethnography)

Matthew Foreman, Ph.D. University of California, Berkeley, *Distinguished Professor of Mathematics; Logic and Philosophy of Science* (ergodic theory and dynamical systems, logic and foundations)

Kim Fortun, Ph.D. Rice University, *Department Chair and Professor of Anthropology* (environmental problems and science, science and technology, environmental health, disaster, India)

Michael Fortun, Ph.D. Harvard University, *Associate Professor of Anthropology* (anthropology of science, air pollution science, data science, genetics, history of science, United States, Iceland)

Charles C. Fowlkes, Ph.D. University of California, Berkeley, *Professor of Computer Science; Cognitive Sciences* (artificial intelligence, computer vision, machine learning, computational biology)

David John Frank, Ph.D. Stanford University, *Professor of Sociology; Education; Political Science* (globalization, sexuality, the natural environment, higher education)

Steven A. Frank, Ph.D. University of Michigan, *Distinguished Professor and Donald Bren Professor of Ecology and Evolutionary Biology; Logic and Philosophy of Science*

Matthew Freedman, Ph.D. University of Maryland-College Park, *Professor of Economics*

Michelle Garfinkel, Ph.D. Brown University, *Professor of Economics*

Howard A. Gillman, Ph.D. University of California, Los Angeles, *Chancellor and Professor of Political Science; Criminology, Law and Society; History; School of Law*

Amihai Glazer, Ph.D. Yale University, *Professor of Economics*

David Theo Goldberg, Ph.D. The Graduate Center, City University of New York, *Director of the UC Humanities Research Institute and Professor of Comparative Literature; Anthropology; Criminology, Law and Society* (race, racism, race and the law, political theory, South Africa, digital humanities)

Rachel E. Goldberg, Ph.D. Brown University, *Assistant Professor of Sociology* (health, social demography, family, children and youth, gender, migration)

Isaac Goldbring, Ph.D. University of Illinois at Urbana-Champaign, *Associate Professor of Mathematics; Logic and Philosophy of Science* (logic and foundations)

Ruth Goldstein, Ph.D. University of California, Berkeley, *Assistant Professor of Global and International Studies*

Gilbert G. Gonzalez, Ph.D. University of California, Los Angeles, *Professor Emeritus of Chicano/Latino Studies; Social Sciences*

Sara Goodman, Ph.D. Georgetown University, *Associate Professor of Political Science; European Languages and Studies* (citizenship policy, immigration, immigrant integration, ethnic diversity in democracies, diaspora)

Michael R. Gottfredson, Ph.D. University at Albany, State University of New York, *Chancellor's Professor of Criminology, Law and Society; School of Law; Sociology* (criminology, juvenile delinquency, crime theory, public policy)

Susan M. Greenhalgh, Ph.D. Columbia University, *Professor Emeritus of Anthropology*

Bernard N. Grofman, Ph.D. University of Chicago, *Professor of Political Science; Economics* (public choice, mathematical models of collective decision making, formal democratic theory, politics of small groups, representation, voting rights)

Emily D. Grossman, Ph.D. Vanderbilt University, *Professor of Cognitive Sciences* (visual perception, neuroimaging)

Sherine Hamdy, Ph.D. New York University, *Associate Professor of Anthropology* (medical anthropology, science, technology and society, bioethics, comics, Islam, Egypt, middle east)

Matthew Harding, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Economics; Statistics*

Heidi Hardt, Ph.D. Graduate Institute of International and Development Studies, *Assistant Professor of Political Science* (international security, international organizations, NATO, European Union, African Union, crisis management, organizational learning)

Richard L. Hasen, J.D. University of California, Los Angeles, *UCI Chancellor's Professor of School of Law; Political Science*

Jeremy Heis, Ph.D. University of Pittsburgh, *Associate Professor of Logic and Philosophy of Science; Philosophy*



Gregory S. Hickok, Ph.D. Brandeis University, *Professor of Cognitive Sciences; Language Science* (neuroanatomy of language, neural plasticity, neuroimaging, cognitive neuroscience)

John R. Hipp, Ph.D. University of North Carolina at Chapel Hill, *Professor of Criminology, Law and Society; Sociology; Urban Planning and Public Policy* (community context of crime, household decisions and neighborhood change, research methods)

Ann Hironaka, Ph.D. Stanford University, *Professor of Sociology; Asian American Studies* (political sociology, war and peace, environmental sociology, ethnic and racial conflict)

David Hirshleifer, Ph.D. University of Chicago, *Paul Merage Chair in Business Growth and Distinguished Professor of Paul Merage School of Business; Economics*

Matthew L. Huffman, Ph.D. University of California, Santa Barbara, *Professor of Sociology* (inequality, organizations, work and employment, research methods)

James R. Hull, Ph.D. University of North Carolina at Chapel Hill, *Assistant Professor of Teaching of Social Sciences* (social networks and social exchange, monetization, barter, multidimensional poverty measures, migration outcomes at origin, classroom technologies and scaling, student engagement, scholarship of teaching and learning)

Anneeth Kaur Hundle, Ph.D. University of Michigan, Ann Arbor, *Dhan Kaur Sahota Presidential Chair of Sikh Studies and Assistant Professor of Anthropology; Religious Studies* (Sikh studies, African and South Asian diaspora/studies; politics of afro-asianism; citizenship, race, and decolonization; minoritization and community formation, postcolonial and transnational feminisms; gender and sexuality; critical university studies; Uganda, East Africa, global south)

Simon Huttegger, Ph.D. University of Salzburg, *Department Chair and Professor of Logic and Philosophy of Science*

Susanne M. Jaeggi, Ph.D. University of Bern, *Associate Professor of Education; Cognitive Sciences* (working memory, executive functions, cognitive training, lifespan development aging, individual differences)

Ivan G. Jeliakov, Ph.D. Washington University, *Associate Professor of Economics; Statistics*

Brian C. Jenkins, Ph.D. University of North Carolina at Chapel Hill, *Assistant Professor of Teaching of Economics*

Angela C. Jenks, Ph.D. University of California, Berkeley, *Associate Professor of Teaching of Anthropology* (medical anthropology, race and ethnicity, urban ethnography, United States)

Valerie Jenness, Ph.D. University of California, Santa Barbara, *Distinguished Professor of Criminology, Law and Society; Sociology* (links between deviance and social control [especially law], the politics of crime control and criminalization, social movements and social change, corrections and public policy)

Linda Cohen Jennings, Ph.D. California Institute of Technology, *Professor of School of Law; Economics*

Priyaranjan Jha, Ph.D. Columbia University, *Professor of Economics*

Lai Jiang, Ph.D. New York University, *Lecturer of Economics*

Philippe Jorion, Ph.D. University of Chicago, *Professor of Paul Merage School of Business; Economics*

Marek Kaminski, Ph.D. University of Maryland, College Park, *Associate Professor of Political Science; Economics* (voting models, democratization, political consequences of electoral laws)

Pamela A. Kelley, J.D. Yale University, *Lecturer of Political Science* (civil rights law, constitutional law, gender discrimination, legal profession, leadership, ethics)

Claire J. Kim, Ph.D. Yale University, *Professor of Asian American Studies; Political Science*

Eleana Kim, Ph.D. New York University, *Associate Professor of Anthropology; Asian American Studies* (kinship, transnationalism, environment, Korea)

Sharon Koppman, Ph.D. University of Arizona, *Assistant Professor of Paul Merage School of Business; Sociology* (work and occupations, sociology of culture, creative industries)

Jeffrey Kopstein, Ph.D. University of California, Berkeley, *Professor of Political Science; Religious Studies* (comparative politics, dictatorship and democracy, ethnic politics, political violence, post-communism)

Igor Kopylov, Ph.D. University of Rochester, *Associate Professor of Economics*

Jeffrey L. Krichmar, Ph.D. George Mason University, *Professor of Cognitive Sciences; Computer Science* (computational neuroscience, robotics)

Charis E. Kubrin, Ph.D. University of Washington, *Professor of Criminology, Law and Society; Sociology* (crime, neighborhood effects and social processes, race/ethnicity and violence, immigration and crime)

Arthur D. Lander, Ph.D. University of California, San Francisco, *Donald Bren Professor and Professor of Developmental and Cell Biology; Biomedical Engineering; Logic and Philosophy of Science* (systems biology of development, pattern formation, growth control)

Alana Lebron, Ph.D. University of Michigan, *Assistant Professor of Program in Public Health; Chicano/Latino Studies*

Jerry Won Lee, Ph.D. University of Arizona, *Associate Professor of English; Anthropology; Asian American Studies; Comparative Literature; Culture and Theory*

Michael D. Lee, Ph.D. University of Adelaide, *Professor of Cognitive Sciences* (computational models and bayesian methods in decision making, representation, categorization, individual differences, and the wisdom of the crowd)

Ying-Ying Lee, Ph.D. University of Wisconsin-Madison, *Assistant Professor of Economics*

Karen Leonard, Ph.D. University of Wisconsin, *Professor Emeritus of Anthropology; Religious Studies*

Julia C. Lerch, Ph.D. Stanford University, *Assistant Professor of Sociology* (sociology of education, global and transnational sociology, civic education, humanitarian emergencies, international organizations)

Ines Levin, Ph.D. California Institute of Technology, *Assistant Professor of Political Science* (elections, voting, statistics)

Mimi Liljeholm, Ph.D. University of California, Los Angeles, *Assistant Professor of Cognitive Sciences* (neural and computational bases of learning, reasoning, and decision making)

Erin Lockwood, Ph.D. Northwestern University, *Assistant Professor of Political Science* (financial derivatives, financial regulation, international political economy, political theory, risk and uncertainty)

Elizabeth F. Loftus, Ph.D. Stanford University, *UCI Distinguished Professor of Psychological Science; Cognitive Sciences; Criminology, Law and Society; School of Law* (cognitive psychology, human memory, psychology and law)

Radhika Lunawat, Ph.D. University of Minnesota, *Assistant Professor of Paul Merage School of Business; Economics*

Cecelia M. Lynch, Ph.D. Columbia University, *Professor of Political Science; Religious Studies* (international relations (theory, organization, law) religion and ethics, social movements and civil society actors (on peace, security, globalization, humanitarianism, and religion)

David C. Lyon, Ph.D. Vanderbilt University, *Department Vice Chair and Associate Professor of Anatomy and Neurobiology; Cognitive Sciences*

Lilith Mahmud, Ph.D. Harvard University, *Associate Professor of Anthropology* (freemasonry, elites, gender, nationalism, race, citizenship, critical studies of Europe, secrecy, transparency, knowledge production, secret societies, power)

David B. Malament, Ph.D. The Rockefeller University, *Professor Emeritus of Logic and Philosophy of Science*

John Manchak, Ph.D. University of California, Irvine, *Professor of Logic and Philosophy of Science; Religious Studies*

George E. Marcus, Ph.D. Harvard University, *Distinguished Professor of Anthropology* (elites, ethnography, cultural critique, Pacific)

Raffaele Mari, M.A. San Diego State University, *Lecturer of Economics*

Richard Matthew, Ph.D. Princeton University, *Professor of Urban Planning and Public Policy; Political Science*

William M. Maurer, Ph.D. Stanford University, *Dean of the School of Social Sciences and Professor of Anthropology; Criminology, Law and Society; School of Law* (anthropology of law, globalization, Caribbean, anthropology of money and finance, gender and kinship)

Shampa Mazumdar, Ph.D. Northeastern University, *Lecturer of Sociology; Religious Studies* (religion, immigration, Asian American, urban sociology)

Michael T. McBride, Ph.D. Yale University, *Professor of Economics; Logic and Philosophy of Science; Religious Studies*

Philip McCarty, Ph.D. University of California, Santa Barbara, *Associate Professor of Teaching of Global and International Studies*

James L. McGaugh, Ph.D. University of California, Berkeley, *Research Professor and Professor Emeritus of Neurobiology and Behavior; Logic and Philosophy of Science*

Martin C. McGuire, Ph.D. Harvard University, *UCI Endowed Chair and Professor Emeritus of Economics*

Mary McThomas, Ph.D. University of California, Los Angeles, *Associate Professor of Political Science* (immigration, theories of citizenship, feminist political theory, gender and politics)

Toby Meadows, Ph.D. University of Melbourne, *Assistant Professor of Logic and Philosophy of Science*

Sara Mednick, Ph.D. Harvard University, *Associate Professor of Cognitive Sciences* (memory consolidation, sleep, pharmacology, aging, brain stimulation)

James W. Meeker, J.D., Ph.D. State University of New York at Buffalo, *Professor Emeritus of Criminology, Law and Society; Sociology* (sociology of law, criminal justice, research methodology, statistics, access to civil justice)

Richard Mendelsohn, Ph.D. Massachusetts Institute of Technology, *Adjunct Professor of Logic and Philosophy of Science*

Carrie Menkel-Meadow, J.D. University of Pennsylvania, *UCI Chancellor's Professor of Political Science; School of Law*

David S. Meyer, Ph.D. Boston University, *Professor of Sociology; Political Science; Urban Planning and Public Policy* (social movements, public policy, peace and war, social justice)

John Middlebrooks, Ph.D. University of California, San Francisco, *Professor of Otolaryngology; Biomedical Engineering; Cognitive Sciences; Neurobiology and Behavior*

Fabio Milani, Ph.D. Princeton University, *Professor of Economics*

Kristen R. Monroe, Ph.D. University of Chicago, *UCI Chancellor's Professor of Political Science* (ethics, international relations, political and moral psychology, normative political theory, politics of difference, conflict resolution)

Michael J. Montoya, Ph.D. Stanford University, *Professor Emeritus of Anthropology*

Alejandro Morales, Ph.D. Rutgers, The State University of New Jersey, *Professor Emeritus of Chicano/Latino Studies* (Latin American and Chicano literature, film studies)

Keith Murphy, Ph.D. University of California, Los Angeles, *Associate Professor of Anthropology* (linguistics, design, aesthetics and morality, Sweden)

Sylvia Nam, Ph.D. University of California, Berkeley, *Assistant Professor of Anthropology; Biological Chemistry; Urban Planning and Public Policy* (urban studies, property, transnational expertise, Southeast Asia)

Louis E. Narens, Ph.D. University of California, Los Angeles, *Professor of Cognitive Sciences; Logic and Philosophy of Science* (measurement, logic, metacognition)

Emre Neftci, Ph.D. University of Zurich, *Assistant Professor of Cognitive Sciences; Computer Science* (computational neuroscience, neuromorphic engineering, machine learning)

David Neumark, Ph.D. Harvard University, *Distinguished Professor of Economics; Paul Merage School of Business*

Riley D. Newman, Ph.D. University of California, Berkeley, *Professor Emeritus of Physics and Astronomy; Logic and Philosophy of Science; Physics and Astronomy*

Walter Nicholls, Ph.D. University of California, Los Angeles, *Associate Professor of Urban Planning and Public Policy; Sociology* (urban sociology, politics and policy, social movements, immigration, comparative urbanism, theory, planning conflicts)

Andrew Noymer, Ph.D. University of California, Berkeley, *Associate Professor of Program in Public Health; Sociology*

Cailin O'Connor, Ph.D. University of California, Irvine, *Associate Professor of Logic and Philosophy of Science*

Gustavo Oliveira, Ph.D. University of California, Berkeley, *Assistant Professor of Global and International Studies*

Kevin E. Olson, Ph.D. Northwestern University, *Professor of Political Science; Culture and Theory; European Languages and Studies* (political theory, history of political thought, legal theory, philosophy of the social sciences)

Valerie A. Olson, Ph.D. Rice University, *Associate Professor of Anthropology* (environmental systems, science and technology, U.S., extreme environments)

Emily Owens, Ph.D. University of Maryland at College Park, *Professor of Criminology, Law and Society; Economics* (how government policies affect the prevalence of criminal activity as well as how agents within the criminal justice system, particularly police, prosecutors, and judges, respond to policy changes)

Lisa Pearl, Ph.D. University of Maryland, College Park, *Professor of Language Science; Cognitive Sciences; Logic and Philosophy of Science* (language development, linguistics, computational sociolinguistics, cognitive modeling)

Andrew Penner, Ph.D. University of California, Berkeley, *UCI Chancellor's Fellow and Professor of Sociology* (gender, inequality, education, family, race)

Megan Peters, Ph.D. University of California, Los Angeles, *Assistant Professor of Cognitive Sciences* (perception, metacognition, consciousness, computational modeling, computational cognitive neuroscience)

Kristin Peterson, Ph.D. Rice University, *Associate Professor of Anthropology* (science and technology, feminism, pharmaceuticals, West Africa)

Bojan M. Petrovic, Ph.D. University of California, Irvine, *Lecturer of Social Sciences*

Davin Phoenix, Ph.D. University of Michigan, *Assistant Professor of Political Science* (racial attitudes, affect and behavior, public opinion, political communication, urban politics, mobilization of marginalized groups)

Zygmunt Pizlo, Ph.D. University of Maryland at College Park, *Falmagne Endowed Chair and Professor of Cognitive Sciences* (human and machine vision, 3D shape, symmetry, virtual reality, robotics, problem solving)

Dale J. Poirier, Ph.D. University of Wisconsin-Madison, *Professor Emeritus of Economics*

Francesca Polletta, Ph.D. Yale University, *Professor of Sociology* (social movements, democracy, culture, sociology of law, political sociology, social theory)

Henry N. Pontell, Ph.D. State University of New York at Stony Brook, *Professor Emeritus of Criminology, Law and Society; Sociology* (white-collar and corporate crime, criminology, criminal justice, deviance and social control, sociology of law)

Charles C. Ragin, Ph.D. University of North Carolina at Chapel Hill, *UCI Chancellor's Professor of Sociology* (comparative and historical sociology, social inequality, political sociology, quantitative methodology, qualitative methodology)

Vibhuti Ramachandran, Ph.D. New York University, *Assistant Professor of Global and International Studies; Criminology, Law and Society*

Maria G. Rendón, Ph.D. Harvard University, *Assistant Professor of Urban Planning and Public Policy; Sociology* (urban sociology, immigration, race/ethnicity, sociology of education and social policy)

Virginia Richards, Ph.D. University of California, Berkeley, *Professor of Cognitive Sciences* (auditory perception and cognition, human psychophysics)

Gary Richardson, Ph.D. University of California, Berkeley, *Professor of Economics; Religious Studies*

Justin Richland, Ph.D. University of California, Los Angeles, *Associate Professor of Anthropology* (legal discourse analysis and semiotics, anthropology of law; contemporary native American law, politics, art, and ethnographic museology)

Ty Robbins, Ph.D. University of California, Santa Barbara, *Lecturer of Economics*

Belinda Robnett, Ph.D. University of Michigan, *Professor of Sociology* (social movements, race and ethnicity, gender, social change, African Americans)

Guillaume Rocheteau, Ph.D. University of Paris, *Professor of Economics*

Jose Antonio Rodriguez Lopez, Ph.D. University of California, Berkeley, *Associate Professor of Economics*

A. K. Romney, Ph.D. Harvard University, *Professor Emeritus of Anthropology*

Rocio Rosales, Ph.D. University of California, Los Angeles, *Assistant Professor of Sociology; Chicano/Latino Studies* (international migration, immigrant and ethnic economics, urban sociology, ethnography, Latino/a studies, race and ethnicity, immigrant detention)

Ana Rosas, Ph.D. University of Southern California, *Associate Professor of Chicano/Latino Studies; History* (Chicana/o comparative history, immigration, ethnicity)

Shawn W. Rosenberg, M.Litt. University of Oxford, *Professor of Political Science* (political psychology, deliberative democracy, ideology, social theory, social and development psychology)

Lauren Ross, Ph.D. University of Pittsburgh, *Assistant Professor of Logic and Philosophy of Science*

Jeffrey Rouder, Ph.D. University of California, Irvine, *Falmagne Endowed Chair and Professor of Cognitive Sciences* (mathematical and statistical models of perception and cognition, bayesian mixed models, psychometrics)

Vicki L. Ruiz, Ph.D. Stanford University, *Professor Emeritus of History; Chicano/Latino Studies* (Chicana/Latina history, U.S. labor, immigration, gender)

Ruben G. Rumbaut, Ph.D. Brandeis University, *Distinguished Professor of Sociology; Chicano/Latino Studies; Criminology, Law and Society; Education* (international migration, immigration laws, criminalization, incarceration, social inequality and mobility, race and ethnicity)

Donald G. Saari, Ph.D. Purdue University, *UCI Distinguished Professor Emeritus of Economics; Logic and Philosophy of Science; Mathematics*

Kourosh Saberi, Ph.D. University of California, Berkeley, *Professor of Cognitive Sciences* (conscious systems, evolutionary game theory, nature of reality, machine learning, artificial intelligence)

Kamal Sadiq, Ph.D. University of Chicago, *Associate Professor of Political Science* (comparative politics, immigration and citizenship in developing countries, India and southeast Asia, Asian security)

Jean-Daniel M. Saphores, Ph.D. Cornell University, *Professor of Civil and Environmental Engineering; Economics; Urban Planning and Public Policy* (transportation and environmental systems (with a focus on air pollution and energy use), travel behavior analysis, alternative fuel vehicles, automated vehicles, transit use, sustainable infrastructure management, and decision making under uncertainty using real options)

Barbara W. Sarnecka, Ph.D. University of Michigan, *Professor of Cognitive Sciences; Logic and Philosophy of Science* (cognitive development, language development, number concepts, conceptual change, individual cognitive development, historical development of science and mathematics)

George Sarraf, Ph.D. Claremont Graduate University, *Lecturer of Economics*

David Schaefer, Ph.D. University of Arizona, *Associate Professor of Sociology* (social networks, social psychology, criminology, health, human development)

Evan Schofer, Ph.D. Stanford University, *Professor of Sociology* (comparative political sociology, sociology of education, quantitative methods and statistics, globalization, sociology of the environment, organizations, sociology of science)

William R. Schonfeld, Ph.D. Princeton University, *Professor Emeritus of Political Science*

Jonas Schultz, Ph.D. Columbia University, *Professor Emeritus of Physics and Astronomy; Logic and Philosophy of Science*

Tonya L. Schuster, Ph.D. University of California, Riverside, *Lecturer of Sociology* (sociology of medicine and alternative medicine, social relationships and health social psychology, research design)

Gabriele M. Schwab, Ph.D. University of Konstanz, *UCI Chancellor's Professor of Comparative Literature; Anthropology; Culture and Theory; English; European Languages and Studies; German* (modern literature, critical theory, psychoanalysis, comparative literature)

Sherilyn K. Sellgren, M.B.A. University of California, Irvine, *Lecturer of Political Science*

Caesar D. Sereseres, Ph.D. University of California, Riverside, *Associate Professor of Political Science* (U.S. foreign policy, U.S. Latin American relations, Mexican-American politics)

Gregory Shaffer, J.D. Stanford University, *Director, Center of Globalization, Law and Society and UCI Chancellor's Professor of School of Law; Political Science*

Nilopa Shah, Ph.D. University of California, Irvine, *Lecturer of Economics*

Paul R. Shirey, Ph.D. University of California, Irvine, *Lecturer of Social Sciences; Economics*

Stergios Skaperdas, Ph.D. Johns Hopkins University, *Clifford S. Heinz Chair and Professor of Economics; Political Science*

Brian Skyrms, Ph.D. University of Pittsburgh, *UCI Distinguished Professor of Logic and Philosophy of Science; Economics; Philosophy*

Kenneth A. Small, Ph.D. University of California, Berkeley, *Professor Emeritus of Economics*

Charles Smith, Ph.D. University of California, San Diego, *Professor of Political Science; Criminology, Law and Society* (law and legal institutions, comparative and international law)

David A. Smith, Ph.D. University of North Carolina at Chapel Hill, *Professor of Sociology; Urban Planning and Public Policy* (world systems analysis, urbanization, development, comparative-historical sociology, dependent development in east Asia)

David A. Snow, Ph.D. University of California, Los Angeles, *Professor Emeritus of Sociology* (collective behavior, protest and social movements, framing processes, social psychology and culture, homelessness and social problems, qualitative methods)

Damien Sojoyner, Ph.D. University of Texas at Austin, *Associate Professor of Anthropology; Culture and Theory* (prisons; public education; urban anthropology; race; African diaspora theory; public policy and law; gender; United States)

Etel Solingen, Ph.D. University of California, Los Angeles, *Thomas T. and Elizabeth C. Tierney Chair in Global Peace and Conflict Studies and Professor of Political Science* (international relations theory, international political economy, international cooperation, macropolitics/institutions, comparative politics, world politics and regional orders)

Dorothy J. Solinger, Ph.D. Stanford University, *Professor Emeritus of Political Science* (Chinese domestic politics and political economy, comparative politics, East Asian politics)



Ramesh Srinivasan, Ph.D. Tulane University, *Department Chair and Professor of Cognitive Sciences; Biomedical Engineering* (perception, attention, decision-making, cognitive and clinical neuroscience)

P. Kyle Stanford, Ph.D. University of California, San Diego, *Professor of Logic and Philosophy of Science; Philosophy*

Judith Stepan-Norris, Ph.D. University of California, Los Angeles, *Professor of Sociology* (labor unions, sociology of work, political sociology, American society, research methods, historical-comparative methods, class formation)

Hal S. Stern, Ph.D. Stanford University, *UCI Chancellor's Professor of Statistics; Cognitive Sciences*

Mark Steyvers, Ph.D. Indiana University, *Professor of Cognitive Sciences; Computer Science; Psychological Science* (higher-order cognition, cognitive neuroscience, computational modeling, collective intelligence)

Ian Straughn, Ph.D. University of Chicago, *Assistant Professor of Teaching of Anthropology; Religious Studies* (archaeology, cultural heritage, middle east and Islamic studies, space and landscape, material culture)

Sabrina Strings, Ph.D. University of California, San Diego, *Assistant Professor of Sociology* (race, gender, embodiment, sociology of medicine, sociology of media)

Yang Su, Ph.D. Stanford University, *Associate Professor of Sociology* (social movements and collective action, political sociology, China's political transition)

Naomi Sugie, Ph.D. Princeton University, *Associate Professor of Criminology, Law and Society; Sociology* (sociology of crime and punishment, inequality, families, demography, methods, new technologies for data collection)

Eric Swanson, Ph.D. Stanford University, *Professor of Economics*

Bryan Sykes, Ph.D. University of California, Berkeley, *Associate Professor of Criminology, Law and Society; Program in Public Health; Sociology* (demography, criminology, research methods, health, social inequality, statistics)

Rein Taagepera, Ph.D. University of Delaware, *Professor Emeritus of Political Science*

Shauhin A. Talesh, J.D., Ph.D. University of Connecticut, University of California, Berkeley, *Director, Law and Graduate Studies Program and Professor of School of Law; Criminology, Law and Society; Sociology*

Michael Tesler, Ph.D. University of California, Los Angeles, *Associate Professor of Political Science* (American politics, race, ethnicity and politics, quantitative methods)

Danielle M. Thomsen, Ph.D. Cornell University, *Assistant Professor of Political Science* (American politics, U.S. congress, political parties, gender and politics)

Hector Tobar, M.F.A. University of California, Irvine, *Associate Professor of Chicano/Latino Studies; English* (storytelling, literature, history of Los Angeles, Latin American history, Latino history)

Keith Topper, Ph.D. University of California, Los Angeles, *Associate Professor of Political Science; Culture and Theory* (political theory, critical theory, poststructuralism, theories of power, language and politics, theory and politics of interpretation, politics of culture, philosophy of the social sciences)

Rodolfo D. Torres, Ph.D. Claremont Graduate University, *Professor of Urban Planning and Public Policy; Political Science*

Judith Treas, Ph.D. University of California, Los Angeles, *UCI Chancellor's Professor of Sociology* (gender, inequality, family, aging and life course, social demography)

Kristin E. Turney, Ph.D. University of Pennsylvania, *Associate Professor of Sociology; Criminology, Law and Society* (social inequality, family demography, population health, incarceration and punishment, intergenerational transmission of disadvantage, child well-being)

Carole J. Uhlaner, Ph.D. Harvard University, *Professor Emeritus of Political Science* (comparative political behavior, formal theory/social choice)

Robert M. Uriu, Ph.D. Columbia University, *Associate Professor of Political Science* (international relations, international political economy, international politics of East Asia/Japan, U.S. foreign policy toward East Asia)

Alfonso Valdez, Ph.D. University of Southern California, *Lecturer of Social Sciences*

Joachim S. Vandekerckhove, Ph.D. University of Leuven, *Associate Professor of Cognitive Sciences; Statistics* (response time modeling, model fitting, computational statistics, psychometrics, bayesian statistics)

Roxanne Varzi, Ph.D. Columbia University, *Professor of Anthropology; Culture and Theory; Film and Media Studies; Religious Studies; Visual Studies* (Iran, media, war, visual anthropology, film studies, ethnographic and fiction writing)

Irene I. Vega, Ph.D. University of California, Los Angeles, *Assistant Professor of Sociology* (international migration, socio-legal studies, race/ethnicity, educational inequality)

Samantha Vortherms, Ph.D. University of Wisconsin, Madison, *Assistant Professor of Political Science* (comparative political economy, development, social welfare)

Linda T. Vö, Ph.D. University of California, San Diego, *Professor of Asian American Studies; Culture and Theory; Sociology; Urban Planning and Public Policy* (race and ethnic relations, immigrants and refugees, gender relations, community and urban studies)

Wilima Wadhwa, Ph.D. University of California, Irvine, *Lecturer of Economics*

Feng Wang, Ph.D. University of Michigan, *Professor of Sociology* (contemporary demographic, economic, and social processes, social inequality in state socialisms, contemporary China)

Martin P. Wattenberg, Ph.D. University of Michigan, *Professor of Political Science* (American and comparative political behavior)

James O. Weatherall, Ph.D. Stevens Institute of Technology, *Professor of Logic and Philosophy of Science*

Kai Wehmeier, Ph.D. University of Münster, *Director, Center for the Advancement of Logic, its Philosophy, History, and Applications and Professor of Logic and Philosophy of Science; Language Science; Philosophy*

Douglas R. White, Ph.D. University of Minnesota, *Professor Emeritus of Anthropology*

Daniel Whiteson, Ph.D. University of California, Berkeley, *Professor of Physics and Astronomy; Logic and Philosophy of Science*

Christopher A. Whytock, J.D. Georgetown University, *Professor of School of Law; Political Science*

Kirk Williams, Ph.D. University of Arizona, *Professor of Criminology, Law and Society; Sociology* (family violence, youth violence, homicide studies, risk assessment, violence prevention program evaluation)

Tiffany Willoughby-Herard, Ph.D. University of California, Santa Barbara, *Associate Professor of African American Studies; Comparative Literature; Culture and Theory; Political Science* (South Africa, poor whites, race in foreign policy, diaspora, comparative racial politics, third world feminisms, feminist pedagogy, black political thought)

Charles E. Wright, Ph.D. University of Michigan, *Associate Professor of Cognitive Sciences* (cognitive psychology, human motor control, fitts task, aimed movements, handwriting, immersive virtual reality, 1/f noise, quantitative models)

Valerie L. Wright, Ph.D. Fuller Theological Seminary, *Lecturer of Social Sciences*

Martin Zeman, Ph.D. Humboldt University of Berlin, *Professor of Mathematics; Logic and Philosophy of Science* (logic and foundations)

Fan-Gang Zeng, Ph.D. Syracuse University, *Director of Hearing Research and Professor of Otolaryngology; Anatomy and Neurobiology; Biomedical Engineering; Cognitive Sciences*

Mei Zhan, Ph.D. Stanford University, *Associate Professor of Anthropology* (medical anthropology, cultural and social studies of science, globalization, transnationalism, gender, China and United States)

## Anthropology Courses

### **ANTHRO 2A. Introduction to Sociocultural Anthropology. 4 Units.**

Introduction to cultural diversity and the methods used by anthropologists to account for it. Family relations, economic activities, politics, gender, and religion in a wide range of societies. Stresses the application of anthropological methods to research problems.

(III and VIII ).

### **ANTHRO 2B. Introduction to Biological Anthropology. 4 Units.**

Evolutionary theory and processes, comparative primate fossil record, human variation, and the adequacy of theory, and empirical data.

(III)

### **ANTHRO 2C. Introduction to Archaeology. 4 Units.**

Archaeological theory and cultural processes with emphasis on the American Southwest, Mesoamerica, and Mesopotamia.

(III)



**ANTHRO 2D. Introduction to Language and Culture. 4 Units.**

Explores what the study of language can reveal about ourselves as bearers of culture. After introducing some basic concepts, examines how cultural knowledge is linguistically organized and how language might shape our perception of the world.

Same as LSCI 68.

(III)

**ANTHRO 10A. Probability and Statistics. 4 Units.**

An introduction to probability and statistics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Emphasizes examples from sociology, anthropology, and related social science disciplines.

Same as SOCIOL 10A.

Overlaps with PSYCH 10A, SOCECOL 13, SOC SCI 10A, POL SCI 10A.

Restriction: Anthropology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

(Va)

**ANTHRO 10B. Probability and Statistics. 4 Units.**

An introduction to probability and statistics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Emphasizes examples from sociology, anthropology, and related social science disciplines.

Prerequisite: SOCIOL 10A or ANTHRO 10A

Same as SOCIOL 10B.

Overlaps with PSYCH 10B, SOCECOL 13, SOC SCI 10B, POL SCI 10B.

Restriction: Anthropology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

(Va)

**ANTHRO 10C. Probability and Statistics. 4 Units.**

An introduction to probability and statistics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Emphasizes examples from sociology, anthropology, and related social science disciplines.

Prerequisite: SOCIOL 10B or ANTHRO 10B

Same as SOCIOL 10C.

Overlaps with PSYCH 10C, SOCECOL 13, SOC SCI 10C, POL SCI 10C.

Restriction: Anthropology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

(Vb)

**ANTHRO 20A. People, Cultures, and Environmental Sustainability. 4 Units.**

Anthropological consideration of global environmental sustainability from the perspective of human cultures and communities. Causes and consequences of population growth, natural resource management, environmental law, environmental ethics. Case studies emphasize tropical rain forests, arid lands of Africa and North America.

(VIII)

**ANTHRO 25A. Environmental Injustice. 4 Units.**

Explores how pollution, climate change, and other environmental problems impact people around the world, often worsening social inequality. Students use social science frameworks to understand environmental problems, different interpretations of these problems, and how people have organized for political change.

(III and VII ).

**ANTHRO 30A. Global Issues in Anthropological Perspective. 4 Units.**

Explores anthropological perspectives on issues of importance in an increasingly global society. Topics include emphases on ethnic conflict; identity; immigration and citizenship; religion and religious diversity; medical anthropology; legal anthropology; development and economic change; gender.

Restriction: Anthropology Majors have first consideration for enrollment.

(VIII)

**ANTHRO 30C. Visual Anthropology . 4 Units.**

Focusing on the construction of culture through visibility, this course engages traditional ethnographic films, popular media and anthropological texts to analyze ethics, "reality" and fiction; propaganda and documentary, construction of a frame, the responsibility of the filmmaker, photographer, and anthropologist.

**ANTHRO 41A. Global Cultures and Society. 4 Units.**

Offers a general overview of the rise of global interdependence in political, economic, demographic, and cultural terms. Considers what drove people from relative isolation into intensified intercourse with one another, and investigates the consequences of this shift.

Same as INTL ST 11.

Restriction: Anthropology Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(III and VIII ).

**ANTHRO 45A. Science, Culture, Power. 4 Units.**

Examines science in historical and cultural context (Scientific and Darwinian Revolutions, Manhattan Project, contemporary biosciences) to understand scientific truths and their limits, scientists as social actors, and vital intersections of sciences with religion, politics, gender, and other forms of culture.

(III)

**ANTHRO 48. Archaeology or Aliens?: Conspiracy, Pseudoscience, and the Emergence of Civilizations. 4 Units.**

Archaeology has inspired (and sometimes actively encouraged) various theories about aliens, lost civilizations, dark conspiracies, and mysterious technologies. Does such an intimate relationship with these fantastic notions undermine archaeology and its claims of authoritative knowledge about past cultures.

(III and VIII ).

**ANTHRO 89. Special Topics in Anthropology. 1-4 Units.**

Studies in selected areas of Anthropology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 100A. Ethnography and Anthropological Methods. 4 Units.**

Anthropological research, learning ethnographic methods, and how to choose a research topic, construct research questions, explore library resources, collect data, and write an analytical paper on research findings.

Prerequisite or corequisite: ANTHRO 2A

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment. Medical Anthropology Minors have first consideration for enrollment.

**ANTHRO 100B. Anthropology Careers. 4 Units.**

Gives students the skills and perspective needed to leverage undergraduate anthropology education in diverse career domains. Students explore different career domains (health care, tech development, environmental governance, etc.) and learn to represent themselves professionally.

Restriction: Anthropology Majors only. Anthropology Minors only. Medical Anthropology Minors only.

**ANTHRO 121AW. Kinship and Social Organization. 4 Units.**

Organization of social life primarily in preindustrial societies. Theories of kinship, marriage regulations, sexual behavior, and social roles. Comparisons of biological, psychological, sociological, and economic explanations of social organization.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**ANTHRO 121D. Cross-Cultural Studies of Gender. 4 Units.**

Explores the construction of gender in national and transnational contexts. Special attention is given to how race, sexuality, class, and global inequalities shape different experiences of gender, and how gender structures political, institutional, and social life across the world.

Same as INTL ST 153B.

(VII)

**ANTHRO 121G. Political Anthropology. 4 Units.**

Utilizes anthropological accounts of Western and non-Western societies to question conventional ways of thinking about power and politics. Classical traditions in political anthropology are critiqued; an alternative view is presented through recent anthropological political analyses of various topics.

**ANTHRO 121J. Urban Anthropology. 4 Units.**

Cultural roles of urban centers and processes of urbanization in comparative perspective, focusing on both nonwestern, nonindustrial societies of past and present; the relationship between modern urban centers and Third World peoples. Migration, urban poverty, in Africa, Asia, Latin America.

Same as INTL ST 153C.

**ANTHRO 124. Gold: The Alchemy of Socio-Economic Practice. 4 Units.**

Before bitcoin, before derivatives and mortgage-backed securities, before even writing itself, there was gold. Explore gold's role in the development of culture, politics, and power. From Pharaohs to modern financial wizards, gold has impacted and mediated social life.

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment. Archaeology Minors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Economics Minors have first consideration for enrollment.

**ANTHRO 125. Anthropology of Debt. 4 Units.**

Explores how debt has shaped culture across varied contexts geographically and historically. In what ways have societies naturalized indebtedness, taken it for granted as a fact of life, and used it for organizing social relations.

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment. Archaeology Minors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Economics Minors have first consideration for enrollment.

**ANTHRO 125A. Economic Anthropology. 4 Units.**

Economic systems in comparative perspective: production, distribution, and consumption in market and non-market societies; agricultural development in the third world.

Prerequisite: One course in general science, anthropology, economics, geography, or sociology.

Same as ECON 152A.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment. Anthropology Majors have first consideration for enrollment.

**ANTHRO 125B. Ecological Anthropology. 4 Units.**

Studies relationships between human communities and their natural environments. The role of environment in shaping culture; effects of extreme environments on human biology and social organization; anthropologist's role in studying global environmental problems, e.g., African famine, tropical rain forests destruction.

Prerequisite: ANTHRO 2A or ANTHRO 2B or ANTHRO 2C

**ANTHRO 125C. Environmental Anthropology. 4 Units.**

Introduces students to anthropological and qualitative research on the relationship of humans, non-humans, and environments. Focuses on how to analyze and evaluate social and cultural differences in environmental perception, relations, justice, governance, sustainability, and cosmology.

Prerequisite: ANTHRO 2A or ANTHRO 2B or ANTHRO 2C or ANTHRO 2D

**(III)**

**ANTHRO 125F. Humans and Other Animals. 4 Units.**

Explores peoples' relationships with other animals, a topic that continues to shape anthropological understandings of humanness, culture, and the social. Subthemes: symbol and matter, nature/culture, ontologies, relations, moralities, ecologies, futures.

Prerequisite: ANTHRO 2A or ANTHRO 2B or ANTHRO 2D

**ANTHRO 125S. The Anthropology of Money. 4 Units.**

Anthropological approaches to money; impact of money on subsistence economies; cultural history of money; and modern transformations of money. Students conduct ethnographic research on alternative money practices in Southern California, and create an online exhibition and research paper.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 125U. Immigration, Nation, and Media. 4 Units.**

Examines media shapes and reflects public opinion on immigration and its representation of immigrants, citizens, and ideas about the nation, and who belongs and who is a potential threat; as well as the relationship between scholars and journalists.

Same as CHC/LAT 123, SPPS 101A.

**ANTHRO 125X. Transnational Migration. 4 Units.**

Examines the movement of people across national borders, governmentality and the role of state practices to control populations, and issues of citizenship, belonging, and identity. Examples are drawn from the United States, Europe, Latin America, Asia, and Africa.

Same as CHC/LAT 161, INTL ST 117A.

**(VIII)****ANTHRO 125Z. Islam in America. 4 Units.**

Offers a critical academic study of Islam in America, focusing on the core tenets of belief, the diversity of practices, and historical transformations that have taken place since the arrival of Muslims in the United States.

Same as ASIANAM 142.

**ANTHRO 126. Cultures of the Middle East. 4 Units.**

The diversity of cultures and peoples who constitute the Middle East demonstrates the failure of much contemporary media and discourse to understand this region. Students learn about the broad scope of the contemporary Middle East through an ethnographic lens.

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment.

**ANTHRO 126A. Elite Cultures. 4 Units.**

The distinctive contribution that ethnographic studies have made to the understanding of elites past and present, in particular societies and globally.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 127. Controversies, Courts, Cultures: The Anthropology of Law. 4 Units.**

Assesses the contributions anthropology has made to legal scholarship, reviewing historical and contemporary themes. Considers both comparative questions of law's norms, structures, and practices around the globe, and the specific insights anthropology offers about contemporary U.S. law.

Same as CRM/LAW C183.

**(III)****ANTHRO 127A. Law and Modernity. 4 Units.**

The rise and spread of Enlightenment legal traditions, social contract theory, individual rights, ideologies of 'liberty, equality, fraternity'; contradictions of liberal law, its understandings of 'primitive' and 'civilized'; pervasive myths of property, difference, race, and rights. Reading- and writing-intensive.

Same as CRM/LAW C191.

**ANTHRO 127B. Global Migrations, Anthropology, and the Law. 4 Units.**

Course explores how cultural contexts and national laws frame migration, and define categories of migrants, families, and people. Topics include illegality, transnational families, refugees and economic migrants, labor conditions, deportation practices, discipline and crime, citizenship controversies, and nativism.

**ANTHRO 128A. Science, Technology, Controversy. 4 Units.**

Explores ways in which the social sciences conceive of science as a sociocultural practice. Emphasis on literature in Science and Technology Studies (STS), especially writings that concern the relationship of science to space and place, power, and politics.

Restriction: Anthropology Majors only.

**ANTHRO 128B. Race, Gender, and Science. 4 Units.**

Perfect for pre-health, science and social science majors wanting to appreciate how science and society interact. Race and gender as biological and socio-cultural constructs are examined. Questions explored: What is disease? What is science? What are social and biological differences.

Same as CHC/LAT 176.

**(VII)**

**ANTHRO 128C. Digital Cultures . 4 Units.**

Explores cultural and political implications of the infotech revolution and the ways new media are used around the world, new cultural practices and spaces (e.g., cybercafes), debates surrounding the meanings of these new technologies, and their implications for transforming society.

Prerequisite: ANTHRO 2A and (ANTHRO 2B or ANTHRO 2C or ANTHRO 2D)

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 129. Special Topics: Social and Economic Anthropology. 1-4 Units.**

Studies in selected areas of Social and Economic Anthropology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 132A. Psychological Anthropology. 4 Units.**

Cultural differences and similarities in personality and behavior. Child-rearing practices and consequent adult personality characteristics, biocultural aspects of child development and attachment, culture and behavior evolutionary models, politically linked personality, cognitive anthropology, psychology of narrative forms, comparative national character studies.

Prerequisite: ANTHRO 2A or PSYCH 7A or (PSYCH 9A and PSYCH 9B and PSYCH 9C) or (PSY BEH 11A and PSY BEH 11B and PSY BEH 11C)

Same as PSYCH 173A.

Restriction: Psychology Majors have first consideration for enrollment.

**ANTHRO 134A. Medical Anthropology. 4 Units.**

Introduces students to cross-cultural perspectives and critical theories in anthropological studies of medicine. Special attention is given to diverse ways of understanding bodies, illnesses, and therapeutic practices in our changing world.

Same as CHC/LAT 178A.

**(VIII)**

**ANTHRO 134B. Cultures of Biomedicine. 4 Units.**

An introduction to the anthropological study of biomedicine and biotechnology. Topics include medicalization, experimentation and discovery, diagnosis, expertise, health activism, and biotechnology.

**ANTHRO 134C. Medicine, Food, and Health. 4 Units.**

With anthropological studies of edible things as its foundation, this course explores topics related to the relationship between medical knowledge, eating, and health from a medical anthropological perspective.

Prerequisite: ANTHRO 2A or ANTHRO 2B or ANTHRO 2D

**ANTHRO 134F. Anthropology of the Body. 4 Units.**

Examines human bodies as both biological and sociocultural entities and explores the relationship among mind, body, and society cross-culturally. Topics include embodiment; race, sex, gender, and the body; somatization; control of the body; commodified bodies; and hybrid/cyborg bodies.

**ANTHRO 134G. HIV/AIDS in a Global Context. 4 Units.**

Examines issues concerning cultural conceptions of HIV infection and disease worldwide. Topics include treatment and prevention, identity and behavior, risk, ethnicity, gender, youth, sexuality, activism, drug use, illness, religion, the clinical encounter, national belonging, and the pharmaceutical industry.

**(VIII)**

**ANTHRO 134H. Anthropology of Food. 4 Units.**

Examines how food communicates ideas about ethnocentrism, disgust, privilege, gender, race, labor, social identities and hierarchies, globalization, power, and the 'Western diet' and its health consequences.

Same as CHC/LAT 118.

**ANTHRO 134N. Disease, Health, and Inequality. 4 Units.**

Examines the relationships among disease, health, and social inequality in the U.S. and globally. Topics include infectious and chronic disease case studies, health policy, and strategies for promoting health equity.

**ANTHRO 135A. Religion and Social Order. 4 Units.**

An anthropological exploration of religious belief and practices in diverse social and historical contexts. Emphasis placed on selected non-western traditions of the sacred, and on issues of power, ritual, moral order, and social transformation.

**ANTHRO 136A. Nationalism and Ethnicity in the Contemporary World. 4 Units.**

An exploration of the concepts of identity, culture, ethnicity, race, and nation through ethnographic cases, with a view to asking larger questions: how do people create nativeness and foreignness? How does 'culture' get worked into contemporary racisms and nationalisms.

Same as INTL ST 153E.

**(VIII)****ANTHRO 136B. History of Anthropological Theory. 4 Units.**

Provides foundational knowledge in the discipline of anthropology by reviewing competing approaches in anthropological theory, from the nineteenth century to the present. Covers historically fundamental approaches—social evolutionism, functionalism—and recent movements such as feminism, cultural studies, poststructuralism, and postmodernism.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 136D. Conflict Resolution in Cross-Cultural Perspective. 4 Units.**

Examines theories of conflict management. Analyzes how conflict is mitigated in diverse cultures: at the interpersonal level, between groups, and on the international scale. Students discuss readings, hear from conflict management practitioners, and simulate negotiations.

Same as POL SCI 154G, SOC SCI 183E, INTL ST 183E.

**(VIII)****ANTHRO 136G. Colonialism and Gender. 4 Units.**

An anthropological enquiry into the ways colonial relations of power have been structured and gendered throughout the world, and to what effect. Examines the social locations of men and women in the everyday exercise of colonial and imperial power.

Same as INTL ST 153D.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 136K. The Woman and the Body. 4 Units.**

Probes culture and politics of the female body in contemporary American life. Focusing on 'feminine beauty,' examines diverse notions of beauty, bodily practices, and body politics embraced by American women of different classes, ethnicities, and sexualities.

**(VII)****ANTHRO 138. Prisons and Public Education. 4 Units.**

Looks at the connections between schools and prisons in the United States. Students learn about ideas that push beyond common trope of the "school to prison pipeline."

Same as AFAM 159.

**ANTHRO 139. Special Topics in Cultural and Psychological Anthropology. 1-4 Units.**

Studies in selected areas of Cultural and Psychological Anthropology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 140. Sex and Conquest in Latin America. 4 Units.**

Competing ideas of masculinity and femininity, sexual violence, sexual identities, and gendered hierarchies informed how the Spanish engaged in military and religious domination of Mexican and Andean communities, as well as the forms of native resistance throughout colonial Latin America.

Same as HISTORY 160, CHC/LAT 150A, GEN&SEX 171A.

**ANTHRO 141A. Ancient Civilization of Mexico and the Southwest. 4 Units.**

The prehistory and cultural evolution of the civilization which originated in Mexico, including the Olmecs, Aztecs, Toltecs, Maya, and Zapotec, as well as the Pueblos of the Southwestern U.S. Topics include the origins of food production and of the state.

Same as INTL ST 177I.

**ANTHRO 146. Consumption and Culture. 4 Units.**

Our modern 'society of the spectacle' often equates your consumption to your very humanity. Explores the ways in which our desire for things expresses our identity, politics, place within society, and how what we consume dominates social life.

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment.

**ANTHRO 147. Egyptomania. 4 Units.**

An exploration into the archaeological heritage and cultures of ancient Egypt. Also examines how ancient Egypt became appropriated as a popular cultural phenomenon and site of scholarship in the centuries after the Pharaohs.

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment. Archaeology Minors have first consideration for enrollment.

**ANTHRO 147A. Archaeology of the Islamic World. 4 Units.**

The archaeological record connected with the Islamic tradition spans nearly 1,500 years and stretches from Spain to South East Asia. Working with artifacts and other materials, students learn about the sites and historical transformations associated with Islam and Muslim societies.

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment. Archaeology Minors have first consideration for enrollment.

**ANTHRO 147B. Archaeology, Politics, and Identity. 4 Units.**

Archaeologists don't excavate in a political vacuum. Their research has profound consequences for the ways in which people identify with and claim their cultural heritage. Examines archaeology's role in constructing such identities through the traces of the past.

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment. Archaeology Minors have first consideration for enrollment.

**ANTHRO 148. I Dig UCI. 4 Units.**

An introduction to archaeological fieldwork through participation in an active excavation on campus. Students engage with research design and learn the foundational methods of archaeological recovery: survey, mapping, sampling strategies, documentation, excavation, artifact identification, and interpretation.

**ANTHRO 149. Special Topics in Archaeology. 1-4 Units.**

Studies in selected areas of Archaeology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 150A. Language and Social Cognition. 4 Units.**

Explores the relationship between language and cognition in social and cultural contexts. The overall goal is to think through how language structure and use impact how individuals perceive, think about, and understand the world around them.

Same as LSCI 168S.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 151A. Improvisation, Language, and Culture. 4 Units.**

Addresses improvisation, both in performance and in everyday life. Examines improvisation as the 'flexible regulation' of everyday behavior by exploring different scholarly treatments of language and interaction, and working on developing actual theatrical improvisation skills.

Same as LSCI 168J.

Restriction: Upper-division students only.

**ANTHRO 152A. Language Origins: Evolution, Genetics, and the Brain. 4 Units.**

Examines how human language(s) may have originated. Studies pertinent techniques (reconstruction) and addresses related questions, including is our language faculty inborn (i.e., genetically encoded)? Can brain imaging and population genetics research help to unlock this mystery of human evolution?.

Same as LSCI 175, GLBLCLT 105, HISTORY 135G.



**ANTHRO 162A. Peoples and Cultures of Latin America. 4 Units.**

Surveys the prehistory of Latin America and its indigenous cultures, emphasizing the impact of colonial rule, capitalism, and twentieth-century transformations. Emphasis on communities from several countries. In some years, emphasis on comparisons between the Latin American and Caribbean experiences.

Same as INTL ST 177J, CHC/LAT 120.

(VIII)

**ANTHRO 162B. Indian North America. 4 Units.**

A survey of indigenous peoples in North America: American Indians, Alaska Natives, First Nations, Native Americans. Tribal populations and geographic distributions, political and social organization, sovereignty, self-determination, intergovernmental relations; cultural continuity and change; management, preservation, development of environments/resources.

(VII)

**ANTHRO 162C. Race and Empire in Colonial Latin America. 4 Units.**

Explores how native people of Latin America with enslaved and free African incorporated and defied Spanish and Portuguese colonization. Focuses on religious adaptations, resistance movements, legal systems, and the emergence of multicultural communities to explain how race shaped European empires.

Same as HISTORY 165.

**ANTHRO 162D. Anthropology of the United States. 4 Units.**

Examines anthropological research in and of the United States. Topics include race, class, identity, politics, law, and media.

**ANTHRO 163A. Peoples of the Pacific. 4 Units.**

The cultural history and recent developments among the Pacific peoples of Polynesia, Micronesia, Melanesia, New Guinea, and Australia.

Same as INTL ST 158B.

(VIII)

**ANTHRO 164A. 21st Century Africa. 4 Units.**

Comparative studies of the cultures and societies of Sub-Saharan Africa, with emphasis on critical study of colonialism and postcoloniality, social transformation, and the politics of identity.

Prerequisite: ANTHRO 2A

Same as INTL ST 157A.

Restriction: Anthropology Majors have first consideration for enrollment.

(Ib)

**ANTHRO 164P. Peoples and Cultures of Post-Soviet Eurasia. 4 Units.**

Examines the cultures and political conflicts of the more than 130 indigenous ethnic groups in the European and Asian territories of the former U.S.S.R. Emphasis is on the theoretical issues of ethnicity, nationalism, and conflict management.

Same as INTL ST 162B, POL SCI 154F.

(VIII)

**ANTHRO 165A. Modern Iran: Cinema and the City. 4 Units.**

Exploring modern Iran through film, literature, photography, travel writing, and philosophy and social science texts that introduce students to important concepts in post-colonial studies, social thought, war culture, religion, and media as experienced through the paradigm of a non-Western modernity.

Same as PERSIAN 165A.

**ANTHRO 169. Special Topics in Area Studies. 1-4 Units.**

Studies in selected areas of Anthropology. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 179. Special Topics: Methods and Formal Representations. 1-4 Units.**

Studies in selected areas of Methods and Formal Representations. Topics addressed vary each quarter.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 180AW. Anthropology Majors Writing Seminar. 4 Units.**

Anthropological theory designed especially for majors in Anthropology. Topics addressed vary each quarter.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 3 times as topics vary.

Restriction: Anthropology Majors only.

**(Ib)****ANTHRO 190. Senior Thesis. 4 Units.**

Senior thesis with Anthropology faculty.

Repeatability: May be taken for credit 3 times.

**ANTHRO H190A. Honors Research Design. 3 Units.**

Students design a research project and articulate its goals and significance. Written work consists of a research proposal describing the research questions, the relevant literature, methods of data collection and analysis, and ethical considerations.

Prerequisite or corequisite: ANTHRO 199

Restriction: Anthropology Honors students only.

**ANTHRO H190B. Honors Field Research. 3 Units.**

Students begin or continue ethnographic field research and gain experience with a variety of data collection methods, including participant-observation, interviews, surveys, and the study of archival and documentary materials.

Prerequisite or corequisite: ANTHRO 199 and ANTHRO H190A

Restriction: Anthropology Honors students only.

**ANTHRO H190C. Honors Research Analysis. 3 Units.**

Students apply qualitative data analysis techniques to ethnographic data collected as part of their Honors research.

Prerequisite or corequisite: ANTHRO H190B and ANTHRO 199. Anthropology Honors ONLY.

**ANTHRO H190W. Honors Thesis Writing. 3 Units.**

Students draft a senior honors thesis (typically) with the following sections: problem statement, literature review, ethnographic background, and descriptions of the methods, results, and conclusions.

Prerequisite or corequisite: ANTHRO H190C and ANTHRO 199. Anthropology Honors ONLY. Satisfactory completion of the Lower-Division Writing requirement.

**(Ib)****ANTHRO 197. Field Study. 1-4 Units.**

Field study with Anthropology faculty.

Repeatability: May be repeated for credit unlimited times.

**ANTHRO 198. Directed Group Study. 1-4 Units.**

Directed study with Anthropology faculty.

Repeatability: May be repeated for credit unlimited times.

**ANTHRO 199. Independent Study. 1-4 Units.**

Independent research with Anthropology faculty.

Repeatability: May be repeated for credit unlimited times.

**ANTHRO 202A. Proseminar in Anthropology. 4 Units.**

Year-long intensive introduction to the history of anthropological thought and reading in classical and contemporary ethnography for first-year graduate students.

Restriction: Graduate students only.

**ANTHRO 202B. Proseminar in Anthropology. 4 Units.**

Year-long intensive introduction to the history of anthropological thought and reading in classical and contemporary ethnography for first-year graduate students.

Prerequisite: ANTHRO 202A

Restriction: Graduate students only.

**ANTHRO 202C. Proseminar in Anthropology. 4 Units.**

Year-long intensive introduction to the history of anthropological thought and reading in classical and contemporary ethnography for first-year graduate students.

Prerequisite: ANTHRO 202B

Restriction: Graduate students only.

**ANTHRO 204A. Proseminar in Medicine, Science, and Technology. 4 Units.**

Explores the phenomena studied by 'medical anthropology' and 'science and technology studies' are inextricably linked, and how understanding formations requires moving between disparate fields of inquiry. Required for students pursuing a Graduate Certificate in Anthropologies of Medicine, Science, and Technology.

Restriction: Students pursuing a Graduate Certification in Anthropologies of Medicine, Science, and Technology have first consideration for enrollment.

**ANTHRO 215A. Ethnographic Methods. 4 Units.**

Exposes students to diverse methods, both traditional and experimental, used in anthropological ethnographic research. Students gain experience practicing diverse methods, and learn to select methods appropriate to particular study designs and contexts.

Restriction: Graduate students only.

**ANTHRO 215B. Research Design. 4 Units.**

Introduces research design for anthropology, including concept work and mapping, research topic and aims development, research question construction, and fieldwork planning.

Prerequisite: ANTHRO 215A

Restriction: Graduate students only.

**ANTHRO 215C. Grant and Proposal Writing. 4 Units.**

Focuses on production, critique, and revision of student research proposals. A practical seminar designed to improve student proposals, help students through the application processes, and increase students' chances of obtaining support for their research.

Prerequisite: ANTHRO 215B

Restriction: Graduate students only.

**ANTHRO 229A. Anthropology of Knowledge. 4 Units.**

Examines the politics of knowledge. Considers the long history of anthropological studies concerning a wide variety of knowledge forms and practices, including more recent feminist and postcolonial studies. Aims to investigate and enlarge normative definitions of knowledge and science.

**ANTHRO 230D. Ethnography and its Collaborative Futures. 4 Units.**

Structured readings of selected career-making ethnographic works, past and present, with an emphasis on how ethnographic projects evolve into diverse, collaborative projects.

**ANTHRO 230F. Ethnography. 4 Units.**

Explores the theory and practice of ethnography with a focus on anthropology, the discipline most associated with ethnography. Students are exposed to the theoretical underpinnings of ethnographic work, traditional and innovative practices, and sample ethnographies.

Same as CRM/LAW C222, CHC/LAT 217.

Restriction: Graduate students only.

**ANTHRO 232B. Medical Anthropology. 4 Units.**

Explores historical and contemporary theoretical positions and debates in medical anthropology. Topics may include subjectivity, theories of the body, biopolitics, biomedical technologies, sexuality, pharmaceuticals, political economy and health, infectious disease and epidemics, health disparities, and humanitarianism.

Restriction: Students pursuing a Graduate Certification in Anthropologies of Medicine, Science, and Technology have first consideration for enrollment.

**ANTHRO 235A. Transnational Migration. 4 Units.**

Examines borders and boundaries as material and semiotic constructs. Drawing upon an array of literatures, but loosely situated in U.S. geo/biopolitics, explores transformative troubleings of places, spaces, borders, and bodies of all sorts.

Same as SOC SCI 254A, CHC/LAT 215.

Restriction: Graduate students only.

**ANTHRO 240A. Economic Anthropology. 4 Units.**

Classic and contemporary theory in economic anthropology. Case studies: Latin America (primarily Mexico and the Andes), Africa, and the Pacific. Substantive topics: non-market exchange, markets and marketplaces, households, gender, management of common property (fisheries, pastoral lands, forests), labor, and development.

Restriction: Graduate students only.

**ANTHRO 245A. Seminar in Political Anthropology. 4 Units.**

Explores anthropological approaches to politics. Covers a range of issues and topics, including: theories of culture, power, and hegemony; approaches to colonial and post-colonial relations of global inequality; and ethnographic approaches to the modern state.

Restriction: Graduate students only.

**ANTHRO 246. Feminist Anthropology. 4 Units.**

Examines feminist anthropology's rise as an interdisciplinary field. Paying special attention to issues of power, subjectivity, and authority in the research encounter, feminist anthropologists' major contributions to ethnography, gender studies, queer studies, and cultural anthropology are surveyed.

Restriction: Graduate students only.

**ANTHRO 246E. Capital and Empire. 4 Units.**

Examines theories of capital and empire via anthropological theory, post/colonial critique, feminist theory, and Black political thought. Moreover, it examines social movements, geo/political trajectories and formations, and political economic trends that have emerged after the 2008 financial crisis.

Restriction: Graduate students only.

**ANTHRO 247A. Structuralism and Post-Structuralism. 4 Units.**

Traces recent theoretical discussions and arguments over the philosophical and historical 'subject' from structuralist decenterings toward the characteristically 'post-structuralist' contemporary concern with the historical and political constitution of subjectivities and subject positions.

Restriction: Graduate students only.

**ANTHRO 249A. Humanism and Posthumanism. 4 Units.**

Examines alternative forms of human, humanisms, and posthumanisms to explore the inherent ambiguities and shifting boundaries of knowing and being human, and to venture into modes of analysis that problematize the universality and globality of liberal humanism.

**ANTHRO 250A. The Cultural Politics of Visual Representation. 4 Units.**

Develops a theoretical framework for analyzing and reading visual images. Images, as cultural productions, are steeped in the values, ideologies, and taken-for-granted beliefs of the culture which produced them and a political economy that is class, race, and gender inflected.

**ANTHRO 250B. Digital Technologies, Culture, and Media. 4 Units.**

Explores questions of sociality in cyberspace, including what social theories and ethnographic methods are effective in studying online cultures. Topics include general issues like indexicality, reference, temporality, spatiality, and embodiment, and topics such as language, gender, ethnicity, property, and inequality.

Restriction: Graduate students only.

**ANTHRO 252A. Queer Anthropology. 4 Units.**

Explores historical and contemporary scholarship that employs ethnographic approaches to address the discursive construction of sexuality. Also examines how the discipline of anthropology has been shaped by the study of sexuality.

Restriction: Graduate students only.

**ANTHRO 253A. Design, Aesthetics, and Social Life. 4 Units.**

Anthropology has only recently recognized that design demands consideration as a cultural form linked to, yet nonetheless distinct from, other aesthetic endeavors. Course is largely oriented toward collaboratively working out a conceptual basis for a distinctly anthropological approach to design.

**ANTHRO 254. Digital Anthropology. 4 Units.**

Examines "the digital" from an anthropological perspective by exploring ethnographic research on digital culture and using anthropological frameworks to approach the digital and the human. Readings are interdisciplinary, including work from history and communications.

Restriction: Graduate students only.

**ANTHRO 255A. Disability Worlds. 4 Units.**

Explores disability from a range of methodological and theoretical perspectives. Examines the genealogy of disability in anthropology and related disciplines, with an emphasis on ethnographic work. Topics addressed include access, embodiment, politics, selfhood, and sexuality.

Restriction: Graduate students only.

**ANTHRO 256B. Secrecy, Security, and Surveillance. 4 Units.**

Explores secrecy and security as fundamental to constructions of public and private domains, relations of citizenship and sovereignty, the militarization of everyday life, and the ways that the fabrics of societies are woven of both trust and deceit.

Restriction: Graduate students only.

**ANTHRO 257A. Natures and Environments. 4 Units.**

Examines social scientific understandings of natural contexts and human milieus via a survey of key analytic categories. Begins by examining historical and ongoing definitions and problems organized around "nature" and "environment" as separate but imbricated concepts.

**ANTHRO 259A. Dissertation Writing Seminar. 4 Units.**

Intended for advanced, post-fieldwork Anthropology graduate students. Emphasis on the presentation of research design and results, problems of ethnographic writing, and qualitative and quantitative data and analysis. Prerequisites: post-fieldwork; graduate standing in Anthropology or consent of instructor.

Restriction: Graduate students only.

**ANTHRO 289. Special Topics in Anthropology. 1-4 Units.**

Studies in selected areas of Anthropology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ANTHRO 290. Dissertation Research. 4-12 Units.**

Dissertation research with Anthropology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ANTHRO 299. Independent Study. 4-12 Units.**

Independent research with Anthropology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Chicano/Latino Studies Courses

**CHC/LAT 61. Introduction to Chicano/Latino Studies I. 4 Units.**

An introduction to the study of the historical foundations of the Chicano/Latino experience. Addresses such topics as empire, migration, immigrant settlement, economic integration, race, gender, and the formation of group identities.

(III, VII)

**CHC/LAT 62. Introduction to Chicano/Latino Studies II. 4 Units.**

Provides an introduction to the arts, literature, and culture of Chicano/Latino communities. Analyzes representations of and cultural production in Chicano/Latino communities through such media as folklore, literature, art, film, architecture, dance theatre, performance, music, poetry, mass media, and language.

(III, VII)

**CHC/LAT 63. Introduction to Chicano/Latino Studies III. 4 Units.**

Examines contemporary public policy issues in Chicano/Latino communities. Each offering addresses at least three of the following themes: migration, immigrant incorporation, identity construction, language policy, health policy, politics, sexuality, gender, labor, class, and education.

(III and VII ).

**CHC/LAT 64. Introduction to Race and Ethnicity in Political Science. 4 Units.**

Examines major theories that attempt to explain the roles of race and ethnicity in U.S. politics.

Same as POL SCI 61A.

(III and VII ).

**CHC/LAT 65. Ethnic and Immigrant America. 4 Units.**

Focusing on Asian, Latino, and Black immigrant groups, examines the second generation's experience of straddling two cultures and growing up American. Covers topics such as assimilation, bilingualism, race relations, education, bicultural conflicts, interracial marriage, and multiracial identities.

Same as SOCIOL 68A.

(VII)

**CHC/LAT H80. Latina/o Childhoods: Comparative Approaches to the Study of Children and Youth. 4 Units.**

Students in this seminar compare the experiences of Latina/o children to other young people in the U.S. and around the world, analyzing the historical, political, economic, and sociocultural factors that have differently structured the life stage we understand as "childhood."

Restriction: Campuswide Honors Collegium students only.

(III)

**CHC/LAT 101. Research in the Latino Community. 4 Units.**

Students engage in firsthand research in the local Orange County environment. Students identify a research problem, conduct a literature review, develop questions and/or hypotheses, appropriate methods, and write a proposal.

Prerequisite: Two courses from CHC/LAT 61 or CHC/LAT 62 or CHC/LAT 63 and two courses from CHC/LAT 110-189.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment.

**CHC/LAT 102W. Chicano/Latino Research Seminar. 4 Units.**

Taught as a writing and research seminar in Chicano/Latino Studies. Student develops own project; engages in peer editing; drafts, writes, and presents paper at Spring research conference. Prior course work in Chicano/Latino Studies helpful, i.e., CHC/LAT 61, 62, 63.

Prerequisite: CHC/LAT 101. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Chicano/Latino Studies Majors only.

(Ib)

**CHC/LAT 110. Topics in Chicano Literature and Culture. 4 Units.**

Studies in selected areas of Chicano/Latino Studies. Topics addressed vary each quarter. Taught in English.

Repeatability: May be taken for credit 4 times as topics vary.

Same as SPANISH 140.

**CHC/LAT 118. Anthropology of Food. 4 Units.**

Examines how food communicates ideas about ethnocentrism, disgust, privilege, gender, race, labor, social identities and hierarchies, globalization, power, and the 'Western diet' and its health consequences.

Same as ANTHRO 134H.

**CHC/LAT 120. Peoples and Cultures of Latin America. 4 Units.**

Surveys the prehistory of Latin America and its indigenous cultures, emphasizing the impact of colonial rule, capitalism, and twentieth-century transformations. Emphasis on communities from several countries. In some years, emphasis on comparisons between the Latin American and Caribbean experiences.

Same as INTL ST 177J, ANTHRO 162A.

**(VIII)****CHC/LAT 121. Latina/Latino Pop: Latina/Latino Popular Culture. 4 Units.**

With a focus on the politics of language and space/place, prepares students to critically analyze sites of Latina/Latino popular culture including: music, film, performance, sports, media, and varied subcultures.

Same as HISTORY 151D.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. History Majors have first consideration for enrollment.

**CHC/LAT 123. Immigration, Nation, and Media. 4 Units.**

Examines media shapes and reflects public opinion on immigration and its representation of immigrants, citizens, and ideas about the nation, and who belongs and who is a potential threat; as well as the relationship between scholars and journalists.

Same as ANTHRO 125U, SPPS 101A.

**CHC/LAT 124W. Immigrant Emotionality. 4 Units.**

Explores the emotional universe created by the Latin American immigrant experience, and guides students in the creation of a literary work based on an investigation into, or reflection on that experience.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

**(Ib)****CHC/LAT 129. Special Topics in Literature, Arts, Media, Culture. 1-4 Units.**

Studies in selected areas of Chicano/Latino Studies. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment.

**CHC/LAT 132A. Chicana/Chicano History: Pre-Colonial to 1900. 4 Units.**

Examines social history of the southwest region from antiquity to 1900. Discusses major questions, theory and research methods pertinent to Chicanas/Chicanos. Themes include: indigenous empires, conquest, colonialism, social stratification, ideology, marriage, sexuality, industrial capitalism, accommodation and resistance.

Same as HISTORY 151A.

**CHC/LAT 132B. Chicana/Chicano History: Twentieth Century. 4 Units.**

Examines social history of the Southwest with emphasis on Mexican-origin people. Discusses major questions, theory and research methods pertinent to Chicana/Chicano history. Themes explored include: immigration, xenophobia, class struggle, leadership, generational cohorts, unionization, education, barrioization, ethnicity, patriarchy, sexuality.

Same as HISTORY 151B.

**CHC/LAT 134. U.S. Latino Literature and Cultures. 4 Units.**

Focuses on aspects of literature, art, cultural production, and history of the multifaceted Latino cultures that have developed within the United States. Focuses on one group, such as Caribbean Americans, Chicanos, Central Americans, or a comparative perspective of several groups.

Same as SPANISH 110C.

**CHC/LAT 135. Latinas in the Twentieth Century U.S.. 4 Units.**

Latinas in the U.S. from 1900 to present, offering a diversity of their cultures, regional histories, sexualities, generations, and classes.

Same as HISTORY 151C.



**CHC/LAT 139. Special Topics in Chicano/Latino History. 1-4 Units.**

Studies in selected areas of Chicano/Latino History. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Chicano/Latino Studies Majors only.

**CHC/LAT 147. Comparative Minority Politics. 4 Units.**

Examines the political experiences of Blacks, Latinos, and Asian Americans in the United States from roughly 1950 to the present. Focuses on how each group has pursued political empowerment via both conventional political channels and social movements.

Same as AFAM 151, ASIANAM 132, POL SCI 124C.

**CHC/LAT 148. Racial and Ethnic Relations in the United States. 4 Units.**

Examines central questions and issues in the field of race and ethnicity; the emergence, maintenance, and consequences of the ethnic and racial stratification system in the United States; the future of racial and ethnic relations; and relevant public policy issues.

Same as SOCIOL 167A.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**CHC/LAT 148W. Racial and Ethnic Relations in the United States. 4 Units.**

Examines central questions and issues in the field of race and ethnicity; the emergence, maintenance, and consequences of the ethnic and racial stratification system in the United States; the future of racial and ethnic relations; and relevant public policy issues.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as SOCIOL 167AW.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**(Ib)**

**CHC/LAT 150. U.S. Intervention in Latin America. 4 Units.**

Explores political, economic, social, and cultural ties that bind Latin America to the United States. Focuses on U.S. intervention and Latin American response from early nineteenth century to present day. Case studies include Mexico, Guatemala, Cuba, Chile, and Central America.

Same as POL SCI 142J, INTL ST 177D, HISTORY 166.

**CHC/LAT 150A. Sex and Conquest in Latin America. 4 Units.**

Competing ideas of masculinity and femininity, sexual violence, sexual identities, and gendered hierarchies informed how the Spanish engaged in military and religious domination of Mexican and Andean communities, as well as the forms of native resistance throughout colonial Latin America.

Same as ANTHRO 140, HISTORY 160, GEN&SEX 171A.

**CHC/LAT 151. Latinos in U.S. Politics. 4 Units.**

Comparing the political issues facing Latino groups by examining their migration histories, voting behavior, nonelectoral participation, and policy issues. Latino issues are examined on the national, state, and local levels, including formal representation, immigration, affirmative action, and language policy.

Same as POL SCI 124B.

**(VII)**

**CHC/LAT 151B. Revolution in Latin America. 4 Units.**

Presents a comparative analysis of the causes, development, and consequences of selected revolutionary movements, focusing on outbreaks in Mexico, Bolivia, Cuba, Chile, Nicaragua, and Grenada. Explores topics of state formation, economic nationalism, social justice, ethnicity, and role of international affairs.

Same as SOC SCI 173N, HISTORY 166D, INTL ST 177C.

**CHC/LAT 152A. Race, Ethnicity, and Social Control. 4 Units.**

Provides a historical and sociological survey of racial and ethnic group relations in contexts of crime control, emphasizing the roles of racial ideology, structural racism, and social movements in shaping these dynamic relations, and their significance to American liberal democracy.

Same as CRM/LAW C116.

**CHC/LAT 152B. Community, Social Justice, and Health Equity Research for Action. 4 Units.**

Focuses on community as a unit of identity, community, well-being, and social justice perspectives and initiatives to promote community health. Addresses community change and improvements in community well-being, with a focus on health equity research for action.

Prerequisite: PUBHLTH 1 or PUBHLTH 2 or CHC/LAT 61 or CHC/LAT 62 or CHC/LAT 63

Same as PUBHLTH 115.

**CHC/LAT 153. Cross-Cultural Research on Urban Gangs. 4 Units.**

Taking an urban policy approach, examines the background and contemporary traditions of gangs in several ethnic groups including African-, Asian-, and Mexican-Americans. Cross-cultural exploration of the varied facets of gang life. The major social-control institutions affecting them.

Same as CRM/LAW C156.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment. Chicano/Latino Studies Majors have first consideration for enrollment.

**(VII)****CHC/LAT 154. Latino Metropolis. 4 Units.**

Explores the processes of Latino urbanization in the United States and the spatialization of Latino identities, particularly in the context of Southern California with selected comparisons drawing from other cities.

Same as UPPP 172.

**(VII)****CHC/LAT 155. Culture Change and the Mexican People. 4 Units.**

Reviews culture contact and colonization, innovation diffusion, acculturation, assimilation, culture conflict and marginality, modernization, urbanization, legal transformations. Mexico and the Southwestern U.S. are reviewed through several centuries to better appreciate the indigenous base of the Mexican people.

Same as CRM/LAW C172.

**CHC/LAT 156W. Chicano/Latinos and Labor. 4 Units.**

Explores theories that explain the occupational pathways and workplace experiences of Latinos in various work sectors. Investigates jobs such as migrant labor, child street vendors, Latina/Latino professionals, and Latinos migrating to the U.S. South that work in poultry processing plants.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

**(Ib)****CHC/LAT 157. Cuban Society and Revolution. 4 Units.**

Explores the causes, development, and legacy of the 1959 Revolution. Themes include economic dependency, democracy, race, gender, culture, and the always volatile relations between Cuba and the United States.

Same as POL SCI 153G, HISTORY 166C, INTL ST 177E.

**CHC/LAT 158. Feminisms of Color. 4 Units.**

Surveys the development of Chicana feminist thought and practice. Focuses on historical contemporary writings by and about Chicana feminists. Draws from interdisciplinary scholarship in order to survey the diversity of Chicana feminisms.

**(VII)****CHC/LAT 159. Special Topics in Society, Labor, Politics, Law, Gender, Race, Ethnicity. 1-4 Units.**

Studies in selected areas of Chicano/Latino Studies. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Chicano/Latino Studies Majors only.

**CHC/LAT 161. Transnational Migration. 4 Units.**

Examines the movement of people across national borders, governmentality and the role of state practices to control populations, and issues of citizenship, belonging, and identity. Examples are drawn from the United States, Europe, Latin America, Asia, and Africa.

Same as ANTHRO 125X, INTL ST 117A.

(VIII)

**CHC/LAT 162A. Urban America . 4 Units.**

Students examine the historical, social, political, and economic factors that contributed to the construction of the American urban context, one that is poverty concentrated and racially/ethnically segregated. Students also critically assess the consequence of growing up in America's urban neighborhoods.

Same as SOC SCI 163A, UPPP 104.

**CHC/LAT 163. U.S. Immigration Policy. 4 Units.**

Examines selected immigration policy debates since the nineteenth century, rationale and consequences of immigration law since 1965, problems of administration, implementation and enforcement, impact of immigration policy on foreign relations, and contemporary debate regarding the future of U.S. policy.

Same as POL SCI 126C.

(VII)

**CHC/LAT 164A. Undocumented Immigrant Experiences. 4 Units.**

Examines the experiences of undocumented immigrants and the policies that structure their educational, economic, social, and political participation.

Same as ASIANAM 130, CRM/LAW C187, SOCIOL 177C.

(III and VII ).

**CHC/LAT 166. Chicano Movement. 4 Units.**

Explores the history of Mexicans in the U.S. with particular attention paid to their integration into the U.S. capitalist economy. Examines this economic history and the Chicano movement, 'El Movimiento,' within the wide context of socio-economic change.

Same as UPPP 177.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**CHC/LAT 167. Latinos in a Global Society. 4 Units.**

Examines interconnections between diverse Latino groups in the U.S. and the effects of globalization on their social, cultural, and political realities. Topics include immigration, demographics, socioeconomic differentiation, familial relations, political protest/resistance, law and policy, and links to 'homeland' issues.

Same as SOC SCI 173L.

(VII)

**CHC/LAT 168. Chicano/Latino Social Psychology. 4 Units.**

Examines theories, research, and major issues of relevance to understanding social psychological processes in Chicano/Latino populations. Topics include social development, cultural orientations, gender and sexuality, close relationships, happiness and well-being, stereotyping, prejudice and discrimination, and mental and physical health.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as PSCI 192Q.

Restriction: Psychological Science Majors have first consideration for enrollment. Chicano/Latino Studies Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

(VII)

**CHC/LAT 169. Special Topics in Globalization, Transnationalism, Immigration, U.S.-Mexico Border. 1-4 Units.**

Studies in selected areas of Chicano/Latino Studies. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**CHC/LAT 170. Chicano/Latino Families. 4 Units.**

Introduction to the research, literature, and issues surrounding the topic of Chicano/Latino families including cultural history, contemporary issues, organization of family, traditions, lifestyles, values, beliefs, generational differences, gender issues, ethnic identity, evolution of demographic patterns, current economic and political standings.

Same as SOC SCI 165, PSCI 166S, PSYCH 174H.

**CHC/LAT 176. Race, Gender, and Science. 4 Units.**

Perfect for pre-health, science and social science majors wanting to appreciate how science and society interact. Race and gender as biological and socio-cultural constructs are examined. Questions explored: What is disease? What is science? What are social and biological differences.

Same as ANTHRO 128B.

**(VII)****CHC/LAT 178A. Medical Anthropology. 4 Units.**

Introduces students to cross-cultural perspectives and critical theories in anthropological studies of medicine. Special attention is given to diverse ways of understanding bodies, illnesses, and therapeutic practices in our changing world.

Same as ANTHRO 134A.

**(VIII)****CHC/LAT 179. Special Topics in Health, Medicine, and Psychosocial Dynamics. 1-4 Units.**

Studies in selected areas of Chicano/Latino Studies. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment.

**CHC/LAT 183. Multicultural Education in K-12 Schools. 4 Units.**

Provides a theoretical and empirical overview of educational issues affecting low-income immigrant and U.S. born minority student populations in an increasingly diverse and changing society.

Same as EDUC 124.

**(VII)****CHC/LAT 189. Special Topics in Educational Policy and Issues. 1-4 Units.**

Studies in selected areas of Chicano/Latino Studies. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: May be repeated for credit unlimited times.

**CHC/LAT H190A. Honors Research Preparation. 4 Units.**

Students write a proposal describing their research question, the relevant background literature, and the method of data collection and analysis. Field work for the project may begin this quarter.

Restriction: Chicano/Latino Studies Honors students only.

**CHC/LAT H190B. Honors Field Research. 4 Units.**

Students begin or continue their research for their senior honors thesis.

Prerequisite: CHC/LAT H190A

**CHC/LAT H190C. Honors Thesis. 4 Units.**

Student drafts a senior honor thesis (typically) with the following sections: problem statement, literature review, description of the methods, results, and conclusions.

Prerequisite: CHC/LAT H190A and CHC/LAT H190B

**CHC/LAT H190W. Honors Thesis. 4 Units.**

Student drafts a senior honor thesis (typically) with the following sections: problem statement, literature review, description of the methods, results, and conclusions.

Prerequisite: CHC/LAT H190A and CHC/LAT H190B. Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**CHC/LAT 198. Directed Group Study. 1-4 Units.**

Directed study with Chicano/Latino faculty.

Repeatability: May be repeated for credit unlimited times.

**CHC/LAT 199. Independent Study. 1-4 Units.**

Independent research with Chicano/Latino faculty.

Repeatability: May be repeated for credit unlimited times.

**CHC/LAT 200A. Theoretical Issues in Chicano/Latino Research. 4 Units.**

Introduction to theoretical issues in the scholarship in Chicano/Latino Studies. Theories from social sciences, humanities, critical theory. Topics: immigration, identity, gender and sexuality, globalization, transnationalism, social, political, and economic integration, race theory, labor market participation, social history, cultural productions.

**CHC/LAT 210A. Cultural and Historical Precedents for Latinos and Medical Care. 2 Units.**

Introduction to the history of Latinos, focusing on relevant pre-Columbian, colonial, and modern social and cultural developments, including issues of race, gender, sexuality, religious beliefs, and health beliefs and practices.

Grading Option: In Progress (Letter Grade with S/U).

**CHC/LAT 210B. Cultural and Historical Precedents for Latinos and Medical Care. 2 Units.**

Introduction to the history of Latinos, focusing on relevant pre-Columbian, colonial, and modern social and cultural developments, including issues of race, gender, sexuality, religious beliefs, and health beliefs and practices.

Prerequisite: CHC/LAT 210A

Restriction: CHC/LAT 210A-210B and CHC/LAT 212 may not both be taken for credit.

**CHC/LAT 211A. Latinos/Latinas and Medical Care: Contemporary Issues. 2 Units.**

Introduction to medical anthropological and social science perspectives on Latinos/Latinas in relation to a number of health and medically-related issues, i.e., immigration, gender, reproduction, culture, social structure, political economy, sexuality, utilization of medical services, and health beliefs.

Same as PUBHLTH 211A.

**CHC/LAT 211B. Latinos/Latinas and Medical Care: Contemporary Issues. 2 Units.**

Introduction to medical anthropological and social science perspectives on Latinos/Latinas in relation to a number of health and medically-related issues, i.e., immigration, gender, reproduction, culture, social structure, political economy, sexuality, utilization of medical services, and health beliefs.

Prerequisite: CHC/LAT 211A

Same as PUBHLTH 211B.

**CHC/LAT 215. Transnational Migration. 4 Units.**

Examines borders and boundaries as material and semiotic constructs. Drawing upon an array of literatures, but loosely situated in U.S. geo/biopolitics, explores transformative troubleings of places, spaces, borders, and bodies of all sorts.

Same as SOC SCI 254A, ANTHRO 235A.

Restriction: Graduate students only.

**CHC/LAT 217. Ethnography. 4 Units.**

Explores the theory and practice of ethnography with a focus on anthropology, the discipline most associated with ethnography. Students are exposed to the theoretical underpinnings of ethnographic work, traditional and innovative practices, and sample ethnographies.

Same as ANTHRO 230F, CRM/LAW C222.

Restriction: Graduate students only.

**CHC/LAT 222. Theorizing Illegality and the Experiences of Undocumented Immigrants. 4 Units.**

Examines theories of illegality and citizenship, historical and contemporary undocumented immigrant experiences, and methodological concerns in this area of study.

Same as SOCIOL 282.

Restriction: Graduate students only.

**CHC/LAT 223. Ethnic America. 4 Units.**

Examines critically the meaning and measurement of ethnicity, race, and nation in sociological theory and research. Theories of ethnicity are explored, along with empirical studies of the construction of ethnic and pan-ethnic identities in historical and contemporary contexts.

Same as SOCIOL 234.

Restriction: Graduate students only.

**CHC/LAT 224. Immigrant America. 4 Units.**

The study of the causes and consequences of international migration has become one of the most vital fields of sociological theory and research. Examines principal theoretical perspectives and empirical research on contemporary immigration flows and the processes of incorporation.

Same as SOCIOL 264.

Restriction: Graduate students only.

**CHC/LAT 225. Crimmigration. 4 Units.**

Examines the criminalization of immigration, with an emphasis on U.S. enforcement procedures and outcomes. Analyzes the devolution of federal immigration law to local authorities, the rise in immigrant detention and deportation, and the militarization of the U.S.-Mexico border.

Same as SOCIOL 268, CRM/LAW C258.

Restriction: Graduate students only.

**CHC/LAT 251. Models of Practice and Intervention at the Community Level. 4 Units.**

Examines and critiques current models, frameworks, theories for.

Prerequisite: CHC/LAT 200A or PUBHLTH 246

Same as PUBHLTH 251.

Restriction: Graduate students only.

**CHC/LAT 289. Special Topics in Chicano/Latino Studies. 1-4 Units.**

Current research in Chicano/Latino Studies.

Repeatability: May be repeated for credit unlimited times.

**CHC/LAT 290. Dissertation Research. 1-12 Units.**

Dissertation research with Chicano/Latino faculty.

Repeatability: May be taken for credit 10 times.

Restriction: Graduate students only.

**CHC/LAT 299. Independent Study. 1-12 Units.**

Independent study with Chicano/Latino Studies faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Cognitive Sciences Courses

**COGS 14P. Python for Cognitive Science and Neuroscience Research. 4 Units.**

Introduces Python for data analysis and modeling encountered in cognitive science and neuroscience. Topics include data structures, execution control, graphic visualization, and interaction with sound and display interfaces. Application in statistical analysis, model simulation, and stimulus presentation and experimental control.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**COGS 109. Cognitive Sciences Research Seminar. 4 Units.**

Read and discuss examples of the primary research leading to the concepts covered in Psychology Fundamentals. Focuses on how this research is conducted and how inferences from it are drawn.

Prerequisite or corequisite: PSYC 9A

Restriction: Cognitive Sciences Majors only.

**COGS 110. Quantitative Methods for Cognitive Sciences Research. 4 Units.**

Basics of quantitative methods used in cognitive sciences research focusing on linear algebra, Fourier analysis, multivariate statistics, and signal detection theory. Examples drawn from models and methods used in cognitive sciences research with practical examples.

Prerequisite: MATH 2B and STAT 7 and (PSYC 114M or ICS 31)

Restriction: Cognitive Sciences majors only.

## Economics Courses

**ECON 1. Introduction to Economics. 4 Units.**

An analysis of the problems society faces in organizing itself to provide goods and services. How decisions of government, business, and the individual relate to current economic problems such as unemployment, inflation, poverty, and environmental pollution.

Restriction: No Economics Majors. ECON 1 may not be taken for credit if taken concurrently or after ECON 20A or ECON 20B.

(III)

**ECON 11. The Internet and Public Policy. 4 Units.**

How the Internet works. Current public policy issues concerning the Internet. Introductory economics. Communications law. Interactions between information technology, economics, and law. Case studies about Internet and communications policy.

Same as ICS 11.

(II or III).

**ECON 12. Federal Reserve: Past, Present, and Future. 4 Units.**

Studies central banking in the United States from colonial times to the present. Focuses on the past, present, and future of the Federal Reserve and precursors to that system, which was established in 1913.

**ECON 13. Global Economy. 4 Units.**

Acquaints students with the fundamental patterns of the global economy. Emphasizes the historical roots and political implications of economic choices.

Same as IS 13.

Restriction: International Studies Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

(III, VIII)

**ECON 15A. Probability and Statistics in Economics I. 4 Units.**

An introduction to probability, statistics, and econometrics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Examples from economics.

Prerequisite: MATH 2A and MATH 2B

Overlaps with MGMT 7.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

(Va)



**ECON 15B. Probability and Statistics in Economics II. 4 Units.**

An introduction to probability, statistics, and econometrics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Examples from economics.

Prerequisite: ECON 15A

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**(Va)****ECON 17. An Economic Approach to Religion. 4 Units.**

Introduction to how basic economic concepts such as demand, supply, consumption, production, competition, free-riding, innovation, regulation, and rent-seeking can be applied to understand observed religious behavior.

Same as RLGN 17.

**(III)****ECON 20A. Basic Economics I. 4 Units.**

The fundamentals of microeconomics. The behavior of firms and consumers: markets, supply/demand, utility maximization, resource allocation, and efficiency.

Overlaps with MGMT 4A, ECON 23.

Restriction: Economics, Quantitative Economics, Business Economics, and Business Info Management majors have first consideration for enrollment. For School of Social Sciences majors, MGMT 4A may not be used as a substitute for ECON 20A.

**(III)****ECON 20B. Basic Economics II. 4 Units.**

The fundamentals of macroeconomics. Government behavior: monetary and fiscal policy, inflation, and unemployment. Effective fall 2006, the content of Economics 20B is macroeconomics. This course cannot be taken to repeat Economics 20B taken prior to fall 2006.

Prerequisite: ECON 20A or ECON 13 or ECON 23

Overlaps with MGMT 4B.

Restriction: Business Information Mgmt Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment. For School of Social Sciences majors, MGMT 4B may not be used as a substitute for ECON 20B.

**(III)****ECON 23. Basic Economics for Engineers. 4 Units.**

The fundamentals of microeconomics. The behavior of firms and of consumers: markets, supply/demand, utility maximization, resource allocation, and efficiency.

Overlaps with ECON 20A.

Restriction: Engineering Majors only. Mechanical Engineering Majors only. Aerospace Engineering Majors only. Civil Engineering Majors only. Environmental Engineering Majors only.

**(III)****ECON 25. The Economics of Accounting Decisions. 4 Units.**

Introduction to accounting concepts and principles, including the accounting model and accounting style, transaction analysis, and preparation of financial statements. An analysis of the similarities and differences between accounting and economic concepts (e.g., value, profits).

Prerequisite: ECON 20A

Overlaps with MGMT 30A.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 100A. Intermediate Economics I. 4 Units.**

Determinants of supply and demand; operation of competitive and monopolistic markets; imperfections of the market system, explanations of unemployment, inflation, recessions; public policy for macroeconomic problems.

Prerequisite: ECON 20A and ECON 20B and MATH 2A and MATH 2B

Overlaps with ECON 105A.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 100B. Intermediate Economic II. 4 Units.**

Determinants of supply and demand; operation of competitive and monopolistic markets; imperfections of the market system, explanations of unemployment, inflation, recessions; public policy for macroeconomic problems.

Prerequisite: ECON 100A

Overlaps with ECON 105B.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 100C. Intermediate Economic III. 4 Units.**

Determinants of supply and demand; operation of competitive and monopolistic markets; imperfections of the market system, explanations of unemployment, inflation, recessions; public policy for macroeconomic problems.

Prerequisite: ECON 100B

Overlaps with ECON 105C.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 105A. Intermediate Quantitative Economics I . 4 Units.**

An advanced and mathematical version of ECON 100A for students in the Quantitative Economics major.

Prerequisite: ECON 20A and ECON 20B and MATH 2A and MATH 2B and MATH 3A

Overlaps with ECON 100A.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 105B. Intermediate Quantitative Economics II . 4 Units.**

An advanced and mathematical version of ECON 100B for students in the Quantitative Economics major.

Prerequisite: ECON 105A

Overlaps with ECON 100B.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 105C. Intermediate Quantitative Economics III . 4 Units.**

An advanced and mathematical version of ECON 100C for students in the Quantitative Economics major.

Prerequisite: ECON 105B

Overlaps with ECON 100C.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 107. Economics of Asymmetric Information. 4 Units.**

Focuses on the effects of asymmetric information in the markets for traditional economic goods and resources, such as labor, insurance, used cars, credit, and in auctions and bargaining problems. Prerequisite:.

Prerequisite: ECON 100A or ECON 105A

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 109. Special Topics in Economic Theory. 4 Units.**

Studies in selected areas of Economics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: May be repeated for credit unlimited times.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 115. Behavioral Economics. 4 Units.**

Studies the behavioral and psychological biases in economics settings. Both individual decisions and games are discussed.

Prerequisite: ECON 20A and ECON 20B

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 116A. Game Theory I. 4 Units.**

Extensive form games with perfect information, and coalitional games. The key solution concepts are Nash Equilibrium, Backward Induction, and the Core. Substantive examples include public good production, oligopoly, electoral competition, auctions, holdup, market entry, and voting.

Prerequisite: (ECON 15B or STAT 120B) and (ECON 100A or ECON 105A)

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 116B. Game Theory II. 4 Units.**

Two-quarter sequence on game theory. Bayesian games, extensive form games with imperfect information, zero-sum games.

Prerequisite: ECON 116A

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 122A. Applied Econometrics I. 4 Units.**

Introduction to econometrics emphasizing practical applications in microeconomics and macroeconomics.

Prerequisite or corequisite: ECON 100A or ECON 105A and (ECON 15B or MATH 130B or MATH 133A or STAT 120C)

Overlaps with ECON 123A, ECON 123B.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 122B. Applied Econometrics II. 4 Units.**

Introduction to econometrics emphasizing practical applications in microeconomics and macroeconomics.

Prerequisite: ECON 122A

Overlaps with ECON 123B.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 122CW. Data Analysis Writing. 4 Units.**

Research writing course in econometrics focusing on individual research projects. Students employ econometric analysis to address an economic question in a 20-page paper and present their findings to the class in a short presentation.

Prerequisite: ECON 15A and ECON 15B and ECON 122A and ECON 122B. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**(Ib)**

**ECON 123A. Econometrics I. 4 Units.**

Specification, estimation, and testing of econometric models. Applications in various areas of microeconomics and macroeconomics.

Prerequisite: MATH 2A and MATH 2B and MATH 3A and STAT 120A and STAT 120B and (STAT 120C or MATH 131C) and (ECON 100A and ECON 100B and ECON 100C) or (ECON 105A and ECON 105B and ECON 105C)

Overlaps with ECON 122A, ECON 122B.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 123B. Econometrics II. 4 Units.**

Specification, estimation, and testing of econometric models. Applications in various areas of microeconomics and macroeconomics.

Prerequisite: ECON 123A

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 123CW. Econometrics III. 4 Units.**

Seminar course in which students do an original econometric research project.

Prerequisite: ECON 123B. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**(Ib)**

**ECON 125. Business Forecasting. 4 Units.**

Students learn how to produce forecasts of the behavior of economic (and other) variables. The techniques examined are linear regression, nonlinear regression, and nonparametric kernel regression; AR, MA, ARMA, ARIMA, and Box-Jenkins.

Prerequisite: ECON 122A

Overlaps with MGMT 180.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 126. Computational Macroeconomics. 4 Units.**

Introduction to the computational methods for studying economic growth and the business cycle. Students learn how to write computer programs to simulate macroeconomic models, download and manage data from internet resources, and to do basic statistics.

Prerequisite or corequisite: (ECON 100C or ECON 105C) and (ECON 122A or ECON 123A)

Restriction: Business Economics Majors only. Economics Majors only. Quantitative Economics Majors only.

**ECON 127A. Experimental Economics . 4 Units.**

Students will learn what constitutes proper experimental design and what laboratory experiments teach us about human behavior and the economy. Students will participate in a sample experiment, evaluate the results, and discuss experiment design and larger issues. Formerly ECON 117.

Prerequisite: ECON 15B and ECON 100B

**ECON 128. Machine Learning for Economists. 4 Units.**

Develops the theory and computation of recent methods at the intersection of econometrics and machine learning as used in economics and business. Building on intermediate econometrics, it introduces causal random forests, double machine learning, and neural networks.

Prerequisite: ECON 123A

Restriction: Business Economics Majors only. Economics Majors only. Quantitative Economics Majors only.

**ECON 129. Special Topics in Quantitative Methods. 4 Units.**

Studies in selected areas of Quantitative Methods. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 131A. The Economics of Risk and Uncertainty. 4 Units.**

The theory of insurance and joint-ownership of risky enterprises; optimal procedures for the allocation of uncertain payoffs.

Prerequisite or corequisite: (ECON 15B or ECON 105A or MATH 130B) and (ECON 100B or ECON 105B or STAT 120B or MATH 133A) and (ECON 100C or STAT 120C)

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 132A. Introduction to Financial Investments. 4 Units.**

Modern theories of investment and their application to the study of financial markets. The relation between risk and return, diversification, asset pricing, efficient markets hypothesis, and the market valuation of stocks, bonds, options, and futures.

Prerequisite or corequisite: ECON 15A and ECON 15B and (ECON 122A or ECON 123A) and (ECON 100A and ECON 100B and ECON 100C) or (ECON 105A and ECON 105B and ECON 105C) or (MATH 130A and STAT 120A and STAT 120B and STAT 120C) or MATH 130B or MATH 133A

Overlaps with MGMT 141.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 134A. Corporate Finance. 4 Units.**

Provides an overview of the modern theory and practice of corporate finance and focuses on two fundamental financial decisions; investment as well as financing. Beginning with discounted cash flow analysis, basic theory will be applied to the valuation of stocks.

Prerequisite: (ECON 100A and ECON 100B and ECON 100C) or (ECON 105A and ECON 105B and ECON 105C) and (ECON 15A or MATH 130A or STAT 120A) and (ECON 15B or STAT 120B)

Overlaps with MGMT 109.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 135. Mathematics of Finance. 4 Units.**

After reviewing tools from probability, statistics, and elementary differential and partial differential equations, concepts such as hedging, arbitrage, Puts, Calls, the design of portfolios, the derivation and solution of the Blac-Scholes, and other equations are discussed.

Prerequisite: MATH 3A or MATH H3A

Same as MATH 176.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Mathematics Majors have first consideration for enrollment.

**ECON 137W. Financial Markets and the Macroeconomy. 4 Units.**

Students are required to write a paper on a research question related to.

Prerequisite: ECON 122A or ECON 123A. Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**ECON 139. Special Topics in Financial Economics. 4 Units.**

Studies in selected areas of Financial Economics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 140. Managerial Economics. 4 Units.**

A collection of concepts and methods for effective decision making. Explores how the tools of microeconomics, including game theory and industrial organization theory, can be used to make better managerial decisions, particularly those involving allocation of resources within firms.

Prerequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B)

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 141A. Public Economics I. 4 Units.**

Examines the role of the government in the economy and its impact on individuals and firms.

Prerequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B)

**ECON 141B. Public Economics II. 4 Units.**

Theory of public goods, externalities, voting models, analysis of bureaucracy, the Tiebout model, income redistribution, intergovernmental grants.

Prerequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B)

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 142A. Industrial Organization I. 4 Units.**

The theory of market structure. Imperfect markets, government policies, and industry performance.

Prerequisite: (ECON 15A and ECON 15B) and (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B)

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 142CW. Industrial Organization III. 4 Units.**

Research in industrial organization. Satisfies the honors research requirement.

Prerequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B). Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

(Ib)

**ECON 143. Energy Economics. 4 Units.**

The economics of markets for oil, natural gas, electricity, and renewable energy, and their interactions with each other and the rest of the economy. Effects of government intervention, policy measures, economic policy issues arising between energy use and the environment.

Prerequisite: ECON 15A and (ECON 100A or ECON 105A)

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 144A. Urban Economics I. 4 Units.**

Why cities exist, economics of urban land-use, housing demand and tenure choice, traffic congestion.

Prerequisite or corequisite: ECON 20A and ECON 20B. Recommended: ECON 100A.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 144B. Urban Economics II. 4 Units.**

Housing policy analysis, urban public goods and services, crime, pollution, urban amenities.

Prerequisite: ECON 20A and ECON 20B. Recommended: ECON 100A.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 145E. Economics of the Environment. 4 Units.**

Surveys economic aspects of natural resources, pollution, population, and the environment. Examines the causes of pollution; analysis of public policies regarding these problems. Emphasis on microeconomic aspects of environmental problems.

Prerequisite: ECON 100A or ECON 105A

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 145FW. Economics of the Environment II. 4 Units.**

Applications of the tools covered in ECON 145E to topics such as global warming, destruction of the ozone layer, and emissions trading. Emphasis on independent research papers. Syllabus and classes include writing technique.

Prerequisite: ECON 145E. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**(Ib)****ECON 145L. Economics of Law. 4 Units.**

Examination of several economic concepts which are useful in understanding legal rules: externalities, the assignment of property rights, and Coase's theorem. Examples are drawn from the fields of pollution control, no-fault insurance, medical malpractice, and product liability.

Prerequisite or corequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B)

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 146A. Illegal Economics. 4 Units.**

How illegal firms function in illegal markets, why individuals participate in these groups and markets, and what federal, state, and local governments do to disrupt organized illegal activity.

Same as CLS C182.

Restriction: Business Economics Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**ECON 147A. Corporate Governance. 4 Units.**

Studies topics in the internal organization of firms, including rent seeking, incentive contracts, principal-agent problems, internal labor markets, contests, and herd behavior.

Prerequisite: ECON 100A

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 147B. Economics of Strategy. 4 Units.**

Uses tools of economics, game theory in particular, to develop an understanding of business decision-making. Deals with questions such as how the firm decides what kind of business to be in, how large should it be, and others.

Prerequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B)

Overlaps with MGMT 110, MGMT 168.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.



**ECON 148. Business Decisions. 4 Units.**

Surveys normative and descriptive models of decision-making behavior, with an emphasis on organizational and policy contexts. Topics include rational choice theory, biases and heuristics, framing effects, and overconfidence. Management fads, panics, and herd behavior are also discussed.

Prerequisite: (ANTH 10A and ANTH 10B and ANTH 10C) or (SOCL 10A and SOCL 10B and SOCL 10C) or (SSCI 10A and SSCI 10B and SSCI 10C) or (MATH 2A and MATH 2B and (STAT 7 or MGMT 7)) or (STAT 120A and STAT 120B and STAT 120C) or (ECON 15A and ECON 15B)

Same as SOCL 138.

Restriction: Sociology Majors have first consideration for enrollment.

**ECON 149. Special Topics in Economics of Public and Private Organizations. 4 Units.**

Studies in selected areas of Economics of Public and Private Organizations. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 149W. Special Topics in Economics of Public and Private Organizations. 4 Units.**

Studies in selected areas of Economics of Public and Private Organizations. Topics addressed vary each quarter.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

(Ib)

**ECON 151A. Labor Economics and Human Resources I. 4 Units.**

Labor demand, labor supply, human capital, personnel economics, and other topics.

Prerequisite: (ECON 15A and ECON 15B) and (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B)

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 152A. Economic Anthropology. 4 Units.**

Economic systems in comparative perspective: production, distribution, and consumption in market and non-market societies; agricultural development in the third world.

Prerequisite: One course in general science, anthropology, economics, geography, or sociology.

Same as ANTH 125A.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment. Anthropology Majors have first consideration for enrollment.

**ECON 154. Voting and Political Manipulation. 4 Units.**

Introduction to social choice and cooperative games. Topics include majority rule, types of voting methods, apportionment and proportional representation, agenda manipulation, coalition formation, voting power, political consequences of electoral laws.

Same as IS 156A, SSCI 121T, PLSC 151H.

Restriction: International Studies Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON H155. Current Issues in Political Economy. 4 Units.**

Political economy seeks explanations that combine insights from both economics and politics. Topics include the interaction of government and markets, the causes of the Great Recession, and the sources of income and wealth inequality.

Prerequisite: ECON 20A or ECON 20B or ECON 13 or IS 13

Restriction: Economics Honors students only.

**ECON 157. Economic Development. 4 Units.**

Considers the process of economic development across the globe and why some countries are rich and others poor. Discusses the major problems facing developing countries, such as population growth, education, capital formation, environmental protection, and international trade.

Prerequisite: ECON 20A and ECON 20B

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 158. Economics of Education. 4 Units.**

Arms students with tools, concepts, and evidence that can be used to analyze complex policy questions in education, enabling students to arrive at their own reasoned judgments about how to improve education.

Prerequisite: ECON 15A and ECON 100A

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 161A. Money and Banking. 4 Units.**

Basic elements of money and banking: institutional features and economics of financial markets and, in particular, the U.S. banking system; determinants of interest rates; the Federal Reserve and its role in money supply; effects of money on output and inflation.

Prerequisite or corequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B) and (ECON 100C or ECON 105C)

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 161B. International Money. 4 Units.**

Open economy macroeconomics and determination of exchange rates. Asset-market approach to the balance of payments. Internal and external balance in the economy. Macroeconomic policies under fixed and floating exchange rates. The international monetary system and institutions.

Prerequisite or corequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B) and ECON 100C

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 161D. Advanced Money and Banking. 4 Units.**

Studies business cycles in the United States during the last century. The first portion of the course reviews the theoretical models employed to study economic fluctuations and empirical methods used to measure fluctuations.

Prerequisite: ECON 161A and (ECON 100C or ECON 105C)

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 162. Poverty, Growth, and Development. 4 Units.**

Examines India as a case study for each of the topics studied: growth experience of India along with its poverty eradication record, aspects of poverty, and the policies that have been undertaken to tackle poverty.

Prerequisite: (ECON 15A or STAT 120A) and (ECON 15B or STAT 120B) and (ECON 100A and ECON 100B and ECON 100C) or (ECON 105A and ECON 105B and ECON 105C)

**ECON 164AW. The Industrial Revolution in Western Europe. 4 Units.**

How do economists explain the process of economic development during the past three centuries? Has the process of industrialization affected living standards? Focusing on these questions, students learn how to apply economic theory and quantitative methods.

Prerequisite or corequisite: ECON 100C or ECON 105C. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

(Ib)

**ECON 164C. American Economic History from Colonization to the Present. 4 Units.**

Examines how the American economy evolved from colonization to the post-war era. Topics include relations with foreign countries, the emergence of manufacturing and big business, railroads, slavery, war, the Great Depression, the rise of fiscal and monetary policies.

Prerequisite: ECON 20A and ECON 20B

**ECON 165. Economics of International Business . 4 Units.**

Students learn to understand and analyze the principal economic issues in the international business arena. Covers topics such as trade theory, foreign direct investment, foreign exchange market, and strategy of international business.

Prerequisite or corequisite: ECON 100C or ECON 105C

**ECON 167. International Trade and Commercial Policy. 4 Units.**

Determination of trade flows and the relative prices. Gains from trade, the terms of trade, and income distribution. Imperfect competition and international trade. The effect of tariffs, export subsidies, and import quotas. The effects of free and restricted trade.

Prerequisite: ECON 100A or ECON 105A

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 169. Special Topics in Development Economics. 4 Units.**

Studies in selected areas of Development Economics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 190. Senior Thesis. 4 Units.**

Students work with faculty to complete their honors thesis.

Repeatability: May be taken for credit 3 times.

**ECON 190BW. Economics Honors Colloquium II. 4 Units.**

Colloquium required for honors students in Economics, Quantitative Economics, and Business Economics. Introduces students to independent research and helps students plan a research program. Students complete their thesis.

Prerequisite: ECON H190A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Economics Honors students only.

**(Ib)****ECON H190A. Economics Honors Colloquium I. 4 Units.**

Colloquium required for honors students in economics, quantitative economics, and business economics. Introduces students to independent research. Helps students plan a research program. Prepares students for thesis writing.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Economics Honors students only.

**ECON 197. Field Study. 4 Units.**

Not listed in Catalogue.

Repeatability: Unlimited as topics vary.

Restriction: Authorization required or Enrollment by add card only

**ECON 198. Directed Group Study. 4 Units.**

Not listed in Catalogue.

Repeatability: Unlimited as topics vary.

Restriction: Authorization required or Enrollment by add card only

**ECON 199. Independent Study. 1-5 Units.**

Independent research with Economics faculty.

Repeatability: May be repeated for credit unlimited times.

**ECON 200A. Graduate Colloquium for Economics I. 2 Units.**

Weekly reports and colloquia by faculty, students, and visitors. Supplemented by class discussion of these presentations and other material on current research methodology.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Economics Majors only.

**ECON 200B. Graduate Colloquium for Economics II. 2 Units.**

Weekly reports and colloquia by faculty, students, and visitors. Supplemented by class discussion of these presentations and other material on current research methodology.

Prerequisite: ECON 200A

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Economics Majors only.

**ECON 200C. Graduate Colloquium for Economics III. 2 Units.**

Weekly reports and colloquia by faculty, students, and visitors. Supplemented by class discussion of these presentations and other material on current research methodology.

Prerequisite: ECON 200B

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Economics Majors only.

**ECON 202. Probability and Statistics. 4 Units.**

Provides lectures on probability theory and the beginning of mathematical statistics (continued in ECON 220A-ECON 221A) necessary to prepare students for the required econometrics sequence. Topics include probability, distributions, mathematical expectation, sampling, and point estimation.

Restriction: Graduate students only.

**ECON 203A. Mathematics for Economists. 4 Units.**

Gives students the mathematical background required for graduate work in economics. Topics covered include multivariate calculus, differential equations, and linear algebra.

Restriction: Graduate students only.

**ECON 210A. Microeconomic Theory I. 4 Units.**

Theoretical microeconomics. Emphasis on the meaning and empirical interpretation of theoretical models. Topics include theory of the firm, theory of the market, theory of the consumer, duality theory, application to econometrics, general equilibrium and welfare economics, uncertainty, game theory.

Restriction: Graduate students only.

**ECON 210B. Microeconomic Theory II. 4 Units.**

Theoretical microeconomics. Emphasis on the meaning and empirical interpretation of theoretical models. Topics include theory of the firm, theory of the market, theory of the consumer, duality theory, application to econometrics, general equilibrium and welfare economics, uncertainty, game theory.

Prerequisite: ECON 210A

Restriction: Graduate students only.

**ECON 210C. Microeconomic Theory III. 4 Units.**

Theoretical microeconomics. Emphasis on the meaning and empirical interpretation of theoretical models. Topics include theory of the firm, theory of the market, theory of the consumer, duality theory, application to econometrics, general equilibrium and welfare economics, uncertainty, game theory.

Prerequisite: ECON 210B

Restriction: Graduate students only.

**ECON 210D. Macroeconomic Theory I. 4 Units.**

Advanced macroeconomic theory including alternative macroeconomic models, microeconomic foundations of macroeconomics, investment and growth theory, inflation and unemployment, rational expectations and macroeconomic policy, wealth effects, crowding out and fiscal policy, money and interest, open economy models.

Restriction: Graduate students only.

**ECON 210E. Macroeconomic Theory II. 4 Units.**

Advanced macroeconomic theory including alternative macroeconomic models, microeconomic foundations of macroeconomics, investment and growth theory, inflation and unemployment, rational expectations and macroeconomic policy, wealth effects, crowding out and fiscal policy, money and interest, open economy models.

Corequisite: ECON 211L

Prerequisite: ECON 210D

Restriction: Graduate students only.

**ECON 210F. Macroeconomic Theory III. 4 Units.**

Advanced macroeconomic theory including alternative macroeconomic models, microeconomic foundations of macroeconomics, investment and growth theory, inflation and unemployment, rational expectations and macroeconomic policy, wealth effects, crowding out and fiscal policy, money and interest, open economy models.

Prerequisite: ECON 210E

Restriction: Graduate students only.

**ECON 211L. Macroeconomics Theory II Lab. 2 Units.**

Overview of stochastic processes; introduction to dynamic programming; two equilibrium concepts; Ricardian equivalence; real business cycle model; complete versus incomplete markets; asset pricing and the equity premium puzzle.

Corequisite: ECON 210E

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**ECON 219. Special Topics in Economic Theory. 2-4 Units.**

Studies in selected areas of Economic Theory. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ECON 220A. Statistics and Econometrics I. 4 Units.**

Takes up where ECON 202 leaves off. Continuing in the likelihood perspective, begins with Bayesian point estimation and then covers interval estimation and hypothesis testing from both frequentist and Bayesian perspectives.

Corequisite: ECON 221A

Restriction: Graduate students only.

**ECON 220B. Statistics and Econometrics II. 4 Units.**

Begins by relaxing the ideal conditions of the standard regression model. Potential topics include kernel density estimation, instrumental variables (IV), two stage least squares (2SLS), panel data models, and simulation-based Bayesian methods, including Gibbs sampling, and the bootstrap.

Corequisite: ECON 221B

Prerequisite: ECON 220A

Restriction: Graduate students only.

**ECON 220C. Statistics and Econometrics III. 4 Units.**

Covers econometric time series, discrete choice and count models, sample selection, and duration models along with Bayesian and classical asymptotic methods.

Corequisite: ECON 221C

Prerequisite: ECON 220B

Restriction: Graduate students only.

**ECON 221A. Statistics and Econometrics Laboratory I. 2 Units.**

Discussion of problems in statistics and econometrics, and their relationships to statistical and econometrics theory. Instruction in the use of computers for applied econometric work.

Corequisite: ECON 220A

**ECON 221B. Statistics and Econometrics Laboratory II. 2 Units.**

Discussion of problems in statistics and econometrics, and their relationships to statistical and econometrics theory. Instruction in the use of computers for applied econometric work.

Corequisite: ECON 220B

**ECON 221C. Statistics and Econometrics Laboratory III. 2 Units.**

Discussion of problems in statistics and econometrics, and their relationships to statistical and econometrics theory. Instruction in the use of computers for applied econometric work.

Corequisite: ECON 220C

**ECON 222. Replication and Applied Economics Writing. 4 Units.**

Before the course begins, students choose a published empirical economics article and obtain the necessary data to replicate it. Students will replicate and extend the economic analysis and write a paper describing their work.

Prerequisite: ECON 220A and ECON 220B and ECON 220C

**ECON 223A. Discrete Choice Econometrics. 4 Units.**

Specification, estimation, and testing of discrete choice models, with emphasis on cross-sectional and panel data models and applications. Students use computer packages to apply models and techniques to real data.

Prerequisite: ECON 220A and ECON 220B and ECON 220C

**ECON 224A. Time Series Econometrics. 4 Units.**

Econometric analysis of time series data. Moving average and autoregressive series, regression analysis, Box-Jenkins techniques, computational methods, and causality conditions.

Prerequisite: ECON 220A and ECON 220B and ECON 220C

**ECON 227A. Experimental Econ I. 4 Units.**

An introduction to experimental social science. Students learn experimental methodology, design, and analysis, and be exposed to active research areas. Each student writes a proposal for their own experiment and presents the design in class.

Restriction: Graduate students only.

**ECON 227B. Experimental Econ II. 4 Units.**

Focuses on implementing experimental projects in a laboratory environment. Subjects learn about human subjects protection, program experimental software for their own projects, and conduct live experiment sessions.

Restriction: Graduate students only.

**ECON 229. Special Topics in Econometrics. 2-4 Units.**

Studies in selected areas of Econometrics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ECON 232. Business Cycles in Historical Perspective. 4 Units.**

Investigates business cycles in the United States and worldwide during the last two centuries. Topics include causes and consequences of business fluctuations, monetary and fiscal policy, models of fluctuations, and empirical macroeconomics.

Prerequisite: ECON 210A and ECON 210B and ECON 210C and ECON 210D and ECON 210E and ECON 210F

**ECON 234. American Economic History. 4 Units.**

Focuses on American economic history from colonization onwards. Topics include the development of legal systems, transport systems, financial markets, industrialization, migration, immigration, technological change, and the consequences of slavery.

Prerequisite: ECON 210A and ECON 210B and ECON 210C and ECON 210D and ECON 210E and ECON 210F

**ECON 239. Special Topics in Financial Economics. 2-4 Units.**

Studies in selected areas of Financial Economics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ECON 241A. Industrial Organization I. 4 Units.**

Analysis of the structure and economic performance of markets, and the impact of public policy and their efficiency and equity. Effects of information structure. Oligopoly, cartels, mergers, vertical integration, patents, innovation, antitrust, and regulation.

Prerequisite: ECON 100B and ECON 203A

Restriction: Graduate students only.

**ECON 241B. Industrial Organization II. 4 Units.**

Analysis of the structure and economic performance of markets, and the impact of public policy and their efficiency and equity. Effects of information structure. Price flexibility and dispersion, auctions, search and industrial structure, intrafirm organization.

Prerequisite: ECON 241A and ECON 100B and ECON 203A

Restriction: Graduate students only.

**ECON 243A. Game Theory. 4 Units.**

A formal introduction to non-cooperative game theory. Topics include properties of Nash Equilibrium and equilibrium refinements, games with imperfect information, and games with incomplete information.

Prerequisite: ECON 210A and ECON 210B and ECON 210C

Restriction: Graduate students only.

**ECON 243B. Advanced Game Theory. 4 Units.**

Provides advanced instruction in game theory. The topics covered will be (i) the theory of repeated games and (ii) evolutionary game theory. Applications include bargaining, collusion, reputation, social norms, and the evolution of preferences via natural selection and cultural transmission.

Prerequisite: ECON 243A

Restriction: Graduate students only.

**ECON 245. Empirical Methods in Applied Microeconomics. 4 Units.**

Focuses on the empirical methods used in modern applied microeconomics. Teaches methods that can be applied to produce original research in applied fields using cross-sectional and panel data. Applications will be drawn heavily from labor, public, health and development economics.

**ECON 249. Special Topics in Microeconomics. 2-4 Units.**

Studies in selected areas of Microeconomics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: May be repeated for credit unlimited times.



**ECON 251A. Labor Economics I . 4 Units.**

Analysis of the relationships between education and the labor market (human capital theory), between resources devoted to education and the return to education (the education production function) and between education and labor market inequality (the theory of skill-biased technical change).

Prerequisite: ECON 203A

Restriction: Graduate students only.

**ECON 251B. Labor Economics II. 4 Units.**

Analysis of core topics in labor economics, with an emphasis on empirical methods. Topics may include minimum wages, discrimination, gender, aging and retirement, labor market networks, personnel economics, and employment policy.

Prerequisite: ECON 203A

Restriction: Graduate students only.

**ECON 251C. Labor Economics III . 4 Units.**

Discussion of treatment effect/program evaluation in labor economics, emphasizing identification. Classical labor topics, including human capital, technology, wages, labor supply, and migration are discussed in the context of causal inference. A unified framework is used in analyzing identification strategies.

Prerequisite: ECON 203A

Restriction: Graduate students only.

**ECON 255. Microeconomics and Public Policy. 4 Units.**

Introduces the fundamental principles of microeconomics that are required for applied policy analysis. Provides students with an intuitive understanding of the microeconomic approach, and familiarizes them with concepts used in applied public policy analysis.

Repeatability: May be taken for credit 2 times.

Same as PPOL 240.

Restriction: Graduate students only.

**ECON 259. Special Topics in Labor Economics. 2-4 Units.**

Studies in selected areas of Labor Economics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ECON 260B. Monetary Economics II. 4 Units.**

Surveys recent issues on monetary policy in uncertain environments. Examines settings where both the policy makers and the private sector are uncertain of future outcomes or the underlying economic structure.

**ECON 261A. International Trade I. 4 Units.**

Covers theoretical models, empirical methods, and policy issues in international trade. Following the conventional treatment of the Richardian model, the Heckscher-Ohlin model and the specific factors model, new trade models which incorporate scale economics and imperfect competition will be discussed.

Prerequisite: ECON 210A and ECON 210B

**ECON 263A. Advanced Macroeconomics I. 4 Units.**

Students build Dynamic Stochastic General Equilibrium (DSGE) macroeconomic models from microeconomic foundations. This approach emphasizes intertemporal optimization by firms and households and typically incorporates nominal rigidities such as sluggish price and/or wage adjustment.

**ECON 269. Special Topics in Macroeconomics. 2-4 Units.**

Studies in selected areas of Macroeconomics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ECON 270A. Political Economy I. 4 Units.**

Political Economy lies at the intersection of economics and political science. Studies effects of politics on the economy and uses tools derived from economics to understand the behavior of governments and of citizens when they deal with politics.

Restriction: Graduate students only.

**ECON 270B. Political Economy II. 4 Units.**

Political Economy lies at the intersection of economics and political science. Studies effects of politics on the economy and uses tools derived from economics to understand the behavior of governments and of citizens when they deal with politics.

Prerequisite: ECON 270A

Restriction: Graduate students only.

**ECON 270C. Political Economy III. 4 Units.**

Political Economy lies at the intersection of economics and political science. Studies effects of politics on the economy and uses tools derived from economics to understand the behavior of governments and of citizens when they deal with politics.

Prerequisite: ECON 270B

Restriction: Graduate students only.

**ECON 272A. Public Economics I. 4 Units.**

Covers two broad categories of government expenditure policies, redistribution programs, and social insurance, from a theoretical and empirical perspective, as well as the effects on individuals of the income tax system.

Prerequisite: ECON 210A and ECON 210B and ECON 210C

**ECON 272B. Public Economics II. 4 Units.**

Covers the theory of public goods and models of decentralized provision of such goods, including voluntary provision, voting, bureaucratic provision, and preference revelation mechanisms.

Prerequisite: ECON 210A and ECON 210B and ECON 210C

**ECON 275. Economics of Government. 4 Units.**

Prepares students to analyze public policy questions with tools from economics. By the end, students should be able to identify important economic issues in public policy debates and consume and critique economic research on these topics.

Same as PPOL 227.

**ECON 279. Special Topics in Political Economy. 2-4 Units.**

Studies in selected areas of Political Economy. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ECON 281A. Urban Economics I. 4 Units.**

Economic reasons for the existence of cities, analysis of urban spatial structure, urban sprawl, Third World urbanization, hedonic price analysis, housing tenure choice.

Prerequisite: ECON 210A

**ECON 281B. Urban Economics II. 4 Units.**

Housing in the portfolio, land-use controls, rent control, homelessness, neighborhood effects, urban quality-of-life measurement, and subcenters.

Prerequisite: ECON 210A

**ECON 282A. Transportation Economics I. 4 Units.**

Applies microeconomic concepts of demand, costs, pricing, investment, and project evaluation to analyze transportation activities. Empirical studies include travel demand using discrete models, and cost functions.

Restriction: Graduate students only.

**ECON 282B. Transportation Economics II. 4 Units.**

Economics of the airline industry. Hub-and-spoke networks, the effects of competition on airfares, price dispersion, airline alliances, airport congestion, product unbundling.

Prerequisite: ECON 282A

Restriction: Graduate students only.

**ECON 289. Special Topics in Urban and Transportation Economics. 2-4 Units.**

Studies in selected areas of Urban and Transportation Economics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: May be repeated for credit unlimited times.

**ECON 290. Dissertation Research. 2-12 Units.**

Dissertation research with Economics faculty.

Repeatability: May be repeated for credit unlimited times.

**ECON 299. Independent Study. 2-4 Units.**

Independent research with Economics faculty.

Repeatability: May be repeated for credit unlimited times.

## International Studies Courses

**INTL ST 1. Introduction to Global Studies. 4 Units.**

Ongoing historical processes that increase global integration, the social, economic, and political interdependence of different regions, cultures, and peoples. Topics include ancient empires, colonialism, nationalism, industrialization, modern imperialism and warfare, decolonization, global social movements, conflict, inequality, and global governance.

Same as SOC SCI 4A.

Restriction: International Studies Majors have first consideration for enrollment.

(III and VIII ).

**INTL ST 11. Global Cultures and Society. 4 Units.**

Offers a general overview of the rise of global interdependence in political, economic, demographic, and cultural terms. Considers what drove people from relative isolation into intensified intercourse with one another, and investigates the consequences of this shift.

Same as ANTHRO 41A.

Restriction: Anthropology Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(III and VIII ).

**INTL ST 12. Global Political Ideologies. 4 Units.**

An overview of the major political ideologies shaping the current world order and global conflict. Topics include liberalism, democracy, nationalism, capitalism, communism, socialism, fascism, neoliberalism, clash of civilizations, sectarian violence, populist nationalism, and de-globalization.

Same as POL SCI 44B, SOC SCI 12.

Restriction: International Studies Majors have first consideration for enrollment.

(III and VIII ).

**INTL ST 13. Global Economy. 4 Units.**

Acquaints students with the fundamental patterns of the global economy. Emphasizes the historical roots and political implications of economic choices.

Same as ECON 13.

Restriction: International Studies Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

(III, VIII)

**INTL ST 14. Introduction to International Relations. 4 Units.**

Analysis of political relations between and among nations with emphasis on explanations of conflict and cooperation. The role of ideologies and their relation to international problems are also examined.

Same as POL SCI 41A.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(III and VIII ).**

**INTL ST 15. Global Political Economy. 4 Units.**

The global economy as an integrated system. The rise of world trade, capitalism, national economies, market cycles, competing economic ideologies, development, globalization, transnational labor, multinational corporations, and the role of UN, World Bank, WTO, and the IMF in global governance.

Same as SOC SCI 15.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

**(III and VIII ).**

**INTL ST 16. Human Rights and Global Governance. 4 Units.**

Historical development of civil, political rights and the rise of human rights in international law. Explores role, and limitations, of the UN, ICJ, and ICC in global governance. Reconceptualizing democracy and political representation in a postnational 21st century.

Same as POL SCI 45A, SOC SCI 16.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

**(III and VIII ).**

**INTL ST 17. Global Environmental Issues. 4 Units.**

Examines problems such as global climate change, growing human populations, fisheries depletion, ocean acidification, biodiversity loss, deforestation, and food security. Introduces political, social, and economic factors contributing to environmental issues and their disproportional impacts on the world's poor and minorities.

Same as SOC SCI 17.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

**(III and VIII ).**

**INTL ST 32A. Dilemmas of Diversity. 4 Units.**

Focuses on racial, ethnic, and gender diversity, multiculturalism, and their impact on our social and political ideals. Traces the sources of ideas about difference, equality, and toleration, and examines tensions that occur when forms of identity conflict with one another.

Same as POL SCI 32A.

**(VII)**

**INTL ST 100. Global Trials. 4 Units.**

Explores landmark legal trials that have impacted both domestic and world affairs. The trials provide a lens through which to explore society at the time, as well as shed light on the historical legacies of current social, political, and legal values.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 101A. Global Social Movements. 4 Units.**

The evolution of global social movements over past 250 years. Age of Revolutions in America, France, and Haiti; nationalism and labor; 1960s global decolonization; 21st century Latin American indigenous movements; Occupy Wall Street, Arab Spring, and social media's #metoo, #BlackLivesMatter.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 101B. Global Cities and Slums. 4 Units.**

Cities as a window into contemporary challenges of the globalized world. Global cities such as Los Angeles, London, and Beijing compared with cities with slums in the global south such as Rio de Janeiro, Johannesburg, and Mumbai.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 102A. Global Refugees and Stateless People. 4 Units.**

Examines the reason behind global refugee crises, and what it means to be a displaced migrant or stateless person in history and in contemporary society. Links case studies about refugees around the world.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 102B. Global Asia and Orientalism. 4 Units.**

Examines how the modern world is divided between East and West in the age of globalization. Through the postcolonial framework of Orientalism, it considers a pluralistic idea of Asia and the current notion of the new world order as one.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 103A. Case Studies in Global and Planetary Health. 4 Units.**

Explores critical global health and planetary health studies, linking past trends to current research of health inequalities. Case studies include maternal-fetal mortality, environmental contamination, disaster preparedness, pharmaceutical development and access, and humanitarian aid interventions.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 104A. Global Trafficking. 4 Units.**

Explores trafficking in different global contexts. Covers sex trafficking, labor trafficking, and organ trafficking. Tracks the use of the concept in policy, human rights, law, humanitarianism, and media. Provides a complex and nuanced understanding of the problem and its solutions.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 104BW. Global Gender and Sexuality. 4 Units.**

Develops critical insights into gender and sexuality as products of the world around us and as lived experiences across the globe. Topics include agency and resistance, intersectionality, feminisms, colonialism, heteronormativity, gender violence, masculinities, media and popular culture, globalization and migration.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**(Ib)****INTL ST 106A. Global Political Ecology. 4 Units.**

Introduction to political ecology and critical analysis of the global scale and globalization. Topics include current and historical climate change, fossil fuels, international trade and investment, soil erosion and pollution, deforestation, waste, ocean ecology, water crisis, wars, revolutions, and refugees.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 106B. Global Food Environment. 4 Units.**

Examines the global political ecology of food, focusing on the U.S., China, and Brazil. Topics include the history of agriculture, imperialism/neocolonialism, Malthusianism, migration, agro-industrialization, deforestation, GMOs, agrochemicals, soil and water contamination, land struggles, food security/safety/sovereignty, dietary habits, and climate change.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 111B. World of Coffee . 4 Units.**

History of consumption and production of coffee over the centuries, and coffee's cultural, economic, social, political consequences. Coffee's social life as a drug, symbol of hospitality, religious rite, sociability and bourgeois lifestyle, commodity, source of livelihoods, imperial revenues, corporate profits.

Same as HISTORY 163.

**INTL ST 112A. International Business. 4 Units.**

Introduction to conducting business in the international arena, decision making in the organization, and globalization of markets and production. Topics covered range from tax and finance to ethics, marketing, and more. Continuing corporate regulatory scandals discussed.

Same as SOC SCI 115D.

**INTL ST 114A. International Political Economy. 4 Units.**

Examination of problems in global political-economic relations through competing conceptual lenses or grand theories: mercantilism, liberalism, and Marxism. Surveys North-North and North-South issues relating power and wealth.

Same as POL SCI 141B.

**(VIII)**

**INTL ST 115. Global Poverty and Inequality in the 21st Century. 4 Units.**

Explores a multidisciplinary understanding of poverty and inequality in the 21st century and assesses impact of education, health, technology, and other interventions. Course offered online only.

Same as UPPP 115.

**INTL ST 117A. Transnational Migration. 4 Units.**

Examines the movement of people across national borders, governmentality and the role of state practices to control populations, and issues of citizenship, belonging, and identity. Examples are drawn from the United States, Europe, Latin America, Asia, and Africa.

Same as CHC/LAT 161, ANTHRO 125X.

**(VIII)****INTL ST 122. Nuclear Environments. 4 Units.**

Understanding the impact of the nuclear age on the environment and human health through interrelated developments of nuclear power and nuclear weapons. The early years of weapon development, catastrophic environmental pollution, perils of nuclear power in the U.S. and Russia.

Same as SOCECOL E127, PUBHLTH 168.

**(VIII)****INTL ST 124A. Introduction to the Comparative Study of Legal Cultures. 4 Units.**

Traces the anthropological and comparative cultural study of law from the nineteenth century to the present; briefly surveys the diversity of recorded legal cultures and critically examines key concepts which have been used to describe and classify them.

Same as CRM/LAW C102.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 130. Transnational Gangs. 4 Units.**

Examines the internationalization of U.S. domestic street gangs. The relationship between California gangs Mara Salvatrucha and 18th Street and Mexico/Central American gangs is assessed. Specified topics include: mobilization, migration, territorialism, culture, organization, and use of technology.

Same as SOC SCI 120.

Overlaps with SOC SCI XI120, INTL ST XI130.

**INTL ST 131A. Just War Revisited. 4 Units.**

Examines the evolution of the doctrine of the just war across the history of Western political thought, the importance of changes in the doctrine and whether it applies today; examines international relations case studies to determine today's relevancy.

Same as POL SCI 135B.

**INTL ST 140A. Approaches to International Relations. 4 Units.**

Reviews theoretical and methodological approaches to the study of international relations using contending perspectives to analyze power and influence, capabilities, interdependence, reciprocity, international regimes, anarchy, cooperation, imperialism, and hegemony.

Same as POL SCI 144A.

Restriction: Upper-division students only. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 141B. Homeland Security . 4.0 Units.**

Examines the 9/11 origins of the concept of homeland security; assess the evolution, structure, and operations of the Department of Homeland Security; critically examines the evolution of threat assessment to the U.S. and the utilization of risk management methodologies.

Same as POL SCI 143G.

**INTL ST 142A. U.S. Foreign Policy I: Globalism and Cold War. 4 Units.**

Looks at changing international perspectives, policy responses, and military strategies of presidential administrations from Truman to Reagan. In assessing the motives and objectives of U.S. foreign policy leaders during the "Cold War" era, the concept of "national interest" is examined.

Same as POL SCI 142D.

Restriction: International Studies Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment.

**INTL ST 142D. The International Relations of East Asia. 4 Units.**

Surveys various aspects of relations between the nations of East Asia. Topics include the historical development of the region; current political and security relations, including the impact of the American military presence.

Same as POL SCI 142B.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 142E. U.S. Coercive Diplomacy. 4 Units.**

Examines the theory of compellence and the U.S. practice of coercive diplomacy--the power to change behavior of other governments. Specific case examples: the Cuban missile crisis, bombing of North Vietnam, the Nicaraguan Contras, Desert Shield/Desert Storm, and Libya.

Same as POL SCI 142G.

Restriction: Upper-division students only. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 142G. U.S. Foreign Policy Toward Asia. 4 Units.**

U.S. policy toward the countries of East Asia: bilateral and regional security relationships, U.S. economic relations with the major Asian countries, the development of regional institutions, and human rights.

Same as POL SCI 141E.

**INTL ST 143A. Vietnam War. 4 Units.**

Examines social structures and social changes in Vietnamese and U.S. societies through the study of the Vietnam War.

Same as SOCIOL 170A.

**INTL ST 144A. Comparative Politics: Four Nations, Three Continents. 4 Units.**

Studies four countries in a comparative fashion: their respective political histories and cultural traditions; actual differences among their superficially similar party, parliamentary, and executive institutions; contemporary economic policy. The countries represent three continents and varying levels of economic development.

Same as POL SCI 154C.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 145A. International Law. 4 Units.**

Examination of the origin, changing structure, application of international law, and the role of legal norms in regulating the behavior of states and maintaining international order.

Prerequisite: POL SCI 71A

Same as POL SCI 172A.

**(VIII)****INTL ST 147CW. International Humanitarianism. 4 Units.**

Examines, analyzes, and evaluates the humanitarian phenomenon, the actors involved in it (including states, international organizations (IOs), and nongovernmental organizations (NGOs)), the rise of a body of international humanitarian law, and the problems and debates associated with international humanitarianism today.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as POL SCI 147CW.

**(Ib)****INTL ST 147D. International Organizations. 4 Units.**

Active learning course that examines origins, decision-making processes, activities, and evolution of leading international organizations (e.g. U.N., NATO, EU, AU, WTO, World Bank, IMF). Activities include drafting reforms, applying theory, assessing dysfunctions, and participating in U.N. negotiation simulations.

Same as POL SCI 147D.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.



**INTL ST 148W. Global Futures. 4 Units.**

Develops critical insights into our collective future as it reflects different perspectives of the world. Topics include techno-orientalism, afro-futurism, feminist futures, indigenous cosmology, and environmental concerns.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**(Ib)**

**INTL ST 150. Racism and Global Apartheid. 4 Units.**

The concept of race has been used to draw a global color line dividing rich from poor, developed from developing, first from third worlds. Racism is used to justify slavery, colonialism, imperialism, eugenics, genocide, and extreme inequalities produced by globalization.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

**INTL ST 151B. Religion and World Politics. 4 Units.**

Examines the relationship between religion and world politics historically and today, focusing on connections with peace/war, democracy, human rights, secularism(s), and globalization. Covers major debates, scholarship, concepts, and theories through class exercises, exams, and essays.

Prerequisite: POL SCI 41A or INTL ST 11 or INTL ST 12 or REL STD 5A or REL STD 5B or REL STD 5C

Same as POL SCI 146B, REL STD 115.

**INTL ST 152A. Non-Government Organization (NGO) Fundamentals. 4 Units.**

Introduction to non-governmental organizations, including their role in U.S. society and the international community. Explores varying definitions of NGOs and the characteristics held in common by all NGOs.

Same as SOC SCI 152A.

**INTL ST 153B. Cross-Cultural Studies of Gender. 4 Units.**

Explores the construction of gender in national and transnational contexts. Special attention is given to how race, sexuality, class, and global inequalities shape different experiences of gender, and how gender structures political, institutional, and social life across the world.

Same as ANTHRO 121D.

**(VII)**

**INTL ST 153C. Urban Anthropology. 4 Units.**

Cultural roles of urban centers and processes of urbanization in comparative perspective, focusing on both nonwestern, nonindustrial societies of past and present; the relationship between modern urban centers and Third World peoples. Migration, urban poverty, in Africa, Asia, Latin America.

Same as ANTHRO 121J.

**INTL ST 153D. Colonialism and Gender. 4 Units.**

An anthropological enquiry into the ways colonial relations of power have been structured and gendered throughout the world, and to what effect. Examines the social locations of men and women in the everyday exercise of colonial and imperial power.

Same as ANTHRO 136G.

Restriction: Anthropology Majors have first consideration for enrollment.

**INTL ST 153E. Nationalism and Ethnicity in the Contemporary World. 4 Units.**

An exploration of the concepts of identity, culture, ethnicity, race, and nation through ethnographic cases, with a view to asking larger questions: how do people create nativeness and foreignness? How does 'culture' get worked into contemporary racisms and nationalisms.

Same as ANTHRO 136A.

**(VIII)**

**INTL ST 153F. Militarism and Gender. 4 Units.**

Examination of feminist approaches to militarism, war, and political violence; drawing on representations of women as both victims of and participants in military violence; effects of militarism on formations of gender; effects of military industrial complex on nationalism and identity.

Same as GEN&SEX 167A.

**INTL ST 154B. Human Rights. 4 Units.**

Examines the causes and consequences of human rights violations with a focus on Latin America. What are human rights? When and where are they violated? What political mechanisms are available to deal with human rights problems? How effective are they.

Same as POL SCI 153E.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 154C. Ethics in an Age of Terror and Genocide. 4 Units.**

Original sources document personal impact of wars on genocides, from World War II to the Bosnian and Rwandan genocides and current wars in Iraq and Afghanistan. Students train for and conduct personal interviews with someone who lived through a war.

Same as POL SCI 145A.

**INTL ST 154W. Ethics and Justice in International Affairs. 4 Units.**

Analyzes choices regarding the use of force, resolving conflict, and promoting human rights and social justice. Special attention is given to the American experience as a principal case study of ethics and statecraft.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. International Studies Majors have first consideration for enrollment.

**(Ib)****INTL ST 156A. Voting and Political Manipulation. 4 Units.**

Introduction to social choice and cooperative games. Topics include majority rule, types of voting methods, apportionment and proportional representation, agenda manipulation, coalition formation, voting power, political consequences of electoral laws.

Same as POL SCI 151H, SOC SCI 121T, ECON 154.

Restriction: International Studies Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**INTL ST 157A. 21st Century Africa. 4 Units.**

Comparative studies of the cultures and societies of Sub-Saharan Africa, with emphasis on critical study of colonialism and postcoloniality, social transformation, and the politics of identity.

Prerequisite: ANTHRO 2A

Same as ANTHRO 164A.

Restriction: Anthropology Majors have first consideration for enrollment.

**(Ib)****INTL ST 157C. Comparing European and US Societies. 4 Units.**

Society, culture, institutions of U.S. and European countries. Fertility to football, guns to government, work to welfare, health to housework. Cross-national approaches for understanding the world and thinking critically about taken-for-granted practices. Policies the U.S. might borrow for social issues.

Same as SOCIOL 157C.

**INTL ST 158B. Peoples of the Pacific. 4 Units.**

The cultural history and recent developments among the Pacific peoples of Polynesia, Micronesia, Melanesia, New Guinea, and Australia.

Same as ANTHRO 163A.

**(VIII)****INTL ST 158D. China in the Global Age. 4 Units.**

Chinese society from 1949 to present. Social change in the context of political control and ideological considerations. Focus on the power structure, political decision processes, and ideological legitimization, and interplay with the Chinese community and its culture.

Same as SOCIOL 175B.

**INTL ST 161A. Political Islam. 4 Units.**

Political Islam is a diverse phenomenon. While noticeable barriers exist to 'Islamist democracy,' it is the Islamists who will define the political future of much of the Muslim world. Reviews the experience of Saudi Arabia, Egypt, Pakistan, Turkey, and Indonesia.

Same as SOC SCI 188K.

**INTL ST 162B. Peoples and Cultures of Post-Soviet Eurasia. 4 Units.**

Examines the cultures and political conflicts of the more than 130 indigenous ethnic groups in the European and Asian territories of the former U.S.S.R. Emphasis is on the theoretical issues of ethnicity, nationalism, and conflict management.

Same as POL SCI 154F, ANTHRO 164P.

**(VIII)**

**INTL ST 163. Global Inequalities. 4 Units.**

An examination of various forms of social, economic, and political inequality within and between nations. Different approaches to understanding inequality and the intersections of poverty, race, ethnicity, class, gender, nationality, health, and violence.

Restriction: International Studies Majors have first consideration for enrollment.

**INTL ST 165. Introduction to Contemporary Middle East Politics. 4 Units.**

An overview of basic issues that shape the politics of the Middle East and North Africa. Themes include implication of the colonization era, nation-state formation, inter-Arab relations, nationalism, Arab-Israel conflict, Islamic resurgence, and more.

Same as SOC SCI 188A, POL SCI 158D.

**INTL ST 175A. U.S. War on Terrorism. 4.0 Units.**

Analyzes the United States war on terrorism by focusing on terrorism, the U.S. wars in Afghanistan and Iraq, and changes in police powers through the Patriot Act, as well as the political leadership which directs the war.

Same as SOCIOL 170B.

**INTL ST 176C. Introduction to Chinese Politics. 4 Units.**

Background to the Chinese revolution, rise of the communist party; and institutions, ideology, and structure of Communist party rule from 1949-present.

Same as POL SCI 151B.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 176D. Chinese Politics: Policy, Leadership, and Change. 4 Units.**

Examines major policies from 1949 to the present, and considers the changing role of the Communist Party and its shifting treatment of various social groups; the era of Mao Zedong, reforms under Deng, and post-Deng politics.

Same as POL SCI 151C.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 176I. West European Politics. 4 Units.**

Explores four main themes: (1) thinking scientifically about politics; (2) understanding the linkages between different political structures and spheres of activity; (3) evaluating some theories about politics; (4) learning about three countries: Britain, France, and Germany.

Same as POL SCI 152F.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 176L. Canadian Politics. 4 Units.**

Addresses the basic structures and processes of contemporary Canadian government and politics. Additional topics may include regionalism, federalism, western alienation and oil, Canadian solutions to social welfare policy questions, developments in Quebec, and other issues associated with French-English relations.

Same as POL SCI 153B.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 177C. Revolution in Latin America. 4 Units.**

Presents a comparative analysis of the causes, development, and consequences of selected revolutionary movements, focusing on outbreaks in Mexico, Bolivia, Cuba, Chile, Nicaragua, and Grenada. Explores topics of state formation, economic nationalism, social justice, ethnicity, and role of international affairs.

Same as CHC/LAT 151B, HISTORY 166D, SOC SCI 173N.

**INTL ST 177D. U.S. Intervention in Latin America. 4 Units.**

Explores political, economic, social, and cultural ties that bind Latin America to the United States. Focuses on U.S. intervention and Latin American response from early nineteenth century to present day. Case studies include Mexico, Guatemala, Cuba, Chile, and Central America.

Same as POL SCI 142J, HISTORY 166, CHC/LAT 150.

**INTL ST 177E. Cuban Society and Revolution. 4 Units.**

Explores the causes, development, and legacy of the 1959 Revolution. Themes include economic dependency, democracy, race, gender, culture, and the always volatile relations between Cuba and the United States.

Same as POL SCI 153G, HISTORY 166C, CHC/LAT 157.

**INTL ST 177G. Revolution and Reaction in Cold War Latin America. 4 Units.**

Explores Latin American experiences of revolutionary change and military dictatorship during the Cold War (1945-1990). Pays particular attention to the lives of women, peasants, workers, and the urban middle classes. Case studies include Guatemala, Cuba, Chile, Argentina, Nicaragua, and Mexico.

Same as HISTORY 166B.

**INTL ST 177I. Ancient Civilization of Mexico and the Southwest. 4 Units.**

The prehistory and cultural evolution of the civilization which originated in Mexico, including the Olmecs, Aztecs, Toltecs, Maya, and Zapotec, as well as the Pueblos of the Southwestern U.S. Topics include the origins of food production and of the state.

Same as ANTHRO 141A.

**INTL ST 177J. Peoples and Cultures of Latin America. 4 Units.**

Surveys the prehistory of Latin America and its indigenous cultures, emphasizing the impact of colonial rule, capitalism, and twentieth-century transformations. Emphasis on communities from several countries. In some years, emphasis on comparisons between the Latin American and Caribbean experiences.

Same as ANTHRO 162A, CHC/LAT 120.

**(VIII)****INTL ST 178A. Immigration Politics in Western Europe. 4 Units.**

Examines immigration politics in Western Europe, analyzing trends and policy from the postwar period through to today. Topics include citizenship, immigrant integration, asylum, the far-right, and a rotating focus on contemporary issues, e.g., terrorism, Islamophobia.

Same as POL SCI 152K.

Overlaps with POL SCI 141D.

**INTL ST 179. Special Topics: Geographic Focus in International Studies. 4 Units.**

Studies in selected areas of international studies. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**INTL ST H180. International Studies Honors Research Seminar. 4 Units.**

Assists students to prepare a thesis prospectus for the Honors Program in International Studies. Students choose a topic, learn writing and research methods, write a prospectus and orally present and defend it, and conduct a literature review.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Honors students only.

**INTL ST 183A. Global and International Studies Forum. 4 Units.**

A faculty-student forum featuring lectures from a variety of institutions with discussion issues related to Global and International Studies.

Repeatability: May be taken for credit 4 times.

Same as SOCECOL 183A, SOC SCI 183A.

**INTL ST 183B. Seminar in Mediation. 4 Units.**

Student develop mediation skills and refine knowledge in the practice and theory of conflict resolution. Students who complete this course may serve as mediators in the Campus Mediation Program. Course is a prerequisite to completing Indep Study as an intern.

Same as SOC SCI 183B, SOCECOL 183B.

Restriction: International Studies Majors have first consideration for enrollment. School of Humanities students have first consideration for enrollment. School of Social Ecology students have first consideration for enrollment. School of Social Sciences students have first consideration for enrollment.

**INTL ST 183CW. Seminar Conflict Resolution. 4 Units.**

Designed for seniors who are pursuing the minor in Conflict Resolution and/or International Studies major. Provides a forum in which students will refine skills and theory in the study of cooperation and conflict, from local to global arenas.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as SOCECOL 183CW, SOC SCI 183CW.

**(Ib)**

**INTL ST 183E. Conflict Resolution in Cross-Cultural Perspective. 4 Units.**

Examines theories of conflict management. Analyzes how conflict is mitigated in diverse cultures: at the interpersonal level, between groups, and on the international scale. Students discuss readings, hear from conflict management practitioners, and simulate negotiations.

Same as ANTHRO 136D, SOC SCI 183E, POL SCI 154G.

**(VIII)**

**INTL ST 189. Special Topics: Global Focus in International Studies. 2-4 Units.**

Studies in selected areas of international studies. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**INTL ST H190. Honors Thesis. 4 Units.**

Students work with faculty to complete their honors thesis.

Repeatability: May be taken for credit 2 times.

Restriction: International Studies Honors students only.

**INTL ST 199. Individual Study. 2-4 Units.**

Students participate in planned research and study under written contract with a supervising UCI instructor. Students may enroll for only one individual study course each quarter.

Repeatability: Unlimited as topics vary.

**INTL ST 201. What is Global Studies?. 4 Units.**

Introduces graduates to the field of global and international studies. Landmark studies outline the transition from globalization studies to contemporary global studies. Identify complex global issues, underlying processes of globalization, and the impacts they have on people around the world.

Restriction: Graduate students only.

**INTL ST 202. Foundations of European Social Thought. 4 Units.**

Provides graduate students with a broad overview of the major landmarks in the development of modern social thought. Introduces key philosophers and theorists Adam Smith, Marx, Durkheim, Weber, Freud, and Du Bois, focusing on the global dimensions of their work.

Restriction: Graduate students only.

**INTL ST 203. Globalizing Social Theory in the Age of Extremes. 4 Units.**

Examines important developments in social theory between 1914 and 1991. The overarching goal is to synthesize from these various approaches a critical and transdisciplinary theoretical framework to analyze complex global issues.

Restriction: Graduate students only.

**INTL ST 204. Theories of Globalization. 4 Units.**

Theories of globalization engage deep historical transformations, keeping the interrelated dynamics of economics, politics, and culture in focus. Theories examine transformations emanating at transnational and state levels, and from below in the form of social movements led by everyday people.

Restriction: Graduate students only.

**INTL ST 205. Theories from the Global South. 4 Units.**

Looking beyond the theoretical traditions of the Euro-American academy scholars can begin to engage important theoretical contributions from the Global South. Explores alternative standpoints and interventions challenging dominant narratives and calling into question taken-for-granted assumptions, categories, concepts, values, and perspectives.

Restriction: Graduate students only.

**INTL ST 206. Engaging Global Issues. 4 Units.**

Critical and interdisciplinary works on global issues serve as examples that graduates can use in their own research. Each week focuses on a different example of outstanding global research done by a scholar having an important impact on the field.

Restriction: Graduate students only.

**INTL ST 207. Research Design and Methods . 4 Units.**

Fundamentals of empirical research design, strategies for global research, sampling logics, reliability, validity, mixed methods, integrating qualitative and quantitative methods. Introduction to basic data collection methods and examples of more advanced methodological strategies. Research ethics and the IRB review process.

Restriction: Graduate students only.

**INTL ST 208. Grant Writing. 4 Units.**

Focuses on production, critique, and revision of student research proposals. A practical seminar designed to improve student proposals, help students through the application processes, and increase students' chances of obtaining support for their research.

Restriction: Graduate students only.

**INTL ST 210A. Proseminar in Global Studies I. 4 Units.**

Year-long intensive introduction to graduate students to a range of topics pertinent to the field of Global Studies. The guest speakers and topics addressed vary each quarter.

Repeatability: May be taken for credit 6 times.

Restriction: Graduate students only.

**INTL ST 210B. Proseminar in Global Studies II. 4 Units.**

Year-long intensive introduction to graduate students to a range of topics pertinent to the field of Global Studies. The guest speakers and topics addressed vary each quarter.

Repeatability: May be taken for credit 6 times.

Restriction: Graduate students only.

**INTL ST 210C. Proseminar in Global Studies III. 4 Units.**

Year-long intensive introduction to graduate students to a range of topics pertinent to the field of Global Studies. The guest speakers and topics addressed vary each quarter.

Repeatability: May be taken for credit 6 times.

Restriction: Graduate students only.

**INTL ST 260. Directed Reading and Research. 4-12 Units.**

Readings focused on specialized topics in consultation with, and with the consent of, a faculty member. Students are expected to produce a paper based on the readings.

Repeatability: May be taken for credit 6 times.

Restriction: Graduate students only.

**INTL ST 290. Dissertation Research. 1-12 Units.**

Dissertation research with Global and International Studies faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**INTL ST 299. Independent Study. 4-12 Units.**

Independent research with Global and International Studies faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Linguistics Courses

**LINGUIS 150. Acquisition of Language II. 4 Units.**

Focuses on native language learning, exploring the way in which infants and very young children unconsciously uncover the rich systematic knowledge of their native language. Examines both experimental and computational studies that quantitatively investigate the 'how' of language acquisition.

Prerequisite: PSYCH 56L or LINGUIS 51

Same as PSYCH 156A.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

## Logic and Philosophy of Science Courses

**LPS 29. Critical Reasoning. 4 Units.**

Introduction to analysis and reasoning. The concepts of argument, premise, and conclusion, validity and invalidity, consistency and inconsistency. Identifying and assessing premises and inferences. Deductive versus inductive reasoning, and introduction to the probability calculus. Evaluating definitions. Informal fallacies.

Same as PHIL 29.

(II and Vb ).

**LPS 30. Introduction to Symbolic Logic. 4 Units.**

An introduction to the symbolism and methods of the logic of statements, including evaluation of arguments by truth tables, the techniques of natural deduction, and semantic tableaux.

Same as LSCI 43, PHIL 30.

(Vb)

**LPS 31. Introduction to Inductive Logic. 4 Units.**

Philosophical questions concerning the foundations of scientific inference, e.g., the traditional problem of induction, the Goodman paradox, the concept of cause, Mill's method of inductive reasoning, probability calculus, different interpretations of probability, and their interaction in inductive reasoning.

Same as PHIL 31.

(II, Va)

**LPS 40. The Nature of Scientific Inquiry. 4 Units.**

Investigates the nature, scope, and status of scientific knowledge and the methods used to acquire it. Uses concrete historical examples from a variety of scientific fields to identify distinctive features of the scientific enterprise and explore their significance.

(II)

**LPS 60. The Making of Modern Science. 4 Units.**

Surveys the history of science and mathematics since the Scientific Revolution, examining central developments both chronologically and thematically, as well as investigating their significance for contemporary philosophical debates about the role and status of current scientific theories.

Same as HIST 60.

(GE II or GE IV ).

**LPS H80. Scientific Realism and Instrumentalism. 4 Units.**

Explores competing views of the character and status of theoretical knowledge in science, including challenges to and defenses of the view that contemporary scientific theories offer straightforward and accurate descriptions of how things stand in otherwise inaccessible domains of nature.

Restriction: Campuswide Honors Collegium students only.

(II)



**LPS H81. What is Space? . 4 Units.**

Historical, philosophical, scientific exploration of the concept of 'space.' Questions of interest include: What kind of a thing is space? How can we know what space is like? How is space different from time.

Restriction: Campuswide Honors Collegium students only.

(II)

**LPS 91. The Philosophy of Sex. 4 Units.**

Discusses the origins of biological sex, dynamics of sexual selection, sex differences in humans, and the construction of gender in human societies. Seeks to understand the role social values play in the creation of science.

Same as PHIL 91.

Overlaps with LPS H91.

(III)

**LPS H91. The Philosophy and Biology of Sex. 4 Units.**

Covers the origins of biological sex, dynamics of sexual selection, the evolution and cultural creation of sexual behavior in humans, and the construction of gender in human societies.

Restriction: Campuswide Honors Collegium students only.

(II and III ).

**LPS H95. Jurisprudence and Constitutional Law. 4 Units.**

Applies competing theories of the nature of law and legal reasoning to evaluate decisions of the U.S. Supreme Court in controversial areas of constitutional law such as free speech, privacy, sexual conduct, affirmative action, and political campaign contributions.

Restriction: Campuswide Honors Collegium students only.

(III)

**LPS 100W. Writing Philosophy. 4 Units.**

Discussion of those aspects of writing of special importance in philosophy, e.g., philosophical terminology, techniques for evaluating arguments, philosophical definitions and theories. At least 4,000 words of assigned composition based on philosophical readings.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as PHIL 100W.

Restriction: Upper-division students only.

(Ib)

**LPS 102. Introduction to the Theory of Knowledge. 4 Units.**

A study of one or more of the basic issues in epistemology, e.g., the role of perception in the acquisition of knowledge, the nature of evidence, the distinction between belief and knowledge, and the nature of truth and certainty.

Same as PHIL 102.

**LPS 104. Introduction to Logic. 4 Units.**

Introduction to sentence logic, including truth tables and natural deduction; and to predicate logic, including semantics and natural deduction.

Same as LSCI 142, PHIL 104.

**LPS 105A. Elementary Set Theory. 4 Units.**

An introduction to the basic working vocabulary of mathematical reasoning. Topics include sets, Boolean operations, ordered n-tuples, relations, functions, ordinal and cardinal numbers.

Same as LSCI 145A, PHIL 105A.

**LPS 105B. Metalogic. 4 Units.**

Introduction to formal syntax (proof theory) and semantics (model theory) for first-order logic, including the deduction, completeness, compactness, and Löwenheim-Skolem theorems.

Prerequisite: PHIL 105A

Same as LSCI 145B, PHIL 105B.  
Overlaps with MATH 150.

**LPS 105C. Undecidability and Incompleteness. 4 Units.**

Introduction to the formal theory of effective processes, including recursive functions, Turing machines, Church's thesis, and proofs of Gödel's incompleteness theorem for arithmetic, and Church's undecidability theorem for first-order logic.

Prerequisite: PHIL 105B

Same as LSCI 145C, PHIL 105C.  
Overlaps with MATH 152.

Concurrent with LPS 205C.

**LPS 106. Topics in Logic . 4 Units.**

Selected topics in mathematical or philosophical logic.

Prerequisite: PHIL 105B or LPS 105B

Repeatability: Unlimited as topics vary.

Same as PHIL 106.

**LPS 108. Topics in Induction, Probability, and Decision Theory. 4 Units.**

Selected topics in induction, probability, and decision theory.

Repeatability: Unlimited as topics vary.

Same as PHIL 108.

**LPS 113. Topics in Modern Philosophy. 4 Units.**

Focuses on the works of central philosophical figures of modern Philosophy (e.g., Descartes, Leibniz, Hobbes, Locke, Hume, Kant) or on the treatment of one or more central philosophical problems by a number of these figures.

Repeatability: Unlimited as topics vary.

Same as PHIL 113.

**LPS 115. Topics in History of Analytic Philosophy. 4 Units.**

Review of central theories or figures in the history of analytic philosophy. Emphasis on writings of Frege, Russell, Schlick, Carnap, and Quine. Topics include the nature of meaning and truth, the synthetic/analytic distinction, and scientific knowledge.

Repeatability: Unlimited as topics vary.

Same as PHIL 115.

**LPS 120. Topics in Metaphysics. 4 Units.**

Examines central philosophical questions concerning our own fundamental nature and that of the world around us (e.g., causation and necessity, determination, free will, personal identity, the mind-body problem).

Repeatability: Unlimited as topics vary.

Same as PHIL 120.

**LPS 121. Topics in the Theory of Knowledge . 4 Units.**

One or more topics in the theory of knowledge, e.g., the nature of rational justification, of perceptual knowledge, of a priori knowledge.

Repeatability: Unlimited as topics vary.

Same as PHIL 121.

**LPS H123. What is Disease?. 4 Units.**

Explores philosophical issues associated with scientific efforts to understand and explain disease.

Restriction: Campuswide Honors Collegium students only.

**(II)****LPS H125. What Is Time? . 4 Units.**

Engages the question 'what is time?' by drawing on physics, philosophy, fiction, film, and psychology. Organized around understanding and addressing the tension between time as represented in physics and our immediate temporal experience.

Restriction: Campuswide Honors Collegium students only.

**(III)****LPS 140. Topics in Philosophy of Science. 4 Units.**

Selected topics in contemporary philosophy of science, e.g., the status of theoretical entities, the confirmation of theories, the nature of scientific explanation.

Repeatability: Unlimited as topics vary.

Same as PHIL 140.

**LPS 141A. Topics in Philosophy of Physics. 4 Units.**

Selected topics in the philosophy of physics, e.g., the interpretation of quantum mechanics, the nature of spacetime, the problem of quantum field theories.

Repeatability: Unlimited as topics vary.

Same as PHIL 141A.

**LPS 141B. Geometry and Spacetime. 4 Units.**

An examination of the foundations of the special theory of relativity, with emphasis on the geometry of Minkowski spacetime, and its relation to both Euclidean and non-Euclidean (hyperbolic) plane geometries.

Prerequisite: MATH 2D and (MATH 3A or MATH 6G)

Same as PHIL 141B.

**LPS 141C. Philosophy of Quantum Mechanics. 4 Units.**

An examination of the standard von Neumann-Dirac formulation of quantum mechanics. The quantum measurement problem is discussed along with several proposed solutions, including GRW, many-worlds, man-minds, and Bohm's theory.

Same as PHIL 141C.

**LPS 141D. Probability and Determinism. 4 Units.**

An examination of a cluster of interrelated issues concerning probability, determinism, logic, and the foundations of quantum mechanics.

Prerequisite: MATH 2D and (MATH 3A or MATH 6G)

Same as PHIL 141D.

**LPS H141. Honors Philosophy of Quantum Mechanics. 4 Units.**

An examination of the standard von Neumann-Dirac formulation of quantum mechanics. The quantum measurement problem is discussed along with several proposed solutions, including GRW, many-worlds, man-minds, and Bohm's theory.

Overlaps with LPS 141C.

Restriction: Campuswide Honors Collegium students only.

**LPS 142W. Writing/Philosophy of Biology. 4 Units.**

Philosophy of biology, e.g., scientific method in biology, the structure of evolutionary theory, teleology, ethics, and evolution. Course work includes one 4,000-word and four 1,000-word papers.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as PHIL 142W, BIOL E142W.

Restriction: Juniors only.

**(Ib)****LPS 143. Topics in Philosophy of Psychology. 4 Units.**

Selected topics in the philosophy of psychology, e.g., the nature of psychological explanation, reductionism, issues in cognitive, behavioral, and neuroscience.

Repeatability: Unlimited as topics vary.

Same as PHIL 143, PSYC 123P.

Restriction: Psychology Majors have first consideration for enrollment. Philosophy Majors have first consideration for enrollment.

**LPS 144. Topics in Philosophy of Social Science. 4 Units.**

Selected topics in the philosophy of the social sciences, e.g., Is their goal to understand behavior or to predict and control it?; Are they normative and the natural sciences not?; Do they incorporate philosophical doctrines about language and mind?.

Repeatability: May be taken for credit for 4 units as topics vary.

Same as PHIL 144.

**LPS 145. Topics in Philosophy of Language. 4 Units.**

Selected topics in the philosophy of language, e.g., the nature of meaning, mechanisms of reference, speech acts.

Repeatability: Unlimited as topics vary.

Same as LSCI 141, PHIL 145.

**LPS 146. Topics in Philosophy of Logic. 4 Units.**

Selected topics in the philosophy of logic, e.g., the nature of logical truth and our knowledge of it, the status of propositions, definite descriptions, and existential presuppositions.

Repeatability: Unlimited as topics vary.

Same as PHIL 146.

**LPS 147. Topics in Philosophy of Mathematics. 4 Units.**

Selected historical and contemporary topics in the philosophy of mathematics, e.g., mathematical truth and ontology, mathematical knowledge, the nature and role of proof, the workings of mathematics in application.

Repeatability: Unlimited as topics vary.

Same as PHIL 147.

**LPS 199. Independent Study. 1-4 Units.**

Independent research with Logic and Philosophy of Science faculty.

Repeatability: May be taken for credit for 12 units.

**LPS 200. Topics in Logic and Philosophy of Science. 4 Units.**

Studies in selected areas of Logic and Philosophy of Science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**LPS 205A. Set Theory. 4 Units.**

The basic working vocabulary of mathematical reasoning. Topics include: sets, Boolean operations, ordered n-tuples, relations, functions, ordinal and cardinal numbers.

Same as PHIL 205A.

**LPS 205B. Metalogic. 4 Units.**

Formal syntax (proof theory) and semantics (model theory) for first-order logic, including the deduction, completeness, compactness, and Loewenheim-Skolem theorems.

Prerequisite: PHIL 205A or LPS 205A

Same as PHIL 205B.

**LPS 205C. Undecidability and Incompleteness. 4 Units.**

Formal theory of effective processes, including recursive function, Turing machines, Church's thesis, proofs of Goedel's incompleteness theorem for arithmetics, and Church's undecidability for first-order logic.

Prerequisite: PHIL 205B or LPS 205B

Same as PHIL 205C.

Restriction: Graduate students only.

Concurrent with LPS 105C.

**LPS 206. Topics in Logic . 4 Units.**

Studies in selected areas of logic. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 206.

**LPS 213. Topics in Modern Philosophy. 4 Units.**

Studies in selected areas of modern philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 213.

**LPS 215. Topics in Analytic Philosophy. 4 Units.**

Studies in selected areas of analytic philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 215.

**LPS 220. Topics in Metaphysics. 4 Units.**

Studies in selected areas of metaphysics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 220.

**LPS 221. Topics in Epistemology. 4 Units.**

Studies in selected areas of epistemology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 221.

**LPS 221A. Medical Epistemology. 4 Units.**

Analysis of epistemological issues concerning medical research and healthcare. Topics may include medical evidence, transmission of medical knowledge in the doctor-patient interaction, medical expertise, epistemology of medical disagreement, classification of illness, well-being, philosophy of pain, or medical decision making.

Same as PHIL 221A.

Restriction: Graduate students only.

**LPS 232. Topics in Political and Social Philosophy. 4 Units.**

Studies in selected areas of political and social philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 232.

**LPS 240. Topics in Philosophy of Science. 4 Units.**

Studies in selected areas of philosophy of science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 240.

**LPS 241. Topics in Philosophy of Physics. 4 Units.**

Studies in selected areas of philosophy of physics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 241.

**LPS 242. Topics in Philosophy of Biology. 4 Units.**

Studies in selected areas of philosophy of biology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 242.

**LPS 243. Topics in Philosophy of Psychology. 4 Units.**

Selected topics in the philosophy of psychology, e.g., the nature of psychological explanation, reductionism, issues in cognitive, behavioral, and neuroscience.

Repeatability: Unlimited as topics vary.

Same as PHIL 243, PSYC 231P.

**LPS 244. Topics in Philosophy of Social Science. 4 Units.**

Studies in selected areas of philosophy and social science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 244.

**LPS 245. Topics in Philosophy of Language. 4 Units.**

Studies in selected areas of philosophy of language. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 245.

**LPS 246. Topics in Philosophy of Logic. 4 Units.**

Studies in selected areas of philosophy of logic. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 246.

**LPS 247. Topics in Philosophy of Mathematics. 4 Units.**

Studies in selected areas of philosophy of mathematics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 247.

**LPS 289. Logic and Philosophy of Science Workshop. 1-4 Units.**

A two- or three-quarter-long workshop on selected topics in logic and philosophy of science.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**LPS 298. Independent Study. 4-12 Units.**

Independent research with Logic and Philosophy of Science Faculty.

Repeatability: May be taken for credit for 12 units.

**LPS 299. Directed Research. 1-12 Units.**

Directed study with Logic and Philosophy of Science Faculty.

Repeatability: May be repeated for credit unlimited times.

**LPS 399. University Teaching. 4-12 Units.**

Required of and limited to Teaching Assistants.

Repeatability: May be taken for credit for 12 units.

## Political Science Courses

**POL SCI 10A. Probability and Statistics in Political Science I. 4 Units.**

Introduction to the variety of statistical applications in the social sciences. Descriptive statistics. Measures of central tendency and dispersion. Percentile ranks. Standardization and normal approximation. Basic probability theory focuses on application to statistical inference and binomial distribution. Laboratory required.

Prerequisite: SOC SCI 3A

Overlaps with ANTHRO 10A, ECON 15A, PSYCH 10A, SOCECOL 13, SOC SCI 9A, SOCIOL 10A.

Restriction: Lower-division students only.

**(Va)**

**POL SCI 10B. Probability and Statistics in Political Science II. 4 Units.**

Introduction to statistical inference, sampling distribution, standard error. Hypothesis tests for proportions and means. Inferential techniques for nominal variables including chi-square, study measures of strengths, significance of relationships between variables, assumptions, data requirements, and types of error in significance tests.

Prerequisite: POL SCI 10A

Overlaps with ANTHRO 10B, ECON 15B, PSYCH 10B, SOCECOL 13, SOC SCI 9B, SOC SCI 10B.

**(Va)**

**POL SCI 10C. Probability and Statistics in Political Science III. 4 Units.**

Focus on correlation, regression, and control for effects of variables. One-way and two-way factorial analysis of variance. A priori and a posteriori comparisons. Introduction to repeated measures design and non-parametric statistics. Discusses use of statistics in newspapers and popular magazines.

Prerequisite: POL SCI 10B

Overlaps with ANTHRO 10C, PSYCH 10C, SOCECOL 13, SOC SCI 9C, SOC SCI 10C, SOCIOL 10C.

**(Vb)**

**POL SCI 11A. Introduction to Political Science: Political Analysis. 4 Units.**

Presents various modes of understanding politics. Emphasis on basic approaches to political analysis, their uses in constructing theories, and their application to particular national political systems.

**(III and VIII ).**



**POL SCI 11C. Introduction to Political Science: Micropolitics. 4 Units.**

Introduction to political behavior of individuals and groups within national systems. Three questions addressed: How do individuals come to understand the political world? How do individuals behave within this world? How do groups and individuals engage in the political process.

(III)

**POL SCI 21A. Introduction to American Government. 4 Units.**

Introduction to American political processes and institutions. Topics include elections, political participation, parties, interest groups, the Presidency, Congress, the bureaucracy, and the judiciary.

(III)

**POL SCI 31A. Introduction to Political Theory. 4 Units.**

Types of questions: What is politics? What are the theoretical and philosophical bases for different types of political arrangements? How do these perspectives get translated into reality? Among others, the works of Rousseau, Locke, Mill, and Marx are read.

(III)

**POL SCI 32A. Dilemmas of Diversity. 4 Units.**

Focuses on racial, ethnic, and gender diversity, multiculturalism, and their impact on our social and political ideals. Traces the sources of ideas about difference, equality, and toleration, and examines tensions that occur when forms of identity conflict with one another.

Same as INTL ST 32A.

(VII)

**POL SCI 41A. Introduction to International Relations. 4 Units.**

Analysis of political relations between and among nations with emphasis on explanations of conflict and cooperation. The role of ideologies and their relation to international problems are also examined.

Same as INTL ST 14.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(III and VIII ).

**POL SCI 44B. Global Political Ideologies. 4 Units.**

An overview of the major political ideologies shaping the current world order and global conflict. Topics include liberalism, democracy, nationalism, capitalism, communism, socialism, fascism, neoliberalism, clash of civilizations, sectarian violence, populist nationalism, and de-globalization.

Same as INTL ST 12, SOC SCI 12.

Restriction: International Studies Majors have first consideration for enrollment.

(III and VIII ).

**POL SCI 45A. Human Rights and Global Governance. 4 Units.**

Historical development of civil, political rights and the rise of human rights in international law. Explores role, and limitations, of the UN, ICJ, and ICC in global governance. Reconceptualizing democracy and political representation in a postnational 21st century.

Same as INTL ST 16, SOC SCI 16.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

(III and VIII ).

**POL SCI 49. Lower-Division Special Topics in International Relations. 4 Units.**

Studies in selected areas of international relations. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**POL SCI 51A. Introduction to Politics Around the World. 4 Units.**

Introduces comparative politics. Compares political systems in a variety of countries. Includes elections, parties, parliaments, presidents, protest movements, and other aspects of national politics. Addresses how to make meaningful comparisons across countries.

(III, VIII)

**POL SCI 61A. Introduction to Race and Ethnicity in Political Science. 4 Units.**

Examines major theories that attempt to explain the roles of race and ethnicity in U.S. politics.

Same as CHC/LAT 64.

(III and VII ).

**POL SCI 71A. Introduction to Law. 4 Units.**

An introduction to the study of judicial politics. Questions include: what is law?; what is a court?; who are the judges? Analysis of a wide range of judicial decisions illustrates the political importance of courts in the U.S. and elsewhere.

(III)

**POL SCI 79. Lower-Division Special Topics in Law. 4 Units.**

Studies in selected areas of law. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**POL SCI H80. Globalization and Human Security. 4 Units.**

Emerging issues of human security in the globalized world, including personal human security, physical integrity, human trafficking, global climate change, food. Challenges of these complex human security problems for a multi-scalar system (international, national, local).

Restriction: Campuswide Honors Collegium students only.

(III, VIII)

**POL SCI 120. Public Opinion. 4 Units.**

Theories concerning sources of public opinion, processes by which it is altered, organization of citizens' belief systems, and role of public opinion in government policy. Students analyze survey data as a research project.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 121A. The American Presidency. 4 Units.**

Presents a comprehensive survey of the American presidency and considers the question of political power.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 121C. U.S. Elections and Voting Behavior. 4 Units.**

Examines how voters evaluate political parties, candidates, and issues in electoral campaigns to reach their decisions. Numerous controversies concerning the degree of issue voting, sophistication of candidate evaluations, and the decline of political parties are discussed.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 121F. Presidents Since World War II. 4 Units.**

Reviews the actions and character of presidents from Harry Truman through Bill Clinton. Each week a different president is examined from a variety of perspectives. Students are expected to write a substantial original research paper.

Prerequisite: POL SCI 21A

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 121G. American Public Policy. 4 Units.**

Focuses on the development and implementation of public policy in the United States. Lectures cover theoretical models of the policy process as well as significant problems facing contemporary American decision-makers.

Same as PUBHLTH 132, SOC SCI 152C, UPPP 129.

**POL SCI 121HW. Writing for the President of the United States. 4 Units.**

Imagines how White House staffers can help presidents with clear, focused, and effective writing. Through a variety of formats, students study, hone, and practice writing skills that will prove useful- in and out of the White House.

Prerequisite: POL SCI 21A

(Ib)

**POL SCI 122A. American Metropolitan Politics. 4 Units.**

Explores the politics of urban and suburban America, including the policy making process; the exercise of political power; local politics, federalism and the problems of metropolitanism; and major policy problems facing urban areas.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 122B. California Politics. 4 Units.**

Examines the structure and function of California government, traces historical development of political power, with constantly changing casts of power-brokers and seekers. Explores California exceptionalism and the roles played by the electorate, legislature, executive, and organized interests in policy making.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 122BW. California Politics. 4 Units.**

Examines the structure and function of California government, traces historical development of political power, with constantly changing casts of power-brokers and seekers. Explores California exceptionalism and the roles played by the electorate, legislature, executive, and organized interests in policy making.

Prerequisite: Satisfactory completion of the Lower-Division writing requirement.

Restriction: Political Science Majors have first consideration for enrollment.

**(Ib)****POL SCI 123B. Representation. 4 Units.**

Deals with classical theories of representation: issues of racial and political representation in U.S. legislatures and city councils; proportional representation models; and comparative election systems.

Prerequisite: SOC SCI 3A or SOC SCI 10A or SOC SCI 10B

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 124A. The Politics of Protest. 4 Units.**

Examines the Civil Rights, Black Power, and women's movements in relationship to the Asian American movement. Uses social movement theories to illuminate the cases, and the cases to critique and revise the theories.

Same as ASIANAM 144.

**(VII)****POL SCI 124B. Latinos in U.S. Politics. 4 Units.**

Comparing the political issues facing Latino groups by examining their migration histories, voting behavior, nonelectoral participation, and policy issues. Latino issues are examined on the national, state, and local levels, including formal representation, immigration, affirmative action, and language policy.

Same as CHC/LAT 151.

**(VII)****POL SCI 124C. Comparative Minority Politics. 4 Units.**

Examines the political experiences of Blacks, Latinos, and Asian Americans in the United States from roughly 1950 to the present. Focuses on how each group has pursued political empowerment via both conventional political channels and social movements.

Same as AFAM 151, CHC/LAT 147, ASIANAM 132.

**POL SCI 124E. African American Politics. 4 Units.**

Examines politics of African Americans in order to gain a broader perspective of the American political process. Major developments in African American politics (including the civil rights movement, Black presidential bids), continuing problem of racism, responsiveness of key governing institutions.

Same as AFAM 152.

**POL SCI 125A. The United States Congress. 4 Units.**

Does the Congress do a good job of representing the American citizenry? Is it the most appropriate mechanism for the creation, resolution, and implementation of public policy.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 125CW. Constitutional Convention. 4 Units.**

Analyzes the Constitution, its amendments, and periods of Constitutional reform as a foundation for a critical evaluation of the Constitution with an eye both to necessary reforms and to elements of the Constitution that should be maintained.

Prerequisite: POL SCI 21A. Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**POL SCI 126C. U.S. Immigration Policy. 4 Units.**

Examines selected immigration policy debates since the nineteenth century, rationale and consequences of immigration law since 1965, problems of administration, implementation and enforcement, impact of immigration policy on foreign relations, and contemporary debate regarding the future of U.S. policy.

Same as CHC/LAT 163.

(VII)

**POL SCI 126D. Urban Politics and Policy. 4 Units.**

Examines economic limits of cities and welfare policy. Addresses such issues as why are the poor concentrated in the central cities? Which anti-poverty programs will work best in cities? Which level of government can best combat poverty in the U.S.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 126F. Politics of Animal Rights. 4 Units.**

Examines animal rights/welfare movement's efforts to transform moral, practical, and legal standing of nonhuman animals in contemporary U.S. Explores intersection of racism, sexism, and speciesism informed by theories of race and ethnicity, including Asian American Studies.

Same as ASIANAM 168.

Restriction: Political Science Majors have first consideration for enrollment. Asian American Studies Majors have first consideration for enrollment.

**POL SCI 128BW. Political Ideologies: The Way We View Our World. 4 Units.**

Politics has become divisive and ideological. But ideologies are poorly understood and have become mere labels for identifying friends and enemies. Course analyzes the nature of ideology, focusing on liberalism, conservatism, fascism, socialism, and contemporary 'liberation' ideologies.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**POL SCI 128C. Political Psychology. 4 Units.**

Examination of how psychological theory and research may be used to better understand political thought and behavior. Drawing on theories of learning, cognition, and personality, discusses such topics as the formation of political attitudes, and the process of political decision-making.

Same as PSYCH 176A.

Restriction: Majors only. POL SCI 128C may not be taken for credit if taken after POL SCI 137C.

**POL SCI 129. Special Topics in American Politics and Society. 4 Units.**

Studies in selected areas of American politics and society. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 130A. Game Theory and Politics I. 4 Units.**

Introduction to game theory and a survey of its political applications. Examples of topics covered include voting in small committees, legislatures, and mass elections; interest group activities and environmental issues; institutional design, and the evolution of cooperative behavior.

Same as SOCIOL 134, SOC SCI 103A.

Restriction: Social Policy/Public Service Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**POL SCI 130B. Game Theory and Politics II. 4 Units.**

More advanced game theory and its political applications, beginning where Game Theory and Politics I ends. Examples of topics covered include revolutions; arms race; spatial models of party competition; political manipulation; political coalitions and their power.

Prerequisite: POL SCI 130A or ECON 116A

Same as SOC SCI 103B.

Restriction: Social Policy/Public Service Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 131C. Modern Political Theory. 4 Units.**

Examines major thinkers and intellectual movements in the political thought of the 17th and 18th centuries.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 131F. Twentieth Century Political Theory. 4 Units.**

Examines major thinkers and intellectual movements in the political thought of the 20th Century.

Prerequisite: POL SCI 31A

**POL SCI 134F. Social and Political Theory. 4 Units.**

Focus is on recent major work in social and political theory. An in-depth analysis of a relatively small body of writing. Authors discussed include Jurgen Habermas, Anthony Giddens, and Richard Rorty.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 135A. Origins of Liberalism. 4 Units.**

Examines the ideals, social forces, and historical events that gave rise to liberal political theory. Topics include patriarchal authority, the divine right of kings, religious toleration, slavery, colonialism, political economy, the evolution of law, and tensions between liberty and equality.

Prerequisite: POL SCI 31A

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 135B. Just War Revisited. 4 Units.**

Examines the evolution of the doctrine of the just war across the history of Western political thought, the importance of changes in the doctrine and whether it applies today; examines international relations case studies to determine today's relevancy.

Same as INTL ST 131A.

**POL SCI 136B. Cannibals and Conquistadores: The Philosophy of the Other. 4 Units.**

Examines critically the notion of the 'other' by looking at the philosophical challenges difference poses in the context of the European discovery of the New World. Seeks to understand the naissence of the concept of human rights and tolerance.

**POL SCI 136BW. Cannibals and Conquistadores: The Philosophy of the Other. 4 Units.**

Examines critically the notion of the 'other' by looking at the philosophical challenges difference poses in the context of the European discovery of the New World. Seeks to understand the naissence of the concept of human rights and tolerance.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Overlaps with POL SCI 136B.

(Ib)

**POL SCI 137BW. Types of Political Representation. 4 Units.**

Political representation plays an important role in democratic systems, but is elusive once examined closely. Students delve into the concept and relate different views to political life. Half of the course is spent on writing instruction.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Recommended: Upper-Division students. Political Science majors have first consideration for enrollment.

(Ib)

**POL SCI 138A. The Moral of the Story: Introductory Seminar in Ethics. 4 Units.**

Introduces major theories and classic texts in ethics, from Plato and Aristotelian virtue ethics to utilitarianism and Kant and contemporary moral psychology.

**POL SCI 138AW. Moral of the Story: Introduction to Ethics. 4 Units.**

Focuses on how we learn about ethics from stories, in the form of fables, bedtime stories, religious stories, soap operas, television, and movies as adults. Students bring in stories that informed their own ethical development.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**POL SCI 138CW. Ethics of Difference. 4 Units.**

Examines differences traditionally judged politically salient—race, ethnicity, religion, gender. Personal interviews with an elderly person encourage students to understand the social construction of difference and to reexamine their own attitudes by putting themselves in the place of another.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Political Science Majors have first consideration for enrollment.

(Ib)

**POL SCI 138DW. The Moral Life During War. 4 Units.**

Can people keep their humanity during war? What does the term humanity signify when simply surviving requires faith, courage, and desperation? When facing wartime brutality, must we abrogate morality? What does it mean to compose a moral life during war?.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Political Science Majors have first consideration for enrollment.

Concurrent with POL SCI 238D.

(Ib)

**POL SCI 139. Special Topics in Political Theory and Methods. 4 Units.**

Studies in selected areas of political theory and methods. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 141B. International Political Economy. 4 Units.**

Examination of problems in global political-economic relations through competing conceptual lenses or grand theories: mercantilism, liberalism, and Marxism. Surveys North-North and North-South issues relating power and wealth.

Same as INTL ST 114A.

(VIII)

**POL SCI 141C. International Political Economy of East Asia. 4 Units.**

Integration of theoretical perspectives in international political economy with the study of economic development in East Asia, with special emphasis on regional integration.

(VIII)

**POL SCI 141E. U.S. Foreign Policy Toward Asia. 4 Units.**

U.S. policy toward the countries of East Asia: bilateral and regional security relationships, U.S. economic relations with the major Asian countries, the development of regional institutions, and human rights.

Same as INTL ST 142G.

**POL SCI 142B. The International Relations of East Asia. 4 Units.**

Surveys various aspects of relations between the nations of East Asia. Topics include the historical development of the region; current political and security relations, including the impact of the American military presence.

Same as INTL ST 142D.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 142D. U.S. Foreign Policy I: Globalism and Cold War. 4 Units.**

Looks at changing international perspectives, policy responses, and military strategies of presidential administrations from Truman to Reagan. In assessing the motives and objectives of U.S. foreign policy leaders during the "Cold War" era, the concept of "national interest" is examined.

Same as INTL ST 142A.

Restriction: International Studies Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment.

**POL SCI 142G. U.S. Coercive Diplomacy. 4 Units.**

Examines the theory of compellence and the U.S. practice of coercive diplomacy--the power to change behavior of other governments. Specific case examples: the Cuban missile crisis, bombing of North Vietnam, the Nicaraguan Contras, Desert Shield/Desert Storm, and Libya.

Same as INTL ST 142E.

Restriction: Upper-division students only. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 142J. U.S. Intervention in Latin America. 4 Units.**

Explores political, economic, social, and cultural ties that bind Latin America to the United States. Focuses on U.S. intervention and Latin American response from early nineteenth century to present day. Case studies include Mexico, Guatemala, Cuba, Chile, and Central America.

Same as HISTORY 166, INTL ST 177D, CHC/LAT 150.

**POL SCI 143G. Homeland Security . 4.0 Units.**

Examines the 9/11 origins of the concept of homeland security; assess the evolution, structure, and operations of the Department of Homeland Security; critically examines the evolution of threat assessment to the U.S. and the utilization of risk management methodologies.

Same as INTL ST 141B.

**POL SCI 144A. Approaches to International Relations. 4 Units.**

Reviews theoretical and methodological approaches to the study of international relations using contending perspectives to analyze power and influence, capabilities, interdependence, reciprocity, international regimes, anarchy, cooperation, imperialism, and hegemony.

Same as INTL ST 140A.

Restriction: Upper-division students only. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 145A. Ethics in an Age of Terror and Genocide. 4 Units.**

Original sources document personal impact of wars on genocides, from World War II to the Bosnian and Rwandan genocides and current wars in Iraq and Afghanistan. Students train for and conduct personal interviews with someone who lived through a war.

Same as INTL ST 154C.

**POL SCI 146B. Religion and World Politics. 4 Units.**

Examines the relationship between religion and world politics historically and today, focusing on connections with peace/war, democracy, human rights, secularism(s), and globalization. Covers major debates, scholarship, concepts, and theories through class exercises, exams, and essays.

Prerequisite: POL SCI 41A or INTL ST 11 or INTL ST 12 or REL STD 5A or REL STD 5B or REL STD 5C

Same as REL STD 115, INTL ST 151B.

**POL SCI 147CW. International Humanitarianism. 4 Units.**

Examines, analyzes, and evaluates the humanitarian phenomenon, the actors involved in it (including states, international organizations (IOs), and nongovernmental organizations (NGOs)), the rise of a body of international humanitarian law, and the problems and debates associated with international humanitarianism today.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as INTL ST 147CW.

(Ib)



**POL SCI 147D. International Organizations. 4 Units.**

Active learning course that examines origins, decision-making processes, activities, and evolution of leading international organizations (e.g. U.N., NATO, EU, AU, WTO, World Bank, IMF). Activities include drafting reforms, applying theory, assessing dysfunctions, and participating in U.N. negotiation simulations.

Same as INTL ST 147D.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 147E. Critical Investigations into Humanitarianism in Africa. 4 Units.**

Explores the complex phenomenon of aid to Africa (emergency and development aid), and the representational, cultural, historical, and other reasons why some participants and many observers critique it. Students occasionally engage with peers and faculty in African institutions.

**(VIII)****POL SCI 149. Special Topics in International Relations. 4 Units.**

Studies in selected areas of international relations. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 151B. Introduction to Chinese Politics. 4 Units.**

Background to the Chinese revolution, rise of the communist party; and institutions, ideology, and structure of Communist party rule from 1949-present.

Same as INTL ST 176C.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 151C. Chinese Politics: Policy, Leadership, and Change. 4 Units.**

Examines major policies from 1949 to the present, and considers the changing role of the Communist Party and its shifting treatment of various social groups; the era of Mao Zedong, reforms under Deng, and post-Deng politics.

Same as INTL ST 176D.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 151H. Voting and Political Manipulation. 4 Units.**

Introduction to social choice and cooperative games. Topics include majority rule, types of voting methods, apportionment and proportional representation, agenda manipulation, coalition formation, voting power, political consequences of electoral laws.

Same as INTL ST 156A, SOC SCI 121T, ECON 154.

Restriction: International Studies Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**POL SCI 152F. West European Politics. 4 Units.**

Explores four main themes: (1) thinking scientifically about politics; (2) understanding the linkages between different political structures and spheres of activity; (3) evaluating some theories about politics; (4) learning about three countries: Britain, France, and Germany.

Same as INTL ST 176I.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 152K. Immigration Politics in Western Europe. 4 Units.**

Examines immigration politics in Western Europe, analyzing trends and policy from the postwar period through to today. Topics include citizenship, immigrant integration, asylum, the far-right, and a rotating focus on contemporary issues, e.g., terrorism, Islamophobia.

Same as INTL ST 178A.

Overlaps with POL SCI 141D.

**POL SCI 153B. Canadian Politics. 4 Units.**

Addresses the basic structures and processes of contemporary Canadian government and politics. Additional topics may include regionalism, federalism, western alienation and oil, Canadian solutions to social welfare policy questions, developments in Quebec, and other issues associated with French-English relations.

Same as INTL ST 176L.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 153E. Human Rights. 4 Units.**

Examines the causes and consequences of human rights violations with a focus on Latin America. What are human rights? When and where are they violated? What political mechanisms are available to deal with human rights problems? How effective are they.

Same as INTL ST 154B.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 153G. Cuban Society and Revolution. 4 Units.**

Explores the causes, development, and legacy of the 1959 Revolution. Themes include economic dependency, democracy, race, gender, culture, and the always volatile relations between Cuba and the United States.

Same as INTL ST 177E, HISTORY 166C, CHC/LAT 157.

**POL SCI 154C. Comparative Politics: Four Nations, Three Continents. 4 Units.**

Studies four countries in a comparative fashion: their respective political histories and cultural traditions; actual differences among their superficially similar party, parliamentary, and executive institutions; contemporary economic policy. The countries represent three continents and varying levels of economic development.

Same as INTL ST 144A.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 154F. Peoples and Cultures of Post-Soviet Eurasia. 4 Units.**

Examines the cultures and political conflicts of the more than 130 indigenous ethnic groups in the European and Asian territories of the former U.S.S.R. Emphasis is on the theoretical issues of ethnicity, nationalism, and conflict management.

Same as INTL ST 162B, ANTHRO 164P.

**(VIII)**

**POL SCI 154G. Conflict Resolution in Cross-Cultural Perspective. 4 Units.**

Examines theories of conflict management. Analyzes how conflict is mitigated in diverse cultures: at the interpersonal level, between groups, and on the international scale. Students discuss readings, hear from conflict management practitioners, and simulate negotiations.

Same as ANTHRO 136D, SOC SCI 183E, INTL ST 183E.

**(VIII)**

**POL SCI 154J. Jews and Power. 4 Units.**

Examines the relationship between the Jewish people and political power over a 3500 year period. How have Jews preserved their communal interests and personal safety? How have they defined the proper relationship of the people to political authority.

Same as HISTORY 130F, REL STD 130F.

**POL SCI 154KW. US Government in Comparative Perspective. 4 Units.**

Introduction to the United States in comparative perspective, covering general features of the United States and other countries, such as institutional design and policy choices. Addresses the debates about American exceptionalism and American decline.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Political Science Majors have first consideration for enrollment.

**(Ib)**

**POL SCI 155C. Organizations. 4 Units.**

How bureaucracies, formal organizations, and voluntary associations work, how/why they grow, and where they are going. History and structure of organizational rationality; dynamics of organized groups; behavior in organizations; limits of bureaucratization and attempts to overcome these limits through decentralization.

Same as SOCIOL 141.

Restriction: Sociology Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment.

**POL SCI 156A. Political Participation. 4 Units.**

The ways in which people in various political systems take part in politics, especially in activities directed toward affecting outcomes. Who is active, what they do, why they do it, and what difference it makes.

**POL SCI 156D. Protests, Movements, and Revolutions. 4 Units.**

A survey of models of collective action drawn from sociology, economics, psychology, and political science. Focus on areas such as social movements, strikes, crowd psychology, cults, fads, fashions, public opinion, and symbolic and mythical elements in collective culture.

Prerequisite: SOCIOL 1 or POL SCI 11A or ECON 1

Same as SOCIOL 174.

Restriction: Political Science Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**POL SCI 157B. International Divided Cities. 4 Units.**

Investigates urban divisions in international cities where deep-seated nationalistic ethnic differences create pressures for intergroup conflicts, autonomy, or territorial separation, and can incite violence. Urban political polarization as it is manifest in the urban setting.

Same as UPPP 178, SOCIOL 176.

**POL SCI 158D. Introduction to Contemporary Middle East Politics. 4 Units.**

An overview of basic issues that shape the politics of the Middle East and North Africa. Themes include implication of the colonization era, nation-state formation, inter-Arab relations, nationalism, Arab-Israel conflict, Islamic resurgence, and more.

Same as SOC SCI 188A, INTL ST 165.

**POL SCI 159. Special Topics in Comparative Politics. 4 Units.**

Studies in selected areas of comparative politics. Topics addressed vary each quarter.

Repeatability: May be repeated for credit unlimited times.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 169. Special Topics in Race and Ethnicity Politics. 4 Units.**

Studies in selected areas of race and ethnicity. Topics vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 171AW. Law and Society. 4 Units.**

Law and its various roles in society. The nature and meaning of law; legality and power in the American system; law as a mechanism for social change; the role of law in dispute processing, social control, compliance with judicial decisions.

Prerequisite: POL SCI 71A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Political Science Majors have first consideration for enrollment.

(Ib)

**POL SCI 171CW. Comparative Constitutional Politics. 4 Units.**

Examines the impact of constitutional courts on politics and policy-making in Canada, France, Germany, and the United States. Cases may focus on the constitutional politics of free speech, abortion, rights to property, and the conduct of foreign relations.

Prerequisite: POL SCI 71A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Political Science Majors have first consideration for enrollment.

(Ib)

**POL SCI 171D. American Constitutional Law. 4 Units.**

American constitutional interpretation of cases involving separation of powers, federal-state relations, rights of property, free expression, privacy, criminal due process, political participation, and equality. Includes legal research methods, development of judicial review, legal reasoning, and impact of Supreme Court decisions.

Prerequisite: POL SCI 71A

Overlaps with CRM/LAW C122.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 171F. Law in the Twenty-First Century. 4 Units.**

Examines the complex relationship between law, the social sciences, and modern society. Lectures explore such issues as the interplay between technology and constitutional rights, the impact of science on law, and the evolving roles of attorneys and judges.

Same as SOC SCI 172D.

Restriction: Political Science Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

**POL SCI 171G. Legal Implications of the Drug Trade. 4 Units.**

Examines United States policy to combat domestic and international narcotics trafficking. Analyzes the national drug policy and program implementation by federal and state agencies. Considers the effects of these policies on our individual constitutional rights and the criminal justice system.

**POL SCI 172A. International Law. 4 Units.**

Examination of the origin, changing structure, application of international law, and the role of legal norms in regulating the behavior of states and maintaining international order.

Prerequisite: POL SCI 71A

Same as INTL ST 145A.

**(VIII)**

**POL SCI 174A. Civil Liberties. 4 Units.**

Political analysis of selected Supreme Court cases involving claims under the Bill of Rights and the Fourteenth Amendment. Topics include: race, sex, and other forms of discrimination; criminal justice; privacy; freedom of speech and related claims.

Prerequisite: POL SCI 71A

Overlaps with CRM/LAW C122.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 174C. U.S. Supreme Court. 4 Units.**

Overview and analysis of the role played by the U.S. Supreme Court in the American political system. Judicial review, appointment of justices, judicial activism and judicial restraint, process of case selection, court deliberation, and decision-making, impact of Supreme Court decisions.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 174CW. U.S. Supreme Court. 4 Units.**

Overview and analysis of the role played by the U.S. Supreme Court in the American political system. Judicial review, appointment of justices, judicial activism and judicial restraint, process of case selection, court deliberation, and decision-making, impact of Supreme Court decisions.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Political Science Majors have first consideration for enrollment.

**(Ib)**

**POL SCI 175. The Bill of Rights in Film. 4 Units.**

Focuses on ways American cinema has portrayed, represented, and analyzed U.S. Bills of Rights. Juxtaposes cinematic presentations on specific Bill of Rights clauses, treating films as cultural texts, with pertinent judicial decisions and more scholarly appraisals of those same provisions.

**POL SCI 179. Special Topics in Public Law. 4 Units.**

Studies in selected areas of public law. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI H180D. Honors Seminar in Political Science. 2-4 Units.**

Course for students enrolled in the Honors Program in Political Science.

Prerequisite: Only open to students in the Political Science Honors Program.

Repeatability: May be repeated for credit unlimited times.

**POL SCI H182A. Honors Thesis Workshop. 4 Units.**

A weekly seminar/workshop to facilitate the exchange of ideas and research strategies among students and to review their progress in writing the thesis.

Restriction: Open only to students in the Political Science Senior Thesis program.

**POL SCI 190W. Senior Thesis. 4 Units.**

Thesis research with Political Science faculty.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 3 times.

**(Ib)****POL SCI 197. Field Study. 1-4 Units.**

Field study with Political Science faculty.

Repeatability: Unlimited as topics vary.

**POL SCI 198. Directed Group Study. 1-4 Units.**

Directed group study with Political Science faculty.

Repeatability: Unlimited as topics vary.

**POL SCI 199. Independent Study. 1-4 Units.**

Independent study or research with a Political Science faculty member.

Repeatability: May be repeated for credit unlimited times.

**POL SCI 209A. Study of Democracy Colloquium. 1.33 Unit.**

Skills critical to professional success. Students learn and practice professional presentation skills, develop substantive knowledge in the field by attending talks and panels, and interact with scholars and professionals in the field.

Restriction: Graduate students only. POL SCI 209A may not be taken for credit if taken after SOCIOL 229.

**POL SCI 209B. Study of Democracy Colloquium. 1.33 Unit.**

This colloquium teaches students skills critical to professional success. Students learn and practice professional presentation skills and develop substantive knowledge in the field by attending talks and panels and interacting with scholars and professionals in the field.

Restriction: Graduate students only. POL SCI 209B may not be taken for credit if taken after SOCIOL 229 Democracy.

**POL SCI 209C. Study of Democracy Colloquium . 1.34 Unit.**

This colloquium teaches students skills critical to professional success. Students learn and practice professional presentation skills and develop substantive knowledge in the field by attending talks and panels and interacting with scholars and professionals in the field.

Restriction: Graduate students only. POL SCI 209C may not be taken for credit if taken after SOCIOL 229 Democracy.

**POL SCI 210A. Colloquium. 1.3 Unit.**

Doctoral training requires more than learning substantive debates and research methods; it also requires students learn professional practices, routines, and expectations. This year-long workshop offers students a mix of professional development, outside speakers, and casual conversations with departmental faculty.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**POL SCI 210B. Colloquium. 1.3 Unit.**

Doctoral training requires more than learning substantive debates and research methods; it also requires students learn professional practices, routines, and expectations. This year-long workshop offers students a mix of professional development, outside speakers, and casual conversations with departmental faculty.

Prerequisite: POL SCI 210A

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**POL SCI 210C. Colloquium. 1.4 Unit.**

Doctoral training requires more than learning substantive debates and research methods; it also requires students learn professional practices, routines, and expectations. This year-long workshop offers students a mix of professional development, outside speakers, and casual conversations with departmental faculty.

Prerequisite: POL SCI 210B

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**POL SCI 212A. Public Opinion. 4 Units.**

Introduction to the study of U.S. public opinion. Provides an overview of the theories regarding opinion formation, the methodologies employed, and the role of public opinion in democratic governments.

Restriction: Graduate students only.

**POL SCI 212B. Ethics Workshop. 4 Units.**

Students find an important question in ethics, search literature to assess topic's importance, pose question to be researched, propose method of analysis and type of data, analyze data, and note how their works contribute to knowledge in the field.

**POL SCI 219. Special Topics in Politics and Society. 4 Units.**

Current research in politics and society.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**POL SCI 221A. Public Policy. 4 Units.**

Explores different approaches to public policy analysis, the diverse conceptions of the goals and objectives that should be served by policy, and the appropriate role of the policy analyst. Policy consequences are traced to indirect and subtle incentives and disincentives.

Same as CRM/LAW C255, UPPP 221.

Restriction: Graduate students only.

**POL SCI 223A. Theories of Power and Empowerment. 4 Units.**

Studies different ways of thinking about power and its uses. Explores theories of power that inform various notions of empowerment, including resistance, participatory democracy, and workplace empowerment.

Same as MGMTPHD 297R, UPPP 279.

Restriction: Graduate students only.

**POL SCI 229. Special Topics in American Politics. 4 Units.**

Current research in American Politics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**POL SCI 231A. Political Epistemology. 4 Units.**

Focuses on fundamental issues of knowledge in the study of politics, especially interconnections and tensions between politics and knowledge. Counts as the Field Seminar in Political Theory.

Restriction: Graduate students only.

**POL SCI 231B. Theories of Textual Interpretation. 4 Units.**

Examination of different theories of textual interpretation, including Straussian, hermeneutical, poststructuralist, feminist, postcolonial, and critical race theories. Key questions include: How does one go about the task of interpreting texts? What makes one interpretation better or more insightful than another.

Restriction: Graduate students only.

**POL SCI 232A. Introduction to Voting Theory. 4 Units.**

Introduction to voting modules. Substantive topics include majority rule, voting methods and their properties, apportionment and proportional representation, agenda manipulation, coalition formation, voting power, political consequences of electoral laws.

Restriction: Graduate students only.

**POL SCI 238D. The Moral Life During War. 4 Units.**

Can people keep their humanity during war? What does the term humanity signify when simply surviving requires faith, courage, and desperation? When facing wartime brutality must we abrogate morality? What does it mean to compose a moral life during war?.

Restriction: Graduate students only. Political Science Majors have first consideration for enrollment.

Concurrent with POL SCI 138DW.

**POL SCI 239. Special Topics in Political Theory. 4 Units.**

Current research in political theory. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**POL SCI 241B. Seminar in International Relations Theory. 4 Units.**

Overview of the major theories guiding research and scholarship in international relations. Focus on major conceptual approaches (realism, neoliberalism, marxism) and levels of analysis (systemic, state, and subnational), as well as on methodological/epistemological debates engulfing the field.

Restriction: Graduate students only.

**POL SCI 241E. Research Design in International Relations. 4 Units.**

Surveys research design primarily through substantive readings in international relations. The purpose is to familiarize students with choices/dilemmas relevant to IR-specific research. Students at various stages in the graduate program and with different methodological orientations are welcome.

**POL SCI 249. Special Topics in International Relations. 4 Units.**

Current research in international relations. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**POL SCI 252G. Theories and Practice of Migration and Citizenship. 4 Units.**

Examines theories of migration and citizenship. In examining these themes, the course includes discussion of theory development, multi-method testing, and case study comparison with a focus on Western Europe and other advanced democratic receiving states.

**POL SCI 254A. Introduction to Game Theory. 4 Units.**

Introduction to non-cooperative games. The prisoner's dilemma, Nash equilibrium, sequential games, subgame perfection. Applications include collective action, agenda-setter models, spatial competition of political parties, models of revolution and arms race.

Restriction: Graduate students only.

**POL SCI 259. Special Topics in Comparative Politics. 4 Units.**

Current research in comparative politics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.



**POL SCI 260B. Political Participation. 4 Units.**

Examines theoretical approaches to the explanation of the pattern of participation and consideration of the results of empirical studies of such activity by mass publics (mainly in Europe and North America). Addresses issues in both comparative politics and political behavior.

Restriction: Graduate students only.

**POL SCI 273A. Advanced Qualitative Methods: Analyzing Qualitative Data. 4 Units.**

Introduction to the theory and practice of analyzing qualitative data. Students must have already learned about data collection and research design for qualitative research and must have qualitative data they can analyze.

Same as MGMTPHD 297K, UPPP 213.

Restriction: Graduate students only.

**POL SCI 276. Predictive Models in Social Sciences. 4 Units.**

Basic numeracy (logarithms, fixed-exponent and exponential formats, graphing). Models based on ignorance and logical constraints. Logical quantitative models (how things should be) to complement and guide statistical analysis (how things are).

**POL SCI 285A. Introduction to Political Psychology I. 4 Units.**

Reviews theoretical questions regarding the relationship between the analytical and normative and the polity. Considers relationships between the analytical and normative concerns of psychology and political science, addressing empirical literatures on political socialization, ideology and public opinion, identity and nationality.

**POL SCI 290. Dissertation Research. 1-12 Units.**

Dissertation research with Political Science faculty.

Repeatability: Unlimited as topics vary.

**POL SCI 299. Independent Study. 1-12 Units.**

Independent research with Political Science faculty.

Repeatability: Unlimited as topics vary.

## Psychology Courses

**PSYCH 7A. Introduction to Psychology. 4 Units.**

Introduction to field of psychology, addressing the application of scientific methods to the study of human development, learning, memory, problem solving, perception, biological mechanisms, emotions and motivation, personality, psychopathology, and effects of diverse social and cultural contexts on human behavior.

Same as PSCI 9.

Overlaps with PSYCH 9A, PSYCH 9B, PSYCH 9C, PSCI 11A, PSCI 11B.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment. PSCI 9 and PSYCH 7A may not be taken for credit if taken concurrently with or after PSCI 11A, PSCI 11B, PSCI 11C, PSYCH 9A, PSYCH 9B, or PSYCH 9C.

(III)

**PSYCH 9A. Psychology Fundamentals. 4 Units.**

Designed to provide freshman with an in-depth survey of general psychology. Topics include biological bases of behavior, sensation, perception, cognition, development, personality, psychopathology, and social psychology.

Same as PSCI 11A.

Restriction: Lower-division students only. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. PSCI 9 and PSYCH 7A may not be taken for credit if taken after PSCI 11A, PSCI 11B, PSCI 11C, PSYCH 9A, PSYCH 9B, or PSYCH 9C.

(III)

**PSYCH 9B. Psychology Fundamentals. 4 Units.**

Designed to provide freshmen with an in-depth survey of general psychology. Topics include biological bases of behavior, sensation, perception, cognition, development, personality, psychopathology, and social psychology.

Same as PSCI 11B.

Restriction: Lower-division students only. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

(III)

**PSYCH 9C. Psychology Fundamentals. 4 Units.**

Designed to provide freshman with an in-depth survey of general psychology. Topics include biological bases of behavior, sensation, perception, cognition, development, personality, psychopathology, and social psychology.

Same as PSCI 11C.

Restriction: Lower-division students only. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

(III)

**PSYCH 10A. Probability and Statistics in Psychology I. 4 Units.**

An introduction to probability and statistics. Emphasis on thorough understanding of the probabilistic basis of statistical inference. Examples drawn primarily from psychology.

Restriction: Psychology Majors have first consideration for enrollment.

(Va)

**PSYCH 10B. Probability and Statistics in Psychology II. 4 Units.**

An introduction to probability and statistics. Emphasis on thorough understanding of the probabilistic basis of statistical inference. Examples drawn primarily from psychology.

Prerequisite: PSYCH 10A

Restriction: Psychology Majors have first consideration for enrollment.

(Va)

**PSYCH 10C. Probability and Statistics in Psychology III. 4 Units.**

An introduction to probability and statistics. Emphasis on thorough understanding of the probabilistic basis of statistical inference. Examples drawn primarily from psychology.

Prerequisite: PSYCH 10B

Restriction: Psychology Majors have first consideration for enrollment.

(Vb)

**PSYCH 21A. Adolescent Psychology. 4 Units.**

Focuses on psychosocial dynamics of today's adolescents in America emphasizing the quest for identity, independence, values, and sexual orientation. The influence of society, family, school, and peers is analyzed. Strategies for helping troubled adolescents are discussed.

Overlaps with PSCI 112D.

(III)

**PSYCH 46A. Introduction to Human Memory. 4 Units.**

Covers the core concepts of modern research and theorizing about human memory, including structural subdivisions (e.g., perceptual memory, short-term memory, long-term memory), different measures of memory (e.g., recall, reorganization), and some practical applications of memory research (e.g., mnemonics).

(III)

**PSYCH 56L. Acquisition of Language. 4 Units.**

What children say, what they mean, and what they understand. Theories about the learning of language by one-, two-, and three-year-olds. Comparison of kinds of data on which these theories are based.

Same as LSCI 51.

(III)

**PSYCH 78A. Self-Identity and Society. 4 Units.**

Studies sociological contributions to theory and research in social psychology, with focus on the social influences on personality, attitudes, beliefs, and behavior; socialization, human groups, and social interaction.

Same as SOCIOL 31.

(III)

**PSYCH 89. Special Topics in Lower-Division Psychology. 4 Units.**

Studies in selected areas of psychology at the lower-division level. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**PSYCH H101A. Honors Seminar in Psychology I. 4 Units.**

Focuses on the research activities and honors thesis research projects of each student and the research of various Cognitive Sciences faculty. Students discuss their research interests in the early and later stages of their projects. Research projects and write-ups required.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

Restriction: Psychology Majors only. Cognitive Sciences Majors only. Social Science Honors students only.

**PSYCH H101B. Honors Seminar in Psychology II. 4 Units.**

Focuses on the research activities and honors thesis research projects of each student and the research of various Cognitive Sciences faculty. Students discuss their research interests in the early and later stages of their projects. Research projects and write-ups required.

Prerequisite: PSYCH H101A

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

Restriction: Psychology Majors only. Cognitive Sciences Majors only. Social Science Honors students only.

**PSYCH H101C. Honors Seminar in Psychology III. 4 Units.**

Focuses on the research activities and honors thesis research projects of each student and the research of various Cognitive Sciences faculty. Students discuss their research interests in the early and later stages of their projects. Research projects and write-ups required.

Prerequisite: PSYCH H101B

Repeatability: May be taken for credit 2 times.

Restriction: Psychology Majors only. Cognitive Sciences Majors only. Social Science Honors students only.

**PSYCH 111BW. Honors Advanced Experimental Psychology. 4 Units.**

Design and analysis of multivalent, factorial, and correlational studies. Students prepare proposals for independent research.

Corequisite: PSYCH H111B

Prerequisite: PSYCH H111A and (PSYC H11A or PSYCH 112A). Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Psychology Majors only. Social Science Honors students only.

**(Ib)**

**PSYCH H111A. Honors Experimental Psychology. 4 Units.**

Emphasis on design of experiments and analysis of results. Experiments are conducted in laboratory sections.

Prerequisite: ((PSYCH 9A and PSYCH 9B and PSYCH 9C) or (PSY BEH 11A and PSY BEH 11B and PSY BEH 11C)) and ((PSYCH 10A and 10B and 10C) or (MATH 2A and MATH 2B and (MATH 7 or STATS 7))).

Overlaps with PSYCH 112A.

Restriction: Psychology and Cognitive Sciences Honors Program students only.

**PSYCH H111B. Honors Advanced Experimental Psychology Laboratory. 2 Units.**

Design and analysis of multivalent, factorial, and correlational studies. Students prepare proposals for independent research.

Corequisite: PSYCH 111BW

**PSYCH H111C. Honors Research in Experimental Psychology. 4 Units.**

Each student conducts a research project in experimental psychology. The projects are discussed in a seminar format. Written reports on each project are submitted at the end of the quarter.

Prerequisite: PSYCH 111BW or PSYCH 112B

Restriction: Psychology Majors only. Social Science Honors students only.

**PSYCH 112A. Experimental Psychology. 4 Units.**

Emphasis on design of experiments and analysis of results. Experiments are conducted in laboratory sections.

Corequisite: PSYCH 112LA

Prerequisite: ((PSYCH 9A and PSYCH 9B and PSYCH 9C) or (PSY BEH 11A and PSY BEH 11B and PSY BEH 11C)) and ((PSYCH 10A and PSYCH 10B and PSYCH 10C) or (MATH 2A and MATH 2B and (MATH 7 or STATS 7)))

Overlaps with PSYCH H111A, PSYCH 112F, PSYCH 112G.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 112BW. Advanced Experimental Psychology. 4 Units.**

Design and analysis of multivalent, factorial, and correlational studies. Students prepare proposals for independent research.

Prerequisite: PSYCH 112A and PSYCH 112LA. Satisfactory completion of the Lower-Division Writing requirement.

Overlaps with PSYCH 112F, PSYCH 112FW, PSYCH 112G, PSYCH 112GW.

Restriction: Psychology Majors have first consideration for enrollment.

**(Ib)**

**PSYCH 112C. Research in Experimental Psychology. 4 Units.**

Each student conducts a research project in experimental psychology. The projects are discussed in a seminar format. Written reports on each project are submitted at the end of the quarter.

Corequisite: PSYCH 112LC

Prerequisite: PSYCH 112B and PSYCH 112LB

Overlaps with PSYCH 112F, PSYCH 112FW, PSYCH 112G, PSYCH 112GW.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 112D. Effective Graphical Presentation of Data. 4 Units.**

Learn to use MATLAB to produce graphical displays of data based on psychological principles for effective design. Approach is problem-oriented, with emphasis on case-studies using data from psychological experiments and real-world corpora. Assessment via independent individual projects.

Corequisite: PSYCH 112LD

Prerequisite: (PSYCH 9A and PSYCH 9B and PSYCH 9C) or (PSY BEH 11A and PSY BEH 11B and PSY BEH 11C) and (PSYCH 10C or SOC SCI 10C or ANTHRO 10C or POL SCI 10C or SOCIOL 10C) or (MATH 2B and STATS 7)

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 112LA. Experimental Psychology Laboratory. 2 Units.**

Required laboratory section and co-requisite for Psych 112A.

Corequisite: PSYCH 112A

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 112LB. Advanced Experimental Psychology Laboratory. 2 Units.**

Required laboratory section for PSYCH 112B and PSYCH 112BW.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 112LC. Research in Experimental Psychology.**

Required laboratory section and co-requisite for PSYCH 112C.

Corequisite: PSYCH 112C

**PSYCH 112LD. Effective Graphical Presentation of Data Lab . 2 Units.**

Lab to learn to use MATLAB to produce graphical displays of data based on psychological principles for effective design. Approach is problem-oriented, with emphasis on case-studies using data from psychological experiments and real-world corpora. Assessment via independent individual projects.

Corequisite: PSYCH 112D

Restriction: Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment.

**PSYCH 112LM. Research Methods in Psychology Laboratory. 2 Units.**

Required laboratory section and co-requisite for PSYCH 112M.

Corequisite: PSYCH 112M

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 112LR. Cognitive Robotics Laboratory. 2 Units.**

Required laboratory section and corequisite for PSYCH 112R.

Corequisite: PSYCH 112R

Restriction: Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment.

**PSYCH 112M. Research Methods in Psychology. 4 Units.**

Research methods in psychology for majors who wish to fulfill this requirement separately from upper-division writing. Covers both experimental and descriptive research methods, analysis of results, and reading the psychological literature. Research experience is provided in laboratory sections.

Corequisite: PSYCH 112LM

Prerequisite: (PSYCH 9A and PSYCH 9B and PSYCH 9C) or (PSY BEH 11A and PSY BEH 11B and PSY BEH 11C) and (PSYCH 10C or SOC SCI 10C or ANTHRO 10C or POL SCI 10C or SOCIOL 10C) or (MATH 2B and STATS 7)

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 112R. Cognitive Robotics. 4 Units.**

Introduces concepts on experimental design, embodiment, robot construction, and computer programming. Concepts of embodied intelligence and case studies of cognitive robotics are covered in lecture. Simple robots are constructed and programmed to carry out different behavioral experiments in lab.

Corequisite: PSYCH 112LR

Prerequisite: (PSYCH 9A and PSYCH 9B and PSYCH 9C) or (PSY BEH 11A and PSY BEH 11B and PSY BEH 11C) and (PSYCH 10C or SOC SCI 10C or ANTHRO 10C or POL SCI 10C or SOCIOL 10C) or (MATH 2B and STATS 7)

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 114M. MATLAB Programming. 4 Units.**

MATLAB is a mathematical software package for solving quantitative problems often encountered in experimental psychology. Topics include rudiments of programming, statistical analysis of data, matrix algebra, signal processing, graphic visualization, and simulated models of cognitive and perceptual processes.

Restriction: Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment.

**PSYCH 119. Special Topics in Research Methodologies. 1-4 Units.**

Studies in selected areas of research methodologies. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 120A. Abnormal Psychology. 4 Units.**

Introduction to psychopathology and behavioral deviations, and the concepts of theories regarding these conditions.

Prerequisite: PSYCH 7A or PSCI 9 or PSYCH 9C or PSCI 11C

Overlaps with PSCI 102C.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 120D. Developmental Psychology. 4 Units.**

A general introduction to the study of the physical, intellectual, social, and emotional development of the child from birth to adulthood.

Prerequisite: PSYCH 7A or PSCI 9 or PSYCH 9A or PSCI 11A

Overlaps with PSCI 111D.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Nursing Science Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 120H. History of Psychology. 4 Units.**

A history of the development of various schools and systems of psychological thought.

Prerequisite: (PSYCH 7A or PSCI 9) or (PSYCH 9A or PSCI 11A) and (PSYCH 9B or PSCI 11B) and (PSYCH 9C or PSCI 11C)

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 120P. Personality Theories. 4 Units.**

A survey of the evolution of personality theory during this century. An overview of major perspectives in the field, with special attention to Freud, Jung, and Adler.

Prerequisite: PSYCH 7A or PSCI 9 or PSYCH 9C or PSCI 11C

Overlaps with PSCI 170S.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 121M. Theories of Motivation. 4 Units.**

Factors affecting the behavioral performance of organisms. A survey of theoretical and empirical approaches to the physiological, psychological, and social factors which generate behavior.

Prerequisite: (PSYCH 7A or PSCI 9) or (PSYCH 9A or PSCI 11A) and (PSYCH 9B or PSCI 11B) and (PSYCH 9C or PSCI 11C)

Overlaps with PSCI 176S.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 121P. Positive Psychology. 4 Units.**

Positive psychology, at the subjective level, is about valued subjective experiences; at the individual level, it is about positive individual traits; and at the group level, it is about the civic virtues and institutions that move individuals toward better citizenship.

Prerequisite: (PSYCH 9A or PSCI 11A) and (PSYCH 9B or PSCI 11B) and (PSYCH 9C or PSCI 11C)

Overlaps with PSY BEH 184S.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 121S. Psychology of Sleep and Consciousness. 4 Units.**

Covers the physiology, neurochemistry, and neuroanatomy associated with sleep, contemporary sleep theory, REM and NREM, phenomenology, sleep disorders, examination of differences between conscious and unconscious cognitive function, the history of sleep and dream theories from ancient time to present day.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 122C. Clinical Psychology. 4 Units.**

Provides overview of the clinical psychology field including theories and techniques used in counseling and testing.

Overlaps with PSY BEH 150C.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 122I. Organizational/Industrial Psychology. 4 Units.**

Introduction to applied psychology in organizations, including personnel testing, selection, training and evaluation, job and classification analysis, job satisfaction and motivation, organizational development, leadership, market research, and consumer psychology. Potential ethical problems are discussed.

Prerequisite: (PSYCH 7A or PSY BEH 9) or (PSYCH 9A or PSY BEH 11A) or (PSYCH 9B or PSY BEH 11B) or (PSYCH 9C or PSY BEH 11C)

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 122P. Clinical Psychophysiology. 4 Units.**

Psychophysiology investigates the relationships between physiological processes and psychological phenomena. Technologies examined include reaction times, heart rate variability, EEGs, ERPs, magnetoencephalography, and eye tracking. Applications include diagnosis, the longitudinal assessment, and the identification of individuals at risk of disease onset.

Prerequisite: BIO SCI N110 or BIO SCI N115A or PSYCH 9A or PSCI 11A

Same as BIO SCI N118.

**(II ).**

**PSYCH 123P. Topics in Philosophy of Psychology. 4 Units.**

Selected topics in the philosophy of psychology, e.g., the nature of psychological explanation, reductionism, issues in cognitive, behavioral, and neuroscience.

Repeatability: Unlimited as topics vary.

Same as LPS 143, PHILOS 143.

Restriction: Psychology Majors have first consideration for enrollment. Philosophy Majors have first consideration for enrollment.

**PSYCH 124S. Sports Psychology. 4 Units.**

Discusses the field of sports psychology with an emphasis on clinical practice including motivation, goal setting, performance skills, and mental skills. Discusses and utilizes a wide range of techniques designed to enhance performance and manage problems among athletes.

Prerequisite: (PSYCH 7A or PSY BEH 9) or (PSYCH 9C or PSY BEH 11C)

Overlaps with PSY BEH 139H.

Restriction: Psychology Majors have first consideration for enrollment.



**PSYCH 124V. Psychology of Violence. 4 Units.**

Discusses the psychology of violence and aggression with an emphasis on understanding the psychological, social, and physiological roots of violent and aggressive behavior. Psychological treatment techniques and strategies for prevention of aggressive and violent behavior are also discussed.

Prerequisite: (PSYCH 7A or PSY BEH 9) or (PSYCH 9C or PSY BEH 11C)

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 129. Special Topics in General Psychology. 4 Units.**

Studies in selected areas of general psychology. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 130A. Perception and Sensory Processes. 4 Units.**

A general introduction to the scientific study of sensory processes and perceptual phenomena, with special emphasis in the visual systems.

Prerequisite: (PSYCH 7A or PSY BEH 9) or (PSYCH 9A or PSY BEH 11A)

Overlaps with PSYCH 131A, PSYCH 131B.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 131A. Vision. 4 Units.**

Visual perception and the anatomy and physiology of the visual system. Topics include the retina and the visual pathway; visual sensitivity; color vision; spatial vision; motion perception; and the development of the visual system.

Same as BIO SCI N182.

Overlaps with PSYCH 130A.

Restriction: Upper-division students only. Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment.

**PSYCH 131B. Hearing. 4 Units.**

Auditory perception, the anatomy and physiology of the auditory system, and the physics of sound. Topics include neural transduction of sound, sensitivity, sound localization, complex sound perception, and hearing loss.

Prerequisite: (PSYCH 9A or PSY BEH 11A) and (PSYCH 9B or PSY BEH 11B)

Overlaps with PSYCH 130A.

Restriction: Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment.

**PSYCH 135M. The Mind/Body Problem. 4 Units.**

What is consciousness and what is matter and how are the two related? How can brains have minds? This multidisciplinary course draws on information from the fields of computer vision, artificial intelligence, cognition, neurophysiology, philosophy, and psychophysics.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 139. Special Topics in Perception and Sensory Processes. 4 Units.**

Studies in selected areas of perception and sensory processes. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 140C. Cognitive Science. 4 Units.**

Introduction to the investigations of the structure and function of the mind, from viewpoints of computation, neuroscience, philosophy, and cognitive psychology. Topics include perception, attention, knowledge representations, learning and memory, action, reasoning, and language.

Prerequisite: (PSYCH 7A or PSY BEH 9) and (PSYCH 9A or PSY BEH 11A) and (PSYCH 9B or PSY BEH 11B)

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 140L. Principles of Learning Theory. 4 Units.**

Investigation of the learning and memory processes of human and animals. Basic experimental approaches to learning and memory, empirical results, and theoretical interpretations of the evidence are discussed.

Prerequisite: (PSYCH 7A or PSY BEH 9) or (PSYCH 9A or PSY BEH 11A)

Restriction: Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment.

**PSYCH 140M. Human Memory. 4 Units.**

Developments in the area of memory; history of memory research; theories of the nature of memory. Visual memory, recognition memory, high-speed scanning, free recall, short-term memory, mnemonics, retrieval, relationship of memory to thinking. Selected theoretical formulations for memory.

Prerequisite: (PSYCH 7A or PSY BEH 9) or (PSYCH 9B or PSY BEH 11B)

Restriction: Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment.

**PSYCH 143P. Human Problem Solving. 4 Units.**

Modern developments in the psychology of human problem solving. Topics include concept identification, arithmetic, sets, logic puzzles, story problems, group problem solving, and theorem proving.

Prerequisite: (PSYCH 7A or PSY BEH 9) or (PSYCH 9B or PSY BEH 11B)

Restriction: Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment.

**PSYCH 146MW. Writing about Memory. 4 Units.**

Covers a broad range of texts, literary, philosophical, and scientific, each probing the nature of memory and its meaning in human life. Readings are drawn from across many disciplines and many perspectives.

Prerequisite: PSYCH 7A or PSYCH 9B or PSY BEH 9 or PSY BEH 11B. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Psychology Majors have first consideration for enrollment.

**(Ib)****PSYCH 149. Special Topics in Cognition and Learning. 4 Units.**

Studies in selected areas of cognition and learning. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 150. Psychology of Language. 4 Units.**

Examines language using the tools of experimental psychology. From sounds to words to spoken and written sentences, explores how language is used in real time, and how its use reveals how it is represented in the mind.

Prerequisite: PSYCH 7A or PSCI 9 or PSYCH 9B or PSCI 11B or LSCI 3

Same as LSCI 155.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Language Science Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 156A. Acquisition of Language II. 4 Units.**

Focuses on native language learning, exploring the way in which infants and very young children unconsciously uncover the rich systematic knowledge of their native language. Examines both experimental and computational studies that quantitatively investigate the 'how' of language acquisition.

Prerequisite: PSYCH 56L or LINGUIS 51

Same as LINGUIS 150.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 157M. Computational Methods for Language Research. 4 Units.**

Focuses on computational methods useful for language research. Students become familiar with software and programming languages used for extracting information from electronic datasets and for creating basic simulations of linguistic cognition. No prior programming experience assumed.

Prerequisite: PSYCH 150 or LSCI 155 or PSYCH 156A or LSCI 151

Same as PSYCH 157M.

**PSYCH 159. Special Topics in Language. 4 Units.**

Studies in selected areas of language sciences. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 160A. Introduction to Cognitive Neuroscience. 4 Units.**

Introduction to the neural basis of human perceptual, motor, and cognitive abilities. Topics include sensory perception, motor control, memory, language, attention, emotion, frontal lobe function, functional brain imaging, and neuropsychological disorders.

Prerequisite: (PSYCH 7A or PSY BEH 9) and (PSYCH 9A or PSY BEH 11A) and (PSYCH 9B or PSY BEH 11B)

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 160D. Brain Disorders and Behavior. 4 Units.**

Examines the localization of human brain functions and the effects of neurological disorders on psychological functions such as perception, motor control, language, memory, and decision-making.

Prerequisite: (PSYCH 7A or PSY BEH 9) and (PSYCH 9A or PSY BEH 11A) and (PSYCH 9B or PSY BEH 11B) or BIO SCI 35 or BIO SCI N110

Same as BIO SCI N165.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Biological Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 160H. History of Cognitive Neuroscience. 4 Units.**

Studies of the human mind from ancient cultures to the innovation of modern methods of brain imaging. Logic of valid and invalid brain hypothesis are examined. Recurring theme is the competition between holistic and localized views of brain function.

Prerequisite: PSYCH 9A or PSY BEH 11A or PSYCH 7A or PSY BEH 9

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 161. Language and the Brain . 4 Units.**

Research analysis on biological bases of human linguistic capacity. Development, focusing on hemispheric specialization, plasticity; localization of specific linguistic functions in adults, with emphasis on study of aphasias; relation of linguistic capacity to general cognitive capacity, considering research on retardation.

Prerequisite: (PSYCH 7A or PSY BEH 9 or PSYCH 9A or PSY BEH 11A) and (PSYCH 9B or PSY BEH 11B or BIO SCI 35 or BIO SCI N110 or BIO SCI N115A)

Same as BIO SCI N160, LSCI 158.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Biological Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 161H. Hearing and the Brain. 4 Units.**

An overview of brain mechanisms of hearing, including perception of simple sounds, speech, and music. Begins with sound itself, and looks at processing by the ear, auditory pathways, auditory cortex, and beyond. Also auditory development, learning, and clinical issues.

Prerequisite: PSYCH 160A or BIO SCI 93 or BIO SCI H93

Same as BIO SCI N147.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Biological Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 162N. Human Neuropsychology. 4 Units.**

A survey of human brain disorders using a clinical case study approach to illustrate fundamental issues in studying brain and behavior. Topics include sensory deficits, attentional neglect, amnesia, cortical organization, clinical psychopathology, and more.

Prerequisite: BIO SCI N110 or BIO SCI N115A or PSYCH 9A or PSCI 11A

Same as BIO SCI N173, PSCI 163C.

Restriction: School of Biological Sciences students have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 169. Special Topics in Cognitive Neuroscience . 4 Units.**

Studies in selected areas of cognitive neuroscience. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 173A. Psychological Anthropology. 4 Units.**

Cultural differences and similarities in personality and behavior. Child-rearing practices and consequent adult personality characteristics, biocultural aspects of child development and attachment, culture and behavior evolutionary models, politically linked personality, cognitive anthropology, psychology of narrative forms, comparative national character studies.

Prerequisite: ANTHRO 2A or PSYCH 7A or (PSYCH 9A and PSYCH 9B and PSYCH 9C) or (PSY BEH 11A and PSY BEH 11B and PSY BEH 11C)

Same as ANTHRO 132A.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 174E. African American Psychology. 4 Units.**

Historical overview of the development of black psychology and the African American frame of reference. Topics include personality development, psychological assessment, issues in education, black mental health, and the role of the African American psychologist in the community.

Same as AFAM 153.

**PSYCH 174H. Chicano/Latino Families. 4 Units.**

Introduction to the research, literature, and issues surrounding the topic of Chicano/Latino families including cultural history, contemporary issues, organization of family, traditions, lifestyles, values, beliefs, generational differences, gender issues, ethnic identity, evolution of demographic patterns, current economic and political standings.

Same as CHC/LAT 170, PSCI 166S, SOC SCI 165.

**PSYCH 176A. Political Psychology. 4 Units.**

Examination of how psychological theory and research may be used to better understand political thought and behavior. Drawing on theories of learning, cognition, and personality, discusses such topics as the formation of political attitudes, and the process of political decision-making.

Same as POL SCI 128C.

Restriction: Majors only. POL SCI 128C may not be taken for credit if taken after POL SCI 137C.

**PSYCH 177D. Deviance. 4 Units.**

Perspectives on deviance and criminality in behavior, institution, community, and myth. The suitability of contemporary theories of deviant behavior.

Same as SOCIOL 156, CRM/LAW C107.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 177F. Forensic Psychology: Advanced Seminar. 4 Units.**

Focuses on the psychology of criminal offending, particularly violent behavior. Examines violence, sexual offending, and mental disorder related to crime with regard to clinical assessment and treatment; mental health services within forensic institutions.

Prerequisite: (PSCI 9 or PSCI 11C or PSYCH 7A or PSYCH 9C) and PSCI 102C and (PSCI 178S or CRM/LAW C149)

Same as CRM/LAW C136, PSCI 156C.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSYCH 178N. Social Psychology of Networks. 4 Units.**

Review of network methods used in small group and organizational research. Discussion of social psychological literature relevant to the network of study of cognitive social structure, exchange/communication, identity negotiation, and social control. Case study of network datasets exemplifies research issues.

Same as SOCIOL 135.

Restriction: Sociology Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 179. Special Topics in Interdisciplinary Studies. 1-4 Units.**

Studies in selected areas of interdisciplinary studies. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 198. Directed Group Study. 1-4 Units.**

Directed study with Cognitive Sciences faculty.

Repeatability: May be repeated for credit unlimited times.

**PSYCH 199. Independent Study. 1-4 Units.**

Independent research with Cognitive Sciences faculty.

**PSYCH 201A. Cognitive Sciences Research Seminar. 1.3 Unit.**

Weekly reports and colloquia by faculty, students, and visitors.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Psychology Majors only.

**PSYCH 201B. Cognitive Sciences Research Seminar. 1.3 Unit.**

Weekly reports and colloquia by faculty, students, and visitors.

Prerequisite: PSYCH 201A

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Psychology Majors only.

**PSYCH 201C. Cognitive Sciences Research Seminar. 1.4 Unit.**

Weekly reports and colloquia by faculty, students, and visitors.

Prerequisite: PSYCH 201B

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Psychology Majors only.

**PSYCH 202A. Proseminar in the Cognitive Sciences. 1 Unit.**

Introduction to the conceptual foundations and basic research results in the cognitive sciences for first-year graduate students.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**PSYCH 203A. Discrete Mathematics and Probability. 4 Units.**

Logic and set theory are covered during the first three weeks, using an interactive computer system. The remaining seven weeks are devoted to probability theory and cover elementary concepts from samples spaces to Chebychev's Inequality and the moment generating function.

Restriction: Graduate students only.

**PSYCH 203C. Algorithmic Statistics. 4 Units.**

Discussion of the fundamentals of statistical inference and computational implementations of common statistical models.

Restriction: Graduate students only.

**PSYCH 203D. Applied Mathematics for Cognitive Sciences Research. 4 Units.**

Covers the basics of linear systems analysis, focusing on linear algebra, Fourier analysis, differential equations, and elementary signal processing. Applications in Cognitive Science and Cognitive Neuroscience research will be developed.

Prerequisite: PSYCH 205A

Restriction: Graduate students only. Psychology Majors only.

**PSYCH 205A. Computational and Research Methods with MATLAB. 4 Units.**

Introduces rudiments of programming, statistical analysis and probability theory, graphic visualization, GUI design, spectral analysis, and simulation models using MATLAB, a software package for solving quantitative problems often encountered in experimental psychology.

Restriction: Graduate students only.

**PSYCH 205B. Running Experiments Using MATLAB. 4 Units.**

Provides an in-depth introduction to writing MATLAB programs to run auditory and visual experiments. Topics covered include program structure, stimulus generation, presentation, and data collection.

Prerequisite: PSYCH 205A

**PSYCH 205C. Computational Statistics. 4 Units.**

Introduction to a number of computational statistics approaches including exploratory data analysis and modeling using a probabilistic framework with Bayesian graphical models. Emphasis will be on in-class programming using MATLAB.

Restriction: Graduate students only.

**PSYCH 210A. Introduction to Cognitive and Brain Sciences I: Perception. 4 Units.**

Discusses models of cognition and evidence linking cognition and the brain. Focus is on visual, auditory, and somatic perception and bottom-up mechanisms of attention.

Restriction: Graduate students only.

**PSYCH 210B. Introduction to Cognitive and Brain Sciences II: Cognition. 4 Units.**

Discusses models of cognition and evidence linking cognition and the brain. Focus is on emotion, top-down attention, goal-directed behavior, categorization, judgment, and decision-making.

Restriction: Graduate students only.

**PSYCH 210C. Introduction to Cognitive and Brain Sciences III: Learning and Development. 4 Units.**

Discusses experimental data, formal models of learning, and evidence linking learning and development to its neural substrates. Topics include Pavlovian and instrumental conditioning, language acquisition, causal reasoning, perceptual learning, category formation, and structure learning.

Restriction: Graduate students only.

**PSYCH 213. The Mind/Body Problem. 4 Units.**

Course is multidisciplinary, drawing on information from the fields of quantum physics, computer vision, artificial intelligence, cognition, neurophysiology, philosophy, and psychophysics.

Restriction: Graduate students only.

**PSYCH 214. Bayesian Cognitive Modeling. 4 Units.**

Considers a range of statistical methods of data analysis and simple cognitive models using the Bayesian graphical modeling framework.

Restriction: Graduate students only.

**PSYCH 218. Hearing. 4 Units.**

Examines auditory sensation and perception using psychophysical and neuroscientific perspectives. Covers physical aspects of sound; subcortical auditory processing; aspects of sensation and perception such as sensitivity, sound localization, and complex-sound recognition; neuroscientific studies of cortical function; and abnormal auditory processing.

Restriction: Graduate students only.

**PSYCH 229. Special Topics in Human Cognition. 1.3-4 Units.**

Current research in brain/ behavior relationships, human memory, and learning theory is presented.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PSYCH 231P. Topics in Philosophy of Psychology. 4 Units.**

Selected topics in the philosophy of psychology, e.g., the nature of psychological explanation, reductionism, issues in cognitive, behavioral, and neuroscience.

Repeatability: Unlimited as topics vary.

Same as LPS 243, PHILOS 243.

**PSYCH 234A. Mathematical Models of Cognitive Processes I . 4 Units.**

Mathematical models of various cognitive processes developed since 1960, including learning, memory, perception, psycholinguistics, and problem solving. Models are formulated in different mathematical languages: calculus, algebra, logic, probability, and computer. Difficulties in testing and validating models discussed.

Restriction: Graduate students only.

**PSYCH 237. Advanced Bayesian Cognitive Modeling. 4 Units.**

Considers a range of advanced cognitive process models including models of signal detection, memory retention, category learning, stimulus representation, and reasoning using the Bayesian graphical modeling framework.

Prerequisite: PSYCH 214

Restriction: Graduate students only.

**PSYCH 239. Special Topics in Methodology and Models. 1.3-4 Units.**

Current research in cognitive sciences methodologies, concepts, and models is presented.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PSYCH 245A. Computational Models of Language Learning. 4 Units.**

Focuses on computational models of native language learning, exploring how probabilistic learning and inference fare on difficult case studies within language acquisition. In all cases, grounds the learning models in available empirical data and considers their psychological plausibility.

Prerequisite: PSYCH 215L

Restriction: Graduate students only.

**PSYCH 245M. Computational Models of Language Learning. 4 Units.**

Focuses on computational models of native language learning, exploring how probabilistic learning and inference fare on difficult case studies within language acquisition. In all cases, grounds the learning models in available empirical data and considers their psychological plausibility.

Prerequisite: LSCI 251. LSCI 251 with a grade of B- or better

Same as LSCI 206C.

Restriction: Graduate students only.

Concurrent with LSCI 106M.



**PSYCH 249. Special Topics in Language Science. 1.3-4 Units.**

Foundations and current research in theoretical, experimental, and computational linguistics.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PSYCH 259. Special Topics in Human Performance. 1.3-4 Units.**

Current research in the human issues involved with sensation, perception, and cognition.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PSYCH 261N. Cortical Neuroscience. 4 Units.**

Physiology of the cerebral cortex, theoretical neuroscience, and the neural basis of perception.

Prerequisite: PSYCH 216

**PSYCH 262. Functional Neuroanatomy. 4 Units.**

It is impossible to truly understand human behavior without some understanding of the physical structure that enables behavior. Examines recent findings in functional neuroanatomy through lectures and papers discussing links between particular behaviors and specific brain structures.

Restriction: Graduate students only.

**PSYCH 265. Introduction to Functional MRI. 4 Units.**

Describes the fundamentals of imaging the human brain function using functional Magnetic Resonance Imaging (fMRI). Topics include basic fMRI physics, experimental design, and data acquisition and analysis.

Restriction: Graduate students only.

**PSYCH 268A. Computational Neuroscience. 4 Units.**

Introduction to computational neuroscience. Mathematical models of single neurons, neural circuits, thalamocortical systems, and cortical mass action can stimulate single-unit, local field potential, and EEG dynamics. These models are used to investigate mechanisms of sensation, motor control, attention, and consciousness.

Prerequisite: PSYCH 205A and (PSYCH 210A or PSYCH 210B or PSYCH 210C)

**PSYCH 268R. Cognitive Robotics. 4 Units.**

Introduces concepts for studying cognitive function by embedding brain models on robotic platforms. Topics include robot construction, computer programming, and the notion of embodiment. Students construct simple robots and program these robots to perform different behaviors.

**PSYCH 269. Special Topics in Cognitive Neuroscience. 1.3-4 Units.**

Current research in cognitive neuroscience.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PSYCH 289. Special Topics in Sensation and Perception. 1.3-4 Units.**

Current research in the reception and processing of visual and auditory stimuli presented.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PSYCH 290. Dissertation Research. 1-12 Units.**

Dissertation research with Cognitive Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Psychology Majors only.

**PSYCH 299. Individual Study. 4-12 Units.**

Individual research with Cognitive Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**Social Sciences Courses****SOC SCI 1A. Principles in the Social Sciences. 4 Units.**

Introduction to various disciplines within the social sciences. Provides an interdisciplinary perspective on understanding human behavior and social institutions, including interpersonal, economic, and cultural activities.

(III)

**SOC SCI H1E. Honors: Critical Issues on the Social Sciences. 6 Units.**

Major themes, methods, and works in the social sciences from an interdisciplinary perspective. Each quarter focuses on a different topic. Weekly seminars emphasizing development of critical thinking skills and quantitative analysis through written work are integral to the course.

Same as SOCECOL H20A.

Restriction: Campuswide Honors Collegium students only.

(III)

**SOC SCI H1F. Honors: Critical Issues on the Social Sciences. 6 Units.**

Major themes, methods, and works in the social sciences from an interdisciplinary perspective. Each quarter focuses on a different topic. Weekly seminars emphasizing development of critical thinking skills and quantitative analysis through written work are integral to the course.

Prerequisite: SOC SCI H1E or SOCECOL H20A

Same as SOCECOL H20B.

Restriction: Campuswide Honors Collegium students only.

(III)

**SOC SCI H1G. Honors: Critical Issues on the Social Sciences. 6 Units.**

Major themes, methods, and works in the social sciences from an interdisciplinary perspective. Each quarter focuses on a different topic. Weekly seminars emphasizing development of critical thinking skills and quantitative analysis through written work are integral to the course.

Prerequisite: SOC SCI H1F or SOCECOL H20B

Same as SOCECOL H20C.

Restriction: Campuswide Honors Collegium students only.

(III)

**SOC SCI 2A. Introduction to Social Science Analysis. 4 Units.**

Introduction to social science research and analytical models. Theory construction and use of research methods in an interdisciplinary context. Discussion of the application of social science research to public policy. Computer laboratories develop creative thinking, graphing, and data presentation skills.

Restriction: School of Social Sciences students have first consideration for enrollment.

(III)

**SOC SCI 3A. Computer-Based Research in the Social Sciences. 4 Units.**

Focuses on the data manipulation, data visualization, and information searching techniques. Hands-on experience in hypothesis testing, mapping, graphics, and data arrays.

Restriction: School of Social Sciences students have first consideration for enrollment.

**SOC SCI 4A. Introduction to Global Studies. 4 Units.**

Ongoing historical processes that increase global integration, the social, economic, and political interdependence of different regions, cultures, and peoples. Topics include ancient empires, colonialism, nationalism, industrialization, modern imperialism and warfare, decolonization, global social movements, conflict, inequality, and global governance.

Same as INTL ST 1.

Restriction: International Studies Majors have first consideration for enrollment.

(III and VIII ).

**SOC SCI 5A. Introduction to Human Geography. 4 Units.**

Human behavior in a geographical context. Spatial patterns and organization of the cultural, social, and economic activities of man as imposed on and influenced by the earth's physical setting.

(III)

**SOC SCI 5B. Introduction to Physical Geography. 4 Units.**

An introduction to the physical world we live in. Distribution and dynamics of the earth's air, water, and solid crust. Concepts and principles from climatology and geology. Selected examples from North America and beyond.

**SOC SCI 5D. US & World Geography. 4 Units.**

Survey of general geographical principles and facts on a world scale, as well as introduction to the broad regional and resource geography of the U.S., emphasizing in particular the interactions of physical and cultural factors.

(III, VIII)

**SOC SCI 10A. Probability and Statistics in Social Sciences I. 4 Units.**

Introduction to the variety of statistical applications in the social sciences. Descriptive statistics. Measures of central tendency and dispersion. Percentile ranks. Standardization and normal approximation. Basic probability theory focuses on application to statistical inference and binomial distribution. Laboratory required.

Corequisite: SOC SCI 3A

Prerequisite: SOC SCI 3A

Overlaps with PSYCH 10A, SOCECOL 13, POL SCI 10A, SOCIOL 10A, ECON 15A.

Restriction: Lower-division students only. Social Science Majors have first consideration for enrollment. SOC SCI 10A may not be taken for credit if taken after or concurrently with ECON 15A.

(Va)

**SOC SCI 10B. Probability and Statistics in Social Sciences II. 4 Units.**

Introduction to statistical inference, sampling distribution, standard error. Hypothesis tests for proportions and means. Inferential techniques for nominal variables including chi-square, study measures of strengths, significance of relationships between variables, assumptions, data requirements, and types of error in significance tests.

Prerequisite: SOC SCI 10A

Overlaps with ANTHRO 10B, POL SCI 10B, SOCECOL 13, SOCIOL 10B, PSYCH 10B.

Restriction: School of Social Sciences students have first consideration for enrollment.

(Va)

**SOC SCI 10C. Probability and Statistics in Social Sciences III. 4 Units.**

Focus on correlation, regression, and control for effects of variables. One-way and two-way factorial analysis of variance. A priori and a posteriori comparisons. Introduction to repeated measures design and non-parametric statistics. Discuss use of statistics in newspapers and popular magazines.

Prerequisite: SOC SCI 10B

Overlaps with ANTHRO 10C, POL SCI 10C, PSYCH 10C, SOCECOL 13, SOCIOL 10C.

Restriction: School of Social Sciences students have first consideration for enrollment.

(Vb)

**SOC SCI 11A. Barter to Bitcoin: Society, Technology and the Future of Money. 4 Units.**

Digital money has captured the broad imagination of speculators, coders, regulators, criminals and the mass media. Course puts this change in context: how do we understand money as a social, political and technological phenomenon?.

Same as IN4MATX 12.

(II and III ).

**SOC SCI 12. Global Political Ideologies. 4 Units.**

An overview of the major political ideologies shaping the current world order and global conflict. Topics include liberalism, democracy, nationalism, capitalism, communism, socialism, fascism, neoliberalism, clash of civilizations, sectarian violence, populist nationalism, and de-globalization.

Same as POL SCI 44B, INTL ST 12.

Restriction: International Studies Majors have first consideration for enrollment.

(III and VIII ).

**SOC SCI 15. Global Political Economy. 4 Units.**

The global economy as an integrated system. The rise of world trade, capitalism, national economies, market cycles, competing economic ideologies, development, globalization, transnational labor, multinational corporations, and the role of UN, World Bank, WTO, and the IMF in global governance.

Same as INTL ST 15.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

(III and VIII ).

**SOC SCI 16. Human Rights and Global Governance. 4 Units.**

Historical development of civil, political rights and the rise of human rights in international law. Explores role, and limitations, of the UN, ICJ, and ICC in global governance. Reconceptualizing democracy and political representation in a postnational 21st century.

Same as POL SCI 45A, INTL ST 16.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

(III and VIII ).

**SOC SCI 17. Global Environmental Issues. 4 Units.**

Examines problems such as global climate change, growing human populations, fisheries depletion, ocean acidification, biodiversity loss, deforestation, and food security. Introduces political, social, and economic factors contributing to environmental issues and their disproportional impacts on the world's poor and minorities.

Same as INTL ST 17.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

(III and VIII ).

**SOC SCI 20. Model United Nations. 2 Units.**

Focuses on simulations of the foreign policy pursuits of selected countries in the international community. Emphasis placed on understanding the rules of debate, as well as the policy positions of the student's selected country in the United Nations.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 6 times.

**SOC SCI H30D. Social Science Perspectives on the Sustainability of Societies. 4 Units.**

Introduces the perspectives of social science using examples from different countries to explore how social issues regarding sustainability are influenced by a society's changing economic and political institutions, and how economic, political, and other social choices affect their sustainability.

Prerequisite: EARTHSS H30C. EARTHSS H30C with a grade of C or better

Restriction: Campuswide Honors Collegium students only.

(III)

**SOC SCI 40. Social Policy and Public Service. 4 Units.**

An introduction to the basic theories and principles of public policy. Students examine various influences on the development of public policy and the principle actors in the process, and learn to identify tools and techniques employed in policy making.

Same as SPPS 40.

(III)

**SOC SCI 66. Introduction to Gangs . 4 Units.**

Introduces students to street gang subculture and explores risk factors associated with gang membership. Students develop a working definition for street gang and understand the difference between social and legal definitions. Also explores the connection between prison and street gangs.

**SOC SCI 70C. Comparing Cultures. 4 Units.**

Introduces students to the scope of cross-cultural comparisons by analyzing the theories, methodologies, and facts utilized by anthropologists, sociologists, social psychologists, political scientists, and historians in comparing cultures.

(III, VII)

**SOC SCI 78A. Asian American Histories. 4 Units.**

Examines and compares diverse experiences of major Asian American groups since the mid-nineteenth century. Topics include origins of emigration; the formation and transformation of community; gender and family life; changing roles of Asian Americans in American society. Formerly ASIANAM 60A.

Same as ASIANAM 50, HISTORY 15C.

((III or IV) and VII ).

**SOC SCI 78B. Asian American Communities. 4 Units.**

Examines the renewal of Asian immigration following World War II. Explores contemporary Asian American populations and communities in the U.S., and the impact of contemporary Asian immigration on the U.S. political economy and social order.

Same as ASIANAM 52.

(III, VII)

**SOC SCI 78C. Asian Americans and Race . 4 Units.**

Analyzes the Asian American experience in comparative perspective, which includes comparisons of different ethnic and racial groups, and across gender and class. Possible topics include labor, economy, politics, migration, nation, popular culture, gender, family, sexuality, and multiraciality.

Same as ASIANAM 53.

(III, VII)

**SOC SCI 89. Special Topics in Social Sciences. 2-4 Units.**

Studies in selected areas of Social Sciences. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**SOC SCI 102A. Introduction to Geographic Information Systems in Social Sciences. 4 Units.**

Hands-on laboratory course introduces students to the fundamentals of Geographic Information Systems (GIS) technology using social science applications. Students learn to organize, manipulate, and display spatial data leading to the design of their own GIS research project.

Restriction: School of Social Sciences students have first consideration for enrollment.

**SOC SCI 102B. Intermediate Geographic Information Systems in Social Sciences. 4 Units.**

Expands Geographic Information Systems (GIS) skills to more advanced theories and concepts in the spatial analysis of social science issues and particularly to analyzing and interpreting spatial data. Students develop and complete a GIS research project of their own choosing.

Prerequisite: SOC SCI 102A

Restriction: School of Social Sciences students have first consideration for enrollment.

**SOC SCI 103A. Game Theory and Politics I. 4 Units.**

Introduction to game theory and a survey of its political applications. Examples of topics covered include voting in small committees, legislatures, and mass elections; interest group activities and environmental issues; institutional design, and the evolution of cooperative behavior.

Same as SOCIOL 134, POL SCI 130A.

Restriction: Social Policy/Public Service Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**SOC SCI 103B. Game Theory and Politics II. 4 Units.**

More advanced game theory and its political applications, beginning where Game Theory and Politics I ends. Examples of topics covered include revolutions; arms race; spatial models of party competition; political manipulation; political coalitions and their power.

Prerequisite: POL SCI 130A or ECON 116A

Same as POL SCI 130B.

Restriction: Social Policy/Public Service Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**SOC SCI 115D. International Business. 4 Units.**

Introduction to conducting business in the international arena, decision making in the organization, and globalization of markets and production. Topics covered range from tax and finance to ethics, marketing, and more. Continuing corporate regulatory scandals discussed.

Same as INTL ST 112A.

**SOC SCI 119. Special Topics in Geography. 4 Units.**

Studies in selected areas of geography. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**SOC SCI 120. Transnational Gangs. 4 Units.**

Examines the internationalization of U.S. domestic street gangs. The relationship between California gangs Mara Salvatrucha and 18th Street and Mexico/Central American gangs is assessed. Specified topics include: mobilization, migration, territorialism, culture, organization, and use of technology.

Same as INTL ST 130.

Overlaps with SOC SCI XI120, INTL ST XI130.

**SOC SCI 121T. Voting and Political Manipulation. 4 Units.**

Introduction to social choice and cooperative games. Topics include majority rule, types of voting methods, apportionment and proportional representation, agenda manipulation, coalition formation, voting power, political consequences of electoral laws.

Same as INTL ST 156A, POL SCI 151H, ECON 154.

Restriction: International Studies Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**SOC SCI 132. Veterans in History and Society. 4 Units.**

Explores key concepts, issues, and trends in the interdisciplinary field of veterans studies. Students gain a deep understanding of the ways that social scientists and historians have analyzed the identities, experiences, and worldviews of U.S. military veterans.

Same as HISTORY 149.

**SOC SCI 133. Veterans' Transitions. 4 Units.**

Provides veteran and non-veteran students with a comprehensive and academically rigorous overview of the ways and means through which diverse communities of veterans have made and continue to make the complex and multi-faceted transition from active military.

**SOC SCI 134W. Veterans' Voices. 4 Units.**

Uses the medium of academic writing to develop a broad understanding and appreciation for the wide range of worldviews, priorities, and values embodied in the creative production and activism of diverse U.S. military veterans.

(Ib)

**SOC SCI 152A. Non-Government Organization (NGO) Fundamentals. 4 Units.**

Introduction to non-governmental organizations, including their role in U.S. society and the international community. Explores varying definitions of NGOs and the characteristics held in common by all NGOs.

Same as INTL ST 152A.

**SOC SCI 152C. American Public Policy. 4 Units.**

Focuses on the development and implementation of public policy in the United States. Lectures cover theoretical models of the policy process as well as significant problems facing contemporary American decision-makers.

Same as PUBHLTH 132, POL SCI 121G, UPPP 129.

**SOC SCI 163A. Urban America . 4 Units.**

Students examine the historical, social, political, and economic factors that contributed to the construction of the American urban context, one that is poverty concentrated and racially/ethnically segregated. Students also critically assess the consequence of growing up in America's urban neighborhoods.

Same as CHC/LAT 162A, UPPP 104.

**SOC SCI 164B. Domestic Gangs. 4 Units.**

Examines the history and development of California street gangs and the role of historical events in that development. Students will be able to contrast and compare gang cohort behaviors between some of the major gangs in California.

Restriction: School of Social Sciences students have first consideration for enrollment.

**SOC SCI 164C. Prison Gangs. 4 Units.**

Examines the growth and spread of prison gangs throughout the country. Relationships between prison and street gangs, and possible relationships with foreign drug trafficking organizations studied. Violence examined as the standard to establish dominance in and out of prison.

Restriction: School of Social Sciences students have first consideration for enrollment.

**SOC SCI 164D. Juvenile Gangs. 4 Units.**

Examines risk factors that can be used to predict gang membership. Compares generational with non-generational gangs and develops a working sociological definition that can be used to identify street gangs. Myths about juveniles, street gangs.

Restriction: School of Social Sciences students have first consideration for enrollment.

**SOC SCI 165. Chicano/Latino Families. 4 Units.**

Introduction to the research, literature, and issues surrounding the topic of Chicano/Latino families including cultural history, contemporary issues, organization of family, traditions, lifestyles, values, beliefs, generational differences, gender issues, ethnic identity, evolution of demographic patterns, current economic and political standings.

Same as CHC/LAT 170, PSCI 166S, PSYCH 174H.

**SOC SCI 168B. Immigration and Inequality. 4 Units.**

Explores immigration, ethnicity, and inequality as interconnected social forces. International migration, propelled by global inequalities, plays a central role in the formation of multinational societies, shapes inter-group relations and patterns of ethnic inequality, and transforms the immigrants themselves.

Same as SOCIOL 166.

**SOC SCI 170A. Research Methods in the Social Sciences. 4 Units.**

Examines how interdisciplinary social science research questions are formulated and studies several research methods including: experimental method, quasi-experimental methods, survey research, field research, evaluation research, and meta-analysis. Parametric and non-parametric statistical methods are illustrated using the SPSS program.

Prerequisite: SOC SCI 1A and SOC SCI 2A and SOC SCI 3A and (SOC SCI 10A or STATS 7)

Restriction: Upper-division students only. School of Social Sciences students have first consideration for enrollment.



**SOC SCI 172AW. American Culture. 4 Units.**

A survey of the historical development of dominant American culture and society; emphasis on a close reading of key cultural texts, with weekly text as a model of writing, examining its use of language and rhetoric.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: School of Social Sciences students have first consideration for enrollment.

**(Ib)****SOC SCI 172D. Law in the Twenty-First Century. 4 Units.**

Examines the complex relationship between law, the social sciences, and modern society. Lectures explore such issues as the interplay between technology and constitutional rights, the impact of science on law, and the evolving roles of attorneys and judges.

Same as POL SCI 171F.

Restriction: Political Science Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

**SOC SCI 173L. Latinos in a Global Society. 4 Units.**

Examines interconnections between diverse Latino groups in the U.S. and the effects of globalization on their social, cultural, and political realities. Topics include immigration, demographics, socioeconomic differentiation, familial relations, political protest/resistance, law and policy, and links to 'homeland' issues.

Same as CHC/LAT 167.

**(VII)****SOC SCI 173N. Revolution in Latin America. 4 Units.**

Presents a comparative analysis of the causes, development, and consequences of selected revolutionary movements, focusing on outbreaks in Mexico, Bolivia, Cuba, Chile, Nicaragua, and Grenada. Explores topics of state formation, economic nationalism, social justice, ethnicity, and role of international affairs.

Same as CHC/LAT 151B, HISTORY 166D, INTL ST 177C.

**SOC SCI 177B. Asian American Women. 4 Units.**

Examines the representations and experiences of Asian American women from diverse perspectives. Explores the commonalities and differences among various groups of Asian American women, with particular focus on history, culture, values, and family roles.

Same as ASIANAM 162.

**SOC SCI 178C. Korean American Studies. 4 Units.**

Explores the factors that have distinctly shaped the Korean American experience, including patterns of racial domination, the profile of immigrant flow, immigrant roles in the urban political economy, politics in Korea, and the role of the church.

Same as ASIANAM 151C.

**SOC SCI 178D. Vietnamese American Studies. 4 Units.**

Studies the resettlement of Vietnamese in the United States following their exodus from Southeast Asia. Topics include the Vietnam War, the 1975 evacuation, boat and land refugees, the shaping of Vietnamese communities, and Vietnamese American literature.

Same as ASIANAM 151D.

**SOC SCI 178E. Japanese American Studies. 4 Units.**

Studies the settlement of Japanese in Hawaii and the continental United States since the late 19th century. Topics include sugar plantations, development of rural Japanese America, World War II internment, post-War community development, and persistence of Japanese American identity.

Same as ASIANAM 151E.

**SOC SCI 178F. South Asian American Studies. 4 Units.**

Examines and compares the experiences of South Asian immigrants in the U.S. over time. Looks at the economic, political, and social positions of the immigrants, with special emphasis on religious changes and the changes in the second and later generations.

Same as ASIANAM 151F.

Restriction: Asian American Studies Majors have first consideration for enrollment. Social Policy/Public Service Majors have first consideration for enrollment.

**SOC SCI 178H. Southeast Asian American Studies. 4 Units.**

Analyzes experiences of refugees and immigrants from Southeast Asia, which may include those from Cambodia, Laos, Vietnam, and the Philippines. Examines political and economic factors for their exodus and how they reconstruct their identities, histories, and communities.

Same as ASIANAM 151H.

**SOC SCI 178J. Chinese American Studies. 4 Units.**

Analyzes the experiences of Chinese in the United States. Immigration, Chinese exclusion, racial and gender identity. Historical overview and contemporary issues covered.

Same as ASIANAM 151J.

**SOC SCI 178K. Filipina/Filipino American Studies. 4 Units.**

Explores the experience of Filipina/Filipino Americans from the era of Spanish colonization of the Philippines to present-day community formations in the United States, with special emphasis on the 20th century. Topics include colonialism, nation, migration, gender, and culture.

Same as ASIANAM 151K.

**SOC SCI 179. Special Topics in Asian American Studies. 4 Units.**

Studies in selected areas of Asian American Studies. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**SOC SCI 181A. Ethical Leadership. 4 Units.**

Explores historical and contemporary theories of ethical and unethical leadership. Examines models of 'good leadership' such as cardinal and monastic virtues; and models of 'bad leadership,' such as Machiavelli's Prince. Explores the philosophies, styles, and accomplishments of leaders.

Restriction: School of Social Sciences students have first consideration for enrollment.

**SOC SCI 183A. Global and International Studies Forum. 4 Units.**

A faculty-student forum featuring lectures from a variety of institutions with discussion issues related to Global and International Studies.

Repeatability: May be taken for credit 4 times.

Same as SOCECOL 183A, INTL ST 183A.

**SOC SCI 183B. Seminar in Mediation. 4 Units.**

Student develop mediation skills and refine knowledge in the practice and theory of conflict resolution. Students who complete this course may serve as mediators in the Campus Mediation Program. Course is a prerequisite to completing Indep Study as an intern.

Same as INTL ST 183B, SOCECOL 183B.

Restriction: International Studies Majors have first consideration for enrollment. School of Humanities students have first consideration for enrollment. School of Social Ecology students have first consideration for enrollment. School of Social Sciences students have first consideration for enrollment.

**SOC SCI 183CW. Seminar Conflict Resolution. 4 Units.**

Designed for seniors who are pursuing the minor in Conflict Resolution and/or International Studies major. Provides a forum in which students will refine skills and theory in the study of cooperation and conflict, from local to global arenas.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as SOCECOL 183CW, INTL ST 183CW.

(Ib)

**SOC SCI 183E. Conflict Resolution in Cross-Cultural Perspective. 4 Units.**

Examines theories of conflict management. Analyzes how conflict is mitigated in diverse cultures: at the interpersonal level, between groups, and on the international scale. Students discuss readings, hear from conflict management practitioners, and simulate negotiations.

Same as ANTHRO 136D, POL SCI 154G, INTL ST 183E.

(VIII)

**SOC SCI 184A. Sage Leader Research I. 2 Units.**

Participants in the SAGE Scholars Program learn to define leadership concepts, discover various leadership styles, and develop strong leadership and communication skills resulting in strengthened ability to contribute to and interact with UCI and the Orange County community.

Grading Option: Pass/no pass only.

Restriction: SAGE Scholars Program students only.

**SOC SCI 184B. Sage Leader Research II. 4 Units.**

Provides a survey of contemporary topics and challenges in the fields of management and leadership. Case studies and text by leading authors are used to analyze key leadership issues in twenty-first century, with particular emphasis on current events.

Restriction: SAGE Scholars Program students only.

**SOC SCI 184GW. Media Writing. 4 Units.**

Designed to teach reporting and news writing basics. Students learn how to gather and organize information, ask effective questions, develop story ideas, research facts, and write stories on deadline.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Overlaps with INTL ST XI155B, SOC SCI XI184G.

Restriction: International Studies Majors have first consideration for enrollment.

**(Ib)**

**SOC SCI 185W. People in Society. 4 Units.**

Through readings about people in distinctly different societies throughout history, students learn concepts that cross the boundaries of the social science disciplines. Such themes as democracy, elitism, power, social class, and gender are the basis for discussion and writing.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: School of Social Sciences students only.

**(Ib)**

**SOC SCI 187. Twenty-First-Century Graduate Education. 2 Units.**

Graduate and professional education in twenty-first century United States. Examines strategies for admission to postbaccalaureate programs and success in graduate study culture. Introduction to processes including planning and preparation, school selection, entrance examination preparation, submission of applications, writing personal statements.

Grading Option: Pass/no pass only.

Restriction: Upper-division students only.

**SOC SCI 188A. Introduction to Contemporary Middle East Politics. 4 Units.**

An overview of basic issues that shape the politics of the Middle East and North Africa. Themes include implication of the colonization era, nation-state formation, inter-Arab relations, nationalism, Arab-Israel conflict, Islamic resurgence, and more.

Same as INTL ST 165, POL SCI 158D.

**SOC SCI 188K. Political Islam. 4 Units.**

Political Islam is a diverse phenomenon. While noticeable barriers exist to 'Islamist democracy,' it is the Islamists who will define the political future of much of the Muslim world. Reviews the experience of Saudi Arabia, Egypt, Pakistan, Turkey, and Indonesia.

Same as INTL ST 161A.

**SOC SCI 189. Special Topics in Social Sciences. 2-4 Units.**

Studies in selected areas of social sciences. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: School of Social Sciences students have first consideration for enrollment.

**SOC SCI H190A. Honors Research Workshop. 4 Units.**

Student develops a 10–15-page prospectus of research for the honors thesis which includes: the research question, literature review, methods of investigation, and bibliography. Student selects a faculty mentor who will supervise thesis research and writing in winter and spring.

Same as SPPS H190A.

Restriction: Social Science Majors only. Social Policy/Public Service Majors only. Social Science Honors students only.

**SOC SCI H190B. Honors Thesis Research. 4 Units.**

The student initiates and completes data collection for the honors thesis. A faculty mentor provides supervision and feedback on thesis chapters.

Prerequisite: SOC SCI H190A or SPPS H190A

Same as SPPS H190B.

**SOC SCI H190C. Honors Thesis. 4 Units.**

The student completes, with the approval of the faculty mentor, an honors thesis containing: statement of the problem, literature review, research hypotheses, methods of investigation, results, discussion, and bibliography.

Prerequisite: SOC SCI H190B or SPPS H190B. Satisfactory completion of the Lower-Division Writing requirement.

Same as SPPS H190C.

**(Ib)**

**SOC SCI 191. Graduate-Mentored Study in the Social Sciences. 4 Units.**

Offers a hands-on research experience while increasing awareness of the various disciplines in the social sciences and of the requirements of graduate school. Features graduate-mentored study under the supervision of the Associate Dean.

Prerequisite: Identification of a graduate student (who is in good standing) as a mentor.

Grading Option: Pass/no pass only.

**SOC SCI 193A. Field Studies in Social Policy and Public Service. 4 Units.**

Advanced training in qualitative and ethnographic research centered on community service. Students pursue field studies at nonprofit agencies (200 hours) to understand current social problems in underrepresented and underserved communities. Through field placement, students apply theory to practice.

Prerequisite: SOC SCI 70C or SOCIOL 63. Satisfactory completion of the Lower-Division Writing requirement.

Same as SPPS 193A.

Restriction: Social Policy/Public Service Majors only.

**SOC SCI 193B. Field Studies in Social Policy and Public Service. 4 Units.**

Advanced training in qualitative and ethnographic research centered on community service. Students pursue field studies at nonprofit agencies (200 hours) to understand current social problems in underrepresented and underserved communities. Through field placement, students apply theory to practice.

Prerequisite: SOC SCI 193A

Same as SPPS 193B.

**SOC SCI 193C. Field Studies in Social Policy and Public Service. 4 Units.**

Advanced training in qualitative and ethnographic research centered on community service. Students pursue field studies at nonprofit agencies (200 hours) to understand current social problems in underrepresented and underserved communities. Through field placement, students apply theory to practice.

Prerequisite: SOC SCI 193B

Same as SPPS 193C.

**SOC SCI 193CW. Field Studies in Social Policy and Public Service. 4 Units.**

Advanced training in qualitative and ethnographic research centered on community service. Students pursue field studies at nonprofit agencies (200 hours) to understand current social problems in underrepresented and under-served communities. Through field placement, students apply theory to practice.

Prerequisite: SOC SCI 193B

Same as SPPS 193CW.

Overlaps with SPPS 193C.

Restriction: Social Science Majors only.

**(Ib)**

**SOC SCI 194A. Public Service Internship. 2-4 Units.**

Introduces the role of etiquette and leadership in the professional environment. With a two-unit (50 hours) or four-unit (100 hours) credit option, students intern at a nonprofit agency exploring their roles as community leaders and improving their professional skills.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 8 units.

Restriction: Social Policy/Public Service Majors only.

**SOC SCI 194C. Management and Leadership Practicum-Social Science . 2-4 Units.**

Social Sciences Academic Resource Center (SSARC) Resource Managers (RMs) report directly to the Director and Associate Director, serving as frontline resource consultants, assisting visitors with resume development, graduate and professional school planning, internship placement, and professional development.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 12 units.

**SOC SCI 195A. Educational Policy Field Studies. 4 Units.**

Integrates academic course work with experiential learning; examines the effects of educational policy on urban and suburban schools; explores the relationship between community service and personal academic interests; and develops awareness about the challenges of public education.

Repeatability: May be taken for credit 3 times.

**SOC SCI 195B. Educational Policy Field Studies. 4 Units.**

Integrates academic course work with experiential learning; examines the effects of educational policy on urban and suburban schools; explores the relationship between community service and personal academic interests; and develops awareness about the challenges of public education.

Prerequisite: SOC SCI 195A

Repeatability: May be taken for credit 3 times.

**SOC SCI 195C. Educational Policy Field Studies . 4 Units.**

Integrates academic course work with experiential learning; examines the effects of educational policy on urban and suburban schools; explores the relationship between community service and personal academic interests; and develops awareness about the challenges of public education.

Prerequisite: SOC SCI 195B

Repeatability: May be taken for credit 3 times.

**SOC SCI 196. Global Connect. 2-4 Units.**

Identifies factors of change that influence the twenty-first century. Students serve as mentors at high schools to introduce globalization issues through workshops and lectures. Students must submit an application and have a 3.0 or higher overall GPA.

Repeatability: May be taken for credit 3 times.

**SOC SCI 197. Professional Internship. 2-4 Units.**

Students apply classroom knowledge through research projects in nonprofit agencies (local, state, and government) and the private sector. They pose solutions to agency-posed questions. Students gain field experience through 50 hours (for 2 units) or 100 (for 4 units).

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit for 8 units.

Restriction: School of Social Sciences students only.

**SOC SCI 198. Directed Group Study. 2-4 Units.**

Directed study with Social Science faculty.

Repeatability: May be taken for credit for 12 units.

**SOC SCI 199. Individual Study. 2-4 Units.**

Opportunities to do research and learn new skills outside the normal classroom environment. Students participate in planned research and study activities under a written contract with a supervising UCI instructor. Students may enroll for only one 199 each quarter.

Repeatability: May be taken for credit for 16 units.

Restriction: Upper-division students only.

**SOC SCI 211A. Mathematical Behavioral Sciences Colloquium. 2 Units.**

Weekly reports and colloquia by faculty, students, and visitors.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**SOC SCI 211B. Mathematical Behavioral Sciences Colloquium. 2 Units.**

Weekly reports and colloquia by faculty, students, and visitors.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**SOC SCI 211C. Mathematical Behavioral Sciences Colloquium. 2 Units.**

Weekly reports and colloquia by faculty, students, and visitors.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**SOC SCI 253K. Race and Justice Studies Writing Seminar . 4 Units.**

A required writing-intensive seminar conducted by an instructor affiliated with the Race and Justice Studies emphasis. Students with manuscripts on relevant topics will read and critique peer manuscripts, and revise manuscripts toward completion of articles, dissertation chapters, and other publications.

Prerequisite: CRM/LAW C260C

Same as HUMAN 261, CRM/LAW C261.

Restriction: Graduate students only.

**SOC SCI 254A. Transnational Migration. 4 Units.**

Examines borders and boundaries as material and semiotic constructs. Drawing upon an array of literatures, but loosely situated in U.S. geo/biopolitics, explores transformative troubleings of places, spaces, borders, and bodies of all sorts.

Same as ANTHRO 235A, CHC/LAT 215.

Restriction: Graduate students only.

**SOC SCI 272A. Origin and Evolution of Marxist Social Thought. 4 Units.**

Focuses on the genesis and evolution of Marxist social thought. The 'systemic' method of Marx and Engels to questions of economic production and reproduction is compared and contrasted with modern world-system grand visions, feminist-theoretic approaches, and postmodern critiques.

Prerequisite: Undergraduate course in political theory or equivalent.

Restriction: Graduate students only.

**SOC SCI 289. Special Topics in Social Science. 4 Units.**

Current research in Social Science.

Repeatability: Unlimited as topics vary.

**SOC SCI 290. Dissertation Research. 4-12 Units.**

Dissertation research with Social Science faculty.

Repeatability: May be repeated for credit unlimited times.

**SOC SCI 299. Independent Study. 1-12 Units.**

Independent research with Social Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**SOC SCI 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Letter Grade only.

Repeatability: May be repeated for credit unlimited times.

## Sociology Courses

**SOCIOL 1. Introduction to Sociology. 4 Units.**

Considers major sociological concepts, theories, and research findings illuminating processes of interpersonal interaction, social differentiation and stratification, integration and conflict, and change, with attention to variation in class, race/ethnic, gender, multicultural, and cross-national perspectives and experiences.

(III, VII)

**SOCIOL 2. Globalization and Transnational Sociology. 4 Units.**

Examines globalization and international issues from the perspective of sociology and related fields. Issues include economic globalization and global inequality, international environmental problems, international politics, trends in global culture, and global conflict.

(III, VIII)

**SOCIOL 3. Social Problems. 4 Units.**

Focuses on how institutional and organizational features of societies generate problems for people. Particular attention directed at a set of problems related to political and economic inequality: poverty, racism, sexism, urban and population problems, the environment, the criminal justice system.

(III, VII)

**SOCIOL 10A. Probability and Statistics. 4 Units.**

An introduction to probability and statistics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Emphasizes examples from sociology, anthropology, and related social science disciplines.

Same as ANTHRO 10A.

Overlaps with PSYCH 10A, SOCECOL 13, SOC SCI 10A, POL SCI 10A.

Restriction: Anthropology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

(Va)



**SOCIOL 10B. Probability and Statistics. 4 Units.**

An introduction to probability and statistics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Emphasizes examples from sociology, anthropology, and related social science disciplines.

Prerequisite: SOCIOL 10A or ANTHRO 10A

Same as ANTHRO 10B.

Overlaps with PSYCH 10B, SOCECOL 13, SOC SCI 10B, POL SCI 10B.

Restriction: Anthropology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**(Va)**

**SOCIOL 10C. Probability and Statistics. 4 Units.**

An introduction to probability and statistics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Emphasizes examples from sociology, anthropology, and related social science disciplines.

Prerequisite: SOCIOL 10B or ANTHRO 10B

Same as ANTHRO 10C.

Overlaps with PSYCH 10C, SOCECOL 13, SOC SCI 10C, POL SCI 10C.

Restriction: Anthropology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**(Vb)**

**SOCIOL 19. Special Topics: Methods. 4 Units.**

Studies in selected areas of methods. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**SOCIOL 29. Special Topics: Theory. 4 Units.**

Studies in selected areas of theory. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: May be repeated for credit unlimited times.

**SOCIOL 31. Self-Identity and Society. 4 Units.**

Studies sociological contributions to theory and research in social psychology, with focus on the social influences on personality, attitudes, beliefs, and behavior; socialization, human groups, and social interaction.

Same as PSYCH 78A.

**(III)**

**SOCIOL 39. Special Topics: Social Psychology. 4 Units.**

Studies in selected areas of social psychology. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**SOCIOL 41. Small Group Dynamics. 4 Units.**

Deals with models for understanding behavior in small groups, including coalition formation, socialization, group norms and decision rules, leadership, conformity, group structure, and communication processes.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 43. City and Community. 4 Units.**

Examines nature, causes, and consequences of urbanization along with changing scale and complexity, demographic/ecological city growth patterns, quality of life in urban areas, processes of decision-making, and bearing of sociological investigation on public policy concerns in contemporary urban society.

Overlaps with UPPP 40.

**SOCIOL 44. Births, Deaths, and Migration. 4 Units.**

Introduction to the analysis of human population including fertility, mortality dispersion, sex distribution. Attention is focused on the effects of these variables on, e.g., over-population, social disorganization, and the stability of social institutions.

(VIII)

**SOCIOL 49. Special Topics: Structures. 4 Units.**

Studies in selected areas of structures. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**SOCIOL 51. Asian American Family & Community. 4 Units.**

Briefly examines the history of different Asian American groups and provides an in-depth analysis of issues related to family composition, mate selection, changing gender roles, and intergenerational conflict.

(VII)

**SOCIOL 56. Religion and Society. 4 Units.**

A critical and personal examination of the varieties of religious and spiritual experiences human beings are undergoing in contemporary society. The role of conscious understanding and unconscious conditioning regarding religion and spirituality.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 59. Special Topics: Social Institutions and Culture. 4 Units.**

Studies in selected areas of social institutions and culture. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**SOCIOL 62. Families and Intimate Relations. 4 Units.**

Sociological theories/research on marriage, kinship, intimacy, and divorce. Emphasis on comparing family patterns in different social classes, ethnic groups, and societies, and on relating family life to the economy and other social institutions. Topics include gender roles, child-rearing, historical change. Materials fee.

(III)

**SOCIOL 63. Race and Ethnicity. 4 Units.**

Focuses on racial and ethnic relations in the United States and compares them with those found in other societies. Analyzes the conditions that favor either cooperation and integration or rivalry, tension, and conflict. Appraises strategies for reducing and resolving conflicts.

Same as SPPS 70A.

(VII)

**SOCIOL 64. Sociology of Sexuality. 4 Units.**

Provides an introduction to and overview of the sociology of sex and sexuality. Considers the social meanings of sex and sexuality, the social contexts of sex and sexuality, and the social regulations of sex and sexuality.

(VII)

**SOCIOL 68. Gender and Race Inequality in the Workplace. 4 Units.**

Analysis of current state and trends in major inequality measures including the wage gap, occupational segregation, and access to managerial positions. Theories that purport to explain such differences, and the related empirical evidence, are also covered.

**SOCIOL 68A. Ethnic and Immigrant America. 4 Units.**

Focusing on Asian, Latino, and Black immigrant groups, examines the second generation's experience of straddling two cultures and growing up American. Covers topics such as assimilation, bilingualism, race relations, education, bicultural conflicts, interracial marriage, and multiracial identities.

Same as CHC/LAT 65.

(VII)

**SOCIOL 69. Special Topics: Age, Gender, Race, and Ethnicity. 4 Units.**

Studies in selected areas of age, gender, race, and ethnicity. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**SOCIOL 79. Special Topics: Societies and Social Inequality. 4 Units.**

Studies in selected areas of societies and social inequality. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**SOCIOL 110. Research Methods. 4 Units.**

Methods of data collection and analysis used by sociologists. Experimental methods, surveys, and interviews, field research and participant observation, demographic methods, historical and comparative approaches.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 119. Special Topics: Methods. 4 Units.**

Studies in selected areas of methods. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 120. Sociological Theory. 4 Units.**

What a theory of society is and is not. Historical and contemporary models, perspectives, and schools.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 120W. Sociological Theory. 4 Units.**

What a theory of society is and is not. Historical and contemporary models, perspectives, and schools.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Sociology Majors have first consideration for enrollment.

**(Ib)****SOCIOL 129. Special Topics: Theory. 4 Units.**

Studies in selected areas of theory. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 134. Game Theory and Politics I. 4 Units.**

Introduction to game theory and a survey of its political applications. Examples of topics covered include voting in small committees, legislatures, and mass elections; interest group activities and environmental issues; institutional design, and the evolution of cooperative behavior.

Same as POL SCI 130A, SOC SCI 103A.

Restriction: Social Policy/Public Service Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**SOCIOL 135. Social Psychology of Networks. 4 Units.**

Review of network methods used in small group and organizational research. Discussion of social psychological literature relevant to the network of study of cognitive social structure, exchange/communication, identity negotiation, and social control. Case study of network datasets exemplifies research issues.

Same as PSYCH 178N.

Restriction: Sociology Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**SOCIOL 136. Religious Traditions of Asian Americans. 4 Units.**

Studies the religious traditions of Asian Americans, focusing on the transplantation of religious institutions, establishment of sacred spaces, celebration of religious holidays, socialization of children, as well as birth, marriage, gender relations, death, family.

Same as ASIANAM 143.

**SOCIOL 138. Business Decisions. 4 Units.**

Surveys normative and descriptive models of decision-making behavior, with an emphasis on organizational and policy contexts. Topics include rational choice theory, biases and heuristics, framing effects, and overconfidence. Management fads, panics, and herd behavior are also discussed.

Prerequisite: (ANTHRO 10A and ANTHRO 10B and ANTHRO 10C) or (SOCIOL 10A and SOCIOL 10B and SOCIOL 10C) or (SOC SCI 10A and SOC SCI 10B and SOC SCI 10C) or (MATH 2A and MATH 2B and (STATS 7 or MGMT 7)) or (STATS 120A and STATS 120B and STATS 120C) or (ECON 15A and ECON 15B)

Same as ECON 148.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 139. Special Topics: Social Psychology. 4 Units.**

Studies in selected areas of social psychology. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 141. Organizations. 4 Units.**

How bureaucracies, formal organizations, and voluntary associations work, how/why they grow, and where they are going. History and structure of organizational rationality; dynamics of organized groups; behavior in organizations; limits of bureaucratization and attempts to overcome these limits through decentralization.

Same as POL SCI 155C.

Restriction: Sociology Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment.

**SOCIOL 142. White-Collar Crime. 4 Units.**

Examines criminal activity in business and corporate enterprise, organizations, and the professions. Theories regarding the causes and control of white-collar and corporate crime are covered as well as the numerous definitions of these terms.

Same as CRM/LAW C142.

Restriction: Sociology Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**SOCIOL 143. Social Networks and Social Support. 4 Units.**

Examines the manner in which behaviors/attitudes of individuals are affected by their network ties to others. How are peoples' opportunities and well-being increased/decreased by their social networks? May include studies in mental/physical health, job seeking, separation and loss, and aging.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 144. Politics, Power, and Society. 4 Units.**

Includes an examination of the major theoretical approaches to political sociology, and the application of these ideas to the politics of advanced capitalist societies. Also considers stability and change in power structures.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 145. Occupations and Professions. 4 Units.**

What makes some jobs satisfying and others boring? How does technology influence the workplace? What changes are coming in the U.S. job market? Sociology and psychology of occupations. Students interview workers and study aspects of their occupations.

Restriction: Upper-division students only. Sociology Majors have first consideration for enrollment.

**SOCIOL 145W. Occupations and Professions. 4 Units.**

What makes some jobs satisfying and others boring? How does technology influence the workplace? What changes are coming in the U.S. job market? Sociology and psychology of occupations. Students interview workers and study aspects of their occupations.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Sociology Majors have first consideration for enrollment.

**(Ib)****SOCIOL 149. Special Topics: Structures. 4 Units.**

Studies in selected areas of structures. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 150. Sociological Lens on Religion. 4 Units.**

Examines the effects of religious beliefs, belonging, and institutions on social dynamics, including class, gender, and racial stratification, politics, and social movements. Additional topics: the sociological significance of conversion, commitment, and secularization/sacralization.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 151. Social Inequalities and Health. 4 Units.**

Introduces ways in which social inequalities produce health disparities. Begins with general perspectives on social causation of health, and then considers how particular individual attributes (e.g., gender, SES, race/ethnicity, nativity) and social contexts (e.g., neighborhoods) can get "under the skin."

**SOCIOL 154. Medical Sociology. 4 Units.**

Current problems in U.S. health-care system and proposals for reform. Examines financial barriers to access; problem of patient dumping; underinsurance; prenatal and perinatal care; child services; preventative care and needs of the elderly; minorities; low-income people; undocumented.

Same as PUBHLTH 135.

Restriction: Upper-division students only. Sociology Majors have first consideration for enrollment.

**SOCIOL 154W. Medical Sociology. 4 Units.**

Current problems in U.S. health-care system and proposals for reform. Examines financial barriers to access; problem of patient dumping; underinsurance; prenatal and perinatal care; child services; preventative care and needs of the elderly; minorities; low-income people; undocumented.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Sociology Majors have first consideration for enrollment.

**(Ib)****SOCIOL 155B. Baseball and Society. 4 Units.**

An examination of baseball's role in American social life over the last 150 years. Issues of fraternal organizations, national development, capitalism, rationalization, race and ethnicity, gender, economic organization, labor relations, and politics are discussed.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 155BW. Baseball and Society. 4 Units.**

An examination of baseball's role in American social life over the last 150 years. Issues of fraternal organizations, national development, capitalism, rationalization, race and ethnicity, gender, economic organization, labor relations, and politics are discussed.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Sociology Majors have first consideration for enrollment.

**(Ib)**

**SOCIOL 156. Deviance. 4 Units.**

Perspectives on deviance and criminality in behavior, institution, community, and myth. The suitability of contemporary theories of deviant behavior.

Same as CRM/LAW C107, PSYCH 177D.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

Sociology Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**SOCIOL 157A. Sociology of Education. 4 Units.**

Focuses on education's role in creating and redressing inequality, and in shaping how we understand our place in society. Education from cross-national and historical perspectives, and education as a vehicle for examining and solving social problems. Course may be offered online.

**SOCIOL 157AW. Sociology of Education. 4 Units.**

Focuses on education's role in creating and redressing inequality, and in shaping how we understand our place in society. Education from cross-national and historical perspectives, and education as a vehicle for examining and solving social problems.

Overlaps with SOCIOL 157A.

**(Ib)**

**SOCIOL 157C. Comparing European and US Societies. 4 Units.**

Society, culture, institutions of U.S. and European countries. Fertility to football, guns to government, work to welfare, health to housework. Cross-national approaches for understanding the world and thinking critically about taken-for-granted practices. Policies the U.S. might borrow for social issues.

Same as INTL ST 157C.

**SOCIOL 158C. Money, Work, and Social Life . 4 Units.**

Sociological perspective on issues related to money and work. Consumption practices and lifestyles, jobs and organizations, issues of money in intimate relations, marriage, and households, illegal work, discrimination, economic globalization are discussed.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 158CW. Money, Work, and Social Life. 4 Units.**

Sociological perspective on issues related to money and work. Consumption practices and lifestyles, jobs and organizations, issues of money in intimate relations, marriage, and households, illegal work, discrimination, economic globalization are discussed.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Sociology Majors have first consideration for enrollment.

**(Ib)**

**SOCIOL 159. Special Topics: Social Institutions and Culture. 4 Units.**

Studies in selected areas of social institutions and culture. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 161. Sociology of Sex and Gender. 4 Units.**

Explores complex processes contributing to social construction of gender and sexuality in the U.S. with focus on intersection of gender, race, ethnicity, sexuality, and class; evaluates how men and women are differentially constituted in family, education, work, politics, media, language.

**SOCIOL 161W. Sociology of Sex and Gender. 4 Units.**

Explores complex processes contributing to social construction of gender and sexuality in the U.S. with focus on intersection of gender, race, ethnicity, sexuality, and class; evaluates how men and women are differentially constituted in family, education, work, politics, media, language.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

**(Ib)**

**SOCIOL 164. Sociology of Aging . 4 Units.**

Introduction to sociology of age, aging, and the aged. Problems posed by aging population. Life course transitions and how social organizations influence the life course. Addresses work, health, and family in later life.

Overlaps with SOCIOL 164W.

Restriction: Upper-division students only. Sociology Majors have first consideration for enrollment.

**SOCIOL 164W. Sociology of Aging . 4 Units.**

Introduction to sociology of age, aging, and the aged. Problems posed by aging population. Life course transitions. How social organizations influence the life course. Work, health, family in later life.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Sociology Majors have first consideration for enrollment.

**(Ib)**

**SOCIOL 166. Immigration and Inequality. 4 Units.**

Explores immigration, ethnicity, and inequality as interconnected social forces. International migration, propelled by global inequalities, plays a central role in the formation of multinational societies, shapes inter-group relations and patterns of ethnic inequality, and transforms the immigrants themselves.

Same as SOC SCI 168B.

**SOCIOL 167A. Racial and Ethnic Relations in the United States. 4 Units.**

Examines central questions and issues in the field of race and ethnicity; the emergence, maintenance, and consequences of the ethnic and racial stratification system in the United States; the future of racial and ethnic relations; and relevant public policy issues.

Same as CHC/LAT 148.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**SOCIOL 167AW. Racial and Ethnic Relations in the United States. 4 Units.**

Examines central questions and issues in the field of race and ethnicity; the emergence, maintenance, and consequences of the ethnic and racial stratification system in the United States; the future of racial and ethnic relations; and relevant public policy issues.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as CHC/LAT 148W.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**(Ib)**

**SOCIOL 169. Special Topics in Age, Gender, Race, and Ethnicity. 4 Units.**

Studies in selected areas of age, gender, race, and ethnicity. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 170A. Vietnam War. 4 Units.**

Examines social structures and social changes in Vietnamese and U.S. societies through the study of the Vietnam War.

Same as INTL ST 143A.



**SOCIOL 170B. U.S. War on Terrorism. 4.0 Units.**

Analyzes the United States war on terrorism by focusing on terrorism, the U.S. wars in Afghanistan and Iraq, and changes in police powers through the Patriot Act, as well as the political leadership which directs the war.

Same as INTL ST 175A.

**SOCIOL 171. Environment and Society. 4 Units.**

Examines society's changing relationship to the natural world. Delineates different models of 'nature' and then explores their institutional roots, the social responses they have generated, and their implications for social inequality.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 172. Revolution and Social Transformation in China. 4 Units.**

Introduces the major political events in Mao's communist revolution and the social transformations afterward. Helps students understand the historic and political landscape from which China is now departing.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 173. Social Inequality. 4 Units.**

Sources, functions, and dynamics of the unequal distribution of wealth, prestige, knowledge, and power in American and other societies.

Overlaps with SOCIOL 173W.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 173W. Social Inequality. 4 Units.**

Sources, functions, and dynamics of the unequal distribution of wealth, prestige, knowledge, and power in American and other societies.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Overlaps with SOCIOL 173.

Restriction: Upper-division students only.

**(Ib)****SOCIOL 174. Protests, Movements, and Revolutions. 4 Units.**

A survey of models of collective action drawn from sociology, economics, psychology, and political science. Focus on areas such as social movements, strikes, crowd psychology, cults, fads, fashions, public opinion, and symbolic and mythical elements in collective culture.

Prerequisite: SOCIOL 1 or POL SCI 11A or ECON 1

Same as POL SCI 156D.

Restriction: Political Science Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**SOCIOL 175B. China in the Global Age. 4 Units.**

Chinese society from 1949 to present. Social change in the context of political control and ideological considerations. Focus on the power structure, political decision processes, and ideological legitimization, and interplay with the Chinese community and its culture.

Same as INTL ST 158D.

**SOCIOL 176. International Divided Cities. 4 Units.**

Investigates urban divisions in international cities where deep-seated nationalistic ethnic differences create pressures for intergroup conflicts, autonomy, or territorial separation, and can incite violence. Urban political polarization as it is manifest in the urban setting.

Same as POL SCI 157B, UPPP 178.

**SOCIOL 177. Immigration and Social Policy. 4 Units.**

Explains how people decide to migrate and how they are incorporated into a host society (both historically and currently), examines the effects of immigration on the U.S., analyzes how the framing of immigration shapes the discourse about the issue.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 177C. Undocumented Immigrant Experiences. 4 Units.**

Examines the experiences of undocumented immigrants and the policies that structure their educational, economic, social, and political participation.

Same as ASIANAM 130, CRM/LAW C187, CHC/LAT 164A.

**(III and VII ).**

**SOCIOL 177W. Immigration and Social Policy. 4 Units.**

Explains how people decide to migrate and how they are incorporated into a host society (both historically and currently), examines the effects of immigration on the U.S., analyzes how the framing of immigration shapes the discourse about the issue.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Sociology Majors have first consideration for enrollment.

**(Ib)**

**SOCIOL 179. Special Topics: Societies and Social Inequality. 4 Units.**

Studies in selected areas of societies and social inequality. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 180A. Sociology Majors Seminar. 4 Units.**

Students learn sociology by doing it. A modest-sized research project is planned and implemented by each student.

Prerequisite: SOCIOL 110

Restriction: Sociology Majors only.

**SOCIOL 180AW. Sociology Majors Seminar. 4 Units.**

Students learn sociology by doing it. A modest-sized research project is planned and implemented by each student.

Prerequisite: SOCIOL 110. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Sociology Majors only.

**(Ib)**

**SOCIOL 188BW. Honors Research and Thesis. 4 Units.**

Focuses on the design and implementation of individual research projects undertaken by senior Sociology majors. Writing projects consist of a proposal and paper on some empirical research.

Prerequisite: SOCIOL H188A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Sociology Honors students only.

**(Ib)**

**SOCIOL H188A. Honors Research and Thesis. 4 Units.**

Focuses on the design and implementation of individual research projects undertaken by senior Sociology majors. Writing projects consist of a proposal and paper on some empirical research.

Restriction: Sociology Honors students only.

**SOCIOL 189. Special Topics: Honors Sequence. 4 Units.**

Independent honors research with Social Sciences faculty.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 197. Field Study. 4 Units.**

Field study with Sociology faculty.

Repeatability: May be repeated for credit unlimited times.

**SOCIOL 198. Directed Group Study . 4 Units.**

Directed study with Sociology faculty.

Repeatability: May be repeated for credit unlimited times.

**SOCIOL 199. Independent Study. 1-4 Units.**

Independent research with Sociology faculty.

Repeatability: May be repeated for credit unlimited times.

**SOCIOL 202A. Proseminar I in Sociology. 1 Unit.**

Introduces first-year graduate students in Sociology to the current research interests of Sociology faculty, as well as to other aspects of graduate life at UCI and to the profession of sociology more generally.

Restriction: Graduate students only.

**SOCIOL 202B. Proseminar II in Sociology. 4 Units.**

Focus is on second-year research projects, design, development, data gathering, analysis, and preparing oral and written presentations of the results. Students learn analytic and writing skills, gain experience with research processes, and become socialized about professional standards, customs, and institutions.

Restriction: Graduate students only.

**SOCIOL 210A. Classical Social Theory. 4 Units.**

Examines the development of classical sociological theory through the writings of Karl Marx, Emile Durkheim, Max Weber, Georg Simmel, and George Herbert Mead.

Restriction: Graduate students only.

**SOCIOL 210B. Contemporary Social Theory. 4 Units.**

Familiarizes students with 20th-century developments in social thought that have influenced sociological research, suggesting 'what is living and what is dead' in the 'classics' and offering an overview of the main outlines of recent sociological theorizing.

Restriction: Graduate students only.

**SOCIOL 211A. Sociology of Gender. 4 Units.**

An introduction to the sociology of gender in the U.S. and globally. The social construction of gender and sexuality; theoretical perspectives and feminist frameworks. Theories of economy, patriarchy, and race, and the social positions of women and men.

Restriction: Graduate students only.

**SOCIOL 212. Network Theory. 4 Units.**

An introduction to theoretical work in the field of social networks. Topics include baseline models, homophily, and propinquity, exchange and power, balance theory, diffusion and social influence, equivalence, and cohesion. Deductive use of theory to make novel predictions is emphasized.

Restriction: Graduate students only.

**SOCIOL 219. Special Topics: Theory. 2-4 Units.**

Studies in selected areas of theory. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 220A. Research Design. 4 Units.**

Data collection, organization, and analysis in ethnographic or quasi-experimental settings, including interviewing, participant observations, behavior observations, and questionnaires. Research design issues include sampling, longitudinal research, and comparative research. Emphasis on the integration of qualitative and quantitative data.

Overlaps with SOCIOL 265.

Restriction: Graduate students only.

**SOCIOL 221A. Graduate Statistics I. 4 Units.**

Statistics with emphasis on applications in sociology and anthropology. Examines exploratory uses of statistical tools in these fields as well as univariate, bivariate, and multivariate applications in the context of the general linear model.

Restriction: Graduate students only.

**SOCIOL 221B. Graduate Statistics II. 4 Units.**

Statistics with emphasis on applications in sociology and anthropology. Examines exploratory uses of statistical tools in these fields as well as univariate, bivariate, and multivariate applications in the context of the general linear model.

Prerequisite: SOCIOL 221A

Restriction: Graduate students only.

**SOCIOL 221C. Graduate Statistics III. 4 Units.**

Statistics with emphasis on applications in sociology and anthropology. Examines exploratory uses of statistical tools in these fields as well as univariate, bivariate, and multivariate applications in the context of the general linear model.

Prerequisite: SOCIOL 221A and SOCIOL 221B

Restriction: Graduate students only.

**SOCIOL 222A. Comparative and Historical Sociological Methods. 4 Units.**

Topics include the logic of comparative and historical analysis techniques and the examination of exemplar works in representative problem areas.

Restriction: Graduate students only.

**SOCIOL 224. Interview Methods . 4 Units.**

Hands-on introduction to the use of interviews in social scientific research. Topics include when to use interviews and/or focus groups; how to design an interview-based study, how to conduct interviews, analyze interview data, and write up and publish interview-based results.

Restriction: Graduate students only.

**SOCIOL 226A. Methods of Demographic Analysis. 4 Units.**

Introduces basic demographic methods used in social science and public health research. Topics include sources and limitations of demographic data; components of population growth; measures of nuptiality, fertility, mortality, and population mobility projection methods; and demographic models.

Same as PUBHLTH 209.

Restriction: Graduate students only.

**SOCIOL 227A. Seminar Ethnographic & Qualitative Field Methods. 4 Units.**

Comprehensive and critical discussion of the traditions of qualitative fieldwork; detailed examination of the collection, coding, analysis, and presentation of ethnographic/qualitative field data; and close mentoring of student projects culminating in an original research paper.

Grading Option: In Progress (Letter Grade with S/U).

Restriction: Graduate students only.

**SOCIOL 227B. Seminar Ethnographic & Qualitative Field Methods. 4 Units.**

Comprehensive and critical discussion of the traditions of qualitative fieldwork; detailed examination of the collection, coding, analysis, and presentation of ethnographic/qualitative field data; and close mentoring of student projects culminating in an original research paper.

Prerequisite: SOCIOL 227A

Restriction: Graduate students only.

**SOCIOL 229. Special Topics: Methods . 1-4 Units.**

Studies in selected areas of methods. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 230A. Race and Ethnicity. 4 Units.**

An examination of central questions and issues in the field of race and ethnicity through a critical analysis and discussion of the principal theoretical perspectives and paradigms that have framed much of the scholarship in the area.

Restriction: Graduate students only.

**SOCIOL 232. Inequality. 4 Units.**

Theoretical and empirical approaches to the study of social and economic inequality, with special attention to race/ethnicity, class, and gender.

Restriction: Graduate students only.

**SOCIOL 234. Ethnic America. 4 Units.**

Examines critically the meaning and measurement of ethnicity, race, and nation in sociological theory and research. Theories of ethnicity are explored, along with empirical studies of the construction of ethnic and pan-ethnic identities in historical and contemporary contexts.

Same as CHC/LAT 223.

Restriction: Graduate students only.

**SOCIOL 235. Poverty and Development . 4 Units.**

Examines competing conceptualizations, methods of measurement, and poverty alleviation strategies widely used in developing countries. Focuses on poverty conceptualized as economic deprivation, well-being, vulnerability, and social exclusion.

Same as UPPP 251.

Restriction: Graduate students only.

**SOCIOL 237. Educational Inequality. 4 Units.**

Focuses on macro-level explanations of inequality of schooling, particularly in the U.S. context. Explores traditional models, such as conflict, functionalism, status-attainment, cultural reproduction, and newer synthetic accounts. Emphasis on higher education access and the intersection of education and work.

Restriction: Graduate students only.

**SOCIOL 239. Special Topics: Social Inequality. 2-4 Units.**

Studies in selected areas of social inequality. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 240A. Social Movements. 4 Units.**

A survey of the field of Social Movements, oriented around critical themes in the major theoretical traditions and contemporary exemplars.

Restriction: Graduate students only.

**SOCIOL 241A. Political Sociology. 4 Units.**

Begins with an examination of the three major orientations to the State (Pluralist, Elitist, and Class). Next considers current topics in political sociology including the Welfare State, the New Deal, political behavior, social movements, participation, and democracy.

Restriction: Graduate students only.

**SOCIOL 242. Sociology of Culture. 4 Units.**

Major perspectives in the sociology of culture. Topics include the role of cultural dynamics in the reproduction of inequality, collective action, political and organizational decision making, emotional experience, and the social impacts of new technologies.

**SOCIOL 249. Special Topics: Political Sociology and Social Movements. 2-4 Units.**

Studies in selected areas of political sociology and social movements. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 252A. Global Urbanization. 4 Units.**

Examines the spread of cities worldwide in the 20th century. What are the political and economic causes of this process? What are the social-cultural, political, and economic effects? How is contemporary urbanization linked to global restructuring of other kinds.

Same as UPPP 273.

Restriction: Graduate students only.

**SOCIOL 259. Special Topics: Global Studies and Comparative Development. 2-4 Units.**

Studies in selected areas of global studies and comparative development. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 262A. Population. 4 Units.**

Introduces the interrelationships between population and social organization. Considers measurement and explanation of historical and contemporary trends in birth rates, death rates, migration, and marriage and divorce. Case material is drawn primarily from the U.S. and other industrialized nations.

Restriction: Graduate students only.

**SOCIOL 264. Immigrant America. 4 Units.**

The study of the causes and consequences of international migration has become one of the most vital fields of sociological theory and research. Examines principal theoretical perspectives and empirical research on contemporary immigration flows and the processes of incorporation.

Same as CHC/LAT 224.

Restriction: Graduate students only.

**SOCIOL 265. DASA Research Design. 4 Units.**

Data collection, organization, and analysis in population studies and demography. Research design issues include sampling, longitudinal research, and comparative research.

Prerequisite: Enrollment in DASA program.

Overlaps with SOCIOL 220A.

Restriction: Graduate students only.

**SOCIOL 268. Crimmigration. 4 Units.**

Examines the criminalization of immigration, with an emphasis on U.S. enforcement procedures and outcomes. Analyzes the devolution of federal immigration law to local authorities, the rise in immigrant detention and deportation, and the militarization of the U.S.-Mexico border.

Same as CHC/LAT 225, CRM/LAW C258.

Restriction: Graduate students only.

**SOCIOL 269. Special Topics: Social Demography. 4 Units.**

Studies in selected areas of social demography. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 279. Special Topics: Social Organizations and Institutions. 2-4 Units.**

Studies in selected areas of social organizations and institutions. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 280. Analysis of Social Network Data. 4 Units.**

Overview and application of methods for analyzing social network data. Topics include: data structures, visualization, graph theory, centrality, subgroups, positions, blockmodels, local properties, and statistical models. Social network analysis software is used to analyze a range of examples.

Restriction: Graduate students only.

**SOCIOL 281. Introduction to Social Networks. 4 Units.**

Provides a broad overview of the history, concepts, and applications of social networks. Students have the opportunity to delve deeply into applications of the network approach in their individual areas of interest.

Restriction: Graduate students only.

**SOCIOL 282. Theorizing Illegality and the Experiences of Undocumented Immigrants. 4 Units.**

Examines theories of illegality and citizenship, historical and contemporary undocumented immigrant experiences, and methodological concerns in this area of study.

Same as CHC/LAT 222.

Restriction: Graduate students only.

**SOCIOL 289. Special Topics . 2-4 Units.**

Studies in selected areas of Social Sciences. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 290. Dissertation Research. 1-12 Units.**

Dissertation research with Sociology faculty.

Repeatability: May be taken for credit 10 times.

Restriction: Graduate students only.

**SOCIOL 299. Independent Study. 1-12 Units.**

Independent research with Sociology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Department of Anthropology

**Kim Fortun, Department Chair**

3203 Social & Behavioral Sciences Gateway

949-824-7602

<http://www.anthropology.uci.edu/>

Anthropology is the comparative study of past and present human societies and cultures. The Department of Anthropology at UCI is at the forefront of addressing issues in contemporary theory and ethnographic methods within the discipline. The Department has a strong interdisciplinary bent, with research and teaching interests in economic anthropology, political and legal anthropology, the anthropology of finance, social history and social change, the anthropology of science, technology and medicine, identity and ethnicity, gender and feminist studies, urban anthropology, modernity and development, religion, visual anthropology, and the arts and expressive culture.

The Department also has a strong emphasis on the study of contemporary issues, especially those concerned with emergent, fluid, and complex global phenomena such as international flows of goods, peoples, images, and ideas; the relationship between global processes and local practices; immigration, citizenship, and refugees; population politics; violence and political conflict; ethnicity and nationalism; gender and family; food, health, and technological innovation; law; development and economic transformation; urban studies; and environmental issues. Geographic regions of expertise include China, Southeast Asia, South Asia, Oceania, Europe, Latin America, the Caribbean, East Africa, Latino communities of the United States, and diasporic and transnational communities in the United States and abroad.

- Anthropology, B.A.
- Anthropology, Minor
- Anthropology, Ph.D.
- Critical Theory, Graduate Emphasis
- Feminist Studies, Graduate Emphasis
- Medical Anthropology, Minor



## Faculty

Samar Al-Bulushi, Ph.D. Yale University, *Assistant Professor of Anthropology* (surveillance, policing, and militarized urbanisms; Islam, Africa, and the racialized geopolitics of the war on terror; elites, diplomacy, and transnational governance)

Victoria Bernal, Ph.D. Northwestern University, *Professor of Anthropology; Culture and Theory; Gender and Sexuality Studies; Religious Studies* (gender, war, cyberspace, Islam, transnationalism, Africa)

Thomas D. Boellstorff, Ph.D. Stanford University, *Professor of Anthropology* (virtual worlds, sexuality, postcoloniality, HIV/AIDS, mass media and popular culture, language and culture, Indonesia, Southeast Asia)

John P. Boyd, Ph.D. University of Michigan, *Professor Emeritus of Anthropology*

Michael L. Burton, Ph.D. Stanford University, *Professor Emeritus of Anthropology*

Francis A. Cancian, Ph.D. Harvard University, *Professor Emeritus of Anthropology*

Leo Chavez, Ph.D. Stanford University, *Distinguished Professor of Anthropology* (migration, media, discourse analysis, visual semiotics, medicine)

Benjamin N. Colby, Ph.D. Harvard University, *Professor Emeritus of Anthropology*

Kim Fortun, Ph.D. Rice University, *Department Chair and Professor of Anthropology* (environmental problems and science, science and technology, environmental health, disaster, India)

Michael Fortun, Ph.D. Harvard University, *Associate Professor of Anthropology* (anthropology of science, air pollution science, data science, genetics, history of science, United States, Iceland)

David Theo Goldberg, Ph.D. The Graduate Center, City University of New York, *Director of the UC Humanities Research Institute and Professor of Comparative Literature; Anthropology; Criminology, Law and Society* (race, racism, race and the law, political theory, South Africa, digital humanities)

Susan M. Greenhalgh, Ph.D. Columbia University, *Professor Emeritus of Anthropology*

Sherine Hamdy, Ph.D. New York University, *Associate Professor of Anthropology* (medical anthropology, science, technology and society, bioethics, comics, Islam, Egypt, middle east)

Anneeth Kaur Hundle, Ph.D. University of Michigan, Ann Arbor, *Dhan Kaur Sahota Presidential Chair of Sikh Studies and Assistant Professor of Anthropology; Religious Studies* (Sikh studies, African and South Asian diaspora/studies; politics of afro-asianism; citizenship, race, and decolonization; minoritization and community formation, postcolonial and transnational feminisms; gender and sexuality; critical university studies; Uganda, East Africa, global south)

Angela C. Jenks, Ph.D. University of California, Berkeley, *Associate Professor of Teaching of Anthropology* (medical anthropology, race and ethnicity, urban ethnography, United States)

Eleana Kim, Ph.D. New York University, *Associate Professor of Anthropology; Asian American Studies* (kinship, transnationalism, environment, Korea)

Karen Leonard, Ph.D. University of Wisconsin, *Professor Emeritus of Anthropology; Religious Studies*

Lilith Mahmud, Ph.D. Harvard University, *Associate Professor of Anthropology* (freemasonry, elites, gender, nationalism, race, citizenship, critical studies of Europe, secrecy, transparency, knowledge production, secret societies, power)

George E. Marcus, Ph.D. Harvard University, *Distinguished Professor of Anthropology* (elites, ethnography, cultural critique, Pacific)

William M. Maurer, Ph.D. Stanford University, *Dean of the School of Social Sciences and Professor of Anthropology; Criminology, Law and Society; School of Law* (anthropology of law, globalization, Caribbean, anthropology of money and finance, gender and kinship)

Michael J. Montoya, Ph.D. Stanford University, *Professor Emeritus of Anthropology*

Keith Murphy, Ph.D. University of California, Los Angeles, *Associate Professor of Anthropology* (linguistics, design, aesthetics and morality, Sweden)

Sylvia Nam, Ph.D. University of California, Berkeley, *Assistant Professor of Anthropology; Biological Chemistry; Urban Planning and Public Policy* (urban studies, property, transnational expertise, Southeast Asia)

Valerie A. Olson, Ph.D. Rice University, *Associate Professor of Anthropology* (environmental systems, science and technology, U.S., extreme environments)

Kristin Peterson, Ph.D. Rice University, *Associate Professor of Anthropology* (science and technology, feminism, pharmaceuticals, West Africa)

Justin Richland, Ph.D. University of California, Los Angeles, *Associate Professor of Anthropology* (legal discourse analysis and semiotics, anthropology of law; contemporary native American law, politics, art, and ethnographic museology)

A. K. Romney, Ph.D. Harvard University, *Professor Emeritus of Anthropology*

Damien Sojoyner, Ph.D. University of Texas at Austin, *Associate Professor of Anthropology; Culture and Theory* (prisons; public education; urban anthropology; race; African diaspora theory; public policy and law; gender; United States)

Ian Straughn, Ph.D. University of Chicago, *Assistant Professor of Teaching of Anthropology; Religious Studies* (archaeology, cultural heritage, middle east and Islamic studies, space and landscape, material culture)

Roxanne Varzi, Ph.D. Columbia University, *Professor of Anthropology; Culture and Theory; Film and Media Studies; Religious Studies; Visual Studies* (Iran, media, war, visual anthropology, film studies, ethnographic and fiction writing)

Douglas R. White, Ph.D. University of Minnesota, *Professor Emeritus of Anthropology*

Mei Zhan, Ph.D. Stanford University, *Associate Professor of Anthropology* (medical anthropology, cultural and social studies of science, globalization, transnationalism, gender, China and United States)

## Affiliate Faculty

Lee Cabatingan, Ph.D. University of Chicago, *Assistant Professor of Criminology, Law and Society; Anthropology* (Caribbean law and sovereignty; construction of authority at the Caribbean Court of Justice)

Susan B. Coutin, Ph.D. Stanford University, *Professor of Criminology, Law and Society; Anthropology; Religious Studies* (law, culture, immigration, human rights, citizenship, political activism, Central America)

Eve Darian-Smith, Ph.D. University of Chicago, *Department Chair and Professor of Global and International Studies; Anthropology; Criminology, Law and Society*

Jerry Won Lee, Ph.D. University of Arizona, *Associate Professor of English; Anthropology; Asian American Studies; Comparative Literature; Culture and Theory*

Gabriele M. Schwab, Ph.D. University of Konstanz, *UCI Chancellor's Professor of Comparative Literature; Anthropology; Culture and Theory; English; European Languages and Studies; German* (modern literature, critical theory, psychoanalysis, comparative literature)

## Courses

### ANTHRO 2A. Introduction to Sociocultural Anthropology. 4 Units.

Introduction to cultural diversity and the methods used by anthropologists to account for it. Family relations, economic activities, politics, gender, and religion in a wide range of societies. Stresses the application of anthropological methods to research problems.

(III and VIII ).

### ANTHRO 2B. Introduction to Biological Anthropology. 4 Units.

Evolutionary theory and processes, comparative primate fossil record, human variation, and the adequacy of theory, and empirical data.

(III)

### ANTHRO 2C. Introduction to Archaeology. 4 Units.

Archaeological theory and cultural processes with emphasis on the American Southwest, Mesoamerica, and Mesopotamia.

(III)

### ANTHRO 2D. Introduction to Language and Culture. 4 Units.

Explores what the study of language can reveal about ourselves as bearers of culture. After introducing some basic concepts, examines how cultural knowledge is linguistically organized and how language might shape our perception of the world.

Same as LSCI 68.

(III)

**ANTHRO 10A. Probability and Statistics. 4 Units.**

An introduction to probability and statistics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Emphasizes examples from sociology, anthropology, and related social science disciplines.

Same as SOCIOL 10A.

Overlaps with PSYCH 10A, SOCECOL 13, SOC SCI 10A, POL SCI 10A.

Restriction: Anthropology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**(Va)**

**ANTHRO 10B. Probability and Statistics. 4 Units.**

An introduction to probability and statistics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Emphasizes examples from sociology, anthropology, and related social science disciplines.

Prerequisite: SOCIOL 10A or ANTHRO 10A

Same as SOCIOL 10B.

Overlaps with PSYCH 10B, SOCECOL 13, SOC SCI 10B, POL SCI 10B.

Restriction: Anthropology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**(Va)**

**ANTHRO 10C. Probability and Statistics. 4 Units.**

An introduction to probability and statistics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Emphasizes examples from sociology, anthropology, and related social science disciplines.

Prerequisite: SOCIOL 10B or ANTHRO 10B

Same as SOCIOL 10C.

Overlaps with PSYCH 10C, SOCECOL 13, SOC SCI 10C, POL SCI 10C.

Restriction: Anthropology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**(Vb)**

**ANTHRO 20A. People, Cultures, and Environmental Sustainability. 4 Units.**

Anthropological consideration of global environmental sustainability from the perspective of human cultures and communities. Causes and consequences of population growth, natural resource management, environmental law, environmental ethics. Case studies emphasize tropical rain forests, arid lands of Africa and North America.

**(VIII)**

**ANTHRO 25A. Environmental Injustice. 4 Units.**

Explores how pollution, climate change, and other environmental problems impact people around the world, often worsening social inequality. Students use social science frameworks to understand environmental problems, different interpretations of these problems, and how people have organized for political change.

**(III and VII ).**

**ANTHRO 30A. Global Issues in Anthropological Perspective. 4 Units.**

Explores anthropological perspectives on issues of importance in an increasingly global society. Topics include emphases on ethnic conflict; identity; immigration and citizenship; religion and religious diversity; medical anthropology; legal anthropology; development and economic change; gender.

Restriction: Anthropology Majors have first consideration for enrollment.

**(VIII)**

**ANTHRO 30C. Visual Anthropology . 4 Units.**

Focusing on the construction of culture through visibility, this course engages traditional ethnographic films, popular media and anthropological texts to analyze ethics, "reality" and fiction; propaganda and documentary, construction of a frame, the responsibility of the filmmaker, photographer, and anthropologist.

**ANTHRO 41A. Global Cultures and Society. 4 Units.**

Offers a general overview of the rise of global interdependence in political, economic, demographic, and cultural terms. Considers what drove people from relative isolation into intensified intercourse with one another, and investigates the consequences of this shift.

Same as INTL ST 11.

Restriction: Anthropology Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(III and VIII ).

**ANTHRO 45A. Science, Culture, Power. 4 Units.**

Examines science in historical and cultural context (Scientific and Darwinian Revolutions, Manhattan Project, contemporary biosciences) to understand scientific truths and their limits, scientists as social actors, and vital intersections of sciences with religion, politics, gender, and other forms of culture.

(III)

**ANTHRO 48. Archaeology or Aliens?: Conspiracy, Pseudoscience, and the Emergence of Civilizations. 4 Units.**

Archaeology has inspired (and sometimes actively encouraged) various theories about aliens, lost civilizations, dark conspiracies, and mysterious technologies. Does such an intimate relationship with these fantastic notions undermine archaeology and its claims of authoritative knowledge about past cultures.

(III and VIII ).

**ANTHRO 89. Special Topics in Anthropology. 1-4 Units.**

Studies in selected areas of Anthropology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 100A. Ethnography and Anthropological Methods. 4 Units.**

Anthropological research, learning ethnographic methods, and how to choose a research topic, construct research questions, explore library resources, collect data, and write an analytical paper on research findings.

Prerequisite or corequisite: ANTHRO 2A

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment. Medical Anthropology Minors have first consideration for enrollment.

**ANTHRO 100B. Anthropology Careers. 4 Units.**

Gives students the skills and perspective needed to leverage undergraduate anthropology education in diverse career domains. Students explore different career domains (health care, tech development, environmental governance, etc.) and learn to represent themselves professionally.

Restriction: Anthropology Majors only. Anthropology Minors only. Medical Anthropology Minors only.

**ANTHRO 121AW. Kinship and Social Organization. 4 Units.**

Organization of social life primarily in preindustrial societies. Theories of kinship, marriage regulations, sexual behavior, and social roles. Comparisons of biological, psychological, sociological, and economic explanations of social organization.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**ANTHRO 121D. Cross-Cultural Studies of Gender. 4 Units.**

Explores the construction of gender in national and transnational contexts. Special attention is given to how race, sexuality, class, and global inequalities shape different experiences of gender, and how gender structures political, institutional, and social life across the world.

Same as INTL ST 153B.

(VII)

**ANTHRO 121G. Political Anthropology. 4 Units.**

Utilizes anthropological accounts of Western and non-Western societies to question conventional ways of thinking about power and politics. Classical traditions in political anthropology are critiqued; an alternative view is presented through recent anthropological political analyses of various topics.

**ANTHRO 121J. Urban Anthropology. 4 Units.**

Cultural roles of urban centers and processes of urbanization in comparative perspective, focusing on both nonwestern, nonindustrial societies of past and present; the relationship between modern urban centers and Third World peoples. Migration, urban poverty, in Africa, Asia, Latin America.

Same as INTL ST 153C.

**ANTHRO 124. Gold: The Alchemy of Socio-Economic Practice. 4 Units.**

Before bitcoin, before derivatives and mortgage-backed securities, before even writing itself, there was gold. Explore gold's role in the development of culture, politics, and power. From Pharaohs to modern financial wizards, gold has impacted and mediated social life.

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment. Archaeology Minors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Economics Minors have first consideration for enrollment.

**ANTHRO 125. Anthropology of Debt. 4 Units.**

Explores how debt has shaped culture across varied contexts geographically and historically. In what ways have societies naturalized indebtedness, taken it for granted as a fact of life, and used it for organizing social relations.

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment. Archaeology Minors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Economics Minors have first consideration for enrollment.

**ANTHRO 125A. Economic Anthropology. 4 Units.**

Economic systems in comparative perspective: production, distribution, and consumption in market and non-market societies; agricultural development in the third world.

Prerequisite: One course in general science, anthropology, economics, geography, or sociology.

Same as ECON 152A.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment. Anthropology Majors have first consideration for enrollment.

**ANTHRO 125B. Ecological Anthropology. 4 Units.**

Studies relationships between human communities and their natural environments. The role of environment in shaping culture; effects of extreme environments on human biology and social organization; anthropologist's role in studying global environmental problems, e.g., African famine, tropical rain forests destruction.

Prerequisite: ANTHRO 2A or ANTHRO 2B or ANTHRO 2C

**ANTHRO 125C. Environmental Anthropology. 4 Units.**

Introduces students to anthropological and qualitative research on the relationship of humans, non-humans, and environments. Focuses on how to analyze and evaluate social and cultural differences in environmental perception, relations, justice, governance, sustainability, and cosmology.

Prerequisite: ANTHRO 2A or ANTHRO 2B or ANTHRO 2C or ANTHRO 2D

**(III)****ANTHRO 125F. Humans and Other Animals. 4 Units.**

Explores peoples' relationships with other animals, a topic that continues to shape anthropological understandings of humanness, culture, and the social. Subthemes: symbol and matter, nature/culture, ontologies, relations, moralities, ecologies, futures.

Prerequisite: ANTHRO 2A or ANTHRO 2B or ANTHRO 2D

**ANTHRO 125S. The Anthropology of Money. 4 Units.**

Anthropological approaches to money; impact of money on subsistence economies; cultural history of money; and modern transformations of money. Students conduct ethnographic research on alternative money practices in Southern California, and create an online exhibition and research paper.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 125U. Immigration, Nation, and Media. 4 Units.**

Examines media shapes and reflects public opinion on immigration and its representation of immigrants, citizens, and ideas about the nation, and who belongs and who is a potential threat; as well as the relationship between scholars and journalists.

Same as CHC/LAT 123, SPSS 101A.

**ANTHRO 125X. Transnational Migration. 4 Units.**

Examines the movement of people across national borders, governmentality and the role of state practices to control populations, and issues of citizenship, belonging, and identity. Examples are drawn from the United States, Europe, Latin America, Asia, and Africa.

Same as CHC/LAT 161, INTL ST 117A.

**(VIII)****ANTHRO 125Z. Islam in America. 4 Units.**

Offers a critical academic study of Islam in America, focusing on the core tenets of belief, the diversity of practices, and historical transformations that have taken place since the arrival of Muslims in the United States.

Same as ASIANAM 142.

**ANTHRO 126. Cultures of the Middle East. 4 Units.**

The diversity of cultures and peoples who constitute the Middle East demonstrates the failure of much contemporary media and discourse to understand this region. Students learn about the broad scope of the contemporary Middle East through an ethnographic lens.

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment.

**ANTHRO 126A. Elite Cultures. 4 Units.**

The distinctive contribution that ethnographic studies have made to the understanding of elites past and present, in particular societies and globally.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 127. Controversies, Courts, Cultures: The Anthropology of Law. 4 Units.**

Assesses the contributions anthropology has made to legal scholarship, reviewing historical and contemporary themes. Considers both comparative questions of law's norms, structures, and practices around the globe, and the specific insights anthropology offers about contemporary U.S. law.

Same as CRM/LAW C183.

**(III)****ANTHRO 127A. Law and Modernity. 4 Units.**

The rise and spread of Enlightenment legal traditions, social contract theory, individual rights, ideologies of 'liberty, equality, fraternity'; contradictions of liberal law, its understandings of 'primitive' and 'civilized'; pervasive myths of property, difference, race, and rights. Reading- and writing-intensive.

Same as CRM/LAW C191.

**ANTHRO 127B. Global Migrations, Anthropology, and the Law. 4 Units.**

Course explores how cultural contexts and national laws frame migration, and define categories of migrants, families, and people. Topics include illegality, transnational families, refugees and economic migrants, labor conditions, deportation practices, discipline and crime, citizenship controversies, and nativism.

**ANTHRO 128A. Science, Technology, Controversy. 4 Units.**

Explores ways in which the social sciences conceive of science as a sociocultural practice. Emphasis on literature in Science and Technology Studies (STS), especially writings that concern the relationship of science to space and place, power, and politics.

Restriction: Anthropology Majors only.

**ANTHRO 128B. Race, Gender, and Science. 4 Units.**

Perfect for pre-health, science and social science majors wanting to appreciate how science and society interact. Race and gender as biological and socio-cultural constructs are examined. Questions explored: What is disease? What is science? What are social and biological differences.

Same as CHC/LAT 176.

**(VII)****ANTHRO 128C. Digital Cultures . 4 Units.**

Explores cultural and political implications of the infotech revolution and the ways new media are used around the world, new cultural practices and spaces (e.g., cybercafes), debates surrounding the meanings of these new technologies, and their implications for transforming society.

Prerequisite: ANTHRO 2A and (ANTHRO 2B or ANTHRO 2C or ANTHRO 2D)

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 129. Special Topics: Social and Economic Anthropology. 1-4 Units.**

Studies in selected areas of Social and Economic Anthropology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 132A. Psychological Anthropology. 4 Units.**

Cultural differences and similarities in personality and behavior. Child-rearing practices and consequent adult personality characteristics, biocultural aspects of child development and attachment, culture and behavior evolutionary models, politically linked personality, cognitive anthropology, psychology of narrative forms, comparative national character studies.

Prerequisite: ANTHRO 2A or PSYCH 7A or (PSYCH 9A and PSYCH 9B and PSYCH 9C) or (PSY BEH 11A and PSY BEH 11B and PSY BEH 11C)

Same as PSYCH 173A.

Restriction: Psychology Majors have first consideration for enrollment.

**ANTHRO 134A. Medical Anthropology. 4 Units.**

Introduces students to cross-cultural perspectives and critical theories in anthropological studies of medicine. Special attention is given to diverse ways of understanding bodies, illnesses, and therapeutic practices in our changing world.

Same as CHC/LAT 178A.

**(VIII)**

**ANTHRO 134B. Cultures of Biomedicine. 4 Units.**

An introduction to the anthropological study of biomedicine and biotechnology. Topics include medicalization, experimentation and discovery, diagnosis, expertise, health activism, and biotechnology.

**ANTHRO 134C. Medicine, Food, and Health. 4 Units.**

With anthropological studies of edible things as its foundation, this course explores topics related to the relationship between medical knowledge, eating, and health from a medical anthropological perspective.

Prerequisite: ANTHRO 2A or ANTHRO 2B or ANTHRO 2D

**ANTHRO 134F. Anthropology of the Body. 4 Units.**

Examines human bodies as both biological and sociocultural entities and explores the relationship among mind, body, and society cross-culturally. Topics include embodiment; race, sex, gender, and the body; somatization; control of the body; commodified bodies; and hybrid/cyborg bodies.

**ANTHRO 134G. HIV/AIDS in a Global Context. 4 Units.**

Examines issues concerning cultural conceptions of HIV infection and disease worldwide. Topics include treatment and prevention, identity and behavior, risk, ethnicity, gender, youth, sexuality, activism, drug use, illness, religion, the clinical encounter, national belonging, and the pharmaceutical industry.

**(VIII)**

**ANTHRO 134H. Anthropology of Food. 4 Units.**

Examines how food communicates ideas about ethnocentrism, disgust, privilege, gender, race, labor, social identities and hierarchies, globalization, power, and the 'Western diet' and its health consequences.

Same as CHC/LAT 118.

**ANTHRO 134N. Disease, Health, and Inequality. 4 Units.**

Examines the relationships among disease, health, and social inequality in the U.S. and globally. Topics include infectious and chronic disease case studies, health policy, and strategies for promoting health equity.

**ANTHRO 135A. Religion and Social Order. 4 Units.**

An anthropological exploration of religious belief and practices in diverse social and historical contexts. Emphasis placed on selected non-western traditions of the sacred, and on issues of power, ritual, moral order, and social transformation.



**ANTHRO 136A. Nationalism and Ethnicity in the Contemporary World. 4 Units.**

An exploration of the concepts of identity, culture, ethnicity, race, and nation through ethnographic cases, with a view to asking larger questions: how do people create nativeness and foreignness? How does 'culture' get worked into contemporary racisms and nationalisms.

Same as INTL ST 153E.

(VIII)

**ANTHRO 136B. History of Anthropological Theory. 4 Units.**

Provides foundational knowledge in the discipline of anthropology by reviewing competing approaches in anthropological theory, from the nineteenth century to the present. Covers historically fundamental approaches—social evolutionism, functionalism—and recent movements such as feminism, cultural studies, poststructuralism, and postmodernism.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 136D. Conflict Resolution in Cross-Cultural Perspective. 4 Units.**

Examines theories of conflict management. Analyzes how conflict is mitigated in diverse cultures: at the interpersonal level, between groups, and on the international scale. Students discuss readings, hear from conflict management practitioners, and simulate negotiations.

Same as POL SCI 154G, SOC SCI 183E, INTL ST 183E.

(VIII)

**ANTHRO 136G. Colonialism and Gender. 4 Units.**

An anthropological enquiry into the ways colonial relations of power have been structured and gendered throughout the world, and to what effect. Examines the social locations of men and women in the everyday exercise of colonial and imperial power.

Same as INTL ST 153D.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 136K. The Woman and the Body. 4 Units.**

Probes culture and politics of the female body in contemporary American life. Focusing on 'feminine beauty,' examines diverse notions of beauty, bodily practices, and body politics embraced by American women of different classes, ethnicities, and sexualities.

(VII)

**ANTHRO 138. Prisons and Public Education. 4 Units.**

Looks at the connections between schools and prisons in the United States. Students learn about ideas that push beyond common trope of the "school to prison pipeline."

Same as AFAM 159.

**ANTHRO 139. Special Topics in Cultural and Psychological Anthropology. 1-4 Units.**

Studies in selected areas of Cultural and Psychological Anthropology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 140. Sex and Conquest in Latin America. 4 Units.**

Competing ideas of masculinity and femininity, sexual violence, sexual identities, and gendered hierarchies informed how the Spanish engaged in military and religious domination of Mexican and Andean communities, as well as the forms of native resistance throughout colonial Latin America.

Same as HISTORY 160, CHC/LAT 150A, GEN&SEX 171A.

**ANTHRO 141A. Ancient Civilization of Mexico and the Southwest. 4 Units.**

The prehistory and cultural evolution of the civilization which originated in Mexico, including the Olmecs, Aztecs, Toltecs, Maya, and Zapotec, as well as the Pueblos of the Southwestern U.S. Topics include the origins of food production and of the state.

Same as INTL ST 177I.

**ANTHRO 146. Consumption and Culture. 4 Units.**

Our modern 'society of the spectacle' often equates your consumption to your very humanity. Explores the ways in which our desire for things expresses our identity, politics, place within society, and how what we consume dominates social life.

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment.

**ANTHRO 147. Egyptomania. 4 Units.**

An exploration into the archaeological heritage and cultures of ancient Egypt. Also examines how ancient Egypt became appropriated as a popular cultural phenomenon and site of scholarship in the centuries after the Pharaohs.

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment. Archaeology Minors have first consideration for enrollment.

**ANTHRO 147A. Archaeology of the Islamic World. 4 Units.**

The archaeological record connected with the Islamic tradition spans nearly 1,500 years and stretches from Spain to South East Asia. Working with artifacts and other materials, students learn about the sites and historical transformations associated with Islam and Muslim societies.

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment. Archaeology Minors have first consideration for enrollment.

**ANTHRO 147B. Archaeology, Politics, and Identity. 4 Units.**

Archaeologists don't excavate in a political vacuum. Their research has profound consequences for the ways in which people identify with and claim their cultural heritage. Examines archaeology's role in constructing such identities through the traces of the past.

Restriction: Anthropology Majors have first consideration for enrollment. Anthropology Minors have first consideration for enrollment. Archaeology Minors have first consideration for enrollment.

**ANTHRO 148. I Dig UCI. 4 Units.**

An introduction to archaeological fieldwork through participation in an active excavation on campus. Students engage with research design and learn the foundational methods of archaeological recovery: survey, mapping, sampling strategies, documentation, excavation, artifact identification, and interpretation.

**ANTHRO 149. Special Topics in Archaeology. 1-4 Units.**

Studies in selected areas of Archaeology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 150A. Language and Social Cognition. 4 Units.**

Explores the relationship between language and cognition in social and cultural contexts. The overall goal is to think through how language structure and use impact how individuals perceive, think about, and understand the world around them.

Same as LSCI 168S.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 151A. Improvisation, Language, and Culture. 4 Units.**

Addresses improvisation, both in performance and in everyday life. Examines improvisation as the 'flexible regulation' of everyday behavior by exploring different scholarly treatments of language and interaction, and working on developing actual theatrical improvisation skills.

Same as LSCI 168J.

Restriction: Upper-division students only.

**ANTHRO 152A. Language Origins: Evolution, Genetics, and the Brain. 4 Units.**

Examines how human language(s) may have originated. Studies pertinent techniques (reconstruction) and addresses related questions, including is our language faculty inborn (i.e., genetically encoded)? Can brain imaging and population genetics research help to unlock this mystery of human evolution?.

Same as LSCI 175, GLBLCLT 105, HISTORY 135G.

**ANTHRO 162A. Peoples and Cultures of Latin America. 4 Units.**

Surveys the prehistory of Latin America and its indigenous cultures, emphasizing the impact of colonial rule, capitalism, and twentieth-century transformations. Emphasis on communities from several countries. In some years, emphasis on comparisons between the Latin American and Caribbean experiences.

Same as INTL ST 177J, CHC/LAT 120.

(VIII)

**ANTHRO 162B. Indian North America. 4 Units.**

A survey of indigenous peoples in North America: American Indians, Alaska Natives, First Nations, Native Americans. Tribal populations and geographic distributions, political and social organization, sovereignty, self-determination, intergovernmental relations; cultural continuity and change; management, preservation, development of environments/resources.

**(VII)****ANTHRO 162C. Race and Empire in Colonial Latin America. 4 Units.**

Explores how native people of Latin America with enslaved and free African incorporated and defied Spanish and Portuguese colonization. Focuses on religious adaptations, resistance movements, legal systems, and the emergence of multicultural communities to explain how race shaped European empires.

Same as HISTORY 165.

**ANTHRO 162D. Anthropology of the United States. 4 Units.**

Examines anthropological research in and of the United States. Topics include race, class, identity, politics, law, and media.

**ANTHRO 163A. Peoples of the Pacific. 4 Units.**

The cultural history and recent developments among the Pacific peoples of Polynesia, Micronesia, Melanesia, New Guinea, and Australia.

Same as INTL ST 158B.

**(VIII)****ANTHRO 164A. 21st Century Africa. 4 Units.**

Comparative studies of the cultures and societies of Sub-Saharan Africa, with emphasis on critical study of colonialism and postcoloniality, social transformation, and the politics of identity.

Prerequisite: ANTHRO 2A

Same as INTL ST 157A.

Restriction: Anthropology Majors have first consideration for enrollment.

**(Ib)****ANTHRO 164P. Peoples and Cultures of Post-Soviet Eurasia. 4 Units.**

Examines the cultures and political conflicts of the more than 130 indigenous ethnic groups in the European and Asian territories of the former U.S.S.R. Emphasis is on the theoretical issues of ethnicity, nationalism, and conflict management.

Same as INTL ST 162B, POL SCI 154F.

**(VIII)****ANTHRO 165A. Modern Iran: Cinema and the City. 4 Units.**

Exploring modern Iran through film, literature, photography, travel writing, and philosophy and social science texts that introduce students to important concepts in post-colonial studies, social thought, war culture, religion, and media as experienced through the paradigm of a non-Western modernity.

Same as PERSIAN 165A.

**ANTHRO 169. Special Topics in Area Studies. 1-4 Units.**

Studies in selected areas of Anthropology. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 179. Special Topics: Methods and Formal Representations. 1-4 Units.**

Studies in selected areas of Methods and Formal Representations. Topics addressed vary each quarter.

Restriction: Anthropology Majors have first consideration for enrollment.

**ANTHRO 180AW. Anthropology Majors Writing Seminar. 4 Units.**

Anthropological theory designed especially for majors in Anthropology. Topics addressed vary each quarter.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 3 times as topics vary.

Restriction: Anthropology Majors only.

**(Ib)****ANTHRO 190. Senior Thesis. 4 Units.**

Senior thesis with Anthropology faculty.

Repeatability: May be taken for credit 3 times.

**ANTHRO H190A. Honors Research Design. 3 Units.**

Students design a research project and articulate its goals and significance. Written work consists of a research proposal describing the research questions, the relevant literature, methods of data collection and analysis, and ethical considerations.

Prerequisite or corequisite: ANTHRO 199

Restriction: Anthropology Honors students only.

**ANTHRO H190B. Honors Field Research. 3 Units.**

Students begin or continue ethnographic field research and gain experience with a variety of data collection methods, including participant-observation, interviews, surveys, and the study of archival and documentary materials.

Prerequisite or corequisite: ANTHRO 199 and ANTHRO H190A

Restriction: Anthropology Honors students only.

**ANTHRO H190C. Honors Research Analysis. 3 Units.**

Students apply qualitative data analysis techniques to ethnographic data collected as part of their Honors research.

Prerequisite or corequisite: ANTHRO H190B and ANTHRO 199. Anthropology Honors ONLY.

**ANTHRO H190W. Honors Thesis Writing. 3 Units.**

Students draft a senior honors thesis (typically) with the following sections: problem statement, literature review, ethnographic background, and descriptions of the methods, results, and conclusions.

Prerequisite or corequisite: ANTHRO H190C and ANTHRO 199. Anthropology Honors ONLY. Satisfactory completion of the Lower-Division Writing requirement.

**(Ib)****ANTHRO 197. Field Study. 1-4 Units.**

Field study with Anthropology faculty.

Repeatability: May be repeated for credit unlimited times.

**ANTHRO 198. Directed Group Study. 1-4 Units.**

Directed study with Anthropology faculty.

Repeatability: May be repeated for credit unlimited times.

**ANTHRO 199. Independent Study. 1-4 Units.**

Independent research with Anthropology faculty.

Repeatability: May be repeated for credit unlimited times.

**ANTHRO 202A. Proseminar in Anthropology. 4 Units.**

Year-long intensive introduction to the history of anthropological thought and reading in classical and contemporary ethnography for first-year graduate students.

Restriction: Graduate students only.

**ANTHRO 202B. Proseminar in Anthropology. 4 Units.**

Year-long intensive introduction to the history of anthropological thought and reading in classical and contemporary ethnography for first-year graduate students.

Prerequisite: ANTHRO 202A

Restriction: Graduate students only.

**ANTHRO 202C. Proseminar in Anthropology. 4 Units.**

Year-long intensive introduction to the history of anthropological thought and reading in classical and contemporary ethnography for first-year graduate students.

Prerequisite: ANTHRO 202B

Restriction: Graduate students only.

**ANTHRO 204A. Proseminar in Medicine, Science, and Technology. 4 Units.**

Explores the phenomena studied by 'medical anthropology' and 'science and technology studies' are inextricably linked, and how understanding formations requires moving between disparate fields of inquiry. Required for students pursuing a Graduate Certificate in Anthropologies of Medicine, Science, and Technology.

Restriction: Students pursuing a Graduate Certification in Anthropologies of Medicine, Science, and Technology have first consideration for enrollment.

**ANTHRO 215A. Ethnographic Methods. 4 Units.**

Exposes students to diverse methods, both traditional and experimental, used in anthropological ethnographic research. Students gain experience practicing diverse methods, and learn to select methods appropriate to particular study designs and contexts.

Restriction: Graduate students only.

**ANTHRO 215B. Research Design. 4 Units.**

Introduces research design for anthropology, including concept work and mapping, research topic and aims development, research question construction, and fieldwork planning.

Prerequisite: ANTHRO 215A

Restriction: Graduate students only.

**ANTHRO 215C. Grant and Proposal Writing. 4 Units.**

Focuses on production, critique, and revision of student research proposals. A practical seminar designed to improve student proposals, help students through the application processes, and increase students' chances of obtaining support for their research.

Prerequisite: ANTHRO 215B

Restriction: Graduate students only.

**ANTHRO 229A. Anthropology of Knowledge. 4 Units.**

Examines the politics of knowledge. Considers the long history of anthropological studies concerning a wide variety of knowledge forms and practices, including more recent feminist and postcolonial studies. Aims to investigate and enlarge normative definitions of knowledge and science.

**ANTHRO 230D. Ethnography and its Collaborative Futures. 4 Units.**

Structured readings of selected career-making ethnographic works, past and present, with an emphasis on how ethnographic projects evolve into diverse, collaborative projects.

**ANTHRO 230F. Ethnography. 4 Units.**

Explores the theory and practice of ethnography with a focus on anthropology, the discipline most associated with ethnography. Students are exposed to the theoretical underpinnings of ethnographic work, traditional and innovative practices, and sample ethnographies.

Same as CRM/LAW C222, CHC/LAT 217.

Restriction: Graduate students only.

**ANTHRO 232B. Medical Anthropology. 4 Units.**

Explores historical and contemporary theoretical positions and debates in medical anthropology. Topics may include subjectivity, theories of the body, biopolitics, biomedical technologies, sexuality, pharmaceuticals, political economy and health, infectious disease and epidemics, health disparities, and humanitarianism.

Restriction: Students pursuing a Graduate Certification in Anthropologies of Medicine, Science, and Technology have first consideration for enrollment.

**ANTHRO 235A. Transnational Migration. 4 Units.**

Examines borders and boundaries as material and semiotic constructs. Drawing upon an array of literatures, but loosely situated in U.S. geo/biopolitics, explores transformative troubleings of places, spaces, borders, and bodies of all sorts.

Same as SOC SCI 254A, CHC/LAT 215.

Restriction: Graduate students only.

**ANTHRO 240A. Economic Anthropology. 4 Units.**

Classic and contemporary theory in economic anthropology. Case studies: Latin America (primarily Mexico and the Andes), Africa, and the Pacific. Substantive topics: non-market exchange, markets and marketplaces, households, gender, management of common property (fisheries, pastoral lands, forests), labor, and development.

Restriction: Graduate students only.

**ANTHRO 245A. Seminar in Political Anthropology. 4 Units.**

Explores anthropological approaches to politics. Covers a range of issues and topics, including: theories of culture, power, and hegemony; approaches to colonial and post-colonial relations of global inequality; and ethnographic approaches to the modern state.

Restriction: Graduate students only.

**ANTHRO 246. Feminist Anthropology. 4 Units.**

Examines feminist anthropology's rise as an interdisciplinary field. Paying special attention to issues of power, subjectivity, and authority in the research encounter, feminist anthropologists' major contributions to ethnography, gender studies, queer studies, and cultural anthropology are surveyed.

Restriction: Graduate students only.

**ANTHRO 246E. Capital and Empire. 4 Units.**

Examines theories of capital and empire via anthropological theory, post/colonial critique, feminist theory, and Black political thought. Moreover, it examines social movements, geo/political trajectories and formations, and political economic trends that have emerged after the 2008 financial crisis.

Restriction: Graduate students only.

**ANTHRO 247A. Structuralism and Post-Structuralism. 4 Units.**

Traces recent theoretical discussions and arguments over the philosophical and historical 'subject' from structuralist decenterings toward the characteristically 'post-structuralist' contemporary concern with the historical and political constitution of subjectivities and subject positions.

Restriction: Graduate students only.

**ANTHRO 249A. Humanism and Posthumanism. 4 Units.**

Examines alternative forms of human, humanisms, and posthumanisms to explore the inherent ambiguities and shifting boundaries of knowing and being human, and to venture into modes of analysis that problematize the universality and globality of liberal humanism.

**ANTHRO 250A. The Cultural Politics of Visual Representation. 4 Units.**

Develops a theoretical framework for analyzing and reading visual images. Images, as cultural productions, are steeped in the values, ideologies, and taken-for-granted beliefs of the culture which produced them and a political economy that is class, race, and gender inflected.

**ANTHRO 250B. Digital Technologies, Culture, and Media. 4 Units.**

Explores questions of sociality in cyberspace, including what social theories and ethnographic methods are effective in studying online cultures. Topics include general issues like indexicality, reference, temporality, spatiality, and embodiment, and topics such as language, gender, ethnicity, property, and inequality.

Restriction: Graduate students only.

**ANTHRO 252A. Queer Anthropology. 4 Units.**

Explores historical and contemporary scholarship that employs ethnographic approaches to address the discursive construction of sexuality. Also examines how the discipline of anthropology has been shaped by the study of sexuality.

Restriction: Graduate students only.

**ANTHRO 253A. Design, Aesthetics, and Social Life. 4 Units.**

Anthropology has only recently recognized that design demands consideration as a cultural form linked to, yet nonetheless distinct from, other aesthetic endeavors. Course is largely oriented toward collaboratively working out a conceptual basis for a distinctly anthropological approach to design.

**ANTHRO 254. Digital Anthropology. 4 Units.**

Examines “the digital” from an anthropological perspective by exploring ethnographic research on digital culture and using anthropological frameworks to approach the digital and the human. Readings are interdisciplinary, including work from history and communications.

Restriction: Graduate students only.

**ANTHRO 255A. Disability Worlds. 4 Units.**

Explores disability from a range of methodological and theoretical perspectives. Examines the genealogy of disability in anthropology and related disciplines, with an emphasis on ethnographic work. Topics addressed include access, embodiment, politics, selfhood, and sexuality.

Restriction: Graduate students only.

**ANTHRO 256B. Secrecy, Security, and Surveillance. 4 Units.**

Explores secrecy and security as fundamental to constructions of public and private domains, relations of citizenship and sovereignty, the militarization of everyday life, and the ways that the fabrics of societies are woven of both trust and deceit.

Restriction: Graduate students only.

**ANTHRO 257A. Natures and Environments. 4 Units.**

Examines social scientific understandings of natural contexts and human milieus via a survey of key analytic categories. Begins by examining historical and ongoing definitions and problems organized around “nature” and “environment” as separate but imbricated concepts.

**ANTHRO 259A. Dissertation Writing Seminar. 4 Units.**

Intended for advanced, post-fieldwork Anthropology graduate students. Emphasis on the presentation of research design and results, problems of ethnographic writing, and qualitative and quantitative data and analysis. Prerequisites: post-fieldwork; graduate standing in Anthropology or consent of instructor.

Restriction: Graduate students only.

**ANTHRO 289. Special Topics in Anthropology. 1-4 Units.**

Studies in selected areas of Anthropology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ANTHRO 290. Dissertation Research. 4-12 Units.**

Dissertation research with Anthropology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ANTHRO 299. Independent Study. 4-12 Units.**

Independent research with Anthropology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Anthropology, B.A.

The major in Anthropology prepares students to embark on a wide range of careers, to pursue graduate studies, and to continue to learn and achieve in our culturally diverse world. The curriculum develops students' knowledge and skills, including (1) an understanding of cultural diversity and global relationships; (2) the fundamentals of conducting research and analyzing sources of information through ethnographic and other anthropological techniques; and (3) communication skills in organizing and presenting information in written reports and oral presentations.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

**Departmental Requirements for the Major**

School Requirements must be met and must include 12 courses (48 units) as specified below:

A. Complete the following:

ANTHRO 2A	Introduction to Sociocultural Anthropology
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B. Select one of the following:



ANTHRO 2B	Introduction to Biological Anthropology
ANTHRO 2C	Introduction to Archaeology
ANTHRO 2D	Introduction to Language and Culture
C. Select one of the following:	
ANTHRO 2B	Introduction to Biological Anthropology
ANTHRO 2C	Introduction to Archaeology
ANTHRO 2D	Introduction to Language and Culture
ANTHRO 20A-89	
D. Complete the following:	
ANTHRO 100A	Ethnography and Anthropological Methods
ANTHRO 100B	Anthropology Careers
ANTHRO 180AW	Anthropology Majors Writing Seminar
E. Select six additional elective courses from the following:	
ANTHRO 120-179	

The four-quarter Honors Program in Anthropology is designed to allow undergraduates to pursue field research and write an honors thesis on a topic of their choice under the guidance of Department of Anthropology faculty members. Research projects typically involve a combination of library research, exploratory ethnographic interviews, participant observation, and systematic data collection and analysis.

Admission to the program is based on a formal application that is normally submitted in the winter quarter of the junior year. Please see the Department of Anthropology website (<https://www.anthropology.uci.edu/>) for detailed information. Applicants must be Anthropology majors with an overall grade point average of 3.3 and a grade point average of at least 3.5 in Anthropology major courses. Prior completion of, or concurrent enrollment in ANTHRO 100A is required. Successful completion of the honors program and the honors thesis satisfies the upper-division writing requirement.

Students who are accepted into the honors program complete a four-quarter honors seminar series beginning in spring quarter of their junior year. Students will write a proposal describing their research questions, the relevant background literature, and the methods of data collection and analysis (ANTHRO H190A); conduct ethnographic field research (ANTHRO H190B); apply qualitative data analysis methods to their research data (ANTHRO H190C); and write a senior honors thesis that is typically 40 to 80 pages long (ANTHRO H190W). Each quarter, students must concurrently be enrolled in one unit of ANTHRO 199 with their thesis advisor. Honors theses are read and evaluated by the advisor and the Undergraduate Program Director.

The faculty encourages Anthropology majors or minors to study abroad and experience a different culture while making progress toward degree objectives. The Study Abroad Center, which includes the UC Education Abroad Program (EAP) and the International Opportunities Program (IOP), assists students in taking advantage of many worldwide opportunities. For example, UCEAP offers excellent opportunities to study anthropology at many universities abroad; courses taken abroad can be used to fulfill departmental requirement C, D, and E. Study abroad also can provide opportunities for cross-cultural experience, field research, and foreign language training. The Undergraduate Research Opportunities Program (UROP) provides funding for independent field research. See the Study Abroad Center and the Undergraduate Research Opportunities Program sections of the *Catalogue* for additional information.

## Anthropology, Minor

Anthropology is the comparative study of past and present human societies and cultures. The Department of Anthropology at UCI is at the forefront of addressing issues in contemporary theory and ethnographic methods within the discipline. The department has a strong interdisciplinary bent, with research and teaching interests in economic anthropology, political and legal anthropology, the anthropology of finance, social history and social change, identity and ethnicity, gender and feminist studies, urban anthropology, and more. Undergraduate minors are welcome to participate in the activities of the Undergraduate Anthropology Club. Undergraduates are also encouraged to join Lambda Alpha, the anthropology Honors Society.

### Anthropology Minor Requirements

Requirements for the minor in Anthropology are met by taking seven Anthropology courses (28 units) as specified below:

A. Complete the following:	
ANTHRO 2A	Introduction to Sociocultural Anthropology
B. Select one of the following:	
ANTHRO 2B	Introduction to Biological Anthropology
ANTHRO 2C	Introduction to Archaeology
ANTHRO 2D	Introduction to Language and Culture
C. Select one of the following:	
ANTHRO 30A	Global Issues in Anthropological Perspective
ANTHRO 100B	Anthropology Careers

D. Select four courses (16 units) from the following:

ANTHRO 120–179

## Anthropology, Ph.D.

The Department of Anthropology offers a Ph.D. program in Anthropology. The program focuses on social and cultural anthropology, with a strong focus on understanding emergent processes and systems at a number of scales, including the national and transnational level. Areas of teaching emphasis include the anthropology of modernity and development; political, legal, and economic anthropology; ethnographic method; and the anthropology of science, technology, and medicine. In addition, Ph.D. students have the option of enrolling in a Feminist Studies or a Critical Theory emphasis, both of which involve interdisciplinary work with departments and centers in the School of Humanities.

The Department's faculty members have interests in ethnicity, gender, international migration, science, technology and medicine, law and finance, urban anthropology, youth culture, and social networks. The program also provides rigorous training in ethnographic method. The Department is committed to fostering new and innovative approaches to anthropological inquiry in a pluralistic and intellectually open academic environment. Program faculty take diverse theoretical and methodological approaches to a variety of substantive issues. They are united, however, in a willingness to question taken-for-granted theoretical premises and analytic frames, and to engage in good-faith intellectual dialogue about alternative models and approaches.

Students are admitted to the program based on their application materials and evidence of scholarly potential, including grade point average and letters of recommendation.

Successful applicants to our program excelled in their undergraduate work and have demonstrated strong intellectual capabilities and creativity in pursuit of their scholarly goals. The program does not require nor do we consider the Graduate Record Examination (GRE) as apart of the application process. The program gives primary consideration to an applicant's statement of purpose, letters of recommendation, and writing sample.

Students must complete a one-year Proseminar in Anthropology (ANTHRO 202A-ANTHRO 202B-ANTHRO 202C) during their first year. In their second year, students are required to complete a three-course sequence in ethnographic methods, research design, and grant writing (ANTHRO 215A, ANTHRO 215B, ANTHRO 215C). Students are also required to complete six elective courses in Anthropology, which are selected in consultation with their advisor and which normally cover a coherent area of specialization within the field. All course work must be completed before a student is advanced to candidacy. Students must demonstrate competence to read one foreign language, in accordance with the requirements of the Ph.D. in Anthropology.

At the end of the first year, students must pass a formal evaluation which is made by the Department on the basis of the first-year course work and examinations to be taken as part of the Proseminar. Students should advance to candidacy by the end of the third year; the advancement to candidacy examination is based on a research proposal, a review of relevant literature, and an annotated bibliography. The fourth (and, in many cases, some or all of the fifth) year is normally devoted to extended anthropological fieldwork. The sixth year (in some cases, also part of the fifth) is devoted to writing the dissertation, in close consultation with the advisor. The normative time for completion of the Ph.D. is seven years, and the maximum time permitted is eight years.

### Program in Law and Graduate Studies (J.D./Ph.D.)

Highly qualified students interested in combining the study of law with graduate research and/or professional qualifications in Anthropology are invited to undertake concurrent degree study under the auspices of UC Irvine's Program in Law and Graduate Studies (PLGS). Students in this program pursue a coordinated curriculum leading to a J.D. from the School of Law in conjunction with a Ph.D. in Anthropology. Additional information is available from the PLGS Program Director's office, 949-824-4158, or by email to [plgs@law.uci.edu](mailto:plgs@law.uci.edu). A full description of the program, with links to all relevant application information, can be found at the School of Law Concurrent Degree Programs website (<http://www.law.uci.edu/academics/interdisciplinary-studies/concurrent-degrees.html>).

## Medical Anthropology, Minor

The Medical Anthropology Minor is designed for students seeking expertise in cross-cultural understandings of illness, medicine, and the body. Students learn to analyze the experience and meanings of illness; understandings of the human body; cross-cultural mental health; social and political disease ecologies; medical practice and biotechnologies; and relationships among gender, race, class, medicine, and science.

A particular emphasis is on the political and economic forces that shape disease burdens and the contributions medical anthropology can make to efforts to achieve global health equity. The minor is open to students in any school and offers excellent preparation for students interested in careers in clinical medicine, nursing, pharmacy, biological research, public health, and environmental health.

### Medical Anthropology Minor Requirements

Requirements for the minor in Medical Anthropology are met by taking seven Anthropology courses (28 units) as specified below:

A. Complete the following:

ANTHRO 2A	Introduction to Sociocultural Anthropology
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B. Select one of the following:

ANTHRO 2B	Introduction to Biological Anthropology
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ANTHRO 2C	Introduction to Archaeology
ANTHRO 2D	Introduction to Language and Culture
C. Select one of the following:	
ANTHRO 30A	Global Issues in Anthropological Perspective
ANTHRO 100B	Anthropology Careers
D. Complete:	
ANTHRO 134A	Medical Anthropology
E. Select three topical courses (12 units) from the following:	
ANTHRO 25A	Environmental Injustice
ANTHRO 121D	Cross-Cultural Studies of Gender
ANTHRO 125F	Humans and Other Animals
ANTHRO 128A	Science, Technology, Controversy
ANTHRO 128B	Race, Gender, and Science
ANTHRO 132A	Psychological Anthropology
ANTHRO 134B	Cultures of Biomedicine
ANTHRO 134C	Medicine, Food, and Health
ANTHRO 134F	Anthropology of the Body
ANTHRO 134G	HIV/AIDS in a Global Context
ANTHRO 134N	Disease, Health, and Inequality
ANTHRO 136K	The Woman and the Body
ANTHRO 139	Special Topics in Cultural and Psychological Anthropology (special topics, by petition to the Undergraduate Director)
SOCIOL 154	Medical Sociology

**Residence Requirement for the Minors:** The four required upper-division courses must be completed successfully at UCI. Two of the four may be taken through the UC Education Abroad Program, provided course content is approved in advance by the Undergraduate Director of the Department of Anthropology.

NOTE: Students may complete only one of the following programs: the major in Anthropology, the minor in Anthropology, or the minor in Medical Anthropology.

## Department of Chicano/Latino Studies

**Louis DeSipio, Department Chair**

383 Social Science Tower

949-824-1420

<http://www.chicanolatinostudies.uci.edu/>

Chicano/Latino Studies is an interdisciplinary Department organized to provide undergraduate and graduate students with the opportunity to examine the historical and contemporary experiences of Americans of Latino origin or ancestry. This diverse population includes people who trace their heritage to Mexico, Puerto Rico, Cuba, El Salvador, Guatemala, Nicaragua, and other Latin American and Caribbean nations. The curriculum is designed to provide an awareness, knowledge, and appreciation of the language, history, culture, literature, sociology, anthropology, politics, social ecology, health, medicine, and creative (art, dance, drama, film, music) accomplishments of Chicano/Latino communities. The Department offers a B.A. in Chicano/Latino Studies, an undergraduate minor, and a graduate emphasis.

### Scholarship Opportunities

The **Jeff Garcilazo Fellowship/Scholarship Fund**, established in honor and memory of the late Chicano/Latino Studies and History professor, provides opportunities for students to examine the historical and contemporary experiences of Latino communities. The Jeff Garcilazo Prize is awarded annually to the undergraduate student author(s) of the best research paper(s) in Chicano/Latino Studies.

The **Hispanic Scholarship Fund (HSF)**, formerly the National Hispanic Scholarship Fund, awards scholarships annually to students enrolled in and attending an accredited college full-time from the fall through the spring (or summer) terms. More information is available at the Hispanic Scholarship Fund (<http://www.hsf.net/>) website (<http://www.hsf.net/>).

### Career Opportunities

Chicano/Latino Studies graduates have used their degrees as the foundation for careers in public service, social service, education, the corporate world, and the law. Many also go on to earn M.A. and Ph.D. degrees in Social Science and Humanities disciplines at major universities throughout the nation. What links all of these careers is that the Chicano/Latino Studies major prepares its students for careers that will speak of the needs of Chicano

and Latino communities nationwide and globally. The highest number of the Department's majors have pursued advanced degrees and professional degrees, such as law degrees or advanced teaching credentials. Their training at UCI has served them well in that the list of institutions that they are attending include the nation's best, such as Harvard University, Stanford University, Columbia University, and several University of California campuses.

Others have moved directly into the workforce. Interestingly, many have selected careers that offer the opportunity to ensure that younger Latinos are able to seize the same opportunities the Department's students did and attend four-year colleges and universities. Chicano/Latino Studies majors work as primary and secondary school teachers, work for advocacy organizations focusing on Latino health and children's services, and have taken positions in legislative offices both in California and in Washington, D.C.

## Additional Opportunities

In addition to satisfying the requirements for the major or minor, students are encouraged to take advantage of the variety of unique educational opportunities available at UCI. Through the University's Education Abroad Program (UCEAP), students receive academic credit while studying at universities in Mexico, Chile, Costa Rica, Brazil, or Spain.

Internship opportunities with private and public institutions concerned with the Chicano/Latino communities are available in Orange County, Sacramento, and Washington, D.C. Independent research with faculty on Chicano/Latino issues is also encouraged. Student research is conducted and given academic credit through independent study or group research courses. The Undergraduate Research Opportunities Program (UROP) and the Summer Academic Enrichment Program (SAEP) are examples of programs at UCI which allow students to work as research assistants with professors.

- Chicano/Latino Studies, B.A.
- Chicano/Latino Studies, Graduate Emphasis
- Chicano/Latino Studies, Minor

## Faculty

Belinda Campos, Ph.D. University of California, Berkeley, *Associate Professor of Chicano/Latino Studies; Family Medicine; Psychological Science* (culture, relationships, positive emotion, health)

Anita Casavantes Bradford, Ph.D. University of California, San Diego, *Associate Professor of Chicano/Latino Studies; Asian American Studies; History* (20th century U.S., U.S. in the world, Cuba and the Caribbean; history of childhood; history of immigration, race and ethnicity; transnational and comparative Latina/o history; religion, politics and social movements)

Louis DeSipio, Ph.D. University of Texas at Austin, *Professor of Chicano/Latino Studies; Political Science* (ethnic politics, Latino politics, immigration, naturalization, U.S. electoral politics)

Laura Enriquez, Ph.D. University of California, Los Angeles, *Assistant Professor of Chicano/Latino Studies; Asian American Studies; Sociology* (undocumented 1.5 generation young adults, immigration, citizenship, Latino families)

Raúl A. Fernández, Ph.D. Claremont Graduate University, *Executive Secretary of the UC-Cuba Academic Initiative and Professor Emeritus of Chicano/Latino Studies; Social Sciences*

Glenda M. Flores, Ph.D. University of Southern California, *Associate Professor of Chicano/Latino Studies; Sociology* (Latina/o sociology, gender and work, middle-class minorities, education, urban ethnography)

Gilbert G. Gonzalez, Ph.D. University of California, Los Angeles, *Professor Emeritus of Chicano/Latino Studies; Social Sciences*

Alana Lebron, Ph.D. University of Michigan, *Assistant Professor of Program in Public Health; Chicano/Latino Studies*

Alejandro Morales, Ph.D. Rutgers, The State University of New Jersey, *Professor Emeritus of Chicano/Latino Studies* (Latin American and Chicano literature, film studies)

Rocio Rosales, Ph.D. University of California, Los Angeles, *Assistant Professor of Sociology; Chicano/Latino Studies* (international migration, immigrant and ethnic economics, urban sociology, ethnography, Latino/a studies, race and ethnicity, immigrant detention)

Ana Rosas, Ph.D. University of Southern California, *Associate Professor of Chicano/Latino Studies; History* (Chicana/o comparative history, immigration, ethnicity)

Vicki L. Ruiz, Ph.D. Stanford University, *Professor Emeritus of History; Chicano/Latino Studies* (Chicana/Latina history, U.S. labor, immigration, gender)

Ruben G. Rumbaut, Ph.D. Brandeis University, *Distinguished Professor of Sociology; Chicano/Latino Studies; Criminology, Law and Society; Education* (international migration, immigration laws, criminalization, incarceration, social inequality and mobility, race and ethnicity)

Hector Tobar, M.F.A. University of California, Irvine, *Associate Professor of Chicano/Latino Studies; English* (storytelling, literature, history of Los Angeles, Latin American history, Latino history)

## Courses

### **CHC/LAT 61. Introduction to Chicano/Latino Studies I. 4 Units.**

An introduction to the study of the historical foundations of the Chicano/Latino experience. Addresses such topics as empire, migration, immigrant settlement, economic integration, race, gender, and the formation of group identities.

(III, VII)

### **CHC/LAT 62. Introduction to Chicano/Latino Studies II. 4 Units.**

Provides an introduction to the arts, literature, and culture of Chicano/Latino communities. Analyzes representations of and cultural production in Chicano/Latino communities through such media as folklore, literature, art, film, architecture, dance theatre, performance, music, poetry, mass media, and language.

(III, VII)

### **CHC/LAT 63. Introduction to Chicano/Latino Studies III. 4 Units.**

Examines contemporary public policy issues in Chicano/Latino communities. Each offering addresses at least three of the following themes: migration, immigrant incorporation, identity construction, language policy, health policy, politics, sexuality, gender, labor, class, and education.

(III and VII).

### **CHC/LAT 64. Introduction to Race and Ethnicity in Political Science. 4 Units.**

Examines major theories that attempt to explain the roles of race and ethnicity in U.S. politics.

Same as POL SCI 61A.

(III and VII).

### **CHC/LAT 65. Ethnic and Immigrant America. 4 Units.**

Focusing on Asian, Latino, and Black immigrant groups, examines the second generation's experience of straddling two cultures and growing up American. Covers topics such as assimilation, bilingualism, race relations, education, bicultural conflicts, interracial marriage, and multiracial identities.

Same as SOCIOL 68A.

(VII)

### **CHC/LAT H80. Latina/o Childhoods: Comparative Approaches to the Study of Children and Youth. 4 Units.**

Students in this seminar compare the experiences of Latina/o children to other young people in the U.S. and around the world, analyzing the historical, political, economic, and sociocultural factors that have differently structured the life stage we understand as "childhood."

Restriction: Campuswide Honors Collegium students only.

(III)

### **CHC/LAT 101. Research in the Latino Community. 4 Units.**

Students engage in firsthand research in the local Orange County environment. Students identify a research problem, conduct a literature review, develop questions and/or hypotheses, appropriate methods, and write a proposal.

Prerequisite: Two courses from CHC/LAT 61 or CHC/LAT 62 or CHC/LAT 63 and two courses from CHC/LAT 110-189.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment.

### **CHC/LAT 102W. Chicano/Latino Research Seminar. 4 Units.**

Taught as a writing and research seminar in Chicano/Latino Studies. Student develops own project; engages in peer editing; drafts, writes, and presents paper at Spring research conference. Prior course work in Chicano/Latino Studies helpful, i.e., CHC/LAT 61, 62, 63.

Prerequisite: CHC/LAT 101. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Chicano/Latino Studies Majors only.

(Ib)

### **CHC/LAT 110. Topics in Chicano Literature and Culture. 4 Units.**

Studies in selected areas of Chicano/Latino Studies. Topics addressed vary each quarter. Taught in English.

Repeatability: May be taken for credit 4 times as topics vary.

Same as SPANISH 140.

**CHC/LAT 118. Anthropology of Food. 4 Units.**

Examines how food communicates ideas about ethnocentrism, disgust, privilege, gender, race, labor, social identities and hierarchies, globalization, power, and the 'Western diet' and its health consequences.

Same as ANTHRO 134H.

**CHC/LAT 120. Peoples and Cultures of Latin America. 4 Units.**

Surveys the prehistory of Latin America and its indigenous cultures, emphasizing the impact of colonial rule, capitalism, and twentieth-century transformations. Emphasis on communities from several countries. In some years, emphasis on comparisons between the Latin American and Caribbean experiences.

Same as INTL ST 177J, ANTHRO 162A.

**(VIII)****CHC/LAT 121. Latina/Latino Pop: Latina/Latino Popular Culture. 4 Units.**

With a focus on the politics of language and space/place, prepares students to critically analyze sites of Latina/Latino popular culture including: music, film, performance, sports, media, and varied subcultures.

Same as HISTORY 151D.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. History Majors have first consideration for enrollment.

**CHC/LAT 123. Immigration, Nation, and Media. 4 Units.**

Examines media shapes and reflects public opinion on immigration and its representation of immigrants, citizens, and ideas about the nation, and who belongs and who is a potential threat; as well as the relationship between scholars and journalists.

Same as ANTHRO 125U, SPPS 101A.

**CHC/LAT 124W. Immigrant Emotionality. 4 Units.**

Explores the emotional universe created by the Latin American immigrant experience, and guides students in the creation of a literary work based on an investigation into, or reflection on that experience.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

**(Ib)****CHC/LAT 129. Special Topics in Literature, Arts, Media, Culture. 1-4 Units.**

Studies in selected areas of Chicano/Latino Studies. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment.

**CHC/LAT 132A. Chicana/Chicano History: Pre-Colonial to 1900. 4 Units.**

Examines social history of the southwest region from antiquity to 1900. Discusses major questions, theory and research methods pertinent to Chicanas/Chicanos. Themes include: indigenous empires, conquest, colonialism, social stratification, ideology, marriage, sexuality, industrial capitalism, accommodation and resistance.

Same as HISTORY 151A.

**CHC/LAT 132B. Chicana/Chicano History: Twentieth Century. 4 Units.**

Examines social history of the Southwest with emphasis on Mexican-origin people. Discusses major questions, theory and research methods pertinent to Chicana/Chicano history. Themes explored include: immigration, xenophobia, class struggle, leadership, generational cohorts, unionization, education, barrioization, ethnicity, patriarchy, sexuality.

Same as HISTORY 151B.

**CHC/LAT 134. U.S. Latino Literature and Cultures. 4 Units.**

Focuses on aspects of literature, art, cultural production, and history of the multifaceted Latino cultures that have developed within the United States. Focuses on one group, such as Caribbean Americans, Chicanos, Central Americans, or a comparative perspective of several groups.

Same as SPANISH 110C.



**CHC/LAT 135. Latinas in the Twentieth Century U.S.. 4 Units.**

Latinas in the U.S. from 1900 to present, offering a diversity of their cultures, regional histories, sexualities, generations, and classes.

Same as HISTORY 151C.

**CHC/LAT 139. Special Topics in Chicano/Latino History. 1-4 Units.**

Studies in selected areas of Chicano/Latino History. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Chicano/Latino Studies Majors only.

**CHC/LAT 147. Comparative Minority Politics. 4 Units.**

Examines the political experiences of Blacks, Latinos, and Asian Americans in the United States from roughly 1950 to the present. Focuses on how each group has pursued political empowerment via both conventional political channels and social movements.

Same as AFAM 151, ASIANAM 132, POL SCI 124C.

**CHC/LAT 148. Racial and Ethnic Relations in the United States. 4 Units.**

Examines central questions and issues in the field of race and ethnicity; the emergence, maintenance, and consequences of the ethnic and racial stratification system in the United States; the future of racial and ethnic relations; and relevant public policy issues.

Same as SOCIOL 167A.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**CHC/LAT 148W. Racial and Ethnic Relations in the United States. 4 Units.**

Examines central questions and issues in the field of race and ethnicity; the emergence, maintenance, and consequences of the ethnic and racial stratification system in the United States; the future of racial and ethnic relations; and relevant public policy issues.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as SOCIOL 167AW.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**(Ib)**

**CHC/LAT 150. U.S. Intervention in Latin America. 4 Units.**

Explores political, economic, social, and cultural ties that bind Latin America to the United States. Focuses on U.S. intervention and Latin American response from early nineteenth century to present day. Case studies include Mexico, Guatemala, Cuba, Chile, and Central America.

Same as POL SCI 142J, INTL ST 177D, HISTORY 166.

**CHC/LAT 150A. Sex and Conquest in Latin America. 4 Units.**

Competing ideas of masculinity and femininity, sexual violence, sexual identities, and gendered hierarchies informed how the Spanish engaged in military and religious domination of Mexican and Andean communities, as well as the forms of native resistance throughout colonial Latin America.

Same as ANTHRO 140, HISTORY 160, GEN&SEX 171A.

**CHC/LAT 151. Latinos in U.S. Politics. 4 Units.**

Comparing the political issues facing Latino groups by examining their migration histories, voting behavior, nonelectoral participation, and policy issues. Latino issues are examined on the national, state, and local levels, including formal representation, immigration, affirmative action, and language policy.

Same as POL SCI 124B.

**(VII)**

**CHC/LAT 151B. Revolution in Latin America. 4 Units.**

Presents a comparative analysis of the causes, development, and consequences of selected revolutionary movements, focusing on outbreaks in Mexico, Bolivia, Cuba, Chile, Nicaragua, and Grenada. Explores topics of state formation, economic nationalism, social justice, ethnicity, and role of international affairs.

Same as SOC SCI 173N, HISTORY 166D, INTL ST 177C.



**CHC/LAT 152A. Race, Ethnicity, and Social Control. 4 Units.**

Provides a historical and sociological survey of racial and ethnic group relations in contexts of crime control, emphasizing the roles of racial ideology, structural racism, and social movements in shaping these dynamic relations, and their significance to American liberal democracy.

Same as CRM/LAW C116.

**CHC/LAT 152B. Community, Social Justice, and Health Equity Research for Action. 4 Units.**

Focuses on community as a unit of identity, community, well-being, and social justice perspectives and initiatives to promote community health. Addresses community change and improvements in community well-being, with a focus on health equity research for action.

Prerequisite: PUBHLTH 1 or PUBHLTH 2 or CHC/LAT 61 or CHC/LAT 62 or CHC/LAT 63

Same as PUBHLTH 115.

**CHC/LAT 153. Cross-Cultural Research on Urban Gangs. 4 Units.**

Taking an urban policy approach, examines the background and contemporary traditions of gangs in several ethnic groups including African-, Asian-, and Mexican-Americans. Cross-cultural exploration of the varied facets of gang life. The major social-control institutions affecting them.

Same as CRM/LAW C156.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment. Chicano/Latino Studies Majors have first consideration for enrollment.

**(VII)****CHC/LAT 154. Latino Metropolis. 4 Units.**

Explores the processes of Latino urbanization in the United States and the spatialization of Latino identities, particularly in the context of Southern California with selected comparisons drawing from other cities.

Same as UPPP 172.

**(VII)****CHC/LAT 155. Culture Change and the Mexican People. 4 Units.**

Reviews culture contact and colonization, innovation diffusion, acculturation, assimilation, culture conflict and marginality, modernization, urbanization, legal transformations. Mexico and the Southwestern U.S. are reviewed through several centuries to better appreciate the indigenous base of the Mexican people.

Same as CRM/LAW C172.

**CHC/LAT 156W. Chicano/Latinos and Labor. 4 Units.**

Explores theories that explain the occupational pathways and workplace experiences of Latinos in various work sectors. Investigates jobs such as migrant labor, child street vendors, Latina/Latino professionals, and Latinos migrating to the U.S. South that work in poultry processing plants.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

**(Ib)****CHC/LAT 157. Cuban Society and Revolution. 4 Units.**

Explores the causes, development, and legacy of the 1959 Revolution. Themes include economic dependency, democracy, race, gender, culture, and the always volatile relations between Cuba and the United States.

Same as POL SCI 153G, HISTORY 166C, INTL ST 177E.

**CHC/LAT 158. Feminisms of Color. 4 Units.**

Surveys the development of Chicana feminist thought and practice. Focuses on historical contemporary writings by and about Chicana feminists. Draws from interdisciplinary scholarship in order to survey the diversity of Chicana feminisms.

**(VII)****CHC/LAT 159. Special Topics in Society, Labor, Politics, Law, Gender, Race, Ethnicity. 1-4 Units.**

Studies in selected areas of Chicano/Latino Studies. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Chicano/Latino Studies Majors only.

**CHC/LAT 161. Transnational Migration. 4 Units.**

Examines the movement of people across national borders, governmentality and the role of state practices to control populations, and issues of citizenship, belonging, and identity. Examples are drawn from the United States, Europe, Latin America, Asia, and Africa.

Same as ANTHRO 125X, INTL ST 117A.

**(VIII)**

**CHC/LAT 162A. Urban America . 4 Units.**

Students examine the historical, social, political, and economic factors that contributed to the construction of the American urban context, one that is poverty concentrated and racially/ethnically segregated. Students also critically assess the consequence of growing up in America's urban neighborhoods.

Same as SOC SCI 163A, UPPP 104.

**CHC/LAT 163. U.S. Immigration Policy. 4 Units.**

Examines selected immigration policy debates since the nineteenth century, rationale and consequences of immigration law since 1965, problems of administration, implementation and enforcement, impact of immigration policy on foreign relations, and contemporary debate regarding the future of U.S. policy.

Same as POL SCI 126C.

**(VII)**

**CHC/LAT 164A. Undocumented Immigrant Experiences. 4 Units.**

Examines the experiences of undocumented immigrants and the policies that structure their educational, economic, social, and political participation.

Same as ASIANAM 130, CRM/LAW C187, SOCIOL 177C.

**(III and VII ).**

**CHC/LAT 166. Chicano Movement. 4 Units.**

Explores the history of Mexicans in the U.S. with particular attention paid to their integration into the U.S. capitalist economy. Examines this economic history and the Chicano movement, 'El Movimiento,' within the wide context of socio-economic change.

Same as UPPP 177.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

**CHC/LAT 167. Latinos in a Global Society. 4 Units.**

Examines interconnections between diverse Latino groups in the U.S. and the effects of globalization on their social, cultural, and political realities. Topics include immigration, demographics, socioeconomic differentiation, familial relations, political protest/resistance, law and policy, and links to 'homeland' issues.

Same as SOC SCI 173L.

**(VII)**

**CHC/LAT 168. Chicano/Latino Social Psychology. 4 Units.**

Examines theories, research, and major issues of relevance to understanding social psychological processes in Chicano/Latino populations. Topics include social development, cultural orientations, gender and sexuality, close relationships, happiness and well-being, stereotyping, prejudice and discrimination, and mental and physical health.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as PSCI 192Q.

Restriction: Psychological Science Majors have first consideration for enrollment. Chicano/Latino Studies Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**(VII)**

**CHC/LAT 169. Special Topics in Globalization, Transnationalism, Immigration, U.S.-Mexico Border. 1-4 Units.**

Studies in selected areas of Chicano/Latino Studies. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**CHC/LAT 170. Chicano/Latino Families. 4 Units.**

Introduction to the research, literature, and issues surrounding the topic of Chicano/Latino families including cultural history, contemporary issues, organization of family, traditions, lifestyles, values, beliefs, generational differences, gender issues, ethnic identity, evolution of demographic patterns, current economic and political standings.

Same as SOC SCI 165, PSCI 166S, PSYCH 174H.

**CHC/LAT 176. Race, Gender, and Science. 4 Units.**

Perfect for pre-health, science and social science majors wanting to appreciate how science and society interact. Race and gender as biological and socio-cultural constructs are examined. Questions explored: What is disease? What is science? What are social and biological differences.

Same as ANTHRO 128B.

**(VII)****CHC/LAT 178A. Medical Anthropology. 4 Units.**

Introduces students to cross-cultural perspectives and critical theories in anthropological studies of medicine. Special attention is given to diverse ways of understanding bodies, illnesses, and therapeutic practices in our changing world.

Same as ANTHRO 134A.

**(VIII)****CHC/LAT 179. Special Topics in Health, Medicine, and Psychosocial Dynamics. 1-4 Units.**

Studies in selected areas of Chicano/Latino Studies. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment.

**CHC/LAT 183. Multicultural Education in K-12 Schools. 4 Units.**

Provides a theoretical and empirical overview of educational issues affecting low-income immigrant and U.S. born minority student populations in an increasingly diverse and changing society.

Same as EDUC 124.

**(VII)****CHC/LAT 189. Special Topics in Educational Policy and Issues. 1-4 Units.**

Studies in selected areas of Chicano/Latino Studies. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: May be repeated for credit unlimited times.

**CHC/LAT H190A. Honors Research Preparation. 4 Units.**

Students write a proposal describing their research question, the relevant background literature, and the method of data collection and analysis. Field work for the project may begin this quarter.

Restriction: Chicano/Latino Studies Honors students only.

**CHC/LAT H190B. Honors Field Research. 4 Units.**

Students begin or continue their research for their senior honors thesis.

Prerequisite: CHC/LAT H190A

**CHC/LAT H190C. Honors Thesis. 4 Units.**

Student drafts a senior honor thesis (typically) with the following sections: problem statement, literature review, description of the methods, results, and conclusions.

Prerequisite: CHC/LAT H190A and CHC/LAT H190B

**CHC/LAT H190W. Honors Thesis. 4 Units.**

Student drafts a senior honor thesis (typically) with the following sections: problem statement, literature review, description of the methods, results, and conclusions.

Prerequisite: CHC/LAT H190A and CHC/LAT H190B. Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**CHC/LAT 198. Directed Group Study. 1-4 Units.**

Directed study with Chicano/Latino faculty.

Repeatability: May be repeated for credit unlimited times.

**CHC/LAT 199. Independent Study. 1-4 Units.**

Independent research with Chicano/Latino faculty.

Repeatability: May be repeated for credit unlimited times.

**CHC/LAT 200A. Theoretical Issues in Chicano/Latino Research. 4 Units.**

Introduction to theoretical issues in the scholarship in Chicano/Latino Studies. Theories from social sciences, humanities, critical theory. Topics: immigration, identity, gender and sexuality, globalization, transnationalism, social, political, and economic integration, race theory, labor market participation, social history, cultural productions.

**CHC/LAT 210A. Cultural and Historical Precedents for Latinos and Medical Care. 2 Units.**

Introduction to the history of Latinos, focusing on relevant pre-Columbian, colonial, and modern social and cultural developments, including issues of race, gender, sexuality, religious beliefs, and health beliefs and practices.

Grading Option: In Progress (Letter Grade with S/U).

**CHC/LAT 210B. Cultural and Historical Precedents for Latinos and Medical Care. 2 Units.**

Introduction to the history of Latinos, focusing on relevant pre-Columbian, colonial, and modern social and cultural developments, including issues of race, gender, sexuality, religious beliefs, and health beliefs and practices.

Prerequisite: CHC/LAT 210A

Restriction: CHC/LAT 210A-210B and CHC/LAT 212 may not both be taken for credit.

**CHC/LAT 211A. Latinos/Latinas and Medical Care: Contemporary Issues. 2 Units.**

Introduction to medical anthropological and social science perspectives on Latinos/Latinas in relation to a number of health and medically-related issues, i.e., immigration, gender, reproduction, culture, social structure, political economy, sexuality, utilization of medical services, and health beliefs.

Same as PUBHLTH 211A.

**CHC/LAT 211B. Latinos/Latinas and Medical Care: Contemporary Issues. 2 Units.**

Introduction to medical anthropological and social science perspectives on Latinos/Latinas in relation to a number of health and medically-related issues, i.e., immigration, gender, reproduction, culture, social structure, political economy, sexuality, utilization of medical services, and health beliefs.

Prerequisite: CHC/LAT 211A

Same as PUBHLTH 211B.

**CHC/LAT 215. Transnational Migration. 4 Units.**

Examines borders and boundaries as material and semiotic constructs. Drawing upon an array of literatures, but loosely situated in U.S. geo/biopolitics, explores transformative troubleings of places, spaces, borders, and bodies of all sorts.

Same as SOC SCI 254A, ANTHRO 235A.

Restriction: Graduate students only.

**CHC/LAT 217. Ethnography. 4 Units.**

Explores the theory and practice of ethnography with a focus on anthropology, the discipline most associated with ethnography. Students are exposed to the theoretical underpinnings of ethnographic work, traditional and innovative practices, and sample ethnographies.

Same as ANTHRO 230F, CRM/LAW C222.

Restriction: Graduate students only.

**CHC/LAT 222. Theorizing Illegality and the Experiences of Undocumented Immigrants. 4 Units.**

Examines theories of illegality and citizenship, historical and contemporary undocumented immigrant experiences, and methodological concerns in this area of study.

Same as SOCIOL 282.

Restriction: Graduate students only.

**CHC/LAT 223. Ethnic America. 4 Units.**

Examines critically the meaning and measurement of ethnicity, race, and nation in sociological theory and research. Theories of ethnicity are explored, along with empirical studies of the construction of ethnic and pan-ethnic identities in historical and contemporary contexts.

Same as SOCIOL 234.

Restriction: Graduate students only.

**CHC/LAT 224. Immigrant America. 4 Units.**

The study of the causes and consequences of international migration has become one of the most vital fields of sociological theory and research. Examines principal theoretical perspectives and empirical research on contemporary immigration flows and the processes of incorporation.

Same as SOCIOL 264.

Restriction: Graduate students only.

**CHC/LAT 225. Crimmigration. 4 Units.**

Examines the criminalization of immigration, with an emphasis on U.S. enforcement procedures and outcomes. Analyzes the devolution of federal immigration law to local authorities, the rise in immigrant detention and deportation, and the militarization of the U.S.-Mexico border.

Same as SOCIOL 268, CRM/LAW C258.

Restriction: Graduate students only.

**CHC/LAT 251. Models of Practice and Intervention at the Community Level. 4 Units.**

Examines and critiques current models, frameworks, theories for.

Prerequisite: CHC/LAT 200A or PUBHLTH 246

Same as PUBHLTH 251.

Restriction: Graduate students only.

**CHC/LAT 289. Special Topics in Chicano/Latino Studies. 1-4 Units.**

Current research in Chicano/Latino Studies.

Repeatability: May be repeated for credit unlimited times.

**CHC/LAT 290. Dissertation Research. 1-12 Units.**

Dissertation research with Chicano/Latino faculty.

Repeatability: May be taken for credit 10 times.

Restriction: Graduate students only.

**CHC/LAT 299. Independent Study. 1-12 Units.**

Independent study with Chicano/Latino Studies faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Chicano/Latino Studies, B.A.

Chicano/Latino Studies is an interdisciplinary department organized to provide undergraduate and graduate students with the opportunity to examine the historical and contemporary experiences of Americans of Latino origin or ancestry. This diverse population includes people who trace their heritage to Mexico, Puerto Rico, Cuba, El Salvador, Guatemala, Nicaragua, and other Latin American and Caribbean nations. The curriculum is designed to provide an awareness, knowledge, and appreciation of the language, history, culture, literature, sociology, anthropology, politics, social ecology, health,

medicine, and creative (art, dance, drama, film, music) accomplishments of Chicano/Latino communities. The Department offers a B.A. degree in Chicano/Latino Studies, an undergraduate minor, and a graduate emphasis.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Departmental Requirements for the Major

A. Complete the following five core courses:

CHC/LAT 61	Introduction to Chicano/Latino Studies I
CHC/LAT 62	Introduction to Chicano/Latino Studies II
CHC/LAT 63	Introduction to Chicano/Latino Studies III
CHC/LAT 101	Research in the Latino Community
CHC/LAT 102W	Chicano/Latino Research Seminar

B. Complete the following:

SPANISH 2A	Intermediate Spanish (or equivalent) <sup>1</sup>
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C. Complete one comparative ethnic studies course selected from African American Studies, Asian American Studies, or

EDUC 124	Multicultural Education in K-12 Schools <sup>2</sup>
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D. Select three upper-division electives, one from each of the following categories:

Literature, Arts, and Media (CHC/LAT 110–129)
History (CHC/LAT 130–139)
Inequalities and Social Context (CHC/LAT 140–189)

E. Select four additional elective courses, three of which must be upper-division, selected from CHC/LAT courses. <sup>3</sup>

<sup>1</sup> Students are encouraged to continue their Spanish language education through SPANISH 2C.

<sup>2</sup> Course must focus on the study of African American or Asian American communities in the United States.

<sup>3</sup> Electives may include Independent Study courses (CHC/LAT 199). Students may obtain credit for one of these three courses through participation in a study abroad program in Mexico. Students must consult with the Department office for additional information regarding this option.

**Residence Requirement for the Major:** A minimum of five upper-division courses required for the major must be completed successfully at UCI. Courses taken through the UC Education Abroad Program will be counted toward satisfaction of the residence requirement.

Students are encouraged to pursue field research and write a substantial research paper on topics of their choice under the guidance of Chicano/Latino faculty members. Often, this project will grow out of issues examined in CHC/LAT 102W. Research projects typically involve a combination of library research and fieldwork in the Chicano/Latino community. Methods and analytical frameworks vary depending on the student and faculty advisors. Interested students should enroll in CHC/LAT 199.

The Honors Program in Chicano/Latino Studies is designed to allow undergraduates to pursue independent research and write an honors thesis on topics of their choice under the guidance of Chicano/Latino Studies faculty members. Research projects typically involve a combination of library research, data analysis, and field research. The program is open to all senior Chicano/Latino Studies majors with a grade point average of 3.3 or better overall, with 3.5 in Chicano/Latino Studies courses (at least five courses). Prior completion of or concurrent enrollment in CHC/LAT 101 is strongly recommended. Successful completion of the Honors Program and the honors thesis satisfies the upper-division writing requirement.

Although course work for the Honors Program does not start until the senior year, it is highly recommended that during the spring quarter of the junior year, students find a professor willing to serve as their research project advisor on the basis of a mutually acceptable abstract that indicates the goal and significance of their project. If extensive research is to be undertaken at this time, students should enroll in CHC/LAT 199.

During the fall quarter of the senior year, students enroll in CHC/LAT H190A and write a proposal describing their research question, the relevant background literature, and the method of data collection and analysis. Fieldwork for the project may begin during this quarter.

In the winter quarter of the senior year, students begin or continue their research by enrolling in CHC/LAT H190B. In the spring quarter of the senior year, students enroll in CHC/LAT H190C and complete a senior honors thesis.

## Chicano/Latino Studies, Graduate Emphasis

The Department of Chicano/Latino Studies offers a graduate emphasis in Chicano/Latino Studies, which is available in conjunction with the Ph.D. programs in the Departments of Anthropology; Criminology, Law and Society; English; History; Political Science; Planning, Policy, and Design; Sociology; Spanish and Portuguese; Gender and Sexuality Studies; the program in Visual Studies; the School of Education; and the program in Social Science. Satisfactory completion of the emphasis is certified by the Chair of Chicano/Latino Studies and is noted in the student's dossier.

Applicants must first be admitted to, or currently enrolled in, one of the participating programs listed above. Applicants must submit to the Chicano/Latino Graduate Program Committee (1) an application form listing prior undergraduate and graduate course work related to Chicano/Latino Studies (if any), institutions attended, and major(s); and (2) a one- to two-page statement of purpose, including career objectives, areas of interest and research, and record of research, teaching, community, and/or creative work.

The Committee determines admissions, in consultation with the Chicano/Latino Studies core faculty, based upon the extent to which the applicant's research interests relate to Chicano/Latino Studies, the applicant's previous course work, and research or other experience related to Chicano/Latino Studies. Lack of prior course work does not preclude admission, so long as the statement of research interests is congruent with the graduate emphasis and makes a compelling case.

Minimum course work for the graduate emphasis in Chicano/Latino Studies consists of four courses: CHC/LAT 200A and three elective courses selected from the list of graduate courses in Chicano/Latino Studies. Two of these elective courses must be cross-listed with department(s) other than the department in which the student is earning his/her Ph.D. One must be cross-listed with a department in a School other than the School in which the student is earning his/her degree and the second must be cross-listed with a department other than the department in which the student is earning his/her degree.

For doctoral students, the qualifying examination and dissertation topic should incorporate U.S. Latinos and/or issues relevant to Chicano/Latino Studies as a central focus of analysis. One member of the candidate's dissertation committee should be a core or affiliate faculty of the Chicano/Latino Studies Department.

## Chicano/Latino Studies, Minor

The minor in Chicano/Latino studies provides undergraduate students with an opportunity to examine the historical and contemporary experiences of Chicanos and Latinos. The curriculum provides awareness, knowledge and appreciation of the language, history, culture, literature, sociology, anthropology, politics, social ecology, health, medicine and creative accomplishments in Chicano/Latino communities. In addition to satisfying the requirements for the minor, students are encouraged to take advantage of the variety of unique educational opportunities available at UCI. Opportunities like the Education Abroad Program (EAP), the Undergraduate Research Opportunities Program (UROP) and the Summer Academic Enrichment Program (SAEP) allow students to gain real-world experience that complements their participation in the Chicano/Latino studies department.

### Departmental Requirements

Completion of seven courses as follows:

A. Complete the following core courses:

CHC/LAT 61	Introduction to Chicano/Latino Studies I
CHC/LAT 62	Introduction to Chicano/Latino Studies II
CHC/LAT 63	Introduction to Chicano/Latino Studies III

B. Select three upper-division courses from CHC/LAT 100–189.

C. Complete the following:

SPANISH 2A	Intermediate Spanish (or equivalent) <sup>1</sup>
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<sup>1</sup> Students who are exempted from SPANISH 2A based on high school study or its equivalent or through test results must instead complete a fourth upper-division course selected from CHC/LAT 100–189.

**Residence Requirements for the Minor:** Other than the language requirement, no more than two courses taken at other academic institutions may be used toward satisfaction of the minor.

## Department of Cognitive Sciences

**Ramesh Srinivasan, Department Chair**

2201 Social & Behavioral Sciences Gateway

949-824-6692

<http://www.cogsci.uci.edu/>

Cognitive Science is a multidisciplinary field integrating behavioral research, computational models, and neuroscience. The department of Cognitive Sciences at UC Irvine has a tradition of excellence in quantitative approaches to understanding the brain, perception, cognition, and behavior. The department maintains its historic strengths in mathematical psychology, and has seen them expand to include computational approaches to studying cognition. The department has also grown a strong and broad research program and graduate concentration in cognitive neuroscience, with expertise ranging from language and memory to brain-computer interfaces. The department continues to specialize in vision and auditory research, and has newer research areas in the language sciences, cognitive development, and cognitive robotics.



## Undergraduate Information

Students should be aware that psychology courses are offered in several different departments and programs. Students interested in general psychology including the areas of development, clinical, perception, learning, memory, cognitive processes, and neuroscience are advised to consult the course listings for the B.A. in Psychology section. The courses in this major are designed to provide students with a strong foundation in general psychology. Students specifically interested in a program with a quantitative approach to theory and research in any of the areas of Cognitive Neuroscience; Experimental Psychology (emphasizing Sensation, Perception, Attention, and Memory); Language Science; or Computational Cognitive Science should consult the course listings for the B.S. in Cognitive Sciences also here in this section. Students interested in other areas of psychology are advised to consult the course listings in the School of Social Ecology and the School of Biological Sciences sections.

- Cognitive Sciences, B.S.
- Cognitive Sciences, Ph.D.
- Hearing and Speech Sciences, Minor
- Psychology, B.A.
- Psychology, B.S.
- Psychology, Minor

## Faculty

Bruce G. Berg, Ph.D. Indiana University, *Associate Professor of Cognitive Sciences* (audition, auditory attention, psychophysics of complex sounds, computational models of hearing)

Aaron Bornstein, Ph.D. New York University, *Assistant Professor of Cognitive Sciences* (memory, decision-making, reinforcement learning, neuroimaging, computational cognitive neuroscience)

Alyssa Brewer, Ph.D. Stanford University, *Associate Professor of Cognitive Sciences; Language Science* (neuroimaging of visual perception, visual deficits, neurological disorders)

Nadia Chernyak, Ph.D. Cornell University, *Assistant Professor of Cognitive Sciences* (cognitive development, social cognition, prosocial behavior, moral cognition, agency and free will, conceptual development)

Thomas M. D'Zmura, Ph.D. University of Rochester, *Professor of Cognitive Sciences* (vision, hearing, language, brain-computer interfaces)

Barbara A. Doshier, Ph.D. University of Oregon, *UCI Distinguished Professor of Cognitive Sciences* (human information processing, memory retrieval, attention, visual perception)

Emily D. Grossman, Ph.D. Vanderbilt University, *Professor of Cognitive Sciences* (visual perception, neuroimaging)

Gregory S. Hickok, Ph.D. Brandeis University, *Professor of Cognitive Sciences; Language Science* (neuroanatomy of language, neural plasticity, neuroimaging, cognitive neuroscience)

Jeffrey L. Krichmar, Ph.D. George Mason University, *Professor of Cognitive Sciences; Computer Science* (computational neuroscience, robotics)

Michael D. Lee, Ph.D. University of Adelaide, *Professor of Cognitive Sciences* (computational models and bayesian methods in decision making, representation, categorization, individual differences, and the wisdom of the crowd)

Mimi Liljeholm, Ph.D. University of California, Los Angeles, *Assistant Professor of Cognitive Sciences* (neural and computational bases of learning, reasoning, and decision making)

Sara Mednick, Ph.D. Harvard University, *Associate Professor of Cognitive Sciences* (memory consolidation, sleep, pharmacology, aging, brain stimulation)

Louis E. Narens, Ph.D. University of California, Los Angeles, *Professor of Cognitive Sciences; Logic and Philosophy of Science* (measurement, logic, metacognition)

Emre Neftci, Ph.D. University of Zurich, *Assistant Professor of Cognitive Sciences; Computer Science* (computational neuroscience, neuromorphic engineering, machine learning)

Lisa Pearl, Ph.D. University of Maryland, College Park, *Professor of Language Science; Cognitive Sciences; Logic and Philosophy of Science* (language development, linguistics, computational sociolinguistics, cognitive modeling)

Megan Peters, Ph.D. University of California, Los Angeles, *Assistant Professor of Cognitive Sciences* (perception, metacognition, consciousness, computational modeling, computational cognitive neuroscience)

Zygmunt Pizlo, Ph.D. University of Maryland at College Park, *Falmagne Endowed Chair and Professor of Cognitive Sciences* (human and machine vision, 3D shape, symmetry, virtual reality, robotics, problem solving)

Virginia Richards, Ph.D. University of California, Berkeley, *Professor of Cognitive Sciences* (auditory perception and cognition, human psychophysics)

Jeffrey Rouder, Ph.D. University of California, Irvine, *Falmagne Endowed Chair and Professor of Cognitive Sciences* (mathematical and statistical models of perception and cognition, bayesian mixed models, psychometrics)

Kourosh Saberi, Ph.D. University of California, Berkeley, *Professor of Cognitive Sciences* (conscious systems, evolutionary game theory, nature of reality, machine learning, artificial intelligence)

Barbara W. Sarnecka, Ph.D. University of Michigan, *Professor of Cognitive Sciences; Logic and Philosophy of Science* (cognitive development, language development, number concepts, conceptual change, individual cognitive development, historical development of science and mathematics)

Ramesh Srinivasan, Ph.D. Tulane University, *Department Chair and Professor of Cognitive Sciences; Biomedical Engineering* (perception, attention, decision-making, cognitive and clinical neuroscience)

Mark Steyvers, Ph.D. Indiana University, *Professor of Cognitive Sciences; Computer Science; Psychological Science* (higher-order cognition, cognitive neuroscience, computational modeling, collective intelligence)

Joachim S. Vandekerckhove, Ph.D. University of Leuven, *Associate Professor of Cognitive Sciences; Statistics* (response time modeling, model fitting, computational statistics, psychometrics, bayesian statistics)

Charles E. Wright, Ph.D. University of Michigan, *Associate Professor of Cognitive Sciences* (cognitive psychology, human motor control, fitts task, aimed movements, handwriting, immersive virtual reality, 1/f noise, quantitative models)

## Affiliate Faculty

Drew Bailey, Ph.D. University of Missouri, *Associate Professor of Education; Cognitive Sciences; Psychological Science*

Nikil D. Dutt, Ph.D. University of Illinois at Urbana–Champaign, *UCI Chancellor's Professor of Computer Science; Cognitive Sciences; Electrical Engineering and Computer Science* (embedded systems, computer architecture, electronic design automation, software systems, brain-inspired architectures and computing)

Charles C. Fowlkes, Ph.D. University of California, Berkeley, *Professor of Computer Science; Cognitive Sciences* (artificial intelligence, computer vision, machine learning, computational biology)

Susanne M. Jaeggi, Ph.D. University of Bern, *Associate Professor of Education; Cognitive Sciences* (working memory, executive functions, cognitive training, lifespan development aging, individual differences)

Elizabeth F. Loftus, Ph.D. Stanford University, *UCI Distinguished Professor of Psychological Science; Cognitive Sciences; Criminology, Law and Society; School of Law* (cognitive psychology, human memory, psychology and law)

David C. Lyon, Ph.D. Vanderbilt University, *Department Vice Chair and Associate Professor of Anatomy and Neurobiology; Cognitive Sciences*

John Middlebrooks, Ph.D. University of California, San Francisco, *Professor of Otolaryngology; Biomedical Engineering; Cognitive Sciences; Neurobiology and Behavior*

Hal S. Stern, Ph.D. Stanford University, *UCI Chancellor's Professor of Statistics; Cognitive Sciences*

Fan-Gang Zeng, Ph.D. Syracuse University, *Director of Hearing Research and Professor of Otolaryngology; Anatomy and Neurobiology; Biomedical Engineering; Cognitive Sciences*

## Cognitive Sciences Courses

### COGS 14P. Python for Cognitive Science and Neuroscience Research. 4 Units.

Introduces Python for data analysis and modeling encountered in cognitive science and neuroscience. Topics include data structures, execution control, graphic visualization, and interaction with sound and display interfaces. Application in statistical analysis, model simulation, and stimulus presentation and experimental control.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**COGS 109. Cognitive Sciences Research Seminar. 4 Units.**

Read and discuss examples of the primary research leading to the concepts covered in Psychology Fundamentals. Focuses on how this research is conducted and how inferences from it are drawn.

Prerequisite or corequisite: PSYC 9A

Restriction: Cognitive Sciences Majors only.

**COGS 110. Quantitative Methods for Cognitive Sciences Research. 4 Units.**

Basics of quantitative methods used in cognitive sciences research focusing on linear algebra, Fourier analysis, multivariate statistics, and signal detection theory. Examples drawn from models and methods used in cognitive sciences research with practical examples.

Prerequisite: MATH 2B and STAT 7 and (PSYC 114M or ICS 31)

Restriction: Cognitive Sciences majors only.

## Psychology Courses

**PSYCH 7A. Introduction to Psychology. 4 Units.**

Introduction to field of psychology, addressing the application of scientific methods to the study of human development, learning, memory, problem solving, perception, biological mechanisms, emotions and motivation, personality, psychopathology, and effects of diverse social and cultural contexts on human behavior.

Same as PSCI 9.

Overlaps with PSYCH 9A, PSYCH 9B, PSYCH 9C, PSCI 11A, PSCI 11B.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment. PSCI 9 and PSYCH 7A may not be taken for credit if taken concurrently with or after PSCI 11A, PSCI 11B, PSCI 11C, PSYCH 9A, PSYCH 9B, or PSYCH 9C.

(III)

**PSYCH 9A. Psychology Fundamentals. 4 Units.**

Designed to provide freshman with an in-depth survey of general psychology. Topics include biological bases of behavior, sensation, perception, cognition, development, personality, psychopathology, and social psychology.

Same as PSCI 11A.

Restriction: Lower-division students only. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. PSCI 9 and PSYCH 7A may not be taken for credit if taken after PSCI 11A, PSCI 11B, PSCI 11C, PSYCH 9A, PSYCH 9B, or PSYCH 9C.

(III)

**PSYCH 9B. Psychology Fundamentals. 4 Units.**

Designed to provide freshmen with an in-depth survey of general psychology. Topics include biological bases of behavior, sensation, perception, cognition, development, personality, psychopathology, and social psychology.

Same as PSCI 11B.

Restriction: Lower-division students only. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

(III)

**PSYCH 9C. Psychology Fundamentals. 4 Units.**

Designed to provide freshman with an in-depth survey of general psychology. Topics include biological bases of behavior, sensation, perception, cognition, development, personality, psychopathology, and social psychology.

Same as PSCI 11C.

Restriction: Lower-division students only. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Public Health Sciences Majors have first consideration for enrollment. Public Health Policy Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Urban Studies Majors have first consideration for enrollment.

(III)

**PSYCH 10A. Probability and Statistics in Psychology I. 4 Units.**

An introduction to probability and statistics. Emphasis on thorough understanding of the probabilistic basis of statistical inference. Examples drawn primarily from psychology.

Restriction: Psychology Majors have first consideration for enrollment.

(Va)

**PSYCH 10B. Probability and Statistics in Psychology II. 4 Units.**

An introduction to probability and statistics. Emphasis on thorough understanding of the probabilistic basis of statistical inference. Examples drawn primarily from psychology.

Prerequisite: PSYCH 10A

Restriction: Psychology Majors have first consideration for enrollment.

(Va)

**PSYCH 10C. Probability and Statistics in Psychology III. 4 Units.**

An introduction to probability and statistics. Emphasis on thorough understanding of the probabilistic basis of statistical inference. Examples drawn primarily from psychology.

Prerequisite: PSYCH 10B

Restriction: Psychology Majors have first consideration for enrollment.

(Vb)

**PSYCH 21A. Adolescent Psychology. 4 Units.**

Focuses on psychosocial dynamics of today's adolescents in America emphasizing the quest for identity, independence, values, and sexual orientation. The influence of society, family, school, and peers is analyzed. Strategies for helping troubled adolescents are discussed.

Overlaps with PSCI 112D.

(III)

**PSYCH 46A. Introduction to Human Memory. 4 Units.**

Covers the core concepts of modern research and theorizing about human memory, including structural subdivisions (e.g., perceptual memory, short-term memory, long-term memory), different measures of memory (e.g., recall, reorganization), and some practical applications of memory research (e.g., mnemonics).

(III)

**PSYCH 56L. Acquisition of Language. 4 Units.**

What children say, what they mean, and what they understand. Theories about the learning of language by one-, two-, and three-year-olds. Comparison of kinds of data on which these theories are based.

Same as LSCI 51.

(III)

**PSYCH 78A. Self-Identity and Society. 4 Units.**

Studies sociological contributions to theory and research in social psychology, with focus on the social influences on personality, attitudes, beliefs, and behavior; socialization, human groups, and social interaction.

Same as SOCIOL 31.

**(III)****PSYCH 89. Special Topics in Lower-Division Psychology. 4 Units.**

Studies in selected areas of psychology at the lower-division level. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**PSYCH H101A. Honors Seminar in Psychology I. 4 Units.**

Focuses on the research activities and honors thesis research projects of each student and the research of various Cognitive Sciences faculty. Students discuss their research interests in the early and later stages of their projects. Research projects and write-ups required.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

Restriction: Psychology Majors only. Cognitive Sciences Majors only. Social Science Honors students only.

**PSYCH H101B. Honors Seminar in Psychology II. 4 Units.**

Focuses on the research activities and honors thesis research projects of each student and the research of various Cognitive Sciences faculty. Students discuss their research interests in the early and later stages of their projects. Research projects and write-ups required.

Prerequisite: PSYCH H101A

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 2 times.

Restriction: Psychology Majors only. Cognitive Sciences Majors only. Social Science Honors students only.

**PSYCH H101C. Honors Seminar in Psychology III. 4 Units.**

Focuses on the research activities and honors thesis research projects of each student and the research of various Cognitive Sciences faculty. Students discuss their research interests in the early and later stages of their projects. Research projects and write-ups required.

Prerequisite: PSYCH H101B

Repeatability: May be taken for credit 2 times.

Restriction: Psychology Majors only. Cognitive Sciences Majors only. Social Science Honors students only.

**PSYCH 111BW. Honors Advanced Experimental Psychology. 4 Units.**

Design and analysis of multivalent, factorial, and correlational studies. Students prepare proposals for independent research.

Corequisite: PSYCH H111B

Prerequisite: PSYCH H111A and (PSYC H11A or PSYCH 112A). Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Psychology Majors only. Social Science Honors students only.

**(Ib)****PSYCH H111A. Honors Experimental Psychology. 4 Units.**

Emphasis on design of experiments and analysis of results. Experiments are conducted in laboratory sections.

Prerequisite: ((PSYCH 9A and PSYCH 9B and PSYCH 9C) or (PSY BEH 11A and PSY BEH 11B and PSY BEH 11C)) and ((PSYCH 10A and 10B and 10C) or (MATH 2A and MATH 2B and (MATH 7 or STATS 7))).

Overlaps with PSYCH 112A.

Restriction: Psychology and Cognitive Sciences Honors Program students only.

**PSYCH H111B. Honors Advanced Experimental Psychology Laboratory. 2 Units.**

Design and analysis of multivalent, factorial, and correlational studies. Students prepare proposals for independent research.

Corequisite: PSYCH 111BW

**PSYCH H111C. Honors Research in Experimental Psychology. 4 Units.**

Each student conducts a research project in experimental psychology. The projects are discussed in a seminar format. Written reports on each project are submitted at the end of the quarter.

Prerequisite: PSYCH 111BW or PSYCH 112B

Restriction: Psychology Majors only. Social Science Honors students only.

**PSYCH 112A. Experimental Psychology. 4 Units.**

Emphasis on design of experiments and analysis of results. Experiments are conducted in laboratory sections.

Corequisite: PSYCH 112LA

Prerequisite: ((PSYCH 9A and PSYCH 9B and PSYCH 9C) or (PSY BEH 11A and PSY BEH 11B and PSY BEH 11C)) and ((PSYCH 10A and PSYCH 10B and PSYCH 10C) or (MATH 2A and MATH 2B and (MATH 7 or STATS 7)))

Overlaps with PSYCH H111A, PSYCH 112F, PSYCH 112G.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 112BW. Advanced Experimental Psychology. 4 Units.**

Design and analysis of multivalent, factorial, and correlational studies. Students prepare proposals for independent research.

Prerequisite: PSYCH 112A and PSYCH 112LA. Satisfactory completion of the Lower-Division Writing requirement.

Overlaps with PSYCH 112F, PSYCH 112FW, PSYCH 112G, PSYCH 112GW.

Restriction: Psychology Majors have first consideration for enrollment.

**(Ib)**

**PSYCH 112C. Research in Experimental Psychology. 4 Units.**

Each student conducts a research project in experimental psychology. The projects are discussed in a seminar format. Written reports on each project are submitted at the end of the quarter.

Corequisite: PSYCH 112LC

Prerequisite: PSYCH 112B and PSYCH 112LB

Overlaps with PSYCH 112F, PSYCH 112FW, PSYCH 112G, PSYCH 112GW.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 112D. Effective Graphical Presentation of Data. 4 Units.**

Learn to use MATLAB to produce graphical displays of data based on psychological principles for effective design. Approach is problem-oriented, with emphasis on case-studies using data from psychological experiments and real-world corpora. Assessment via independent individual projects.

Corequisite: PSYCH 112LD

Prerequisite: (PSYCH 9A and PSYCH 9B and PSYCH 9C) or (PSY BEH 11A and PSY BEH 11B and PSY BEH 11C) and (PSYCH 10C or SOC SCI 10C or ANTHRO 10C or POL SCI 10C or SOCIOL 10C) or (MATH 2B and STATS 7)

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 112LA. Experimental Psychology Laboratory. 2 Units.**

Required laboratory section and co-requisite for Psych 112A.

Corequisite: PSYCH 112A

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 112LB. Advanced Experimental Psychology Laboratory. 2 Units.**

Required laboratory section for PSYCH 112B and PSYCH 112BW.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 112LC. Research in Experimental Psychology.**

Required laboratory section and co-requisite for PSYCH 112C.

Corequisite: PSYCH 112C

**PSYCH 112LD. Effective Graphical Presentation of Data Lab . 2 Units.**

Lab to learn to use MATLAB to produce graphical displays of data based on psychological principles for effective design. Approach is problem-oriented, with emphasis on case-studies using data from psychological experiments and real-world corpora. Assessment via independent individual projects.

Corequisite: PSYCH 112D

Restriction: Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment.

**PSYCH 112LM. Research Methods in Psychology Laboratory. 2 Units.**

Required laboratory section and co-requisite for PSYCH 112M.

Corequisite: PSYCH 112M

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 112LR. Cognitive Robotics Laboratory. 2 Units.**

Required laboratory section and corequisite for PSYCH 112R.

Corequisite: PSYCH 112R

Restriction: Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment.

**PSYCH 112M. Research Methods in Psychology. 4 Units.**

Research methods in psychology for majors who wish to fulfill this requirement separately from upper-division writing. Covers both experimental and descriptive research methods, analysis of results, and reading the psychological literature. Research experience is provided in laboratory sections.

Corequisite: PSYCH 112LM

Prerequisite: (PSYCH 9A and PSYCH 9B and PSYCH 9C) or (PSY BEH 11A and PSY BEH 11B and PSY BEH 11C) and (PSYCH 10C or SOC SCI 10C or ANTHRO 10C or POL SCI 10C or SOCIOL 10C) or (MATH 2B and STATS 7)

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 112R. Cognitive Robotics. 4 Units.**

Introduces concepts on experimental design, embodiment, robot construction, and computer programming. Concepts of embodied intelligence and case studies of cognitive robotics are covered in lecture. Simple robots are constructed and programmed to carry out different behavioral experiments in lab.

Corequisite: PSYCH 112LR

Prerequisite: (PSYCH 9A and PSYCH 9B and PSYCH 9C) or (PSY BEH 11A and PSY BEH 11B and PSY BEH 11C) and (PSYCH 10C or SOC SCI 10C or ANTHRO 10C or POL SCI 10C or SOCIOL 10C) or (MATH 2B and STATS 7)

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 114M. MATLAB Programming. 4 Units.**

MATLAB is a mathematical software package for solving quantitative problems often encountered in experimental psychology. Topics include rudiments of programming, statistical analysis of data, matrix algebra, signal processing, graphic visualization, and simulated models of cognitive and perceptual processes.

Restriction: Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment.

**PSYCH 119. Special Topics in Research Methodologies. 1-4 Units.**

Studies in selected areas of research methodologies. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Psychology Majors have first consideration for enrollment.



**PSYCH 120A. Abnormal Psychology. 4 Units.**

Introduction to psychopathology and behavioral deviations, and the concepts of theories regarding these conditions.

Prerequisite: PSYCH 7A or PSCI 9 or PSYCH 9C or PSCI 11C

Overlaps with PSCI 102C.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 120D. Developmental Psychology. 4 Units.**

A general introduction to the study of the physical, intellectual, social, and emotional development of the child from birth to adulthood.

Prerequisite: PSYCH 7A or PSCI 9 or PSYCH 9A or PSCI 11A

Overlaps with PSCI 111D.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Nursing Science Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 120H. History of Psychology. 4 Units.**

A history of the development of various schools and systems of psychological thought.

Prerequisite: (PSYCH 7A or PSCI 9) or (PSYCH 9A or PSCI 11A) and (PSYCH 9B or PSCI 11B) and (PSYCH 9C or PSCI 11C)

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 120P. Personality Theories. 4 Units.**

A survey of the evolution of personality theory during this century. An overview of major perspectives in the field, with special attention to Freud, Jung, and Adler.

Prerequisite: PSYCH 7A or PSCI 9 or PSYCH 9C or PSCI 11C

Overlaps with PSCI 170S.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 121M. Theories of Motivation. 4 Units.**

Factors affecting the behavioral performance of organisms. A survey of theoretical and empirical approaches to the physiological, psychological, and social factors which generate behavior.

Prerequisite: (PSYCH 7A or PSCI 9) or (PSYCH 9A or PSCI 11A) and (PSYCH 9B or PSCI 11B) and (PSYCH 9C or PSCI 11C)

Overlaps with PSCI 176S.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 121P. Positive Psychology. 4 Units.**

Positive psychology, at the subjective level, is about valued subjective experiences; at the individual level, it is about positive individual traits; and at the group level, it is about the civic virtues and institutions that move individuals toward better citizenship.

Prerequisite: (PSYCH 9A or PSCI 11A) and (PSYCH 9B or PSCI 11B) and (PSYCH 9C or PSCI 11C)

Overlaps with PSY BEH 184S.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 121S. Psychology of Sleep and Consciousness. 4 Units.**

Covers the physiology, neurochemistry, and neuroanatomy associated with sleep, contemporary sleep theory, REM and NREM, phenomenology, sleep disorders, examination of differences between conscious and unconscious cognitive function, the history of sleep and dream theories from ancient time to present day.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 122C. Clinical Psychology. 4 Units.**

Provides overview of the clinical psychology field including theories and techniques used in counseling and testing.

Overlaps with PSY BEH 150C.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 122I. Organizational/Industrial Psychology. 4 Units.**

Introduction to applied psychology in organizations, including personnel testing, selection, training and evaluation, job and classification analysis, job satisfaction and motivation, organizational development, leadership, market research, and consumer psychology. Potential ethical problems are discussed.

Prerequisite: (PSYCH 7A or PSY BEH 9) or (PSYCH 9A or PSY BEH 11A) or (PSYCH 9B or PSY BEH 11B) or (PSYCH 9C or PSY BEH 11C)

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 122P. Clinical Psychophysiology. 4 Units.**

Psychophysiology investigates the relationships between physiological processes and psychological phenomena. Technologies examined include reaction times, heart rate variability, EEGs, ERPs, magnetoencephalography, and eye tracking. Applications include diagnosis, the longitudinal assessment, and the identification of individuals at risk of disease onset.

Prerequisite: BIO SCI N110 or BIO SCI N115A or PSYCH 9A or PSCI 11A

Same as BIO SCI N118.

(II ).

**PSYCH 123P. Topics in Philosophy of Psychology. 4 Units.**

Selected topics in the philosophy of psychology, e.g., the nature of psychological explanation, reductionism, issues in cognitive, behavioral, and neuroscience.

Repeatability: Unlimited as topics vary.

Same as LPS 143, PHILOS 143.

Restriction: Psychology Majors have first consideration for enrollment. Philosophy Majors have first consideration for enrollment.

**PSYCH 124S. Sports Psychology. 4 Units.**

Discusses the field of sports psychology with an emphasis on clinical practice including motivation, goal setting, performance skills, and mental skills. Discusses and utilizes a wide range of techniques designed to enhance performance and manage problems among athletes.

Prerequisite: (PSYCH 7A or PSY BEH 9) or (PSYCH 9C or PSY BEH 11C)

Overlaps with PSY BEH 139H.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 124V. Psychology of Violence. 4 Units.**

Discusses the psychology of violence and aggression with an emphasis on understanding the psychological, social, and physiological roots of violent and aggressive behavior. Psychological treatment techniques and strategies for prevention of aggressive and violent behavior are also discussed.

Prerequisite: (PSYCH 7A or PSY BEH 9) or (PSYCH 9C or PSY BEH 11C)

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 129. Special Topics in General Psychology. 4 Units.**

Studies in selected areas of general psychology. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 130A. Perception and Sensory Processes. 4 Units.**

A general introduction to the scientific study of sensory processes and perceptual phenomena, with special emphasis in the visual systems.

Prerequisite: (PSYCH 7A or PSY BEH 9) or (PSYCH 9A or PSY BEH 11A)

Overlaps with PSYCH 131A, PSYCH 131B.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 131A. Vision. 4 Units.**

Visual perception and the anatomy and physiology of the visual system. Topics include the retina and the visual pathway; visual sensitivity; color vision; spatial vision; motion perception; and the development of the visual system.

Same as BIO SCI N182.

Overlaps with PSYCH 130A.

Restriction: Upper-division students only. Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment. School of Biological Sciences students have first consideration for enrollment.

**PSYCH 131B. Hearing. 4 Units.**

Auditory perception, the anatomy and physiology of the auditory system, and the physics of sound. Topics include neural transduction of sound, sensitivity, sound localization, complex sound perception, and hearing loss.

Prerequisite: (PSYCH 9A or PSY BEH 11A) and (PSYCH 9B or PSY BEH 11B)

Overlaps with PSYCH 130A.

Restriction: Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment.

**PSYCH 135M. The Mind/Body Problem. 4 Units.**

What is consciousness and what is matter and how are the two related? How can brains have minds? This multidisciplinary course draws on information from the fields of computer vision, artificial intelligence, cognition, neurophysiology, philosophy, and psychophysics.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 139. Special Topics in Perception and Sensory Processes. 4 Units.**

Studies in selected areas of perception and sensory processes. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 140C. Cognitive Science. 4 Units.**

Introduction to the investigations of the structure and function of the mind, from viewpoints of computation, neuroscience, philosophy, and cognitive psychology. Topics include perception, attention, knowledge representations, learning and memory, action, reasoning, and language.

Prerequisite: (PSYCH 7A or PSY BEH 9) and (PSYCH 9A or PSY BEH 11A) and (PSYCH 9B or PSY BEH 11B)

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 140L. Principles of Learning Theory. 4 Units.**

Investigation of the learning and memory processes of human and animals. Basic experimental approaches to learning and memory, empirical results, and theoretical interpretations of the evidence are discussed.

Prerequisite: (PSYCH 7A or PSY BEH 9) or (PSYCH 9A or PSY BEH 11A)

Restriction: Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment.

**PSYCH 140M. Human Memory. 4 Units.**

Developments in the area of memory; history of memory research; theories of the nature of memory. Visual memory, recognition memory, high-speed scanning, free recall, short-term memory, mnemonics, retrieval, relationship of memory to thinking. Selected theoretical formulations for memory.

Prerequisite: (PSYCH 7A or PSY BEH 9) or (PSYCH 9B or PSY BEH 11B)

Restriction: Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment.

**PSYCH 143P. Human Problem Solving. 4 Units.**

Modern developments in the psychology of human problem solving. Topics include concept identification, arithmetic, sets, logic puzzles, story problems, group problem solving, and theorem proving.

Prerequisite: (PSYCH 7A or PSY BEH 9) or (PSYCH 9B or PSY BEH 11B)

Restriction: Psychology Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment.

**PSYCH 146MW. Writing about Memory. 4 Units.**

Covers a broad range of texts, literary, philosophical, and scientific, each probing the nature of memory and its meaning in human life. Readings are drawn from across many disciplines and many perspectives.

Prerequisite: PSYCH 7A or PSYCH 9B or PSY BEH 9 or PSY BEH 11B. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Psychology Majors have first consideration for enrollment.

(Ib)

**PSYCH 149. Special Topics in Cognition and Learning. 4 Units.**

Studies in selected areas of cognition and learning. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 150. Psychology of Language. 4 Units.**

Examines language using the tools of experimental psychology. From sounds to words to spoken and written sentences, explores how language is used in real time, and how its use reveals how it is represented in the mind.

Prerequisite: PSYCH 7A or PSCI 9 or PSYCH 9B or PSCI 11B or LSCI 3

Same as LSCI 155.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Language Science Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 156A. Acquisition of Language II. 4 Units.**

Focuses on native language learning, exploring the way in which infants and very young children unconsciously uncover the rich systematic knowledge of their native language. Examines both experimental and computational studies that quantitatively investigate the 'how' of language acquisition.

Prerequisite: PSYCH 56L or LINGUIS 51

Same as LINGUIS 150.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 157M. Computational Methods for Language Research. 4 Units.**

Focuses on computational methods useful for language research. Students become familiar with software and programming languages used for extracting information from electronic datasets and for creating basic simulations of linguistic cognition. No prior programming experience assumed.

Prerequisite: PSYCH 150 or LSCI 155 or PSYCH 156A or LSCI 151

Same as PSYCH 157M.

**PSYCH 159. Special Topics in Language. 4 Units.**

Studies in selected areas of language sciences. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 160A. Introduction to Cognitive Neuroscience. 4 Units.**

Introduction to the neural basis of human perceptual, motor, and cognitive abilities. Topics include sensory perception, motor control, memory, language, attention, emotion, frontal lobe function, functional brain imaging, and neuropsychological disorders.

Prerequisite: (PSYCH 7A or PSY BEH 9) and (PSYCH 9A or PSY BEH 11A) and (PSYCH 9B or PSY BEH 11B)

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 160D. Brain Disorders and Behavior. 4 Units.**

Examines the localization of human brain functions and the effects of neurological disorders on psychological functions such as perception, motor control, language, memory, and decision-making.

Prerequisite: (PSYCH 7A or PSY BEH 9) and (PSYCH 9A or PSY BEH 11A) and (PSYCH 9B or PSY BEH 11B) or BIO SCI 35 or BIO SCI N110

Same as BIO SCI N165.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Biological Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 160H. History of Cognitive Neuroscience. 4 Units.**

Studies of the human mind from ancient cultures to the innovation of modern methods of brain imaging. Logic of valid and invalid brain hypothesis are examined. Recurring theme is the competition between holistic and localized views of brain function.

Prerequisite: PSYCH 9A or PSY BEH 11A or PSYCH 7A or PSY BEH 9

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 161. Language and the Brain . 4 Units.**

Research analysis on biological bases of human linguistic capacity. Development, focusing on hemispheric specialization, plasticity; localization of specific linguistic functions in adults, with emphasis on study of aphasias; relation of linguistic capacity to general cognitive capacity, considering research on retardation.

Prerequisite: (PSYCH 7A or PSY BEH 9 or PSYCH 9A or PSY BEH 11A) and (PSYCH 9B or PSY BEH 11B or BIO SCI 35 or BIO SCI N110 or BIO SCI N115A)

Same as BIO SCI N160, LSCI 158.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Biological Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 161H. Hearing and the Brain. 4 Units.**

An overview of brain mechanisms of hearing, including perception of simple sounds, speech, and music. Begins with sound itself, and looks at processing by the ear, auditory pathways, auditory cortex, and beyond. Also auditory development, learning, and clinical issues.

Prerequisite: PSYCH 160A or BIO SCI 93 or BIO SCI H93

Same as BIO SCI N147.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Biological Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 162N. Human Neuropsychology. 4 Units.**

A survey of human brain disorders using a clinical case study approach to illustrate fundamental issues in studying brain and behavior. Topics include sensory deficits, attentional neglect, amnesia, cortical organization, clinical psychopathology, and more.

Prerequisite: BIO SCI N110 or BIO SCI N115A or PSYCH 9A or PSCI 11A

Same as BIO SCI N173, PSCI 163C.

Restriction: School of Biological Sciences students have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 169. Special Topics in Cognitive Neuroscience . 4 Units.**

Studies in selected areas of cognitive neuroscience. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 173A. Psychological Anthropology. 4 Units.**

Cultural differences and similarities in personality and behavior. Child-rearing practices and consequent adult personality characteristics, biocultural aspects of child development and attachment, culture and behavior evolutionary models, politically linked personality, cognitive anthropology, psychology of narrative forms, comparative national character studies.

Prerequisite: ANTHRO 2A or PSYCH 7A or (PSYCH 9A and PSYCH 9B and PSYCH 9C) or (PSY BEH 11A and PSY BEH 11B and PSY BEH 11C)

Same as ANTHRO 132A.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 174E. African American Psychology. 4 Units.**

Historical overview of the development of black psychology and the African American frame of reference. Topics include personality development, psychological assessment, issues in education, black mental health, and the role of the African American psychologist in the community.

Same as AFAM 153.

**PSYCH 174H. Chicano/Latino Families. 4 Units.**

Introduction to the research, literature, and issues surrounding the topic of Chicano/Latino families including cultural history, contemporary issues, organization of family, traditions, lifestyles, values, beliefs, generational differences, gender issues, ethnic identity, evolution of demographic patterns, current economic and political standings.

Same as CHC/LAT 170, PSCI 166S, SOC SCI 165.

**PSYCH 176A. Political Psychology. 4 Units.**

Examination of how psychological theory and research may be used to better understand political thought and behavior. Drawing on theories of learning, cognition, and personality, discusses such topics as the formation of political attitudes, and the process of political decision-making.

Same as POL SCI 128C.

Restriction: Majors only. POL SCI 128C may not be taken for credit if taken after POL SCI 137C.

**PSYCH 177D. Deviance. 4 Units.**

Perspectives on deviance and criminality in behavior, institution, community, and myth. The suitability of contemporary theories of deviant behavior.

Same as SOCIOL 156, CRM/LAW C107.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 177F. Forensic Psychology: Advanced Seminar. 4 Units.**

Focuses on the psychology of criminal offending, particularly violent behavior. Examines violence, sexual offending, and mental disorder related to crime with regard to clinical assessment and treatment; mental health services within forensic institutions.

Prerequisite: (PSCI 9 or PSCI 11C or PSYCH 7A or PSYCH 9C) and PSCI 102C and (PSCI 178S or CRM/LAW C149)

Same as CRM/LAW C136, PSCI 156C.

Restriction: Psychological Science Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**PSYCH 178N. Social Psychology of Networks. 4 Units.**

Review of network methods used in small group and organizational research. Discussion of social psychological literature relevant to the network of study of cognitive social structure, exchange/communication, identity negotiation, and social control. Case study of network datasets exemplifies research issues.

Same as SOCIOL 135.

Restriction: Sociology Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**PSYCH 179. Special Topics in Interdisciplinary Studies. 1-4 Units.**

Studies in selected areas of interdisciplinary studies. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Psychology Majors have first consideration for enrollment.

**PSYCH 198. Directed Group Study. 1-4 Units.**

Directed study with Cognitive Sciences faculty.

Repeatability: May be repeated for credit unlimited times.

**PSYCH 199. Independent Study. 1-4 Units.**

Independent research with Cognitive Sciences faculty.

**PSYCH 201A. Cognitive Sciences Research Seminar. 1.3 Unit.**

Weekly reports and colloquia by faculty, students, and visitors.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Psychology Majors only.

**PSYCH 201B. Cognitive Sciences Research Seminar. 1.3 Unit.**

Weekly reports and colloquia by faculty, students, and visitors.

Prerequisite: PSYCH 201A

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Psychology Majors only.

**PSYCH 201C. Cognitive Sciences Research Seminar. 1.4 Unit.**

Weekly reports and colloquia by faculty, students, and visitors.

Prerequisite: PSYCH 201B

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Psychology Majors only.

**PSYCH 202A. Proseminar in the Cognitive Sciences. 1 Unit.**

Introduction to the conceptual foundations and basic research results in the cognitive sciences for first-year graduate students.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**PSYCH 203A. Discrete Mathematics and Probability. 4 Units.**

Logic and set theory are covered during the first three weeks, using an interactive computer system. The remaining seven weeks are devoted to probability theory and cover elementary concepts from samples spaces to Chebychev's Inequality and the moment generating function.

Restriction: Graduate students only.

**PSYCH 203C. Algorithmic Statistics. 4 Units.**

Discussion of the fundamentals of statistical inference and computational implementations of common statistical models.

Restriction: Graduate students only.



**PSYCH 203D. Applied Mathematics for Cognitive Sciences Research. 4 Units.**

Covers the basics of linear systems analysis, focusing on linear algebra, Fourier analysis, differential equations, and elementary signal processing. Applications in Cognitive Science and Cognitive Neuroscience research will be developed.

Prerequisite: PSYCH 205A

Restriction: Graduate students only. Psychology Majors only.

**PSYCH 205A. Computational and Research Methods with MATLAB. 4 Units.**

Introduces rudiments of programming, statistical analysis and probability theory, graphic visualization, GUI design, spectral analysis, and simulation models using MATLAB, a software package for solving quantitative problems often encountered in experimental psychology.

Restriction: Graduate students only.

**PSYCH 205B. Running Experiments Using MATLAB. 4 Units.**

Provides an in-depth introduction to writing MATLAB programs to run auditory and visual experiments. Topics covered include program structure, stimulus generation, presentation, and data collection.

Prerequisite: PSYCH 205A

**PSYCH 205C. Computational Statistics. 4 Units.**

Introduction to a number of computational statistics approaches including exploratory data analysis and modeling using a probabilistic framework with Bayesian graphical models. Emphasis will be on in-class programming using MATLAB.

Restriction: Graduate students only.

**PSYCH 210A. Introduction to Cognitive and Brain Sciences I: Perception. 4 Units.**

Discusses models of cognition and evidence linking cognition and the brain. Focus is on visual, auditory, and somatic perception and bottom-up mechanisms of attention.

Restriction: Graduate students only.

**PSYCH 210B. Introduction to Cognitive and Brain Sciences II: Cognition. 4 Units.**

Discusses models of cognition and evidence linking cognition and the brain. Focus is on emotion, top-down attention, goal-directed behavior, categorization, judgment, and decision-making.

Restriction: Graduate students only.

**PSYCH 210C. Introduction to Cognitive and Brain Sciences III: Learning and Development. 4 Units.**

Discusses experimental data, formal models of learning, and evidence linking learning and development to its neural substrates. Topics include Pavlovian and instrumental conditioning, language acquisition, causal reasoning, perceptual learning, category formation, and structure learning.

Restriction: Graduate students only.

**PSYCH 213. The Mind/Body Problem. 4 Units.**

Course is multidisciplinary, drawing on information from the fields of quantum physics, computer vision, artificial intelligence, cognition, neurophysiology, philosophy, and psychophysics.

Restriction: Graduate students only.

**PSYCH 214. Bayesian Cognitive Modeling. 4 Units.**

Considers a range of statistical methods of data analysis and simple cognitive models using the Bayesian graphical modeling framework.

Restriction: Graduate students only.

**PSYCH 218. Hearing. 4 Units.**

Examines auditory sensation and perception using psychophysical and neuroscientific perspectives. Covers physical aspects of sound; subcortical auditory processing; aspects of sensation and perception such as sensitivity, sound localization, and complex-sound recognition; neuroscientific studies of cortical function; and abnormal auditory processing.

Restriction: Graduate students only.

**PSYCH 229. Special Topics in Human Cognition. 1.3-4 Units.**

Current research in brain/ behavior relationships, human memory, and learning theory is presented.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PSYCH 231P. Topics in Philosophy of Psychology. 4 Units.**

Selected topics in the philosophy of psychology, e.g., the nature of psychological explanation, reductionism, issues in cognitive, behavioral, and neuroscience.

Repeatability: Unlimited as topics vary.

Same as LPS 243, PHILOS 243.

**PSYCH 234A. Mathematical Models of Cognitive Processes I . 4 Units.**

Mathematical models of various cognitive processes developed since 1960, including learning, memory, perception, psycholinguistics, and problem solving. Models are formulated in different mathematical languages: calculus, algebra, logic, probability, and computer. Difficulties in testing and validating models discussed.

Restriction: Graduate students only.

**PSYCH 237. Advanced Bayesian Cognitive Modeling. 4 Units.**

Considers a range of advanced cognitive process models including models of signal detection, memory retention, category learning, stimulus representation, and reasoning using the Bayesian graphical modeling framework.

Prerequisite: PSYCH 214

Restriction: Graduate students only.

**PSYCH 239. Special Topics in Methodology and Models. 1.3-4 Units.**

Current research in cognitive sciences methodologies, concepts, and models is presented.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PSYCH 245A. Computational Models of Language Learning. 4 Units.**

Focuses on computational models of native language learning, exploring how probabilistic learning and inference fare on difficult case studies within language acquisition. In all cases, grounds the learning models in available empirical data and considers their psychological plausibility.

Prerequisite: PSYCH 215L

Restriction: Graduate students only.

**PSYCH 245M. Computational Models of Language Learning. 4 Units.**

Focuses on computational models of native language learning, exploring how probabilistic learning and inference fare on difficult case studies within language acquisition. In all cases, grounds the learning models in available empirical data and considers their psychological plausibility.

Prerequisite: LSCI 251. LSCI 251 with a grade of B- or better

Same as LSCI 206C.

Restriction: Graduate students only.

Concurrent with LSCI 106M.

**PSYCH 249. Special Topics in Language Science. 1.3-4 Units.**

Foundations and current research in theoretical, experimental, and computational linguistics.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PSYCH 259. Special Topics in Human Performance. 1.3-4 Units.**

Current research in the human issues involved with sensation, perception, and cognition.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PSYCH 261N. Cortical Neuroscience. 4 Units.**

Physiology of the cerebral cortex, theoretical neuroscience, and the neural basis of perception.

Prerequisite: PSYCH 216

**PSYCH 262. Functional Neuroanatomy. 4 Units.**

It is impossible to truly understand human behavior without some understanding of the physical structure that enables behavior. Examines recent findings in functional neuroanatomy through lectures and papers discussing links between particular behaviors and specific brain structures.

Restriction: Graduate students only.

**PSYCH 265. Introduction to Functional MRI. 4 Units.**

Describes the fundamentals of imaging the human brain function using functional Magnetic Resonance Imaging (fMRI). Topics include basic fMRI physics, experimental design, and data acquisition and analysis.

Restriction: Graduate students only.

**PSYCH 268A. Computational Neuroscience. 4 Units.**

Introduction to computational neuroscience. Mathematical models of single neurons, neural circuits, thalamocortical systems, and cortical mass action can stimulate single-unit, local field potential, and EEG dynamics. These models are used to investigate mechanisms of sensation, motor control, attention, and consciousness.

Prerequisite: PSYCH 205A and (PSYCH 210A or PSYCH 210B or PSYCH 210C)

**PSYCH 268R. Cognitive Robotics. 4 Units.**

Introduces concepts for studying cognitive function by embedding brain models on robotic platforms. Topics include robot construction, computer programming, and the notion of embodiment. Students construct simple robots and program these robots to perform different behaviors.

**PSYCH 269. Special Topics in Cognitive Neuroscience. 1.3-4 Units.**

Current research in cognitive neuroscience.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PSYCH 289. Special Topics in Sensation and Perception. 1.3-4 Units.**

Current research in the reception and processing of visual and auditory stimuli presented.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**PSYCH 290. Dissertation Research. 1-12 Units.**

Dissertation research with Cognitive Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Psychology Majors only.

**PSYCH 299. Individual Study. 4-12 Units.**

Individual research with Cognitive Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Cognitive Sciences, B.S.

The B.S. in Cognitive Sciences is structured to provide students with a challenging introduction to the broad field of Cognitive Sciences that is strongly grounded in theory and an empirical approach emphasizing experimental/computational methods. To ensure an intellectually coherent experience, students in the major are able to choose courses from areas including: (a) Cognitive Neuroscience; (b) Experimental Psychology–Sensation, Perception,

Attention, and Memory; (c) Language Science; and (d) Computational Cognitive Science. In addition, students are required to acquire a background in (a) calculus, (b) statistics, (c) introductory computer programming, and (d) some combination of the natural sciences, logic and philosophy of science, linguistics, or more advanced computer science or mathematics.

NOTE: Students may complete either the B.A. in Psychology, the B.S. in Psychology, or the B.S. in Cognitive Sciences. You may not double major within the majors offered by the department.

The B.S. in Cognitive Sciences is structured to provide students with a challenging introduction to the broad field of Cognitive Sciences that is strongly grounded in theory and an empirical approach emphasizing experimental/computational methods. To ensure an intellectually coherent experience, students in the major are able to choose courses from areas including: (a) Cognitive Neuroscience; (b) Experimental Psychology—Sensation, Perception, Attention, and Memory; (c) Language Science; and (d) Computational Cognitive Science. In addition, students are required to acquire a background in (a) calculus, (b) statistics, (c) introductory computer programming, and (d) some combination of the natural sciences, logic and philosophy of science, linguistics, or more advanced computer science or mathematics.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Departmental Requirements for the Major

School requirements must be met and must include courses as specified below:

A. Complete the following:

MATH 2A- 2B	Single-Variable Calculus and Single-Variable Calculus
COGS 110 or STATS 110	Quantitative Methods for Cognitive Sciences Research Statistical Methods for Data Analysis I
PSYCH 114M or I&C SCI 31	MATLAB Programming Introduction to Programming
PSYCH 9A- 9B- 9C	Psychology Fundamentals and Psychology Fundamentals and Psychology Fundamentals
COGS 109	Cognitive Sciences Research Seminar
PSYCH H101A	Honors Seminar in Psychology I
PSYCH H111A	Honors Experimental Psychology
PSYCH 111BW- H111B	Honors Advanced Experimental Psychology and Honors Advanced Experimental Psychology Laboratory
PSYCH H111C	Honors Research in Experimental Psychology
STATS 7	Basic Statistics

B. Select three courses from the following list:

BIO SCI 35	The Brain and Behavior
BIO SCI 36	Drugs and the Brain
BIO SCI 37	Brain Dysfunction and Repair
BIO SCI 38	Mind, Memory, Amnesia, and the Brain
BIO SCI 93	From DNA to Organisms
BIO SCI 94	From Organisms to Ecosystems
I&C SCI 31	Introduction to Programming <sup>1</sup>
I&C SCI 32	Programming with Software Libraries
I&C SCI 33	Intermediate Programming
PHYSICS 3A- 3B- 3C	Basic Physics I and Basic Physics II and Basic Physics III
or	
PHYSICS 7C- 7D- 7E	Classical Physics and Classical Physics and Classical Physics

with labs PHYSICS 7LC and PHYSICS 7LD

NOTE: Careful selection should be made in order to satisfy general education requirements and prerequisites for upper-division courses.

C. Three additional courses must be taken in Biology, Physics, Computer Science, Linguistics, Logic and Philosophy of Science, Mathematics, or Statistics. They can be chosen either from the list above or from the following list:

LSCI 1	Languages of the World
LSCI 3	Introduction to Linguistics
LSCI 10	Introduction to Phonology
LSCI 20	Introduction to Syntax
LSCI 51	Acquisition of Language
LSCI 68	Introduction to Language and Culture
LPS 30	Introduction to Symbolic Logic
LPS 31	Introduction to Inductive Logic
MATH 2D	Multivariable Calculus
MATH 2E	Multivariable Calculus
MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations
MATH 4	
PHYSICS 15	Physics of Music
PSYCH 56L	Acquisition of Language
STATS 111	Statistical Methods for Data Analysis II
STATS 112	Statistical Methods for Data Analysis III

D. Three core courses must be selected from this list:

PSYCH 120A	Abnormal Psychology
PSYCH 120D	Developmental Psychology
PSYCH 120H	History of Psychology
PSYCH 120P	Personality Theories
PSYCH 130A	Perception and Sensory Processes
PSYCH 140C	Cognitive Science
PSYCH 140L	Principles of Learning Theory
PSYCH 140M	Human Memory
PSYCH 150	Psychology of Language
PSYCH 160A	Introduction to Cognitive Neuroscience
PSYCH 160D	Brain Disorders and Behavior

E. Four core electives must be selected from this list:

COMPSCI 171	Introduction to Artificial Intelligence
COMPSCI 178	Machine Learning and Data-Mining
COMPSCI 183	Introduction to Computational Biology
LSCI 102	Formal Languages and Automata
LSCI 111	Intermediate Phonology
LSCI 121	Intermediate Syntax
PSYCH 112R- 112LR	Cognitive Robotics and Cognitive Robotics Laboratory
PSYCH 131A	Vision
PSYCH 131B	Hearing
PSYCH 156A	Acquisition of Language II
PSYCH 161	Language and the Brain
PSYCH 161H	Hearing and the Brain
PSYCH 162N	Human Neuropsychology

F. Six additional electives must be selected from the lists under requirements D and E only. <sup>2</sup>

G. All courses for the above major requirements must be taken with a grade of B- or better. Students must maintain an overall grade point average of 3.0 for courses within the major.

<sup>1</sup> If not used to satisfy Introductory Programming Requirement.

<sup>2</sup> If accepted into the Honors Program, only four additional electives must be selected from the lists under requirements D and E.

Sample Program - Interest in Cognitive Neuroscience

<b>Freshman</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
PSYCH 9A	PSYCH 9B	PSYCH 9C
MATH 2A	MATH 2B	STATS 7
General Education	General Education	General Education
BIO SCI 35	COGS 109	
<b>Sophomore</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
PSYCH H111A	PSYCH 111BW	PSYCH H111C
PSYCH 114M	PSYCH H111B	COGS 110
BIO SCI 36	General Education	General Education
		BIO SCI 37
<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
Core course	Core course	Core course
PSYCH H101A	General Education	General Education
Addl. science course	Addl. science course	Addl. science course
Elective	Core elective	Elective
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
Core elective	Core elective	Core elective
Addl. elective	Addl. elective	Addl. elective
Addl. elective	Addl. elective	Addl. elective
Elective	Elective	Elective

## Honors Program in Psychology and Cognitive Sciences

The Honors Program in Psychology and Cognitive Sciences is an advanced educational and research program for outstanding undergraduate students in these two majors.

The program emphasizes advanced competence in scientific research, and allows participants the opportunity to pursue advanced work in independent research, in addition to earning honors upon graduation. While the program is designed for students who are interested in pursuing graduate study or seeking challenging research experiences as a capstone to their undergraduate experience, all Psychology and Cognitive Sciences majors who meet the minimum eligibility requirements are welcome to apply.

The program has a limited number of openings and seeks to attract outstanding students who plan to undertake postgraduate education in some field of cognitive/psychological sciences. Admission to the program is based on a formal application submitted prior to the start of the junior year. Applicants should have an overall grade point average of at least 3.2 and a grade point average of at least 3.5 in courses within their major. Students are encouraged to apply in the summer two years prior to graduation, and, in some instances, may be accepted one year prior to graduation.

During the junior year, students who participate in the program are expected to enroll in the Honors Experimental Psychology series (PSYCH H111A-PSYCH 111BW-PSYCH H111C), and enroll in the first course in the Honors Seminar series (PSYCH H101A) in the fall quarter. As seniors, following successful completion of these junior-year requirements, honors students are enrolled in the remaining courses of the Honors Seminar series in fall (PSYCH H101B) and spring (PSYCH H101C). In addition, honors students must successfully complete a senior honors thesis as part of the senior-year course work.

The Honors Experimental Psychology series can be used to satisfy the Research Methods requirement for the major. The Honors Seminar series may be used to satisfy two of the courses required by Part A of the B.S. in Psychology major requirements.

### Sample Program - Honors

<b>Freshman</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
PSYCH 9A	PSYCH 9B	PSYCH 9C
PSYCH 10A	PSYCH 10B	PSYCH 10C
General Education	General Education	General Education
	Computer Tech Requirement	
<b>Sophomore</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
General Education	General Education	General Education
Science course	Science course	Science course
Psych. Core course	Psych. Core course	Psych. Core course
Psych. Module	Psych. Module	Psych. Module

<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
PSYCH H101A	PSYCH 111BW	PSYCH H111C
PSYCH H111A	PSYCH H111B	Additional Science course
Logic course	Additional Science course	Psych. Core course
General Education	Additional Science course	
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
PSYCH H101B	Additional Psych. course	PSYCH H101C
Additional Science course	Elective	Elective
Additional Psych. course	Elective	Elective
Elective	Elective	Elective

## Cognitive Sciences, Ph.D.

The Department of Cognitive Sciences offers a Ph.D. program in cognitive sciences, along with a concentration in cognitive neuroscience, to prepare students for research and teaching careers in academia, industry, and government. The emphasis is on modern techniques of experimentation and theory construction. Special attention is given to providing hands-on research experience and equipping students with sophisticated mathematical and computing skills. The department faculty, which includes two members of the National Academy of Sciences, has many who serve as editors or editorial board members of leading professional journals, and as members of NSF and NIH study panels. Many cognitive sciences faculty are also members of UCI's Institute for Mathematical Behavioral Sciences, and the department is generally regarded as one of the world's leading centers for mathematically oriented research in cognitive psychology. The department is also allied closely to the school's Center for Cognitive Neuroscience and Engineering and the Center for Language Science.

In addition to meeting the general requirements for admission, applicants should have acquired a background in mathematics equivalent to at least one year of calculus. Advanced course work in some of the following fields is highly desirable: psychology, computer science, mathematics, physical sciences, engineering, biology, logic, and linguistics. Standard requirements for admission include Graduate Record Examination (GRE) scores for tests taken within the past five years, official transcripts of all college course work, and at least three letters of recommendation. Applicants whose primary language is not English are required to demonstrate proficiency in English for admission consideration. Information about this requirement is available at <https://www.grad.uci.edu/admissions/applying-to-uci/english-proficiency.php>.

To receive full consideration for fellowship and assistantship awards, applications must be received by December 1. Admissions decisions are made in March. Application materials are available online at the Graduate Division website (<http://www.grad.uci.edu/html>).

A. Select two cognitive and brain sciences core courses:

PSYCH 210A	Introduction to Cognitive and Brain Sciences I: Perception
PSYCH 210B	Introduction to Cognitive and Brain Sciences II: Cognition
PSYCH 210C	Introduction to Cognitive and Brain Sciences III: Learning and Development

B. Select three quantitative courses:

PSYCH 203A	Discrete Mathematics and Probability
PSYCH 203C	Algorithmic Statistics
PSYCH 203D	Applied Mathematics for Cognitive Sciences Research
PSYCH 214	Bayesian Cognitive Modeling
STATS 210	Statistical Methods I: Linear Models

C. Select two computational methods courses:

PSYCH 205A	Computational and Research Methods with MATLAB
PSYCH 205B	Running Experiments Using MATLAB
PSYCH 205C	Computational Statistics

D. Select two Cognitive Sciences core courses from PSYCH 211-219

E. Complete three electives

Students must fulfill the Ph.D. program's computer-programming language requirement.

Students are expected to enroll in the Cognitive Sciences Research Seminar PSYCH 201A-PSYCH 201B- PSYCH 201C during all quarters in residence prior to passage of the advancement-to-candidacy examination. During the fall of the first year in the program, students must enroll in PSYCH 202A.

**Second-year examination.** During the first year, in consultation with their advisor, the student should establish an advisory committee consisting of three faculty members, including the advisor and at least one other cognitive sciences faculty member. The committee should meet with the student during spring quarter of the first year to determine the student's area(s) of research interest and to identify the published literature with which the student must be familiar. At the beginning of the fall quarter of their second year, students will be required to take a second-year examination. It will involve (1)



a critical review of work in the student's area of research interest, and (2) an oral examination by the student's committee members. Should the student fail the second-year exam, the student will be allowed to repeat the exam in the winter quarter. A subsequent failure results in the student exiting the program.

**Pre-advancement talk.** Prior to advancement, usually in the third year, each student is required to give a talk to the department faculty and students. Each student is expected to carry out theoretical/empirical research during the first two years. By the start of the third year, each student should have completed a research project of a scope and nature that is potentially publishable in a professional journal. This talk is required prior to the student's advancement to candidacy.

**Advancement examination.** The advancement examination consists of a written research proposal in NIH NRSA Predoctoral Fellowship format and an oral defense of the proposed research. The requirements for advancement are detailed below.

**Dissertation.** Students must submit a dissertation describing original publishable research and present a public defense of the dissertation as the final requirement of the Ph.D. program as detailed below.

## Requirements for Advancement to Candidacy

The requirements for advancement to candidacy are (1) the student must meet the requirements listed above for the appropriate Master's degree; (2) the student must, in addition, form a five-member faculty committee selected according to Graduate Division policy. The committee will examine the student on a topic which is determined in consultation with the committee. A written document describing the student's work on this topic must be submitted to the committee prior to advancement. The student must demonstrate an understanding of the background and issues for the research topic and show sufficient preparation and creativity to undertake planning for a dissertation project (e.g., by describing a possible experimental design or outlining a possible theoretical development); and (3) students are required to advance to candidacy by the end of their third year in the program.

## Requirements for the Ph.D.

The requirements for the Ph.D. degree are (1) the student must formally present and defend a written dissertation proposal to a committee of at least three members selected according to Graduate Division requirements. The dissertation proposal presentation may take place as part of the examination for Advancement to Candidacy, in which case, that five-member committee will approve the dissertation proposal; (2) the proposal must be approved prior to the final dissertation defense (usually at least three months before to allow time for the candidate to incorporate suggestions and changes required by the committee); (3) prior to the approval of the final version of the dissertation the student is expected to defend the dissertation in a public colloquium announced with at least two week's notice; and (4) all requirements for the Ph.D. degree must be fulfilled within three years after advancement to candidacy.

The normative time for advancement to candidacy is three years. The normative time for completion of the Ph.D. is five years, and the maximum time permitted is six years.

## Joint M.S. in Statistics and Ph.D. in Cognitive Sciences Program

Students must be admitted into the Ph.D. program in Cognitive Sciences or the Ph.D. program in Cognitive Sciences with a concentration in Cognitive Neuroscience in order to be eligible for the joint program. During their first year, Ph.D. students interested in pursuing the joint program must enroll in STATS 210 and either STATS 202 or STATS 211, which fulfills the quantitative requirement in the Ph.D. program.

### Admissions

In the winter quarter of their first year, interested Ph.D. students must contact the Graduate Director to indicate interest in applying for the joint M.S./Ph.D. program. The application consists of:

1. A copy of the original application to the Department of Cognitive Sciences' Ph.D. program, including transcripts, GRE scores, and letters of recommendation.
2. A letter from the Cognitive Sciences Department Chair recommending the student for the joint program in Statistics/Cognitive Sciences.
3. A letter of approval from the School of Social Sciences' Associate Dean for Research and Graduate Studies.

The Department of Statistics reviews the application to determine whether the student is adequately prepared for the M.S. in Statistics component.

Upon admission into the joint program, the student is expected to pass a comprehensive exam covering the material in either STATS 210-STATS 211-STATS 212 or STATS 210-STATS 202-STATS 203, following the spring quarter. In the fall of the second year, the student enrolls as an M.S. in Statistics student through the Department of Statistics and completes the remaining coursework and comprehensive exam. During this year, the student continues to receive financial support from the School of Social Sciences, as outlined in the original admissions letter.

After successfully completing one year in the Statistics program, the student will enroll in the Cognitive Sciences Ph.D. program in year three, and complete the normal requirements for the Ph.D.

**Requirements for the M.S. in Statistics**

A. Complete the following:

STATS 200A- 200B- 200C	Intermediate Probability and Statistical Theory and Intermediate Probability and Statistical Theory and Intermediate Probability and Statistical Theory
STATS 202	Statistical Methods for Data Analysis II <sup>1</sup>
STATS 203	Statistical Methods for Data Analysis III <sup>1</sup>
STATS 210	Statistical Methods I: Linear Models
STATS 205	Introduction to Bayesian Data Analysis

B. Complete three quarters of STATS 280

C. Select two elective graduate courses offered by the Department of Statistics <sup>2</sup>D. Select three electives from the Ph.D. program in Cognitive Sciences. The three electives must be selected from the following two areas: <sup>3</sup>**Computational Methods**

PSYCH 203C	Algorithmic Statistics
PSYCH 205A	Computational and Research Methods with MATLAB
PSYCH 205B	Running Experiments Using MATLAB
PSYCH 205C	Computational Statistics
PSYCH 214	Bayesian Cognitive Modeling
PSYCH 237	Advanced Bayesian Cognitive Modeling

**Neuroscience Methods**

PSYCH 265	Introduction to Functional MRI
PSYCH 268A	Computational Neuroscience

<sup>1</sup> STATS 211 and STATS 212 may be substituted for STATS 202 and STATS 203.<sup>2</sup> At most, one of the two elective courses may be STATS 299, and only with prior approval from the Department's Graduate Committee.<sup>3</sup> These three courses fulfill requirements for both programs.

The entire program of courses must be approved by the Statistics Department Graduate Committee. Students with previous graduate training in statistics may petition the Committee to substitute other courses for a subset of the required courses. Students are required to pass a written comprehensive examination ordinarily at the end of the first year covering the material in either STATS 202, STATS 203, and STATS 210 or STATS 210, STATS 211, and STATS 212. At the end of the second year, the student must pass a written comprehensive examination covering the material from STATS 200A-STATS 200B-STATS 200C.

**Requirements for the Ph.D. in Cognitive Sciences**

A. Complete the following:

PSYCH 210A- 210B	Introduction to Cognitive and Brain Sciences I: Perception and Introduction to Cognitive and Brain Sciences II: Cognition
PSYCH 205A	Computational and Research Methods with MATLAB

B. Select one of the following:

PSYCH 205B	Running Experiments Using MATLAB
PSYCH 205C	Computational Statistics
PSYCH 214	Bayesian Cognitive Modeling

C. Select two Cognitive Science core courses from PSYCH 211-219.

D. Complete three electives (one technical elective is required).

The technical elective must be selected from the following two technical areas:

**Computational Methods**

PSYCH 203C	Algorithmic Statistics
PSYCH 205A	Computational and Research Methods with MATLAB
PSYCH 205B	Running Experiments Using MATLAB
PSYCH 205C	Computational Statistics
PSYCH 214	Bayesian Cognitive Modeling
PSYCH 237	Advanced Bayesian Cognitive Modeling

**Neuroscience Methods**

PSYCH 265

Introduction to Functional MRI

PSYCH 268A

Computational Neuroscience

Students must fulfill the Ph.D. program's computer-programming language requirement.

Students are expected to enroll in the Cognitive Sciences Research Seminar PSYCH 201A-PSYCH 201B-PSYCH 201C during all quarters in residence prior to passage of the advancement to candidacy examination. During the fall of the first year in the program, students must enroll in PSYCH 202A (Proseminar in the Cognitive Sciences).

**Second-year examination.** During the first-year in the Ph.D. program, the student in consultation with their advisor should establish an advisory committee consisting of three faculty members, including the advisor and at least one other cognitive sciences faculty member. The committee should meet with the student during the spring quarter of the first year to determine the student's area(s) of research interest and to identify the published literature with which the student must be familiar. At the beginning of the fall quarter of their second year in the Ph.D. program, students will be required to take a second-year examination. It involves (1) a critical review of work in the student's area of research interest, and (2) an oral examination by the student's committee members. Should the student fail the second year exam, the student will be allowed to repeat the exam in the winter quarter. A subsequent failure results in the student leaving the program.

**Pre-advancement talk.** Prior to advancement, usually in the third year in the Ph.D., each student is required to give a talk to the department faculty and students. Each student is expected to carry out theoretical/empirical research during the first two years. By the start of the third year, each student should have completed a research project of a scope and nature that is potentially publishable in a professional journal. This talk is required prior to the student's advancement to candidacy.

**Advancement examination.** The advancement examination consists of a written research proposal in NIH NRSA Predoctoral Fellowship format, and an oral defense of the proposed research. The requirements for advancement are detailed below.

**Dissertation.** Students must submit a dissertation describing original publishable research and present a public defense of the dissertation as the final requirement of the Ph.D. program as detailed below.

## Ph.D. in Cognitive Sciences with a Concentration in Cognitive Neuroscience

Students can also pursue a Ph.D. in cognitive sciences with a concentration in cognitive neuroscience. This is an interdisciplinary field which studies the relation between mind and brain. With the development of non-invasive functional brain imaging techniques during the last two decades, the integration of cognitive and neural models of information processing has become a major focus in the field, and a major growth area within the department's academic plan.

Commensurate with the multidisciplinary nature of cognitive neuroscience, the department expects to admit students with a variety of undergraduate educational backgrounds. These include, but are not necessarily limited to, undergraduate degrees in psychology/cognitive science, neuroscience, biology, computer science, mathematics and engineering.

A. Select two cognitive and brain sciences core courses:

PSYCH 210A	Introduction to Cognitive and Brain Sciences I: Perception
PSYCH 210B	Introduction to Cognitive and Brain Sciences II: Cognition
PSYCH 210C	Introduction to Cognitive and Brain Sciences III: Learning and Development

B. Select two quantitative courses:

PSYCH 203A	Discrete Mathematics and Probability
PSYCH 203C	Algorithmic Statistics
PSYCH 203D	Applied Mathematics for Cognitive Sciences Research
PSYCH 214	Bayesian Cognitive Modeling
STATS 210	Statistical Methods I: Linear Models

C. Select one computational methods course:

PSYCH 205A	Computational and Research Methods with MATLAB
PSYCH 205B	Running Experiments Using MATLAB
PSYCH 205C	Computational Statistics

D. Complete two neuroscience methods courses:

PSYCH 265	Introduction to Functional MRI
PSYCH 268A	Computational Neuroscience

E. Select two neuroscience courses from PSYCH 261-269

F. Complete three electives

Students must fulfill the Ph.D. program's computer-programming language requirement.

Students are expected to enroll in the Cognitive Sciences Research Seminar PSYCH 201A-PSYCH 201B- PSYCH 201C during all quarters in residence prior to passage of the advancement-to-candidacy examination. During the fall of the first year in the program, students must enroll in PSYCH 202A.

**Second-year examination.** During the first year, the student in consultation with their advisor should establish an advisory committee consisting of three faculty members, including the advisor and at least one other cognitive sciences faculty member. The committee should meet with the student during spring quarter of the first year to determine the student's area(s) of research interest and to identify the published literature with which the student must be familiar. At the beginning of the fall quarter of their second year, students will be required to take a second-year examination. It will involve (1) a critical review of work in the student's area of research interest, and (2) an oral examination by the student's committee members. Should the student fail the second year exam, the student will be allowed to repeat the exam in the winter quarter. A subsequent failure results in the student leaving the program.

**Pre-advancement talk.** Prior to advancement, usually in the third year, each student is required to give a talk to the department faculty and students. Each student is expected to carry out theoretical/empirical research during the first two years. By the start of the third year, each student should have completed a research project of a scope and nature that is potentially publishable in a professional journal. This talk is required prior to the student's advancement to candidacy.

**Advancement examination.** The advancement examination consists of a written research proposal in NIH NRSA Predoctoral Fellowship format and an oral defense of the proposed research. The requirements for advancement are detailed below.

**Dissertation.** Students must submit a dissertation describing original publishable research and present a public defense of the dissertation as the final requirement of the Ph.D. program as detailed below.

## M.S. in Cognitive Neuroscience

Students enrolled in the concentration program in Cognitive Neuroscience may earn an M.S. in Cognitive Neuroscience by completing the following requirements: The student must 1) complete the required course work as outlined below; 2) pass the second year examination, which requires both a written critical review of literature in the student's area of interest and an oral examination by the student's committee members; and 3) fulfill a computer-programming language requirement by satisfactorily completing the computational research methods requirement, or by demonstrating proficiency in use of a programming language for cognitive sciences research as assessed by two faculty members and approved by the Graduate Director.

## Hearing and Speech Sciences, Minor

A minor in Hearing and Speech Sciences will provide in-depth training for undergraduates interested in becoming scientists and/or clinicians in health-related fields. This minor will help stimulate students' interest in hearing and speech as well as increase their opportunities to be admitted to postgraduate programs in audiology, speech-language pathology, biomedical engineering, psychology, neuroscience, medicine and other allied areas.

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### Hearing and Speech Sciences Minor Requirements

A. Complete the following:

BIO SCI N110 or PSYCH 160A	Neurobiology and Behavior Introduction to Cognitive Neuroscience
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B. Statistic course(s) selected from the following: <sup>1</sup>

STATS 120A- 120B- 120C	Introduction to Probability and Statistics I and Introduction to Probability and Statistics II and Introduction to Probability and Statistics III
PSYCH 10A- 10B- 10C	Probability and Statistics in Psychology I and Probability and Statistics in Psychology II and Probability and Statistics in Psychology III
SOC SCI 10A- 10B- 10C	Probability and Statistics in Social Sciences I and Probability and Statistics in Social Sciences II and Probability and Statistics in Social Sciences III
STATS 7	Basic Statistics
STATS 8	Introduction to Biological Statistics
PUBHLTH 7A	Public Health Statistics I

C. Complete the following:

BIO SCI N147	Hearing and the Brain
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D. Complete four courses from the following categories, with at least one course from each category:

#### Category I:

MATH 3A or MATH 113A	Introduction to Linear Algebra Mathematical Modeling in Biology
PSYCH 114M or I&C SCI 31	MATLAB Programming Introduction to Programming
An additional statistics or probability course beyond Requirement B (listed above).	

**Category II:**

LSCI 3	Introduction to Linguistics
LSCI 10	Introduction to Phonology
PSYCH 56L	Acquisition of Language (same as LINGUIS 51)
PSYCH 150	Psychology of Language (same as LINGUIS 155)

**Category III:**

BIO SCI N152	Developmental Neurobiology
PSYCH 131B	Hearing
PSYCH 161	Language and the Brain

E. Research Requirement - one quarter of research experience mentored by a CHR member (others may be allowed with prior approval). One year of research is highly recommended: <sup>2</sup>

BME 199	Individual Study
BIO SCI 199	Independent Study in Biological Sciences Research
MATH 199A or MATH 199B or MATH 199C	Special Studies in Mathematics Special Studies in Mathematics Special Studies in Mathematics
PSYCH 199	Independent Study

<sup>1</sup> For students with majors within the School of Social Sciences, one statistics course in addition to the School requirement must be completed. For students with majors outside of the School of Social Sciences, at least one statistics course is required. Other statistics courses may be approved for substitution.

<sup>2</sup> Note: BIO SCI 194S is a prerequisite to BME 199 and BIO SCI 199.

**Residency Requirement:** A minimum of five courses required for the minor must be completed at UCI. Approved courses taken in the Education Abroad Program are considered to be in-residence courses.

## Psychology, B.A.

NOTE: Students may complete either the B.A. in Psychology, the B.S. in Psychology, or the B.S. in Cognitive Sciences. You may not double major within the majors offered by the department.

The courses in this major are designed to provide students with a strong foundation in general psychology.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Departmental Requirements for the Major

School requirements must be met and must include 18 courses (70 units) as specified below:

A. Complete the following:

PSYCH 9A- 9B- 9C	Psychology Fundamentals and Psychology Fundamentals and Psychology Fundamentals
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B. Two introductory courses (eight units) in the social sciences selected from:

ANTHRO 2A	Introduction to Sociocultural Anthropology
ANTHRO 2B	Introduction to Biological Anthropology
ANTHRO 2D	Introduction to Language and Culture
ECON 1	Introduction to Economics
LSCI 3	Introduction to Linguistics
POL SCI 11C	Introduction to Political Science: Micropolitics
SOC SCI 5A	Introduction to Human Geography
SOCIOL 1	Introduction to Sociology

SOCIOL 2	Globalization and Transnational Sociology
SOCIOL 3	Social Problems
or one or two quarters of the following when topic is not psychology:	
SOC SCI H1E- H1F- H1G	Honors: Critical Issues on the Social Sciences and Honors: Critical Issues on the Social Sciences and Honors: Critical Issues on the Social Sciences
C. A one-quarter course and laboratory in experimental psychology or research methods selected from the following:	
PSYCH 112A- 112LA	Experimental Psychology and Experimental Psychology Laboratory
PSYCH 112D- 112LD	Effective Graphical Presentation of Data and Effective Graphical Presentation of Data Lab
PSYCH 112M- 112LM	Research Methods in Psychology and Research Methods in Psychology Laboratory
PSYCH 112R- 112LR	Cognitive Robotics and Cognitive Robotics Laboratory
NOTE: These courses have as prerequisites PSYCH 9A, PSYCH 9B, PSYCH 9C and one year of mathematics/statistics (see course listings). These prerequisites are strictly enforced. PSYCH 112A, PSYCH 112LA are the first quarter of a multi-quarter sequence that satisfies the upper-division writing requirement and allows students to plan and conduct research projects. Students taking these courses should plan to continue in them through at least the second quarter. Students who intend to fulfill the upper-division writing requirement in some other way should consider taking PSYCH 112D and PSYCH 112LD, PSYCH 112M and PSYCH 112LM, or PSYCH 112R and PSYCH 112LR to fulfill the laboratory requirement.	
D. Select four upper-division Psychology core courses (16 units). These courses are designated with an ending number '0' and include the following:	
PSYCH 120A	Abnormal Psychology
PSYCH 120D	Developmental Psychology
PSYCH 120H	History of Psychology
PSYCH 120P	Personality Theories
PSYCH 130A	Perception and Sensory Processes
PSYCH 140C	Cognitive Science
PSYCH 140L	Principles of Learning Theory
PSYCH 140M	Human Memory
PSYCH 150	Psychology of Language
PSYCH 160A	Introduction to Cognitive Neuroscience
PSYCH 160D	Brain Disorders and Behavior
E. Select seven additional courses (four or more units each) with emphasis in psychology, distributed as follows:	
1. No more than one of the seven may be lower-division. PSYCH 7A may not be used to fulfill this requirement.	
2. Three of the upper-division courses used to satisfy requirements D and E must be taken from one of the following modules: Psychology 110–119 (Research Methodologies), 120–129 (General Psychology), 130–139 (Perception and Sensory Processes), 140–149 and 150–159 (Learning and Cognition and Language Sciences combined), 160–169 (Cognitive Neuroscience), and 170–179 (Interdisciplinary Studies).	
3. Certain courses offered in the School of Biological Sciences and the School of Social Ecology may be used in partial satisfaction of this requirement. A total of three of these courses (12 units) may be used in this way with a maximum of two from either of these Schools.	
Psychology and Social Behavior courses that do not overlap with Psychology courses may be used along with PSY BEH 193E (same as CRM/LAW C105) and BIO SCI D137, BIO SCI E174, BIO SCI N110, and BIO SCI N159.	
4. No more than three of the courses (each of four or more units) may be numbered 190–199.	

NOTE: Psychology majors are strongly encouraged to take BIO SCI 1A and BIO SCI 35 toward satisfaction of the science and technology portion of the general education requirement (category II). Furthermore, it is strongly recommended that students who intend to pursue post-baccalaureate work in psychology take the PSYCH 112A-PSYCH 112BW-PSYCH 112C sequence. Most psychology graduate programs require statistics (which, at UCI, may be satisfied by taking PSYCH 10A-PSYCH 10B-PSYCH 10C or SOC SCI 10A-SOC SCI 10B-SOC SCI 10C), but some require calculus (which, at UCI, may be satisfied by taking MATH 2A-MATH 2B).

#### General

Freshman		
Fall	Winter	Spring
PSYCH 9A	PSYCH 9B	PSYCH 9C
General Education	General Education	General Education
General Education	General Education	General Education
	SOC SCI 3A	Intro. Soc. Sci. course

**Sophomore**

Fall	Winter	Spring
PSYCH 10A	PSYCH 10B	PSYCH 10C
Psych. Core course <sup>1</sup>	Psych. Core course <sup>1</sup>	Psych. Core course <sup>1</sup>
Intro. Soc. Sci. course	General Education	General Education
General Education	General Education	General Education

**Junior**

Fall	Winter	Spring
Psych. Core course <sup>1</sup>	General Education	U-D Psych. course <sup>1</sup>
Module <sup>2</sup>	Module <sup>2</sup>	Module <sup>2</sup>
Experimental <sup>3</sup>	Electives	Electives
Electives	U-D Psych. course	Electives

**Senior**

Fall	Winter	Spring
U-D Psych. course	U-D Psych. course	Electives
PSYCH 199	PSYCH 199	Electives
Electives	Electives	Electives
Electives	Electives	Electives

<sup>1</sup> Psychology core course, an upper-division course with the ending number "0."

<sup>2</sup> Select three courses from one module sequence: Psychology 110–119 (Research Methodologies), 120–129 (General Psychology), 130–139 (Perception and Sensory Processes), 140–149 and 150–159 (Learning and Cognition and Language Sciences combined), 160–169 (Cognitive Neuroscience), and 170–179 (Interdisciplinary Studies).

<sup>3</sup> For Experimental course select one course and lab course: PSYCH 112A, PSYCH 112D, PSYCH 112M, PSYCH 112R.

## Sample Program — Graduate School Track

**Freshman**

Fall	Winter	Spring
PSYCH 9A	PSYCH 9B	PSYCH 9C
HUMAN 1A	HUMAN 1B	HUMAN 1C
HUMAN 1AS	HUMAN 1BS	HUMAN 1CS
MATH 2A	MATH 2B	STATS 7

**Sophomore**

Fall	Winter	Spring
PSYCH 10A	PSYCH 10B	PSYCH 10C
Psych. Core course <sup>1</sup>	Psych. Core course <sup>1</sup>	Psych. Core course <sup>1</sup>
Intro. Soc. Sci. course	Intro. Soc. Sci. course	General Education
1 Computer Tech. course	General Education	General Education
		* Apply to honors in spring

**Junior**

Fall	Winter	Spring
PSYCH 112A	PSYCH 112BW	PSYCH 112C
Psych. Core course <sup>1</sup>	U-D Psych. course	U-D Psych. course
General Education	General Education	General Education
General Education	General Education	General Education

**Senior**

Fall	Winter	Spring
PSYCH 199	PSYCH 199	PSYCH H101C
Electives	Electives	Electives
Electives	Electives	Electives
Electives	Electives	Electives

<sup>1</sup> Psychology core course, an upper-division course with the ending number "0."

## Sample Program — Transfer Psychology Track

Fall	Winter	Spring
PSYCH 10A	PSYCH 10B	PSYCH 10C
1 Computer Tech. course	Psych. Core course <sup>1</sup>	Psych. Core course <sup>1</sup>
Psych. Core course <sup>1</sup>	U-D Psych. course	U-D Writing course



<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
U-D Psych. course	U-D Psych. course	U-D Psych. course
Experimental <sup>2</sup>	Psych. Core course <sup>1</sup>	U-D Psych. course
U-D Psych. course	Electives	Electives
Electives	Electives	Electives

<sup>1</sup> Psychology core course, an upper-division course with the ending number "0."

<sup>2</sup> For the Experimental course, select one course and lab course: PSYCH 112A, PSYCH 112D, PSYCH 112M, PSYCH 112R.

## Honors Program in Psychology and Cognitive Sciences

The Honors Program in Psychology and Cognitive Sciences is an advanced educational and research program for outstanding undergraduate students in these two majors.

The program emphasizes advanced competence in scientific research, and allows participants the opportunity to pursue advanced work in independent research, in addition to earning honors upon graduation. While the program is designed for students who are interested in pursuing graduate study or seeking challenging research experiences as a capstone to their undergraduate experience, all Psychology and Cognitive Sciences majors who meet the minimum eligibility requirements are welcome to apply.

The program has a limited number of openings and seeks to attract outstanding students who plan to undertake postgraduate education in some field of cognitive/psychological sciences. Admission to the program is based on a formal application submitted prior to the start of the junior year. Applicants should have an overall grade point average of at least 3.2 and a grade point average of at least 3.5 in courses within their major. Students are encouraged to apply in the summer two years prior to graduation, and, in some instances, may be accepted one year prior to graduation.

During the junior year, students who participate in the program are expected to enroll in the Honors Experimental Psychology series (PSYCH H111A-PSYCH 111BW-PSYCH H111C), and enroll in the first course in the Honors Seminar series (PSYCH H101A) in the fall quarter. As seniors, following successful completion of these junior-year requirements, honors students are enrolled in the remaining courses of the Honors Seminar series in fall (PSYCH H101B) and spring (PSYCH H101C). In addition, honors students must successfully complete a senior honors thesis as part of the senior-year course work.

The Honors Experimental Psychology series can be used to satisfy the Research Methods requirement for the major. The Honors Seminar series may be used to satisfy two of the courses required by Part A of the B.S. in Psychology major requirements.

### Sample Program - Honors

<b>Freshman</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
PSYCH 9A	PSYCH 9B	PSYCH 9C
PSYCH 10A	PSYCH 10B	PSYCH 10C
General Education	General Education	General Education
	Computer Tech Requirement	
<b>Sophomore</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
General Education	General Education	General Education
Science course	Science course	Science course
Psych. Core course	Psych. Core course	Psych. Core course
Psych. Module	Psych. Module	Psych. Module
<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
PSYCH H101A	PSYCH 111BW	PSYCH H111C
PSYCH H111A	PSYCH H111B	Additional Science course
Logic course	Additional Science course	Psych. Core course
General Education	Additional Science course	
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
PSYCH H101B	Additional Psych. course	PSYCH H101C
Additional Science course	Elective	Elective
Additional Psych. course	Elective	Elective
Elective	Elective	Elective

## Psychology, B.S.

Students should be aware that psychology courses are offered in several different departments and programs.

The B.A. in Psychology is designed to provide students with a strong foundation in general psychology, including the areas of development, clinical, perception, learning, memory, cognitive processes, and neuroscience. The B.S. in Psychology incorporates more science content, as the physical and biological sciences play a critical role in deeper study of the mind and brain. The B.S. in Cognitive Sciences is structured to provide students with a challenging introduction to the broad field of Cognitive Sciences that is strongly grounded in theory emphasizing experimental and computational methods.

Students interested in other areas of psychology are advised to consult the course listings in the School of Social Ecology and the School of Biological Sciences sections.

NOTE: Students may complete either the B.A. in Psychology, the B.S. in Psychology, or the B.S. in Cognitive Sciences. You may not double major within the majors offered by the department.

## Requirements for the B.S. in Psychology

**All students must meet the** University Requirements.

**All students must meet the** School Requirements.

### Departmental Requirements for the Major

School requirements must be met and must include courses as specified below:

A. Complete:

PSYCH 10A- 10B- 10C	Probability and Statistics in Psychology I and Probability and Statistics in Psychology II and Probability and Statistics in Psychology III
PSYCH 9A- 9B- 9C	Psychology Fundamentals and Psychology Fundamentals and Psychology Fundamentals

B. Select one of the following:

LPS 30	Introduction to Symbolic Logic
LPS 31	Introduction to Inductive Logic

C. Select three of the following. At least two of these courses must come from a single discipline:

#### Background in Science

BIO SCI 35	The Brain and Behavior
BIO SCI 36	Drugs and the Brain
BIO SCI 37	Brain Dysfunction and Repair
BIO SCI 38	Mind, Memory, Amnesia, and the Brain
BIO SCI 41	Aspects of Mood Disorder
BIO SCI 47	Stress
BIO SCI 75	Human Development: Conception to Birth
BIO SCI 93	From DNA to Organisms
BIO SCI 94	From Organisms to Ecosystems
CHEM 1A- 1LA	General Chemistry and General Chemistry Laboratory
CHEM 1B	General Chemistry
CHEM 1C- 1LC	General Chemistry and General Chemistry Laboratory
PHYSICS 3A	Basic Physics I
PHYSICS 3B- 3LB	Basic Physics II and Basic Physics Laboratory
PHYSICS 3C- 3LC	Basic Physics III and Basic Physics Laboratory
PHYSICS 7C- 7LC	Classical Physics and Classical Physics Laboratory
PHYSICS 7D- 7LD	Classical Physics and Classical Physics Laboratory
PHYSICS 7E	Classical Physics

D. Complete three additional courses that must be taken in Biology, Physics, Chemistry, Logic and Philosophy of Science, Mathematics, or Statistics. They can be selected from the above list, from the Logic requirements (requirement B.), or from the following list:

**Additional Science Background**

MATH 2A- 2B	Single-Variable Calculus and Single-Variable Calculus
MATH 5A- 5B	Calculus for Life Sciences and Calculus for Life Sciences
MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations
LPS 30	Introduction to Symbolic Logic
LPS 31	Introduction to Inductive Logic
LPS 40	The Nature of Scientific Inquiry
LPS 60	The Making of Modern Science
PHYSICS 15	Physics of Music
STATS 110- 111- 112	Statistical Methods for Data Analysis I and Statistical Methods for Data Analysis II and Statistical Methods for Data Analysis III
CHEM 51A	Organic Chemistry
CHEM 51B- 51LB	Organic Chemistry and Organic Chemistry Laboratory
CHEM 51C- 51LC	Organic Chemistry and Organic Chemistry Laboratory

E. Select four from the following:

**Psychology Core Courses**

PSYCH 120A	Abnormal Psychology
PSYCH 120D	Developmental Psychology
PSYCH 120H	History of Psychology
PSYCH 120P	Personality Theories
PSYCH 130A	Perception and Sensory Processes
PSYCH 140C	Cognitive Science
PSYCH 140L	Principles of Learning Theory
PSYCH 140M	Human Memory
PSYCH 150	Psychology of Language
PSYCH 160A	Introduction to Cognitive Neuroscience
PSYCH 160D	Brain Disorders and Behavior
PSYCH 160H	History of Cognitive Neuroscience

F. Select three courses from the following modules: <sup>1</sup>

**Psychology Module Courses**

PSYCH 120 to PSYCH 129 (General)
PSYCH 130 to PSYCH 139 (Perception and Sensory Processes)
PSYCH 140 to PSYCH 149 (Cognition and Learning) <sup>2</sup>
PSYCH 150 to PSYCH 159 (Language)
PSYCH 160 to PSYCH 169 (Cognitive Neuroscience)

G. Select three of the following:

**Research Methods**

PSYCH 112A- 112LA	Experimental Psychology and Experimental Psychology Laboratory
PSYCH 112BW- 112LB	Advanced Experimental Psychology and Advanced Experimental Psychology Laboratory
PSYCH 112C- 112LC	Research in Experimental Psychology and Research in Experimental Psychology
PSYCH 112D- 112LD	Effective Graphical Presentation of Data and Effective Graphical Presentation of Data Lab
PSYCH 112M- 112LM	Research Methods in Psychology and Research Methods in Psychology Laboratory

## PSYCH 112R- 112LR

Cognitive Robotics  
and Cognitive Robotics Laboratory

H. Select four courses from the following (four or more units each) with emphasis in psychology, distributed as follows: <sup>2</sup>

1. No more than one may be lower-division. PSYC 7A may not be used to fulfill this requirement.

2. No more than one of the courses may be numbered 190-199.

<sup>1</sup> Core courses may be used to fulfill this requirement, but cannot count for both requirements.

<sup>2</sup> PSYCH 141J, PSYCH 141K, PSYCH 141L, PSYCH 141M, PSYCH 141N, PSYCH 141O, PSYCH 141P, PSYCH 141Q, PSYCH 141R cannot be used to fulfill this requirement.

## Sample Program - General

Freshman		
Fall	Winter	Spring
PSYCH 9A	PSYCH 9B	PSYCH 9C
PSYCH 10A	PSYCH 10B	PSYCH 10C
General Education	General Education	General Education
	Computer Tech Requirement	
Sophomore		
Fall	Winter	Spring
Psych. Core course	Psych. Core course	PSYCH 112D
Logic Course	General Education	PSYCH 112LD
General Education	Science Course 1	General Education
General Education	Psych. Module	Science Course 2
Junior		
Fall	Winter	Spring
PSYCH 112M	PSYCH 112R	Psych. Module
PSYCH 112LM	PSYCH 112R	Psych. Module
Psych. Core course	Psych. Core course	Additional science course
Science course	Additional science course	Additional science course
Senior		
Fall	Winter	Spring
Additional Psych. course	Additional Psych. course	Elective
Additional Psych. course	Elective	Elective
Elective	Elective	Elective
Elective	Elective	Elective

## Sample Program - Transfer

Junior		
Fall	Winter	Spring
PSYCH 9B	Computer Tech Requirement	Logic course
PSYCH 10A	PSYCH 10B	PSYCH 10C
Psych. Core course	Psych. Core course	Psych. Core course
Elective	Elective	Upper-division writing
Senior		
Fall	Winter	Spring
PSYCH 112D	PSYCH 112R	PSYCH 112M
PSYCH 112LD	PSYCH 112LR	PSYCH 112LM
Psych. Module	Psych. Module	Psych. Module
Psych. Core course	Additional Psych. course	Additional Psych. course

## Sample Program - Transfer

(Taking PSYCH 112A-PSYCH 112BW-PSYCH 112C)

Junior		
Fall	Winter	Spring
PSYCH 9B	Computer Tech Requirement	Logic course
PSYCH 10A	PSYCH 10B	PSYCH 10C
Psych. Core course	Psych. Core course	Psych. Core course
Elective	Elective	Psych. Core course

<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
PSYCH 112A	PSYCH 112BW	PSYCH 112C
PSYCH 112LA	PSYCH 112LB	Elective
Psych. Module	Psych. Module	Psych. Module
Psych. Core course	Elective	Elective

NOTE: The Humanities Honors sequence satisfies the General Education Requirements in Categories I, IV, and VII, replacing the equivalent of six courses (24 units).

## Honors Program in Psychology and Cognitive Sciences

The Honors Program in Psychology and Cognitive Sciences is an advanced educational and research program for outstanding undergraduate students in these two majors.

The program emphasizes advanced competence in scientific research, and allows participants the opportunity to pursue advanced work in independent research, in addition to earning honors upon graduation. While the program is designed for students who are interested in pursuing graduate study or seeking challenging research experiences as a capstone to their undergraduate experience, all Psychology and Cognitive Sciences majors who meet the minimum eligibility requirements are welcome to apply.

The program has a limited number of openings and seeks to attract outstanding students who plan to undertake postgraduate education in some field of cognitive/psychological sciences. Admission to the program is based on a formal application submitted prior to the start of the junior year. Applicants should have an overall grade point average of at least 3.2 and a grade point average of at least 3.5 in courses within their major. Students are encouraged to apply in the summer two years prior to graduation, and, in some instances, may be accepted one year prior to graduation.

During the junior year, students who participate in the program are expected to enroll in the Honors Experimental Psychology series (PSYCH H111A-PSYCH 111BW-PSYCH H111C), and enroll in the first course in the Honors Seminar series (PSYCH H101A) in the fall quarter. As seniors, following successful completion of these junior-year requirements, honors students are enrolled in the remaining courses of the Honors Seminar series in fall (PSYCH H101B) and spring (PSYCH H101C). In addition, honors students must successfully complete a senior honors thesis as part of the senior-year course work.

The Honors Experimental Psychology series can be used to satisfy the Research Methods requirement for the major. The Honors Seminar series may be used to satisfy two of the courses required by Part A of the B.S. in Psychology major requirements.

### Sample Program - Honors

<b>Freshman</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
PSYCH 9A	PSYCH 9B	PSYCH 9C
PSYCH 10A	PSYCH 10B	PSYCH 10C
General Education	General Education	General Education
	Computer Tech Requirement	
<b>Sophomore</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
General Education	General Education	General Education
Science course	Science course	Science course
Psych. Core course	Psych. Core course	Psych. Core course
Psych. Module	Psych. Module	Psych. Module
<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
PSYCH H101A	PSYCH 111BW	PSYCH H111C
PSYCH H111A	PSYCH H111B	Additional Science course
Logic course	Additional Science course	Psych. Core course
General Education	Additional Science course	
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
PSYCH H101B	Additional Psych. course	PSYCH H101C
Additional Science course	Elective	Elective
Additional Psych. course	Elective	Elective
Elective	Elective	Elective

## Psychology, Minor

Students with a variety of interests (e.g., business, education, health care, and criminology) may seek a wider exposure to psychology. The flexibility of the minor in psychology offers the opportunity to pursue deeper understanding areas of psychology relevant to an individual's field.

### Psychology Minor Requirements

Requirements for the minor in psychology are met by taking seven or eight psychology courses (28 or 32 units) as specified below:

A. Complete the following:

PSYCH 7A	Introduction to Psychology (for the 28-unit minor)
or	
PSYCH 9A- 9B- 9C	Psychology Fundamentals and Psychology Fundamentals and Psychology Fundamentals (for the 32-unit minor)

B. Select three upper-division psychology courses from the following:

PSYCH 120A	Abnormal Psychology
PSYCH 120D	Developmental Psychology
PSYCH 120H	History of Psychology
PSYCH 120P	Personality Theories
PSYCH 130A	Perception and Sensory Processes
PSYCH 140C	Cognitive Science
PSYCH 140L	Principles of Learning Theory
PSYCH 140M	Human Memory
PSYCH 150	Psychology of Language
PSYCH 160A	Introduction to Cognitive Neuroscience
PSYCH 160D	Brain Disorders and Behavior

C. Complete one of the following:

For students who took PSYCH 7A: Select three additional psychology courses (four or more units each) no more than one of which is a lower-division course.

For students who took PSYCH 9A, PSYCH 9B, PSYCH 9C: select two additional upper-division psychology courses (four or more units each). PSYCH 190–199 cannot be used to fulfill this requirement.

D. In addition, the school mathematics and computer science requirement (school requirement 1) must be satisfied.

## Department of Economics

### William Branch, Department Chair

3279 Social Science Plaza B

949-824-5788

<http://www.economics.uci.edu/>

Economics is concerned with the way individuals or societies allocate scarce resources and distribute goods and services. Any situation requiring choice among competing alternatives can be viewed as an economic problem. Economics courses enable students to study the way individuals make these choices (microeconomics), the way governments make these choices (public choice), and the aggregate consequences of these choices (macroeconomics). In addition, the Economics curriculum addresses international trade, money and banking, and economic development of the less developed nations.

Faculty members in the Department of Economics have research and teaching interests that span a broad range of fields. In addition to strengths in micro theory, macroeconomics, and econometrics (Bayesian and classical), the Department has expertise in many applied fields, including economic history, industrial organization, international economics, labor economics, public choice and public finance, transportation economics, and urban economics. Members of the Department maintain close ties with members of the Department of Political Science, the Department of Statistics, and The Paul Merage School of Business. Members of the Department maintain affiliations with the Center for Population, Inequality, and Policy, Institute for Mathematical Behavioral Sciences, Institute of Transportation Studies, Institute on Global Conflict and Cooperation, Center for the Study of Democracy, and program in International Studies.

- Business Economics, B.A.
- Economics, B.A.
- Economics, Minor

- Economics, Ph.D.
- Quantitative Economics, B.A.

## Faculty

Neerja Aggarwal, Ph.D. University of California, Irvine, *Lecturer of Economics*

Vellore Arthi, Ph.D. University of Oxford, *Assistant Professor of Economics*

D. Bell, Ph.D. University of California, Berkeley, *Professor Emeritus of Economics*

Daniel E. Bogart, Ph.D. University of California, Los Angeles, *Professor of Economics*

William A. Branch, Ph.D. University of Oregon, *Department Chair and Professor of Economics*

David Brownstone, Ph.D. University of California, Berkeley, *Professor Emeritus of Economics*

Jan K. Brueckner, Ph.D. Stanford University, *Distinguished Professor of Economics; Urban Planning and Public Policy*

Jean-Paul Carvalho, Ph.D. Oxford University, *Associate Professor of Economics; Logic and Philosophy of Science; Religious Studies*

Jiawei Chen, Ph.D. Johns Hopkins University, *Associate Professor of Economics*

Natalia Chernyshoff, Ph.D. University of California, Davis, *Lecturer of Economics*

Michael Choi, Ph.D. University of Wisconsin, Madison, *Assistant Professor of Economics*

Damon Clark, Ph.D. Oxford University, *Associate Professor of Economics; Urban Planning and Public Policy*

Arthur S. De Vany, Ph.D. University of California, Los Angeles, *Professor Emeritus of Economics*

Yingying Dong, Ph.D. Boston College, *Associate Professor of Economics*

John Duffy, Ph.D. University of California, Los Angeles, *Professor of Economics*

Gordon J. Fielding, Ph.D. University of California, Los Angeles, *Professor Emeritus of Economics*

Matthew Freedman, Ph.D. University of Maryland-College Park, *Professor of Economics*

Michelle Garfinkel, Ph.D. Brown University, *Professor of Economics*

Amihai Glazer, Ph.D. Yale University, *Professor of Economics*

Matthew Harding, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Economics; Statistics*

Ivan G. Jeliakov, Ph.D. Washington University, *Associate Professor of Economics; Statistics*

Brian C. Jenkins, Ph.D. University of North Carolina at Chapel Hill, *Assistant Professor of Teaching of Economics*

Linda Cohen Jennings, Ph.D. California Institute of Technology, *Professor of School of Law; Economics*

Priyaranjan Jha, Ph.D. Columbia University, *Professor of Economics*

Lai Jiang, Ph.D. New York University, *Lecturer of Economics*

Igor Kopylov, Ph.D. University of Rochester, *Associate Professor of Economics*

Ying-Ying Lee, Ph.D. University of Wisconsin-Madison, *Assistant Professor of Economics*

Raffaele Mari, M.A. San Diego State University, *Lecturer of Economics*

Michael T. McBride, Ph.D. Yale University, *Professor of Economics; Logic and Philosophy of Science; Religious Studies*

Martin C. McGuire, Ph.D. Harvard University, *UCI Endowed Chair and Professor Emeritus of Economics*

Fabio Milani, Ph.D. Princeton University, *Professor of Economics*

David Neumark, Ph.D. Harvard University, *Distinguished Professor of Economics; Paul Merage School of Business*

Dale J. Poirier, Ph.D. University of Wisconsin-Madison, *Professor Emeritus of Economics*



Gary Richardson, Ph.D. University of California, Berkeley, *Professor of Economics; Religious Studies*

Ty Robbins, Ph.D. University of California, Santa Barbara, *Lecturer of Economics*

Guillaume Rocheteau, Ph.D. University of Paris, *Professor of Economics*

Jose Antonio Rodriguez Lopez, Ph.D. University of California, Berkeley, *Associate Professor of Economics*

Donald G. Saari, Ph.D. Purdue University, *UCI Distinguished Professor Emeritus of Economics; Logic and Philosophy of Science; Mathematics*

George Sarraf, Ph.D. Claremont Graduate University, *Lecturer of Economics*

Nilopa Shah, Ph.D. University of California, Irvine, *Lecturer of Economics*

Paul R. Shirey, Ph.D. University of California, Irvine, *Lecturer of Social Sciences; Economics*

Stergios Skaperdas, Ph.D. Johns Hopkins University, *Clifford S. Heinz Chair and Professor of Economics; Political Science*

Kenneth A. Small, Ph.D. University of California, Berkeley, *Professor Emeritus of Economics*

Eric Swanson, Ph.D. Stanford University, *Professor of Economics*

Wilima Wadhwa, Ph.D. University of California, Irvine, *Lecturer of Economics*

## Affiliate Faculty

Frank D. Bean, Ph.D. Duke University, *UCI Distinguished Professor of Sociology; Economics; Education* (international migration, demography, Mexican immigration, racial and ethnic relations, economic sociology, family)

N. Edward Coulson, Ph.D. University of California, San Diego, *Professor of Paul Merage School of Business; Economics; Psychological Science*

Greg Duncan, Ph.D. University of Michigan, *UCI Distinguished Professor of Education; Economics; Psychological Science* (economics of education, program evaluation, child development)

Bernard N. Grofman, Ph.D. University of Chicago, *Professor of Political Science; Economics* (public choice, mathematical models of collective decision making, formal democratic theory, politics of small groups, representation, voting rights)

David Hirshleifer, Ph.D. University of Chicago, *Paul Merage Chair in Business Growth and Distinguished Professor of Paul Merage School of Business; Economics*

Philippe Jorion, Ph.D. University of Chicago, *Professor of Paul Merage School of Business; Economics*

Marek Kaminski, Ph.D. University of Maryland, College Park, *Associate Professor of Political Science; Economics* (voting models, democratization, political consequences of electoral laws)

Radhika Lunawat, Ph.D. University of Minnesota, *Assistant Professor of Paul Merage School of Business; Economics*

Emily Owens, Ph.D. University of Maryland at College Park, *Professor of Criminology, Law and Society; Economics* (how government policies affect the prevalence of criminal activity as well as how agents within the criminal justice system, particularly police, prosecutors, and judges, respond to policy changes)

Jean-Daniel M. Saphores, Ph.D. Cornell University, *Professor of Civil and Environmental Engineering; Economics; Urban Planning and Public Policy* (transportation and environmental systems (with a focus on air pollution and energy use), travel behavior analysis, alternative fuel vehicles, automated vehicles, transit use, sustainable infrastructure management, and decision making under uncertainty using real options)

Brian Skyrms, Ph.D. University of Pittsburgh, *UCI Distinguished Professor of Logic and Philosophy of Science; Economics; Philosophy*

## Courses

### ECON 1. Introduction to Economics. 4 Units.

An analysis of the problems society faces in organizing itself to provide goods and services. How decisions of government, business, and the individual relate to current economic problems such as unemployment, inflation, poverty, and environmental pollution.

Restriction: No Economics Majors. ECON 1 may not be taken for credit if taken concurrently or after ECON 20A or ECON 20B.

(III)

**ECON 11. The Internet and Public Policy. 4 Units.**

How the Internet works. Current public policy issues concerning the Internet. Introductory economics. Communications law. Interactions between information technology, economics, and law. Case studies about Internet and communications policy.

Same as ICS 11.

**(II or III).**

**ECON 12. Federal Reserve: Past, Present, and Future. 4 Units.**

Studies central banking in the United States from colonial times to the present. Focuses on the past, present, and future of the Federal Reserve and precursors to that system, which was established in 1913.

**ECON 13. Global Economy. 4 Units.**

Acquaints students with the fundamental patterns of the global economy. Emphasizes the historical roots and political implications of economic choices.

Same as IS 13.

Restriction: International Studies Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**(III, VIII)**

**ECON 15A. Probability and Statistics in Economics I. 4 Units.**

An introduction to probability, statistics, and econometrics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Examples from economics.

Prerequisite: MATH 2A and MATH 2B

Overlaps with MGMT 7.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**(Va)**

**ECON 15B. Probability and Statistics in Economics II. 4 Units.**

An introduction to probability, statistics, and econometrics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Examples from economics.

Prerequisite: ECON 15A

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**(Va)**

**ECON 17. An Economic Approach to Religion. 4 Units.**

Introduction to how basic economic concepts such as demand, supply, consumption, production, competition, free-riding, innovation, regulation, and rent-seeking can be applied to understand observed religious behavior.

Same as RLGN 17.

**(III)**

**ECON 20A. Basic Economics I. 4 Units.**

The fundamentals of microeconomics. The behavior of firms and consumers: markets, supply/demand, utility maximization, resource allocation, and efficiency.

Overlaps with MGMT 4A, ECON 23.

Restriction: Economics, Quantitative Economics, Business Economics, and Business Info Management majors have first consideration for enrollment. For School of Social Sciences majors, MGMT 4A may not be used as a substitute for ECON 20A.

**(III)**

**ECON 20B. Basic Economics II. 4 Units.**

The fundamentals of macroeconomics. Government behavior: monetary and fiscal policy, inflation, and unemployment. Effective fall 2006, the content of Economics 20B is macroeconomics. This course cannot be taken to repeat Economics 20B taken prior to fall 2006.

Prerequisite: ECON 20A or ECON 13 or ECON 23

Overlaps with MGMT 4B.

Restriction: Business Information Mgmt Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment. For School of Social Sciences majors, MGMT 4B may not be used as a substitute for ECON 20B.

(III)

**ECON 23. Basic Economics for Engineers. 4 Units.**

The fundamentals of microeconomics. The behavior of firms and of consumers: markets, supply/demand, utility maximization, resource allocation, and efficiency.

Overlaps with ECON 20A.

Restriction: Engineering Majors only. Mechanical Engineering Majors only. Aerospace Engineering Majors only. Civil Engineering Majors only. Environmental Engineering Majors only.

(III)

**ECON 25. The Economics of Accounting Decisions. 4 Units.**

Introduction to accounting concepts and principles, including the accounting model and accounting style, transaction analysis, and preparation of financial statements. An analysis of the similarities and differences between accounting and economic concepts (e.g., value, profits).

Prerequisite: ECON 20A

Overlaps with MGMT 30A.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 100A. Intermediate Economics I. 4 Units.**

Determinants of supply and demand; operation of competitive and monopolistic markets; imperfections of the market system, explanations of unemployment, inflation, recessions; public policy for macroeconomic problems.

Prerequisite: ECON 20A and ECON 20B and MATH 2A and MATH 2B

Overlaps with ECON 105A.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 100B. Intermediate Economic II. 4 Units.**

Determinants of supply and demand; operation of competitive and monopolistic markets; imperfections of the market system, explanations of unemployment, inflation, recessions; public policy for macroeconomic problems.

Prerequisite: ECON 100A

Overlaps with ECON 105B.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 100C. Intermediate Economic III. 4 Units.**

Determinants of supply and demand; operation of competitive and monopolistic markets; imperfections of the market system, explanations of unemployment, inflation, recessions; public policy for macroeconomic problems.

Prerequisite: ECON 100B

Overlaps with ECON 105C.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 105A. Intermediate Quantitative Economics I . 4 Units.**

An advanced and mathematical version of ECON 100A for students in the Quantitative Economics major.

Prerequisite: ECON 20A and ECON 20B and MATH 2A and MATH 2B and MATH 3A

Overlaps with ECON 100A.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 105B. Intermediate Quantitative Economics II . 4 Units.**

An advanced and mathematical version of ECON 100B for students in the Quantitative Economics major.

Prerequisite: ECON 105A

Overlaps with ECON 100B.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 105C. Intermediate Quantitative Economics III . 4 Units.**

An advanced and mathematical version of ECON 100C for students in the Quantitative Economics major.

Prerequisite: ECON 105B

Overlaps with ECON 100C.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 107. Economics of Asymmetric Information. 4 Units.**

Focuses on the effects of asymmetric information in the markets for traditional economic goods and resources, such as labor, insurance, used cars, credit, and in auctions and bargaining problems. Prerequisite:..

Prerequisite: ECON 100A or ECON 105A

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 109. Special Topics in Economic Theory. 4 Units.**

Studies in selected areas of Economics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: May be repeated for credit unlimited times.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 115. Behavioral Economics. 4 Units.**

Studies the behavioral and psychological biases in economics settings. Both individual decisions and games are discussed.

Prerequisite: ECON 20A and ECON 20B

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 116A. Game Theory I. 4 Units.**

Extensive form games with perfect information, and coalitional games. The key solution concepts are Nash Equilibrium, Backward Induction, and the Core. Substantive examples include public good production, oligopoly, electoral competition, auctions, holdup, market entry, and voting.

Prerequisite: (ECON 15B or STAT 120B) and (ECON 100A or ECON 105A)

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 116B. Game Theory II. 4 Units.**

Two-quarter sequence on game theory. Bayesian games, extensive form games with imperfect information, zero-sum games.

Prerequisite: ECON 116A

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 122A. Applied Econometrics I. 4 Units.**

Introduction to econometrics emphasizing practical applications in microeconomics and macroeconomics.

Prerequisite or corequisite: ECON 100A or ECON 105A and (ECON 15B or MATH 130B or MATH 133A or STAT 120C)

Overlaps with ECON 123A, ECON 123B.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 122B. Applied Econometrics II. 4 Units.**

Introduction to econometrics emphasizing practical applications in microeconomics and macroeconomics.

Prerequisite: ECON 122A

Overlaps with ECON 123B.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 122CW. Data Analysis Writing. 4 Units.**

Research writing course in econometrics focusing on individual research projects. Students employ econometric analysis to address an economic question in a 20-page paper and present their findings to the class in a short presentation.

Prerequisite: ECON 15A and ECON 15B and ECON 122A and ECON 122B. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

(Ib)

**ECON 123A. Econometrics I. 4 Units.**

Specification, estimation, and testing of econometric models. Applications in various areas of microeconomics and macroeconomics.

Prerequisite: MATH 2A and MATH 2B and MATH 3A and STAT 120A and STAT 120B and (STAT 120C or MATH 131C) and (ECON 100A and ECON 100B and ECON 100C) or (ECON 105A and ECON 105B and ECON 105C)

Overlaps with ECON 122A, ECON 122B.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 123B. Econometrics II. 4 Units.**

Specification, estimation, and testing of econometric models. Applications in various areas of microeconomics and macroeconomics.

Prerequisite: ECON 123A

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 123CW. Econometrics III. 4 Units.**

Seminar course in which students do an original econometric research project.

Prerequisite: ECON 123B. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**(Ib)**

**ECON 125. Business Forecasting. 4 Units.**

Students learn how to produce forecasts of the behavior of economic (and other) variables. The techniques examined are linear regression, nonlinear regression, and nonparametric kernel regression; AR, MA, ARMA, ARIMA, and Box-Jenkins.

Prerequisite: ECON 122A

Overlaps with MGMT 180.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 126. Computational Macroeconomics. 4 Units.**

Introduction to the computational methods for studying economic growth and the business cycle. Students learn how to write computer programs to simulate macroeconomic models, download and manage data from internet resources, and to do basic statistics.

Prerequisite or corequisite: (ECON 100C or ECON 105C) and (ECON 122A or ECON 123A)

Restriction: Business Economics Majors only. Economics Majors only. Quantitative Economics Majors only.

**ECON 127A. Experimental Economics . 4 Units.**

Students will learn what constitutes proper experimental design and what laboratory experiments teach us about human behavior and the economy. Students will participate in a sample experiment, evaluate the results, and discuss experiment design and larger issues. Formerly ECON 117.

Prerequisite: ECON 15B and ECON 100B

**ECON 128. Machine Learning for Economists. 4 Units.**

Develops the theory and computation of recent methods at the intersection of econometrics and machine learning as used in economics and business. Building on intermediate econometrics, it introduces causal random forests, double machine learning, and neural networks.

Prerequisite: ECON 123A

Restriction: Business Economics Majors only. Economics Majors only. Quantitative Economics Majors only.

**ECON 129. Special Topics in Quantitative Methods. 4 Units.**

Studies in selected areas of Quantitative Methods. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 131A. The Economics of Risk and Uncertainty. 4 Units.**

The theory of insurance and joint-ownership of risky enterprises; optimal procedures for the allocation of uncertain payoffs.

Prerequisite or corequisite: (ECON 15B or ECON 105A or MATH 130B) and (ECON 100B or ECON 105B or STAT 120B or MATH 133A) and (ECON 100C or STAT 120C)

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 132A. Introduction to Financial Investments. 4 Units.**

Modern theories of investment and their application to the study of financial markets. The relation between risk and return, diversification, asset pricing, efficient markets hypothesis, and the market valuation of stocks, bonds, options, and futures.

Prerequisite or corequisite: ECON 15A and ECON 15B and (ECON 122A or ECON 123A) and (ECON 100A and ECON 100B and ECON 100C) or (ECON 105A and ECON 105B and ECON 105C) or (MATH 130A and STAT 120A and STAT 120B and STAT 120C) or MATH 130B or MATH 133A

Overlaps with MGMT 141.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 134A. Corporate Finance. 4 Units.**

Provides an overview of the modern theory and practice of corporate finance and focuses on two fundamental financial decisions; investment as well as financing. Beginning with discounted cash flow analysis, basic theory will be applied to the valuation of stocks.

Prerequisite: (ECON 100A and ECON 100B and ECON 100C) or (ECON 105A and ECON 105B and ECON 105C) and (ECON 15A or MATH 130A or STAT 120A) and (ECON 15B or STAT 120B)

Overlaps with MGMT 109.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 135. Mathematics of Finance. 4 Units.**

After reviewing tools from probability, statistics, and elementary differential and partial differential equations, concepts such as hedging, arbitrage, Puts, Calls, the design of portfolios, the derivation and solution of the Blac-Scholes, and other equations are discussed.

Prerequisite: MATH 3A or MATH H3A

Same as MATH 176.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Mathematics Majors have first consideration for enrollment.

**ECON 137W. Financial Markets and the Macroeconomy. 4 Units.**

Students are required to write a paper on a research question related to.

Prerequisite: ECON 122A or ECON 123A. Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**ECON 139. Special Topics in Financial Economics. 4 Units.**

Studies in selected areas of Financial Economics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 140. Managerial Economics. 4 Units.**

A collection of concepts and methods for effective decision making. Explores how the tools of microeconomics, including game theory and industrial organization theory, can be used to make better managerial decisions, particularly those involving allocation of resources within firms.

Prerequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B)

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 141A. Public Economics I. 4 Units.**

Examines the role of the government in the economy and its impact on individuals and firms.

Prerequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B)



**ECON 141B. Public Economics II. 4 Units.**

Theory of public goods, externalities, voting models, analysis of bureaucracy, the Tiebout model, income redistribution, intergovernmental grants.

Prerequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B)

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 142A. Industrial Organization I. 4 Units.**

The theory of market structure. Imperfect markets, government policies, and industry performance.

Prerequisite: (ECON 15A and ECON 15B) and (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B)

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 142CW. Industrial Organization III. 4 Units.**

Research in industrial organization. Satisfies the honors research requirement.

Prerequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B). Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

(Ib)

**ECON 143. Energy Economics. 4 Units.**

The economics of markets for oil, natural gas, electricity, and renewable energy, and their interactions with each other and the rest of the economy. Effects of government intervention, policy measures, economic policy issues arising between energy use and the environment.

Prerequisite: ECON 15A and (ECON 100A or ECON 105A)

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 144A. Urban Economics I. 4 Units.**

Why cities exist, economics of urban land-use, housing demand and tenure choice, traffic congestion.

Prerequisite or corequisite: ECON 20A and ECON 20B. Recommended: ECON 100A.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 144B. Urban Economics II. 4 Units.**

Housing policy analysis, urban public goods and services, crime, pollution, urban amenities.

Prerequisite: ECON 20A and ECON 20B. Recommended: ECON 100A.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 145E. Economics of the Environment. 4 Units.**

Surveys economic aspects of natural resources, pollution, population, and the environment. Examines the causes of pollution; analysis of public policies regarding these problems. Emphasis on microeconomic aspects of environmental problems.

Prerequisite: ECON 100A or ECON 105A

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 145FW. Economics of the Environment II. 4 Units.**

Applications of the tools covered in ECON 145E to topics such as global warming, destruction of the ozone layer, and emissions trading. Emphasis on independent research papers. Syllabus and classes include writing technique.

Prerequisite: ECON 145E. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

(Ib)

**ECON 145L. Economics of Law. 4 Units.**

Examination of several economic concepts which are useful in understanding legal rules: externalities, the assignment of property rights, and Coase's theorem. Examples are drawn from the fields of pollution control, no-fault insurance, medical malpractice, and product liability.

Prerequisite or corequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B)

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 146A. Illegal Economics. 4 Units.**

How illegal firms function in illegal markets, why individuals participate in these groups and markets, and what federal, state, and local governments do to disrupt organized illegal activity.

Same as CLS C182.

Restriction: Business Economics Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**ECON 147A. Corporate Governance. 4 Units.**

Studies topics in the internal organization of firms, including rent seeking, incentive contracts, principal-agent problems, internal labor markets, contests, and herd behavior.

Prerequisite: ECON 100A

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 147B. Economics of Strategy. 4 Units.**

Uses tools of economics, game theory in particular, to develop an understanding of business decision-making. Deals with questions such as how the firm decides what kind of business to be in, how large should it be, and others.

Prerequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B)

Overlaps with MGMT 110, MGMT 168.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 148. Business Decisions. 4 Units.**

Surveys normative and descriptive models of decision-making behavior, with an emphasis on organizational and policy contexts. Topics include rational choice theory, biases and heuristics, framing effects, and overconfidence. Management fads, panics, and herd behavior are also discussed.

Prerequisite: (ANTH 10A and ANTH 10B and ANTH 10C) or (SOCL 10A and SOCL 10B and SOCL 10C) or (SSCI 10A and SSCI 10B and SSCI 10C) or (MATH 2A and MATH 2B and (STAT 7 or MGMT 7)) or (STAT 120A and STAT 120B and STAT 120C) or (ECON 15A and ECON 15B)

Same as SOCL 138.

Restriction: Sociology Majors have first consideration for enrollment.

**ECON 149. Special Topics in Economics of Public and Private Organizations. 4 Units.**

Studies in selected areas of Economics of Public and Private Organizations. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 149W. Special Topics in Economics of Public and Private Organizations. 4 Units.**

Studies in selected areas of Economics of Public and Private Organizations. Topics addressed vary each quarter.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: Unlimited as topics vary.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**(Ib)**

**ECON 151A. Labor Economics and Human Resources I. 4 Units.**

Labor demand, labor supply, human capital, personnel economics, and other topics.

Prerequisite: (ECON 15A and ECON 15B) and (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B)

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 152A. Economic Anthropology. 4 Units.**

Economic systems in comparative perspective: production, distribution, and consumption in market and non-market societies; agricultural development in the third world.

Prerequisite: One course in general science, anthropology, economics, geography, or sociology.

Same as ANTH 125A.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment. Anthropology Majors have first consideration for enrollment.

**ECON 154. Voting and Political Manipulation. 4 Units.**

Introduction to social choice and cooperative games. Topics include majority rule, types of voting methods, apportionment and proportional representation, agenda manipulation, coalition formation, voting power, political consequences of electoral laws.

Same as IS 156A, SSCI 121T, PLSC 151H.

Restriction: International Studies Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON H155. Current Issues in Political Economy. 4 Units.**

Political economy seeks explanations that combine insights from both economics and politics. Topics include the interaction of government and markets, the causes of the Great Recession, and the sources of income and wealth inequality.

Prerequisite: ECON 20A or ECON 20B or ECON 13 or IS 13

Restriction: Economics Honors students only.

**ECON 157. Economic Development. 4 Units.**

Considers the process of economic development across the globe and why some countries are rich and others poor. Discusses the major problems facing developing countries, such as population growth, education, capital formation, environmental protection, and international trade.

Prerequisite: ECON 20A and ECON 20B

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 158. Economics of Education. 4 Units.**

Arms students with tools, concepts, and evidence that can be used to analyze complex policy questions in education, enabling students to arrive at their own reasoned judgments about how to improve education.

Prerequisite: ECON 15A and ECON 100A

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 161A. Money and Banking. 4 Units.**

Basic elements of money and banking: institutional features and economics of financial markets and, in particular, the U.S. banking system; determinants of interest rates; the Federal Reserve and its role in money supply; effects of money on output and inflation.

Prerequisite or corequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B) and (ECON 100C or ECON 105C)

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 161B. International Money. 4 Units.**

Open economy macroeconomics and determination of exchange rates. Asset-market approach to the balance of payments. Internal and external balance in the economy. Macroeconomic policies under fixed and floating exchange rates. The international monetary system and institutions.

Prerequisite or corequisite: (ECON 100A and ECON 100B) or (ECON 105A and ECON 105B) and ECON 100C

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 161D. Advanced Money and Banking. 4 Units.**

Studies business cycles in the United States during the last century. The first portion of the course reviews the theoretical models employed to study economic fluctuations and empirical methods used to measure fluctuations.

Prerequisite: ECON 161A and (ECON 100C or ECON 105C)

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

**ECON 162. Poverty, Growth, and Development. 4 Units.**

Examines India as a case study for each of the topics studied: growth experience of India along with its poverty eradication record, aspects of poverty, and the policies that have been undertaken to tackle poverty.

Prerequisite: (ECON 15A or STAT 120A) and (ECON 15B or STAT 120B) and (ECON 100A and ECON 100B and ECON 100C) or (ECON 105A and ECON 105B and ECON 105C)

**ECON 164AW. The Industrial Revolution in Western Europe. 4 Units.**

How do economists explain the process of economic development during the past three centuries? Has the process of industrialization affected living standards? Focusing on these questions, students learn how to apply economic theory and quantitative methods.

Prerequisite or corequisite: ECON 100C or ECON 105C. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Business Economics Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment.

(Ib)

**ECON 164C. American Economic History from Colonization to the Present. 4 Units.**

Examines how the American economy evolved from colonization to the post-war era. Topics include relations with foreign countries, the emergence of manufacturing and big business, railroads, slavery, war, the Great Depression, the rise of fiscal and monetary policies.

Prerequisite: ECON 20A and ECON 20B

**ECON 165. Economics of International Business . 4 Units.**

Students learn to understand and analyze the principal economic issues in the international business arena. Covers topics such as trade theory, foreign direct investment, foreign exchange market, and strategy of international business.

Prerequisite or corequisite: ECON 100C or ECON 105C

**ECON 167. International Trade and Commercial Policy. 4 Units.**

Determination of trade flows and the relative prices. Gains from trade, the terms of trade, and income distribution. Imperfect competition and international trade. The effect of tariffs, export subsidies, and import quotas. The effects of free and restricted trade.

Prerequisite: ECON 100A or ECON 105A

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 169. Special Topics in Development Economics. 4 Units.**

Studies in selected areas of Development Economics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**ECON 190. Senior Thesis. 4 Units.**

Students work with faculty to complete their honors thesis.

Repeatability: May be taken for credit 3 times.

**ECON 190BW. Economics Honors Colloquium II. 4 Units.**

Colloquium required for honors students in Economics, Quantitative Economics, and Business Economics. Introduces students to independent research and helps students plan a research program. Students complete their thesis.

Prerequisite: ECON H190A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Economics Honors students only.

**(Ib)****ECON H190A. Economics Honors Colloquium I. 4 Units.**

Colloquium required for honors students in economics, quantitative economics, and business economics. Introduces students to independent research. Helps students plan a research program. Prepares students for thesis writing.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Economics Honors students only.

**ECON 197. Field Study. 4 Units.**

Not listed in Catalogue.

Repeatability: Unlimited as topics vary.

Restriction: Authorization required or Enrollment by add card only

**ECON 198. Directed Group Study. 4 Units.**

Not listed in Catalogue.

Repeatability: Unlimited as topics vary.

Restriction: Authorization required or Enrollment by add card only

**ECON 199. Independent Study. 1-5 Units.**

Independent research with Economics faculty.

Repeatability: May be repeated for credit unlimited times.

**ECON 200A. Graduate Colloquium for Economics I. 2 Units.**

Weekly reports and colloquia by faculty, students, and visitors. Supplemented by class discussion of these presentations and other material on current research methodology.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Economics Majors only.

**ECON 200B. Graduate Colloquium for Economics II. 2 Units.**

Weekly reports and colloquia by faculty, students, and visitors. Supplemented by class discussion of these presentations and other material on current research methodology.

Prerequisite: ECON 200A

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Economics Majors only.

**ECON 200C. Graduate Colloquium for Economics III. 2 Units.**

Weekly reports and colloquia by faculty, students, and visitors. Supplemented by class discussion of these presentations and other material on current research methodology.

Prerequisite: ECON 200B

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Economics Majors only.

**ECON 202. Probability and Statistics. 4 Units.**

Provides lectures on probability theory and the beginning of mathematical statistics (continued in ECON 220A-ECON 221A) necessary to prepare students for the required econometrics sequence. Topics include probability, distributions, mathematical expectation, sampling, and point estimation.

Restriction: Graduate students only.

**ECON 203A. Mathematics for Economists. 4 Units.**

Gives students the mathematical background required for graduate work in economics. Topics covered include multivariate calculus, differential equations, and linear algebra.

Restriction: Graduate students only.

**ECON 210A. Microeconomic Theory I. 4 Units.**

Theoretical microeconomics. Emphasis on the meaning and empirical interpretation of theoretical models. Topics include theory of the firm, theory of the market, theory of the consumer, duality theory, application to econometrics, general equilibrium and welfare economics, uncertainty, game theory.

Restriction: Graduate students only.

**ECON 210B. Microeconomic Theory II. 4 Units.**

Theoretical microeconomics. Emphasis on the meaning and empirical interpretation of theoretical models. Topics include theory of the firm, theory of the market, theory of the consumer, duality theory, application to econometrics, general equilibrium and welfare economics, uncertainty, game theory.

Prerequisite: ECON 210A

Restriction: Graduate students only.

**ECON 210C. Microeconomic Theory III. 4 Units.**

Theoretical microeconomics. Emphasis on the meaning and empirical interpretation of theoretical models. Topics include theory of the firm, theory of the market, theory of the consumer, duality theory, application to econometrics, general equilibrium and welfare economics, uncertainty, game theory.

Prerequisite: ECON 210B

Restriction: Graduate students only.

**ECON 210D. Macroeconomic Theory I. 4 Units.**

Advanced macroeconomic theory including alternative macroeconomic models, microeconomic foundations of macroeconomics, investment and growth theory, inflation and unemployment, rational expectations and macroeconomic policy, wealth effects, crowding out and fiscal policy, money and interest, open economy models.

Restriction: Graduate students only.

**ECON 210E. Macroeconomic Theory II. 4 Units.**

Advanced macroeconomic theory including alternative macroeconomic models, microeconomic foundations of macroeconomics, investment and growth theory, inflation and unemployment, rational expectations and macroeconomic policy, wealth effects, crowding out and fiscal policy, money and interest, open economy models.

Corequisite: ECON 211L

Prerequisite: ECON 210D

Restriction: Graduate students only.

**ECON 210F. Macroeconomic Theory III. 4 Units.**

Advanced macroeconomic theory including alternative macroeconomic models, microeconomic foundations of macroeconomics, investment and growth theory, inflation and unemployment, rational expectations and macroeconomic policy, wealth effects, crowding out and fiscal policy, money and interest, open economy models.

Prerequisite: ECON 210E

Restriction: Graduate students only.

**ECON 211L. Macroeconomics Theory II Lab. 2 Units.**

Overview of stochastic processes; introduction to dynamic programming; two equilibrium concepts; Ricardian equivalence; real business cycle model; complete versus incomplete markets; asset pricing and the equity premium puzzle.

Corequisite: ECON 210E

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**ECON 219. Special Topics in Economic Theory. 2-4 Units.**

Studies in selected areas of Economic Theory. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ECON 220A. Statistics and Econometrics I. 4 Units.**

Takes up where ECON 202 leaves off. Continuing in the likelihood perspective, begins with Bayesian point estimation and then covers interval estimation and hypothesis testing from both frequentist and Bayesian perspectives.

Corequisite: ECON 221A

Restriction: Graduate students only.

**ECON 220B. Statistics and Econometrics II. 4 Units.**

Begins by relaxing the ideal conditions of the standard regression model. Potential topics include kernel density estimation, instrumental variables (IV), two stage least squares (2SLS), panel data models, and simulation-based Bayesian methods, including Gibbs sampling, and the bootstrap.

Corequisite: ECON 221B

Prerequisite: ECON 220A

Restriction: Graduate students only.

**ECON 220C. Statistics and Econometrics III. 4 Units.**

Covers econometric time series, discrete choice and count models, sample selection, and duration models along with Bayesian and classical asymptotic methods.

Corequisite: ECON 221C

Prerequisite: ECON 220B

Restriction: Graduate students only.

**ECON 221A. Statistics and Econometrics Laboratory I. 2 Units.**

Discussion of problems in statistics and econometrics, and their relationships to statistical and econometrics theory. Instruction in the use of computers for applied econometric work.

Corequisite: ECON 220A



**ECON 221B. Statistics and Econometrics Laboratory II. 2 Units.**

Discussion of problems in statistics and econometrics, and their relationships to statistical and econometrics theory. Instruction in the use of computers for applied econometric work.

Corequisite: ECON 220B

**ECON 221C. Statistics and Econometrics Laboratory III. 2 Units.**

Discussion of problems in statistics and econometrics, and their relationships to statistical and econometrics theory. Instruction in the use of computers for applied econometric work.

Corequisite: ECON 220C

**ECON 222. Replication and Applied Economics Writing. 4 Units.**

Before the course begins, students choose a published empirical economics article and obtain the necessary data to replicate it. Students will replicate and extend the economic analysis and write a paper describing their work.

Prerequisite: ECON 220A and ECON 220B and ECON 220C

**ECON 223A. Discrete Choice Econometrics. 4 Units.**

Specification, estimation, and testing of discrete choice models, with emphasis on cross-sectional and panel data models and applications. Students use computer packages to apply models and techniques to real data.

Prerequisite: ECON 220A and ECON 220B and ECON 220C

**ECON 224A. Time Series Econometrics. 4 Units.**

Econometric analysis of time series data. Moving average and autoregressive series, regression analysis, Box-Jenkins techniques, computational methods, and causality conditions.

Prerequisite: ECON 220A and ECON 220B and ECON 220C

**ECON 227A. Experimental Econ I. 4 Units.**

An introduction to experimental social science. Students learn experimental methodology, design, and analysis, and be exposed to active research areas. Each student writes a proposal for their own experiment and presents the design in class.

Restriction: Graduate students only.

**ECON 227B. Experimental Econ II. 4 Units.**

Focuses on implementing experimental projects in a laboratory environment. Subjects learn about human subjects protection, program experimental software for their own projects, and conduct live experiment sessions.

Restriction: Graduate students only.

**ECON 229. Special Topics in Econometrics. 2-4 Units.**

Studies in selected areas of Econometrics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ECON 232. Business Cycles in Historical Perspective. 4 Units.**

Investigates business cycles in the United States and worldwide during the last two centuries. Topics include causes and consequences of business fluctuations, monetary and fiscal policy, models of fluctuations, and empirical macroeconomics.

Prerequisite: ECON 210A and ECON 210B and ECON 210C and ECON 210D and ECON 210E and ECON 210F

**ECON 234. American Economic History. 4 Units.**

Focuses on American economic history from colonization onwards. Topics include the development of legal systems, transport systems, financial markets, industrialization, migration, immigration, technological change, and the consequences of slavery.

Prerequisite: ECON 210A and ECON 210B and ECON 210C and ECON 210D and ECON 210E and ECON 210F

**ECON 239. Special Topics in Financial Economics. 2-4 Units.**

Studies in selected areas of Financial Economics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ECON 241A. Industrial Organization I. 4 Units.**

Analysis of the structure and economic performance of markets, and the impact of public policy and their efficiency and equity. Effects of information structure. Oligopoly, cartels, mergers, vertical integration, patents, innovation, antitrust, and regulation.

Prerequisite: ECON 100B and ECON 203A

Restriction: Graduate students only.

**ECON 241B. Industrial Organization II. 4 Units.**

Analysis of the structure and economic performance of markets, and the impact of public policy and their efficiency and equity. Effects of information structure. Price flexibility and dispersion, auctions, search and industrial structure, intrafirm organization.

Prerequisite: ECON 241A and ECON 100B and ECON 203A

Restriction: Graduate students only.

**ECON 243A. Game Theory. 4 Units.**

A formal introduction to non-cooperative game theory. Topics include properties of Nash Equilibrium and equilibrium refinements, games with imperfect information, and games with incomplete information.

Prerequisite: ECON 210A and ECON 210B and ECON 210C

Restriction: Graduate students only.

**ECON 243B. Advanced Game Theory. 4 Units.**

Provides advanced instruction in game theory. The topics covered will be (i) the theory of repeated games and (ii) evolutionary game theory. Applications include bargaining, collusion, reputation, social norms, and the evolution of preferences via natural selection and cultural transmission.

Prerequisite: ECON 243A

Restriction: Graduate students only.

**ECON 245. Empirical Methods in Applied Microeconomics. 4 Units.**

Focuses on the empirical methods used in modern applied microeconomics. Teaches methods that can be applied to produce original research in applied fields using cross-sectional and panel data. Applications will be drawn heavily from labor, public, health and development economics.

**ECON 249. Special Topics in Microeconomics. 2-4 Units.**

Studies in selected areas of Microeconomics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: May be repeated for credit unlimited times.

**ECON 251A. Labor Economics I . 4 Units.**

Analysis of the relationships between education and the labor market (human capital theory), between resources devoted to education and the return to education (the education production function) and between education and labor market inequality (the theory of skill-biased technical change).

Prerequisite: ECON 203A

Restriction: Graduate students only.

**ECON 251B. Labor Economics II. 4 Units.**

Analysis of core topics in labor economics, with an emphasis on empirical methods. Topics may include minimum wages, discrimination, gender, aging and retirement, labor market networks, personnel economics, and employment policy.

Prerequisite: ECON 203A

Restriction: Graduate students only.

**ECON 251C. Labor Economics III . 4 Units.**

Discussion of treatment effect/program evaluation in labor economics, emphasizing identification. Classical labor topics, including human capital, technology, wages, labor supply, and migration are discussed in the context of causal inference. A unified framework is used in analyzing identification strategies.

Prerequisite: ECON 203A

Restriction: Graduate students only.

**ECON 255. Microeconomics and Public Policy. 4 Units.**

Introduces the fundamental principles of microeconomics that are required for applied policy analysis. Provides students with an intuitive understanding of the microeconomic approach, and familiarizes them with concepts used in applied public policy analysis.

Repeatability: May be taken for credit 2 times.

Same as PPOL 240.

Restriction: Graduate students only.

**ECON 259. Special Topics in Labor Economics. 2-4 Units.**

Studies in selected areas of Labor Economics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ECON 260B. Monetary Economics II. 4 Units.**

Surveys recent issues on monetary policy in uncertain environments. Examines settings where both the policy makers and the private sector are uncertain of future outcomes or the underlying economic structure.

**ECON 261A. International Trade I. 4 Units.**

Covers theoretical models, empirical methods, and policy issues in international trade. Following the conventional treatment of the Richardian model, the Heckscher-Ohlin model and the specific factors model, new trade models which incorporate scale economics and imperfect competition will be discussed.

Prerequisite: ECON 210A and ECON 210B

**ECON 263A. Advanced Macroeconomics I. 4 Units.**

Students build Dynamic Stochastic General Equilibrium (DSGE) macroeconomic models from microeconomic foundations. This approach emphasizes intertemporal optimization by firms and households and typically incorporates nominal rigidities such as sluggish price and/or wage adjustment.

**ECON 269. Special Topics in Macroeconomics. 2-4 Units.**

Studies in selected areas of Macroeconomics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ECON 270A. Political Economy I. 4 Units.**

Political Economy lies at the intersection of economics and political science. Studies effects of politics on the economy and uses tools derived from economics to understand the behavior of governments and of citizens when they deal with politics.

Restriction: Graduate students only.

**ECON 270B. Political Economy II. 4 Units.**

Political Economy lies at the intersection of economics and political science. Studies effects of politics on the economy and uses tools derived from economics to understand the behavior of governments and of citizens when they deal with politics.

Prerequisite: ECON 270A

Restriction: Graduate students only.

**ECON 270C. Political Economy III. 4 Units.**

Political Economy lies at the intersection of economics and political science. Studies effects of politics on the economy and uses tools derived from economics to understand the behavior of governments and of citizens when they deal with politics.

Prerequisite: ECON 270B

Restriction: Graduate students only.

**ECON 272A. Public Economics I. 4 Units.**

Covers two broad categories of government expenditure policies, redistribution programs, and social insurance, from a theoretical and empirical perspective, as well as the effects on individuals of the income tax system.

Prerequisite: ECON 210A and ECON 210B and ECON 210C

**ECON 272B. Public Economics II. 4 Units.**

Covers the theory of public goods and models of decentralized provision of such goods, including voluntary provision, voting, bureaucratic provision, and preference revelation mechanisms.

Prerequisite: ECON 210A and ECON 210B and ECON 210C

**ECON 275. Economics of Government. 4 Units.**

Prepares students to analyze public policy questions with tools from economics. By the end, students should be able to identify important economic issues in public policy debates and consume and critique economic research on these topics.

Same as PPOL 227.

**ECON 279. Special Topics in Political Economy. 2-4 Units.**

Studies in selected areas of Political Economy. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ECON 281A. Urban Economics I. 4 Units.**

Economic reasons for the existence of cities, analysis of urban spatial structure, urban sprawl, Third World urbanization, hedonic price analysis, housing tenure choice.

Prerequisite: ECON 210A

**ECON 281B. Urban Economics II. 4 Units.**

Housing in the portfolio, land-use controls, rent control, homelessness, neighborhood effects, urban quality-of-life measurement, and subcenters.

Prerequisite: ECON 210A

**ECON 282A. Transportation Economics I. 4 Units.**

Applies microeconomic concepts of demand, costs, pricing, investment, and project evaluation to analyze transportation activities. Empirical studies include travel demand using discrete models, and cost functions.

Restriction: Graduate students only.

**ECON 282B. Transportation Economics II. 4 Units.**

Economics of the airline industry. Hub-and-spoke networks, the effects of competition on airfares, price dispersion, airline alliances, airport congestion, product unbundling.

Prerequisite: ECON 282A

Restriction: Graduate students only.

**ECON 289. Special Topics in Urban and Transportation Economics. 2-4 Units.**

Studies in selected areas of Urban and Transportation Economics. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: May be repeated for credit unlimited times.

**ECON 290. Dissertation Research. 2-12 Units.**

Dissertation research with Economics faculty.

Repeatability: May be repeated for credit unlimited times.

**ECON 299. Independent Study. 2-4 Units.**

Independent research with Economics faculty.

Repeatability: May be repeated for credit unlimited times.

## Business Economics, B.A.

The Business Economics major is for students seeking a business orientation in their study of economics. It does not replicate the traditional undergraduate business school curriculum. Instead, it offers a more tightly focused curriculum that is guided by the rigorous logic and integrative perspective of economics.

NOTE: Students may complete only one of the three Economics majors.

**Freshmen:** Preference will be given to those who rank among the highest using the selection criteria as stated in the Undergraduate Admissions section of this *Catalogue*.

**Transfer Student Applicants:** Transfer applicants with the highest grades overall who satisfactorily complete course prerequisites will be given preference for admission. All applicants must complete one course in microeconomics, one course in macroeconomics, and two semesters/two quarters of approved first-year calculus. Applicants interested in the major of Quantitative Economics must also complete one quarter/one semester of approved linear algebra.

**Change of Major:** Information about change-of-major requirements, procedures, and policies is available in the School of Social Sciences Undergraduate Student Affairs Office and at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu>).

### Departmental Requirements for the Major in Business Economics

The Business Economics major is for students seeking a business orientation in their study of economics. It does not replicate the traditional undergraduate business school curriculum. Instead, it offers a more tightly focused curriculum that is guided by the rigorous logic and integrative perspective of economics. University and School requirements must be met and must include 19 courses as specified below.

#### A. Lower-division:

ECON 20A- 20B	Basic Economics I and Basic Economics II
ECON 15A- 15B	Probability and Statistics in Economics I and Probability and Statistics in Economics II
ECON 25	The Economics of Accounting Decisions
MATH 2A- 2B	Single-Variable Calculus and Single-Variable Calculus

#### B. Upper-division:

ECON 100A- 100B- 100C	Intermediate Economics I and Intermediate Economic II and Intermediate Economic III
ECON 122A- 122B	Applied Econometrics I and Applied Econometrics II

#### C. Seven additional Economics courses, including at least four four-unit upper-division courses.<sup>1</sup>

Two of the electives must be selected from following business electives list:

ECON 125	Business Forecasting
ECON 131A	The Economics of Risk and Uncertainty
ECON 132A	Introduction to Financial Investments
ECON 134A	Corporate Finance
ECON 135	Mathematics of Finance
ECON 142A	Industrial Organization I
ECON 143	Energy Economics
ECON 161A	Money and Banking
ECON 161B	International Money
ECON 167	International Trade and Commercial Policy

And two of the electives must be selected from the following management electives list:

ECON 140	Managerial Economics
ECON 145L	Economics of Law
ECON 147A	Corporate Governance
ECON 147B	Economics of Strategy
ECON 148	Business Decisions
ECON 115	Behaviorial Economics
ECON 151A	Labor Economics and Human Resources I
ECON 165	Economics of International Business

#### D. A maximum of three four-unit courses selected from ECON 190–199 may be counted toward the major.

<sup>1</sup> It is strongly recommended that students satisfy the upper-division writing requirement with one of the Economics electives.

Undergraduates in any of the three Economics majors may complete the Honors Program in Economics. Entry into the program requires a 3.4 GPA or better in upper-division Economics courses and an overall GPA of 3.2 or better. Undergraduates hoping to enter the program must apply no later than the spring quarter of their junior year. Students in the Honors Program must complete an honors thesis and the two-quarter Economics Honors Colloquium (ECON H190A-ECON 190BW; satisfies the upper-division writing requirement).

Freshman		
Fall	Winter	Spring
ECON 20A	ECON 20B	Intro. Soc. Sci. course
MATH 2A	MATH 2B	ECON 25
Lower-Division Writing	Lower-Division Writing	General Education
	General Education	
Sophomore		
Fall	Winter	Spring
ECON 15A	ECON 15B	ECON 122A
ECON 100A	ECON 100B	ECON 100C
SOC SCI 3A	Intro. Soc. Sci. course	General Education
General Education	General Education	General Education
Junior		
Fall	Winter	Spring
ECON 122B	U-D Econ. course	U-D Econ. course
U-D Econ. course	General Education	General Education
U-D Econ. course	Electives	Electives
General Education	Electives	Electives
Senior		
Fall	Winter	Spring
U-D Econ. course	U-D Econ. course	U-D Econ. course
Electives	Electives	Electives
Electives	Electives	Electives
Electives	Electives	Electives

## Economics, B.A.

This major is designed for students seeking a broad education applicable to occupations in business, law, and government or as preparation for graduate school in the social sciences.

The Honors Program in Economics is open to high-achieving students in all Economics majors.

NOTE: Students may complete only one of the three Economics majors.

**Freshmen:** Preference will be given to those who rank among the highest using the selection criteria as stated in the Undergraduate Admissions section of this *Catalogue*.

**Transfer Student Applicants:** Transfer applicants with the highest grades overall who satisfactorily complete course prerequisites will be given preference for admission. All applicants must complete one course in microeconomics, one course in macroeconomics, and two semesters/two quarters of approved first-year calculus. Applicants interested in the major of Quantitative Economics must also complete one quarter/one semester of approved linear algebra.

**Change of Major:** Information about change-of-major requirements, procedures, and policies is available in the School of Social Sciences Undergraduate Student Affairs Office and at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu>).

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Departmental Requirements for the Major in Economics

This major is designed for students seeking a broad education applicable to occupations in business, law, and government or as preparation for graduate school in the social sciences. University and School requirements must be met and must include 16 courses as specified below.

A. Lower-division:

ECON 20A- 20B	Basic Economics I and Basic Economics II
ECON 15A- 15B	Probability and Statistics in Economics I and Probability and Statistics in Economics II

MATH 2A- 2B	Single-Variable Calculus and Single-Variable Calculus
B. Upper-division: ECON 100A- 100B- 100C	Intermediate Economics I and Intermediate Economic II and Intermediate Economic III
ECON 122A	Applied Econometrics I
C. Six additional ECON courses, one of which may be lower-division.	
D. A maximum of three four-unit courses selected from ECON 190–199 may be counted toward the major.	

Undergraduates in any of the three Economics majors may complete the Honors Program in Economics. Entry into the program requires a 3.4 GPA or better in upper-division Economics courses and an overall GPA of 3.2 or better. Undergraduates hoping to enter the program must apply no later than the spring quarter of their junior year. Students in the Honors Program must complete an honors thesis and the two-quarter Economics Honors Colloquium (ECON H190A-ECON 190BW; satisfies the upper-division writing requirement).

Freshman		
Fall	Winter	Spring
ECON 20A	ECON 20B	Intro. Soc. Sci. course
MATH 2A	MATH 2B	General Education
Lower-Division Writing	Lower-Division Writing	General Education
	General Education	
Sophomore		
Fall	Winter	Spring
ECON 15A	ECON 15B	ECON 100C
ECON 100A	ECON 100B	ECON 122A
SOC SCI 3A	Intro. Soc. Sci. course	General Education
General Education	General Education	General Education
Junior		
Fall	Winter	Spring
U-D Econ. course	U-D Econ. course	U-D Econ. course
U-D Econ. course	General Education	U-D Econ. course
General Education	Electives	Electives
Electives	Electives	Electives
Senior		
Fall	Winter	Spring
U-D Econ. course	U-D Econ. course	U-D Econ. course
Electives	Electives	Electives
Electives	Electives	Electives
Electives	Electives	Electives

## Economics, Minor

The minor introduces students to the fundamentals of economic theory and builds basic economic literacy. Students apply economic theory in two upper-division electives of their choosing. The minor is ideal for anyone seeking careers in business, government, law, or non-profits or who simply has interest in economic issues.

### Economics Minor Requirements

Requirements for the minor in Economics are met by taking nine courses (36 units) as specified below:

A. Complete the following core courses (28 units):

ECON 15A- 15B	Probability and Statistics in Economics I and Probability and Statistics in Economics II <sup>1</sup>
ECON 20A- 20B	Basic Economics I and Basic Economics II <sup>2</sup>
and select one of the following sequences:	
ECON 100A- 100B- 100C	Intermediate Economics I and Intermediate Economic II and Intermediate Economic III
or	



ECON 105A- 105B- 105C

Intermediate Quantitative Economics I  
and Intermediate Quantitative Economics II  
and Intermediate Quantitative Economics IIIB. Electives (eight units): two upper-division ECON electives (excluding ECON 199).<sup>3</sup>

NOTE: Prerequisites for the Economics core courses include MATH 2A-MATH 2B and MATH 4.

- <sup>1</sup> MGMT 7 may not be used to substitute for ECON 15A-ECON 15B. Furthermore, students will not receive credit for MGMT 7 if taken after ECON 15A-ECON 15B.
- <sup>2</sup> Note that ECON 20A-ECON 20B is a requirement of both the undergraduate major in Business Administration and the Economics minor.
- <sup>3</sup> As noted in the Economics courses list (click on the 'Courses' tab at the top of this page), some courses overlap with upper-division courses offered by The Paul Merage School of Business. Where there is overlap, students may use the course to count toward satisfying the upper-division requirements of the Business Administration major or the Economics minor, but not both.

## Economics, Ph.D.

The Department of Economics offers a Ph.D. program in Economics. Drawing upon the School's strong quantitative tradition, it specializes in public choice, transportation economics, urban economics, econometrics, macroeconomics, and applied microeconomics. Admission is highly selective and is limited to students whose interests mesh closely with those of the faculty. By requiring a high degree of overlap between faculty and student research interests, the program offers extensive faculty contact within a tutorial framework. Motivated and well-qualified students find the graduate program highly attractive because of its small size and its great flexibility. Self-discipline and an inquiring mind are prerequisites.

The deadline for application for admission is December 1 for fall quarter. Students are admitted for winter or spring quarters only under exceptional circumstances. Late applications are considered on a space-available basis. All applicants must take the Graduate Record Exam (GRE) prior to the application deadline. Applicants whose primary language is not English must also submit Test of English as a Foreign Language (TOEFL) scores. To be considered for any financial aid (including a teaching assistantship), students who are not citizens of countries where English is either the primary or dominant language as approved by the UCI Graduate Council must submit a passing score from the Test of Spoken English (TSE).

The Master's degree is awarded only to students admitted to the Ph.D. program who have completed the following requirements: The nine core courses in microeconomics (ECON 210A-ECON 210B-ECON 210C), macroeconomics (ECON 210D-ECON 210E-ECON 210F), and econometrics (ECON 220A-ECON 220B-ECON 220C), with no grade lower than a B and with a grade point average across all graduate courses of at least 3.1. Pass the written preliminary exam following the first-year courses at least at the Master's-pass level.

### Requirements

All students must show competence in the core areas of microeconomics, macroeconomics, and econometrics. This is done by taking the three-quarter required course sequences in microeconomics, macroeconomics, and econometrics, with no grade lower than a B and with a grade point average across these courses of at least 3.25. The Department may also require students to pass a written qualifying exam in one or more of the core course sequences after taking the courses.

Students take the oral candidacy examination based on their research. A student making satisfactory progress in the program will have advanced to Ph.D. candidacy before the beginning of their third year.

Students also must master two fields of economics by taking a two-course sequence (possibly including independent reading courses) and writing a research paper in each field. Students also must enroll for at least four quarters in the graduate colloquium, in which attendance at regular Economics faculty research colloquia is supplemented by discussion of the papers presented and additional reading. Students are encouraged to become conversant with areas of current economic research early in their graduate careers, in order to facilitate a timely transition from meeting course and field requirements to thinking through a dissertation research plan.

Two or three quarters before the expected completion of the dissertation, the dissertation committee will organize an oral examination of the candidate's dissertation prospectus. Ordinarily, the prospectus will describe in detail the dissertation, and will typically be accompanied by at least one completed chapter of the dissertation.

Students are expected to complete their dissertation by the end of their fifth year. The maximum time permitted for completion of the Ph.D. is six years.

### Ph.D. in Economics with a Concentration in Transportation

Students can also pursue a Ph.D. in Economics with a concentration in Transportation Economics. This option draws upon the transportation researchers on the campus within the School of Social Sciences, The Henry Samueli School of Engineering, The Paul Merage School of Business, and the School of Social Ecology. Students benefit from association with the Institute of Transportation Studies, which facilitates student research by providing research assistantships and interdisciplinary seminars on all modes of transportation.

### Requirements

Requirements for the concentration are the same as those described above with the following three exceptions:

1. Instead of the third quarter of microeconomics and macroeconomics, students may substitute specified courses such as Discrete Choice Econometrics (ECON 223A), Travel Demand Analysis I (ENGRCEE 220A), or Management Science (MGMTMBA 201B);
2. One of the student's two required fields of competence must be transportation economics; the other must be a related field such as urban economics, labor economics, industrial organization, or a transportation-related field from outside economics (such as travel demand and flow theory, urban and transportation policy analysis, environmental impacts of transportation, or urban and transportation planning) subject to the approval of the Director of Graduate Studies for Economics; and
3. Students must take at least one additional course from a list of designated courses in transportation and related subject areas.

## Ph.D. in Economics with a Concentration in Public Choice

Students can also pursue a Ph.D. in Economics with a concentration in Public Choice. This is an interdisciplinary field, at the intersection of Economics and Political Science, which draws on quantitative tools to model the functioning of political institutions. Faculty from the Departments of Economics, Political Science, and Logic and Philosophy of Science and from The Paul Merage School of Business are involved in research that supports the concentration.

### Requirements

Students who elect this concentration are admitted under the normal procedures for the program in Economics and must fulfill all the requirements for the Economics degree with the following modifications:

1. One of the student's two required fields of competence must be public choice; included is a three-quarter core course in public choice, ECON 270A-ECON 270B-ECON 270C, which is jointly organized by faculty in the Departments of Economics and Political Science. (A background in economic theory is a prerequisite to this sequence.) The requirement for competence in a second field may be met with a one-quarter course, instead of two, if it provides sufficient fluency in the field; and
2. Students must obtain a background knowledge in political science equivalent to that provided by a one-year undergraduate survey course, if they do not already have it.

## Ph.D. in Economics with a Concentration in Monetary Policy and Central Banking

Students can also pursue a Ph.D. in Economics with a concentration in Monetary Policy and Central Banking. The concentration draws on faculty's expertise in Monetary Policy and Central Banking - a number of UCI faculty members across the social sciences have experience working in and with central banks. This concentration provides students with the tools necessary for careers in monetary policy research or central banking.

### Requirements

Students who elect to earn a Ph.D. in Economics with a concentration in Monetary Policy and Central Banking are admitted under the normal procedures for the program in Economics, and must fulfill all the requirements for the Economics degree. In addition, a candidate for the concentration in Monetary Policy and Central Banking must:

1. Fulfill the requirements for the macroeconomics subfield as one of the two fields of specialization required of all Economics Ph.D. candidates.
2. Fulfill the requirements for either the international economics subfield or the econometrics subfield as the second of the two fields of specialization required of all Economics Ph.D. candidates.
3. Students must take ECON 224A.
4. Students' dissertations must be aligned with the research initiatives undertaken by central banks, as determined by the program director.

## Program in Law and Graduate Studies (J.D./Ph.D.)

Highly qualified students interested in combining the study of law with graduate research and/or professional qualifications in Economics are invited to undertake concurrent degree study under the auspices of UC Irvine's Program in Law and Graduate Studies (PLGS). Students in this program pursue a coordinated curriculum leading to a J.D. degree from the School of Law in conjunction with a Ph.D. degree in Economics. Additional information is available from the PLGS Program Director's office, 949-824-4158, or by email to [plgs@law.uci.edu](mailto:plgs@law.uci.edu). A full description of the program, with links to all relevant application information, can be found at the School of Law Concurrent Degree Programs website (<http://www.law.uci.edu/academics/interdisciplinary-studies/concurrent-degrees.html>).

UCI is a major research university and has an excellent library that offers in electronic and print formats more than 3.2 million volumes, as well as special interlibrary loan arrangements with the other University of California libraries. The School of Social Sciences provides computer rooms, conference rooms, and offices for graduate students. The Economics Department has a small library with current journals and unpublished working papers from other universities. Students also have access to advanced computing resources as well as PC and UNIX laboratories.

Currently, there are four research units that provide excellent research opportunities for Economics graduate students: the Institute of Transportation Studies, the Center for Research on Information Technology and Organizations, the Institute for Mathematical Behavioral Sciences, and the Center for Economics & Public Policy (CEPP), established in 2011, which seeks to improve analysis, formulation, and debate on economics-related public policy issues at the international, national, state, and local levels.

## Quantitative Economics, B.A.

The Department strongly urges students to consider the major in Quantitative Economics, which best prepares them for careers in business and finance, for law school, for M.B.A. programs, and for graduate studies in the social sciences.

The Honors Program in Economics is open to high-achieving students in all Economics majors.

NOTE: Students may complete only one of the three Economics majors.

**Freshmen:** Preference will be given to those who rank among the highest using the selection criteria as stated in the Undergraduate Admissions section of this *Catalogue*.

**Transfer Student Applicants:** Transfer applicants with the highest grades overall who satisfactorily complete course prerequisites will be given preference for admission. All applicants must complete one course in microeconomics, one course in macroeconomics, and two semesters/two quarters of approved first-year calculus. Applicants interested in the major of Quantitative Economics must also complete one quarter/one semester of approved linear algebra.

**Change of Major:** Information about change-of-major requirements, procedures, and policies is available in the School of Social Sciences Undergraduate Student Affairs Office and at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu>).

### Departmental Requirements for the Major in Quantitative Economics

The Department strongly urges students to consider the major in Quantitative Economics, which best prepares them for careers in business and finance, for law school, for M.B.A. programs, and for graduate studies in the social sciences. University and School requirements must be met and must include 19 courses as specified below.

A. Lower-division:

ECON 20A- 20B	Basic Economics I and Basic Economics II
MATH 2A- 2B	Single-Variable Calculus and Single-Variable Calculus
MATH 3A	Introduction to Linear Algebra

B. Upper-division:

ECON 105A- 105B- 105C	Intermediate Quantitative Economics I and Intermediate Quantitative Economics II and Intermediate Quantitative Economics III
ECON 123A- 123B	Econometrics I and Econometrics II

C. Select one of the following series:

STATS 120A- 120B- 120C	Introduction to Probability and Statistics I and Introduction to Probability and Statistics II and Introduction to Probability and Statistics III
MATH 130A- 130B- 130C	Probability I and Probability II and Stochastic Processes

D. Complete five additional four-unit upper-division Economics electives. One course must satisfy the upper-division writing requirement. Two courses must be selected from the list below.<sup>1</sup>

ECON 107	Economics of Asymmetric Information
ECON 116A	Game Theory I
ECON 116B	Game Theory II
ECON 122CW	Data Analysis Writing
ECON 123CW	Econometrics III
ECON 126	Computational Macroeconomics
ECON 128	Machine Learning for Economists
ECON 129	Special Topics in Quantitative Methods
ECON 131A	The Economics of Risk and Uncertainty
ECON 135	Mathematics of Finance

E. A maximum of three four-unit courses selected from ECON 190–199 may be counted toward the major.

<sup>1</sup> Additional courses may be added to this list; up-to-date information is available at the Department of Economics website (<http://www.economics.uci.edu/>).

Undergraduates in any of the three Economics majors may complete the Honors Program in Economics. Entry into the program requires a 3.4 GPA or better in upper-division Economics courses and an overall GPA of 3.2 or better. Undergraduates hoping to enter the program must apply no later than the spring quarter of their junior year. Students in the Honors Program must complete an honors thesis and the two-quarter Economics Honors Colloquium (ECON H190A-ECON 190BW; satisfies the upper-division writing requirement).

<b>Freshman</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
ECON 20A	ECON 20B	Intro. Soc. Sci. course
MATH 2A	MATH 2B	General Education
Lower-Division Writing	Lower-Division Writing	MATH 3A
	General Education	
<b>Sophomore</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
ECON 105A	ECON 105B	ECON 105C
STATS 120A	STATS 120B	STATS 120C
SOC SCI 3A	Intro. Soc. Sci. course	General Education
General Education	General Education	General Education
<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
ECON 123A	ECON 123B	U-D Econ. course
U-D Econ. course	General Education	U-D Econ. course
U-D Econ. course	U-D Econ. course	Electives
General Education	Electives	Electives
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
U-D Econ. course	U-D Econ. course	U-D Econ. course
Electives	Electives	Electives
Electives	Electives	Electives
Electives	Electives	Electives

## Department of Global and International Studies

### Eve Darian-Smith, Department Chair

569 Social Science Tower

949-824-1072

<https://www.globalstudies.uci.edu> (<https://www.globalstudies.uci.edu/>)

The Department of Global and International Studies provides a critical interdisciplinary perspective on pressing global issues such as climate change, mass migrations, human rights, global health, food insecurity, rising authoritarianism, regional conflict, and the global political economy.

International Studies majors acquire 21st century analytical skills and knowledge that will enable them to understand and contribute to shaping the rapidly evolving global community. The degree in International Studies prepares students for graduate study and professional careers in a variety of fields in the national and international job markets such as international affairs and public policy, international law, international organizations, academic research and teaching, and non-governmental work (in human rights, humanitarianism, development and environmental issues).

- Global Studies, Graduate Emphasis
- Global Studies, Ph.D.
- International Studies, B.A.
- International Studies, Minor

## Faculty

Yousuf Al-Bulushi, Ph.D. University of North Carolina at Chapel Hill, *Assistant Professor of Global and International Studies*

Long T. Bui, Ph.D. University of California, San Diego, *Assistant Professor of Global and International Studies*

Eve Darian-Smith, Ph.D. University of Chicago, *Department Chair and Professor of Global and International Studies; Anthropology; Criminology, Law and Society*

Ruth Goldstein, Ph.D. University of California, Berkeley, *Assistant Professor of Global and International Studies*

Philip McCarty, Ph.D. University of California, Santa Barbara, *Associate Professor of Teaching of Global and International Studies*

Gustavo Oliveira, Ph.D. University of California, Berkeley, *Assistant Professor of Global and International Studies*

Vibhuti Ramachandran, Ph.D. New York University, *Assistant Professor of Global and International Studies; Criminology, Law and Society*

## Courses

### **INTL ST 1. Introduction to Global Studies. 4 Units.**

Ongoing historical processes that increase global integration, the social, economic, and political interdependence of different regions, cultures, and peoples. Topics include ancient empires, colonialism, nationalism, industrialization, modern imperialism and warfare, decolonization, global social movements, conflict, inequality, and global governance.

Same as SOC SCI 4A.

Restriction: International Studies Majors have first consideration for enrollment.

**(III and VIII ).**

### **INTL ST 11. Global Cultures and Society. 4 Units.**

Offers a general overview of the rise of global interdependence in political, economic, demographic, and cultural terms. Considers what drove people from relative isolation into intensified intercourse with one another, and investigates the consequences of this shift.

Same as ANTHRO 41A.

Restriction: Anthropology Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(III and VIII ).**

### **INTL ST 12. Global Political Ideologies. 4 Units.**

An overview of the major political ideologies shaping the current world order and global conflict. Topics include liberalism, democracy, nationalism, capitalism, communism, socialism, fascism, neoliberalism, clash of civilizations, sectarian violence, populist nationalism, and de-globalization.

Same as POL SCI 44B, SOC SCI 12.

Restriction: International Studies Majors have first consideration for enrollment.

**(III and VIII ).**

### **INTL ST 13. Global Economy. 4 Units.**

Acquaints students with the fundamental patterns of the global economy. Emphasizes the historical roots and political implications of economic choices.

Same as ECON 13.

Restriction: International Studies Majors have first consideration for enrollment. Economics Majors have first consideration for enrollment. Quantitative Economics Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**(III, VIII)**

### **INTL ST 14. Introduction to International Relations. 4 Units.**

Analysis of political relations between and among nations with emphasis on explanations of conflict and cooperation. The role of ideologies and their relation to international problems are also examined.

Same as POL SCI 41A.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**(III and VIII ).**

### **INTL ST 15. Global Political Economy. 4 Units.**

The global economy as an integrated system. The rise of world trade, capitalism, national economies, market cycles, competing economic ideologies, development, globalization, transnational labor, multinational corporations, and the role of UN, World Bank, WTO, and the IMF in global governance.

Same as SOC SCI 15.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

**(III and VIII ).**

**INTL ST 16. Human Rights and Global Governance. 4 Units.**

Historical development of civil, political rights and the rise of human rights in international law. Explores role, and limitations, of the UN, ICJ, and ICC in global governance. Reconceptualizing democracy and political representation in a postnational 21st century.

Same as POL SCI 45A, SOC SCI 16.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

(III and VIII ).

**INTL ST 17. Global Environmental Issues. 4 Units.**

Examines problems such as global climate change, growing human populations, fisheries depletion, ocean acidification, biodiversity loss, deforestation, and food security. Introduces political, social, and economic factors contributing to environmental issues and their disproportional impacts on the world's poor and minorities.

Same as SOC SCI 17.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

(III and VIII ).

**INTL ST 32A. Dilemmas of Diversity. 4 Units.**

Focuses on racial, ethnic, and gender diversity, multiculturalism, and their impact on our social and political ideals. Traces the sources of ideas about difference, equality, and toleration, and examines tensions that occur when forms of identity conflict with one another.

Same as POL SCI 32A.

(VII)

**INTL ST 100. Global Trials. 4 Units.**

Explores landmark legal trials that have impacted both domestic and world affairs. The trials provide a lens through which to explore society at the time, as well as shed light on the historical legacies of current social, political, and legal values.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 101A. Global Social Movements. 4 Units.**

The evolution of global social movements over past 250 years. Age of Revolutions in America, France, and Haiti; nationalism and labor; 1960s global decolonization; 21st century Latin American indigenous movements; Occupy Wall Street, Arab Spring, and social media's #metoo, #BlackLivesMatter.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 101B. Global Cities and Slums. 4 Units.**

Cities as a window into contemporary challenges of the globalized world. Global cities such as Los Angeles, London, and Beijing compared with cities with slums in the global south such as Rio de Janeiro, Johannesburg, and Mumbai.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 102A. Global Refugees and Stateless People. 4 Units.**

Examines the reason behind global refugee crises, and what it means to be a displaced migrant or stateless person in history and in contemporary society. Links case studies about refugees around the world.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 102B. Global Asias and Orientalism. 4 Units.**

Examines how the modern world is divided between East and West in the age of globalization. Through the postcolonial framework of Orientalism, it considers a pluralistic idea of Asia and the current notion of the new world order as one.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 103A. Case Studies in Global and Planetary Health. 4 Units.**

Explores critical global health and planetary health studies, linking past trends to current research of health inequalities. Case studies include maternal-fetal mortality, environmental contamination, disaster preparedness, pharmaceutical development and access, and humanitarian aid interventions.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 104A. Global Trafficking. 4 Units.**

Explores trafficking in different global contexts. Covers sex trafficking, labor trafficking, and organ trafficking. Tracks the use of the concept in policy, human rights, law, humanitarianism, and media. Provides a complex and nuanced understanding of the problem and its solutions.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 104BW. Global Gender and Sexuality. 4 Units.**

Develops critical insights into gender and sexuality as products of the world around us and as lived experiences across the globe. Topics include agency and resistance, intersectionality, feminisms, colonialism, heteronormativity, gender violence, masculinities, media and popular culture, globalization and migration.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**(Ib)**

**INTL ST 106A. Global Political Ecology. 4 Units.**

Introduction to political ecology and critical analysis of the global scale and globalization. Topics include current and historical climate change, fossil fuels, international trade and investment, soil erosion and pollution, deforestation, waste, ocean ecology, water crisis, wars, revolutions, and refugees.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 106B. Global Food Environment. 4 Units.**

Examines the global political ecology of food, focusing on the U.S., China, and Brazil. Topics include the history of agriculture, imperialism/neocolonialism, Malthusianism, migration, agro-industrialization, deforestation, GMOs, agrochemicals, soil and water contamination, land struggles, food security/safety/sovereignty, dietary habits, and climate change.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**INTL ST 111B. World of Coffee . 4 Units.**

History of consumption and production of coffee over the centuries, and coffee's cultural, economic, social, political consequences. Coffee's social life as a drug, symbol of hospitality, religious rite, sociability and bourgeois lifestyle, commodity, source of livelihoods, imperial revenues, corporate profits.

Same as HISTORY 163.

**INTL ST 112A. International Business. 4 Units.**

Introduction to conducting business in the international arena, decision making in the organization, and globalization of markets and production. Topics covered range from tax and finance to ethics, marketing, and more. Continuing corporate regulatory scandals discussed.

Same as SOC SCI 115D.

**INTL ST 114A. International Political Economy. 4 Units.**

Examination of problems in global political-economic relations through competing conceptual lenses or grand theories: mercantilism, liberalism, and Marxism. Surveys North-North and North-South issues relating power and wealth.

Same as POL SCI 141B.

**(VIII)**

**INTL ST 115. Global Poverty and Inequality in the 21st Century. 4 Units.**

Explores a multidisciplinary understanding of poverty and inequality in the 21st century and assesses impact of education, health, technology, and other interventions. Course offered online only.

Same as UPPP 115.

**INTL ST 117A. Transnational Migration. 4 Units.**

Examines the movement of people across national borders, governmentality and the role of state practices to control populations, and issues of citizenship, belonging, and identity. Examples are drawn from the United States, Europe, Latin America, Asia, and Africa.

Same as CHC/LAT 161, ANTHRO 125X.

**(VIII)**



**INTL ST 122. Nuclear Environments. 4 Units.**

Understanding the impact of the nuclear age on the environment and human health through interrelated developments of nuclear power and nuclear weapons. The early years of weapon development, catastrophic environmental pollution, perils of nuclear power in the U.S. and Russia.

Same as SOCECOL E127, PUBHLTH 168.

**(VIII)****INTL ST 124A. Introduction to the Comparative Study of Legal Cultures. 4 Units.**

Traces the anthropological and comparative cultural study of law from the nineteenth century to the present; briefly surveys the diversity of recorded legal cultures and critically examines key concepts which have been used to describe and classify them.

Same as CRM/LAW C102.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. SocEcol-Urban & Regional Plan Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 130. Transnational Gangs. 4 Units.**

Examines the internationalization of U.S. domestic street gangs. The relationship between California gangs Mara Salvatrucha and 18th Street and Mexico/Central American gangs is assessed. Specified topics include: mobilization, migration, territorialism, culture, organization, and use of technology.

Same as SOC SCI 120.

Overlaps with SOC SCI XI120, INTL ST XI130.

**INTL ST 131A. Just War Revisited. 4 Units.**

Examines the evolution of the doctrine of the just war across the history of Western political thought, the importance of changes in the doctrine and whether it applies today; examines international relations case studies to determine today's relevancy.

Same as POL SCI 135B.

**INTL ST 140A. Approaches to International Relations. 4 Units.**

Reviews theoretical and methodological approaches to the study of international relations using contending perspectives to analyze power and influence, capabilities, interdependence, reciprocity, international regimes, anarchy, cooperation, imperialism, and hegemony.

Same as POL SCI 144A.

Restriction: Upper-division students only. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 141B. Homeland Security . 4.0 Units.**

Examines the 9/11 origins of the concept of homeland security; assess the evolution, structure, and operations of the Department of Homeland Security; critically examines the evolution of threat assessment to the U.S. and the utilization of risk management methodologies.

Same as POL SCI 143G.

**INTL ST 142A. U.S. Foreign Policy I: Globalism and Cold War. 4 Units.**

Looks at changing international perspectives, policy responses, and military strategies of presidential administrations from Truman to Reagan. In assessing the motives and objectives of U.S. foreign policy leaders during the "Cold War" era, the concept of "national interest" is examined.

Same as POL SCI 142D.

Restriction: International Studies Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment.

**INTL ST 142D. The International Relations of East Asia. 4 Units.**

Surveys various aspects of relations between the nations of East Asia. Topics include the historical development of the region; current political and security relations, including the impact of the American military presence.

Same as POL SCI 142B.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 142E. U.S. Coercive Diplomacy. 4 Units.**

Examines the theory of compellence and the U.S. practice of coercive diplomacy--the power to change behavior of other governments. Specific case examples: the Cuban missile crisis, bombing of North Vietnam, the Nicaraguan Contras, Desert Shield/Desert Storm, and Libya.

Same as POL SCI 142G.

Restriction: Upper-division students only. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 142G. U.S. Foreign Policy Toward Asia. 4 Units.**

U.S. policy toward the countries of East Asia: bilateral and regional security relationships, U.S. economic relations with the major Asian countries, the development of regional institutions, and human rights.

Same as POL SCI 141E.

**INTL ST 143A. Vietnam War. 4 Units.**

Examines social structures and social changes in Vietnamese and U.S. societies through the study of the Vietnam War.

Same as SOCIOL 170A.

**INTL ST 144A. Comparative Politics: Four Nations, Three Continents. 4 Units.**

Studies four countries in a comparative fashion: their respective political histories and cultural traditions; actual differences among their superficially similar party, parliamentary, and executive institutions; contemporary economic policy. The countries represent three continents and varying levels of economic development.

Same as POL SCI 154C.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 145A. International Law. 4 Units.**

Examination of the origin, changing structure, application of international law, and the role of legal norms in regulating the behavior of states and maintaining international order.

Prerequisite: POL SCI 71A

Same as POL SCI 172A.

**(VIII)**

**INTL ST 147CW. International Humanitarianism. 4 Units.**

Examines, analyzes, and evaluates the humanitarian phenomenon, the actors involved in it (including states, international organizations (IOs), and nongovernmental organizations (NGOs)), the rise of a body of international humanitarian law, and the problems and debates associated with international humanitarianism today.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as POL SCI 147CW.

**(Ib)**

**INTL ST 147D. International Organizations. 4 Units.**

Active learning course that examines origins, decision-making processes, activities, and evolution of leading international organizations (e.g. U.N., NATO, EU, AU, WTO, World Bank, IMF). Activities include drafting reforms, applying theory, assessing dysfunctions, and participating in U.N. negotiation simulations.

Same as POL SCI 147D.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 148W. Global Futures. 4 Units.**

Develops critical insights into our collective future as it reflects different perspectives of the world. Topics include techno-orientalism, afro-futurism, feminist futures, indigenous cosmology, and environmental concerns.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: International Studies Majors have first consideration for enrollment. International Studies Minors have first consideration for enrollment.

**(Ib)**

**INTL ST 150. Racism and Global Apartheid. 4 Units.**

The concept of race has been used to draw a global color line dividing rich from poor, developed from developing, first from third worlds. Racism is used to justify slavery, colonialism, imperialism, eugenics, genocide, and extreme inequalities produced by globalization.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

**INTL ST 151B. Religion and World Politics. 4 Units.**

Examines the relationship between religion and world politics historically and today, focusing on connections with peace/war, democracy, human rights, secularism(s), and globalization. Covers major debates, scholarship, concepts, and theories through class exercises, exams, and essays.

Prerequisite: POL SCI 41A or INTL ST 11 or INTL ST 12 or REL STD 5A or REL STD 5B or REL STD 5C

Same as POL SCI 146B, REL STD 115.

**INTL ST 152A. Non-Government Organization (NGO) Fundamentals. 4 Units.**

Introduction to non-governmental organizations, including their role in U.S. society and the international community. Explores varying definitions of NGOs and the characteristics held in common by all NGOs.

Same as SOC SCI 152A.

**INTL ST 153B. Cross-Cultural Studies of Gender. 4 Units.**

Explores the construction of gender in national and transnational contexts. Special attention is given to how race, sexuality, class, and global inequalities shape different experiences of gender, and how gender structures political, institutional, and social life across the world.

Same as ANTHRO 121D.

**(VII)****INTL ST 153C. Urban Anthropology. 4 Units.**

Cultural roles of urban centers and processes of urbanization in comparative perspective, focusing on both nonwestern, nonindustrial societies of past and present; the relationship between modern urban centers and Third World peoples. Migration, urban poverty, in Africa, Asia, Latin America.

Same as ANTHRO 121J.

**INTL ST 153D. Colonialism and Gender. 4 Units.**

An anthropological enquiry into the ways colonial relations of power have been structured and gendered throughout the world, and to what effect. Examines the social locations of men and women in the everyday exercise of colonial and imperial power.

Same as ANTHRO 136G.

Restriction: Anthropology Majors have first consideration for enrollment.

**INTL ST 153E. Nationalism and Ethnicity in the Contemporary World. 4 Units.**

An exploration of the concepts of identity, culture, ethnicity, race, and nation through ethnographic cases, with a view to asking larger questions: how do people create nativeness and foreignness? How does 'culture' get worked into contemporary racisms and nationalisms.

Same as ANTHRO 136A.

**(VIII)****INTL ST 153F. Militarism and Gender. 4 Units.**

Examination of feminist approaches to militarism, war, and political violence; drawing on representations of women as both victims of and participants in military violence; effects of militarism on formations of gender; effects of military industrial complex on nationalism and identity.

Same as GEN&SEX 167A.

**INTL ST 154B. Human Rights. 4 Units.**

Examines the causes and consequences of human rights violations with a focus on Latin America. What are human rights? When and where are they violated? What political mechanisms are available to deal with human rights problems? How effective are they.

Same as POL SCI 153E.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 154C. Ethics in an Age of Terror and Genocide. 4 Units.**

Original sources document personal impact of wars on genocides, from World War II to the Bosnian and Rwandan genocides and current wars in Iraq and Afghanistan. Students train for and conduct personal interviews with someone who lived through a war.

Same as POL SCI 145A.

**INTL ST 154W. Ethics and Justice in International Affairs. 4 Units.**

Analyzes choices regarding the use of force, resolving conflict, and promoting human rights and social justice. Special attention is given to the American experience as a principal case study of ethics and statecraft.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. International Studies Majors have first consideration for enrollment.

**(Ib)**

**INTL ST 156A. Voting and Political Manipulation. 4 Units.**

Introduction to social choice and cooperative games. Topics include majority rule, types of voting methods, apportionment and proportional representation, agenda manipulation, coalition formation, voting power, political consequences of electoral laws.

Same as POL SCI 151H, SOC SCI 121T, ECON 154.

Restriction: International Studies Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**INTL ST 157A. 21st Century Africa. 4 Units.**

Comparative studies of the cultures and societies of Sub-Saharan Africa, with emphasis on critical study of colonialism and postcoloniality, social transformation, and the politics of identity.

Prerequisite: ANTHRO 2A

Same as ANTHRO 164A.

Restriction: Anthropology Majors have first consideration for enrollment.

**(Ib)**

**INTL ST 157C. Comparing European and US Societies. 4 Units.**

Society, culture, institutions of U.S. and European countries. Fertility to football, guns to government, work to welfare, health to housework. Cross-national approaches for understanding the world and thinking critically about taken-for-granted practices. Policies the U.S. might borrow for social issues.

Same as SOCIOL 157C.

**INTL ST 158B. Peoples of the Pacific. 4 Units.**

The cultural history and recent developments among the Pacific peoples of Polynesia, Micronesia, Melanesia, New Guinea, and Australia.

Same as ANTHRO 163A.

**(VIII)**

**INTL ST 158D. China in the Global Age. 4 Units.**

Chinese society from 1949 to present. Social change in the context of political control and ideological considerations. Focus on the power structure, political decision processes, and ideological legitimation, and interplay with the Chinese community and its culture.

Same as SOCIOL 175B.

**INTL ST 161A. Political Islam. 4 Units.**

Political Islam is a diverse phenomenon. While noticeable barriers exist to 'Islamist democracy,' it is the Islamists who will define the political future of much of the Muslim world. Reviews the experience of Saudi Arabia, Egypt, Pakistan, Turkey, and Indonesia.

Same as SOC SCI 188K.

**INTL ST 162B. Peoples and Cultures of Post-Soviet Eurasia. 4 Units.**

Examines the cultures and political conflicts of the more than 130 indigenous ethnic groups in the European and Asian territories of the former U.S.S.R. Emphasis is on the theoretical issues of ethnicity, nationalism, and conflict management.

Same as POL SCI 154F, ANTHRO 164P.

**(VIII)****INTL ST 163. Global Inequalities. 4 Units.**

An examination of various forms of social, economic, and political inequality within and between nations. Different approaches to understanding inequality and the intersections of poverty, race, ethnicity, class, gender, nationality, health, and violence.

Restriction: International Studies Majors have first consideration for enrollment.

**INTL ST 165. Introduction to Contemporary Middle East Politics. 4 Units.**

An overview of basic issues that shape the politics of the Middle East and North Africa. Themes include implication of the colonization era, nation-state formation, inter-Arab relations, nationalism, Arab-Israel conflict, Islamic resurgence, and more.

Same as SOC SCI 188A, POL SCI 158D.

**INTL ST 175A. U.S. War on Terrorism. 4.0 Units.**

Analyzes the United States war on terrorism by focusing on terrorism, the U.S. wars in Afghanistan and Iraq, and changes in police powers through the Patriot Act, as well as the political leadership which directs the war.

Same as SOCIOL 170B.

**INTL ST 176C. Introduction to Chinese Politics. 4 Units.**

Background to the Chinese revolution, rise of the communist party; and institutions, ideology, and structure of Communist party rule from 1949-present.

Same as POL SCI 151B.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 176D. Chinese Politics: Policy, Leadership, and Change. 4 Units.**

Examines major policies from 1949 to the present, and considers the changing role of the Communist Party and its shifting treatment of various social groups; the era of Mao Zedong, reforms under Deng, and post-Deng politics.

Same as POL SCI 151C.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 176I. West European Politics. 4 Units.**

Explores four main themes: (1) thinking scientifically about politics; (2) understanding the linkages between different political structures and spheres of activity; (3) evaluating some theories about politics; (4) learning about three countries: Britain, France, and Germany.

Same as POL SCI 152F.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 176L. Canadian Politics. 4 Units.**

Addresses the basic structures and processes of contemporary Canadian government and politics. Additional topics may include regionalism, federalism, western alienation and oil, Canadian solutions to social welfare policy questions, developments in Quebec, and other issues associated with French-English relations.

Same as POL SCI 153B.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**INTL ST 177C. Revolution in Latin America. 4 Units.**

Presents a comparative analysis of the causes, development, and consequences of selected revolutionary movements, focusing on outbreaks in Mexico, Bolivia, Cuba, Chile, Nicaragua, and Grenada. Explores topics of state formation, economic nationalism, social justice, ethnicity, and role of international affairs.

Same as CHC/LAT 151B, HISTORY 166D, SOC SCI 173N.

**INTL ST 177D. U.S. Intervention in Latin America. 4 Units.**

Explores political, economic, social, and cultural ties that bind Latin America to the United States. Focuses on U.S. intervention and Latin American response from early nineteenth century to present day. Case studies include Mexico, Guatemala, Cuba, Chile, and Central America.

Same as POL SCI 142J, HISTORY 166, CHC/LAT 150.

**INTL ST 177E. Cuban Society and Revolution. 4 Units.**

Explores the causes, development, and legacy of the 1959 Revolution. Themes include economic dependency, democracy, race, gender, culture, and the always volatile relations between Cuba and the United States.

Same as POL SCI 153G, HISTORY 166C, CHC/LAT 157.

**INTL ST 177G. Revolution and Reaction in Cold War Latin America. 4 Units.**

Explores Latin American experiences of revolutionary change and military dictatorship during the Cold War (1945-1990). Pays particular attention to the lives of women, peasants, workers, and the urban middle classes. Case studies include Guatemala, Cuba, Chile, Argentina, Nicaragua, and Mexico.

Same as HISTORY 166B.

**INTL ST 177I. Ancient Civilization of Mexico and the Southwest. 4 Units.**

The prehistory and cultural evolution of the civilization which originated in Mexico, including the Olmecs, Aztecs, Toltecs, Maya, and Zapotec, as well as the Pueblos of the Southwestern U.S. Topics include the origins of food production and of the state.

Same as ANTHRO 141A.

**INTL ST 177J. Peoples and Cultures of Latin America. 4 Units.**

Surveys the prehistory of Latin America and its indigenous cultures, emphasizing the impact of colonial rule, capitalism, and twentieth-century transformations. Emphasis on communities from several countries. In some years, emphasis on comparisons between the Latin American and Caribbean experiences.

Same as ANTHRO 162A, CHC/LAT 120.

**(VIII)**

**INTL ST 178A. Immigration Politics in Western Europe. 4 Units.**

Examines immigration politics in Western Europe, analyzing trends and policy from the postwar period through to today. Topics include citizenship, immigrant integration, asylum, the far-right, and a rotating focus on contemporary issues, e.g., terrorism, Islamophobia.

Same as POL SCI 152K.

Overlaps with POL SCI 141D.

**INTL ST 179. Special Topics: Geographic Focus in International Studies. 4 Units.**

Studies in selected areas of international studies. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**INTL ST H180. International Studies Honors Research Seminar. 4 Units.**

Assists students to prepare a thesis prospectus for the Honors Program in International Studies. Students choose a topic, learn writing and research methods, write a prospectus and orally present and defend it, and conduct a literature review.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Honors students only.

**INTL ST 183A. Global and International Studies Forum. 4 Units.**

A faculty-student forum featuring lectures from a variety of institutions with discussion issues related to Global and International Studies.

Repeatability: May be taken for credit 4 times.

Same as SOCECOL 183A, SOC SCI 183A.

**INTL ST 183B. Seminar in Mediation. 4 Units.**

Student develop mediation skills and refine knowledge in the practice and theory of conflict resolution. Students who complete this course may serve as mediators in the Campus Mediation Program. Course is a prerequisite to completing Indep Study as an intern.

Same as SOC SCI 183B, SOCECOL 183B.

Restriction: International Studies Majors have first consideration for enrollment. School of Humanities students have first consideration for enrollment. School of Social Ecology students have first consideration for enrollment. School of Social Sciences students have first consideration for enrollment.

**INTL ST 183CW. Seminar Conflict Resolution. 4 Units.**

Designed for seniors who are pursuing the minor in Conflict Resolution and/or International Studies major. Provides a forum in which students will refine skills and theory in the study of cooperation and conflict, from local to global arenas.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as SOCECOL 183CW, SOC SCI 183CW.

**(Ib)****INTL ST 183E. Conflict Resolution in Cross-Cultural Perspective. 4 Units.**

Examines theories of conflict management. Analyzes how conflict is mitigated in diverse cultures: at the interpersonal level, between groups, and on the international scale. Students discuss readings, hear from conflict management practitioners, and simulate negotiations.

Same as ANTHRO 136D, SOC SCI 183E, POL SCI 154G.

**(VIII)****INTL ST 189. Special Topics: Global Focus in International Studies. 2-4 Units.**

Studies in selected areas of international studies. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**INTL ST H190. Honors Thesis. 4 Units.**

Students work with faculty to complete their honors thesis.

Repeatability: May be taken for credit 2 times.

Restriction: International Studies Honors students only.

**INTL ST 199. Individual Study. 2-4 Units.**

Students participate in planned research and study under written contract with a supervising UCI instructor. Students may enroll for only one individual study course each quarter.

Repeatability: Unlimited as topics vary.

**INTL ST 201. What is Global Studies?. 4 Units.**

Introduces graduates to the field of global and international studies. Landmark studies outline the transition from globalization studies to contemporary global studies. Identify complex global issues, underlying processes of globalization, and the impacts they have on people around the world.

Restriction: Graduate students only.

**INTL ST 202. Foundations of European Social Thought. 4 Units.**

Provides graduate students with a broad overview of the major landmarks in the development of modern social thought. Introduces key philosophers and theorists Adam Smith, Marx, Durkheim, Weber, Freud, and Du Bois, focusing on the global dimensions of their work.

Restriction: Graduate students only.

**INTL ST 203. Globalizing Social Theory in the Age of Extremes. 4 Units.**

Examines important developments in social theory between 1914 and 1991. The overarching goal is to synthesize from these various approaches a critical and transdisciplinary theoretical framework to analyze complex global issues.

Restriction: Graduate students only.

**INTL ST 204. Theories of Globalization. 4 Units.**

Theories of globalization engage deep historical transformations, keeping the interrelated dynamics of economics, politics, and culture in focus. Theories examine transformations emanating at transnational and state levels, and from below in the form of social movements led by everyday people.

Restriction: Graduate students only.

**INTL ST 205. Theories from the Global South. 4 Units.**

Looking beyond the theoretical traditions of the Euro-American academy scholars can begin to engage important theoretical contributions from the Global South. Explores alternative standpoints and interventions challenging dominant narratives and calling into question taken-for-granted assumptions, categories, concepts, values, and perspectives.

Restriction: Graduate students only.



**INTL ST 206. Engaging Global Issues. 4 Units.**

Critical and interdisciplinary works on global issues serve as examples that graduates can use in their own research. Each week focuses on a different example of outstanding global research done by a scholar having an important impact on the field.

Restriction: Graduate students only.

**INTL ST 207. Research Design and Methods . 4 Units.**

Fundamentals of empirical research design, strategies for global research, sampling logics, reliability, validity, mixed methods, integrating qualitative and quantitative methods. Introduction to basic data collection methods and examples of more advanced methodological strategies. Research ethics and the IRB review process.

Restriction: Graduate students only.

**INTL ST 208. Grant Writing. 4 Units.**

Focuses on production, critique, and revision of student research proposals. A practical seminar designed to improve student proposals, help students through the application processes, and increase students' chances of obtaining support for their research.

Restriction: Graduate students only.

**INTL ST 210A. Proseminar in Global Studies I. 4 Units.**

Year-long intensive introduction to graduate students to a range of topics pertinent to the field of Global Studies. The guest speakers and topics addressed vary each quarter.

Repeatability: May be taken for credit 6 times.

Restriction: Graduate students only.

**INTL ST 210B. Proseminar in Global Studies II. 4 Units.**

Year-long intensive introduction to graduate students to a range of topics pertinent to the field of Global Studies. The guest speakers and topics addressed vary each quarter.

Repeatability: May be taken for credit 6 times.

Restriction: Graduate students only.

**INTL ST 210C. Proseminar in Global Studies III. 4 Units.**

Year-long intensive introduction to graduate students to a range of topics pertinent to the field of Global Studies. The guest speakers and topics addressed vary each quarter.

Repeatability: May be taken for credit 6 times.

Restriction: Graduate students only.

**INTL ST 260. Directed Reading and Research. 4-12 Units.**

Readings focused on specialized topics in consultation with, and with the consent of, a faculty member. Students are expected to produce a paper based on the readings.

Repeatability: May be taken for credit 6 times.

Restriction: Graduate students only.

**INTL ST 290. Dissertation Research. 1-12 Units.**

Dissertation research with Global and International Studies faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**INTL ST 299. Independent Study. 4-12 Units.**

Independent research with Global and International Studies faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## **Global Studies, Graduate Emphasis**

**Philip McCarty, Graduate Director**

591 Social Science Tower  
 949-824-6352  
 philip.mccarty@uci.edu (%20philip.mccarty@uci.edu)

Students from any UCI graduate or professional program (except for those in self-supporting graduate programs) are eligible to apply to the emphasis in Global Studies, administered through the Department of Global and International Studies.

In the spring quarter of their first or second year, interested Ph.D. students must contact the Graduate Director (philip.mccarty@uci.edu) to indicate interests in applying for the Graduate Emphasis in Global Studies. The application process consists of:

- An online application: <https://www.globalstudies.uci.edu/grad/emphasis.php>
- A one-page statement of purpose, including areas of interest and research
- One copy of student's unofficial transcript
- Two faculty letters of recommendation (one from the student's primary advisor)

Upon admission into the Graduate Emphasis in Global Studies, the student must complete the three-course sequence: INTL ST 204-INTL ST 205-INTL ST 206.

The emphasis is comprised of three inter-connected components: 1) a year-long theory and research sequence of three seminars taught by core faculty in the Department of Global and International Studies; 2) cross-disciplinary and interdisciplinary mentorship and advising; and 3) ongoing professionalization opportunities for students. The courses are designed to be taken in sequence, but to ensure flexibility, a student can take the courses in any order and complete them over one year or more.

Each student will be assigned a faculty member *outside* of his or her home department and will meet with that mentor on a regular basis to discuss the student's ongoing research.

Admitted students who satisfactorily complete the program requirements are awarded a letter signed by the Director noting that the student has incorporated Global Studies into their research and professional activities.

## Global Studies, Ph.D.

The Department of Global and International Studies offers a Ph.D. program in Global Studies. The program provides a critical transdisciplinary degree that stands out from other programs for its cutting-edge curriculum, faculty research, and embracing of scholarship from across the social sciences and humanities engaging multiple theoretical perspectives and methodologies. Faculty analyze global issues such as conflict, inequality, migration, human rights, climate change, health, indigeneity, racial formations, global cultures, diasporas, and development from an interdisciplinary perspective.

The program is unique for its foregrounding the importance of engaging global south scholarship and non-western epistemologies that broaden the base of knowledge production and bring new perspectives to bear on the pressing global issues of our times. The program interrogates taken-for-granted concepts and relations of power while foregrounding the deep historical legacies of colonialism and imperialism.

Graduate students work closely with core faculty in the Department in conjunction with over 50 associated faculty from across the campus, providing access to a broad spectrum of expertise and interdisciplinary scholarship. The Department maintains close ties with the School of Humanities, as well as faculty housed in various ethnic programs including Asian American Studies, African American Studies, and Chicano/Latino Studies. Graduate students have the opportunity to participate in and apply for funding from a variety of interdisciplinary research units including the Center for Global Peace and Conflict Studies; the Humanities Research Center; the Latin American Studies Center; Center for Critical Korean Studies; and the Long China-US Institute. In addition, Ph.D. students have the option of taking graduate emphases in Feminist Studies, Critical Theory, and Law, Society and Culture. Students are also encouraged to work with faculty in the School of Law and College of Health Sciences.

Applicants are normally expected to have earned an undergraduate degree in the social sciences or humanities, though applications are also welcome from students with backgrounds in other areas. All applicants are expected to possess strong analytical and writing skills. The online application must be submitted, and all supporting materials must be received by December 1. Supporting materials must include: a personal statement of the applicant's experiences, interest in specified global issues, and career goals; one academic writing sample; GRE exam scores (taken within the last five years); TOEFL for international students; three letters of recommendation; and a statement indicating how the proposed research interests promote diversity and inclusive excellence.

Students must complete at least 48 units in the first two years, excluding units earned in SOC SCI 399 (University Teaching). The number of units earned thereafter will vary in accordance with the time required to pass the qualifying examination, advance to candidacy, and complete the dissertation.

A. Complete:

INTL ST 201	What is Global Studies?
INTL ST 202	Foundations of European Social Thought
INTL ST 203	Globalizing Social Theory in the Age of Extremes

INTL ST 204	Theories of Globalization
INTL ST 205	Theories from the Global South
INTL ST 206	Engaging Global Issues
B. Complete:	
INTL ST 207	Research Design and Methods
INTL ST 208	Grant Writing
INTL ST 210A- 210B- 210C	Proseminar in Global Studies I and Proseminar in Global Studies II and Proseminar in Global Studies III
C. Select two electives offered by the Department of International Studies or an outside department. <sup>1</sup>	
D. During the fourth, fifth, and sixth years, students take, as needed, up to 12 units in INTL ST 290.	

<sup>1</sup> Students do not have to take two elective courses in their first two years, but are strongly encouraged to do so. Students choose electives in consultation with the Graduate Director and/or their advisor.

## Master's Degree

NOTE: Although the Department does not have a terminal master's program, students may earn an optional Master's degree as part of the Ph.D. program.

Students enrolled in the Global Studies program may earn an M.A. in Global Studies by completing the following requirements. Students must:

1. Complete satisfactorily the first two years of coursework in the Ph.D. program
2. Complete satisfactorily the preliminary examination for the Ph.D. program
3. Fulfill the language requirement of the Ph.D. program.

## Language Requirement

Before advancing to candidacy, students must demonstrate a reading knowledge of one language other than English relevant to the student's program of study. This requirement will be met by passing a translation examination administered by the Department.

## Advancement to Candidacy

The qualifying examination, administered by a committee of faculty members, is typically taken in early to mid-Spring quarter of the third year. The qualifying examination consists of two parts: 1) preliminary examination and 2) prospectus defense. Toward the end of the second year of study, students start preparing by establishing a primary advisor and committee. The student will work with their committee members to establish a reading list on two different topics of relevance to their research interests over the summer. In the fall quarter of the third year, the student will enroll in two Directed Reading courses and produce two papers (of approximately 30 pages each). These papers will include literature reviews and develop conceptual and theoretical frameworks pertinent to the students' research interests. These papers will be orally examined by the committee at the end of the fall quarter of the third year.

The dissertation prospectus is presented in a colloquium that includes all three members of the dissertation committee plus two other members of the Academic Senate, one of whom (the "outside" member) may not hold either a primary or joint appointment in the department of Global and International Studies. The dissertation colloquium is typically held mid-Spring quarter in the third year. The basis of the dissertation prospectus is a significant research grant (i.e., National Science Foundation grant). Upon presentation and acceptance of the prospectus, the student will be advanced to candidacy for a Ph.D.

## Dissertation

Students must submit a dissertation describing original publishable research and present a public defense of the dissertation as the final requirement of the Ph.D. as listed below. The normative time for completion of the Ph.D. is six years, and the maximum time permitted is eight years.

The requirements for the Ph.D. are 1) the student must formally present and defend a written dissertation proposal to a committee of at least three members selected according to Graduate Division requirements. The dissertation proposal presentation may take place as part of the examination for Advancement to Candidacy, in which case, that five-member committee will approve the dissertation proposal. 2) The proposal must be approved prior to the final dissertation defense (usually at least three months before to allow time for the candidate to incorporate suggestions and changes required by the committee); 3) prior to the approval of the final version of the dissertation, the student is expected to defend the dissertation in a public colloquium announced with at least two weeks' notice; and 4) all requirements for the Ph.D. degree must be fulfilled within three years after advancement to candidacy.

# International Studies, B.A.

The major in international studies provides an interdisciplinary perspective on global politics, economics, cultures and history. International studies majors acquire twenty-first-century analytical skills and knowledge that will enable them to understand and contribute to shaping the rapidly evolving global community. The degree in international studies prepares students for careers in a variety of fields such as international public policy, international business and finance, international organizations, non-governmental organizations, and academic research and teaching.

Requirements for the major include a core set of courses: Introduction to Global Studies, Global Cultures and Society, Global Political Ideologies, Global Political Economy, Human Rights and Global Governance, and Global Environmental Issues. Also required is an additional lower-division social science course, and the Global and International Studies Forum. Students also choose both a geographic focus and a global focus to enable them to broaden and deepen areas of knowledge and topics of particular interest. The final requirements are competence in a language other than English and an international experience or approved internship.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

## Requirements for the Major

All International Studies majors must complete a minimum of 16 courses for a letter grade, with a minimum GPA of 2.0.

A. Complete:

INTL ST 1	Introduction to Global Studies
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B. Select four from the following:

INTL ST 11	Global Cultures and Society
INTL ST 12	Global Political Ideologies
INTL ST 15	Global Political Economy
INTL ST 16	Human Rights and Global Governance
INTL ST 17	Global Environmental Issues

C. Select one from the following:

ANTHRO 2A	Introduction to Sociocultural Anthropology
HISTORY 21A	World: Innovations
HISTORY 21B	World: Empires and Revolutions
HISTORY 21C	World: Nation, War, and Rights
INTL ST 13	Global Economy
INTL ST 14	Introduction to International Relations
POL SCI 51A	Introduction to Politics Around the World
SOC SCI 5D	US & World Geography
SOCIOL 2	Globalization and Transnational Sociology

D. Competency in a language other than English. <sup>1</sup>

E. Geographic Focus: Select two upper-division courses in any one geographic area. <sup>2</sup>

F. Global Focus: Select five upper-division courses. At least two courses must be from Module A. <sup>2</sup>

### Module A:

INTL ST 100	Global Trials
INTL ST 101A	Global Social Movements
INTL ST 101B	Global Cities and Slums
INTL ST 102A	Global Refugees and Stateless People
INTL ST 103A	Case Studies in Global and Planetary Health
INTL ST 104A	Global Trafficking
INTL ST 104BW	Global Gender and Sexuality
INTL ST 106A	Global Political Ecology
INTL ST 106B	Global Food Environment
INTL ST 150	Racism and Global Apartheid
INTL ST 163	Global Inequalities

### Module B:

For a quarterly list of approved upper-division courses, please visit the Social Sciences Undergraduate Student Affairs Office: <https://www.undergrad.socsci.uci.edu/policies/index.php>

G. Two quarters of INTL ST 183A, one quarter of which must be taken during the junior or senior year as a capstone experience.

H. At least one quarter of international experience.<sup>3</sup>

<sup>1</sup> Competency is established by college-level course work equivalent to UCI's fifth quarter of study (usually 2B).

<sup>2</sup> Visit the Global and International Studies website ([http://catalogue.uci.edu/schoolofsocialsciences/departments/globalandinternationalstudies/internationalstudies\\_ba/%20https://www.globalstudies.uci.edu/](http://catalogue.uci.edu/schoolofsocialsciences/departments/globalandinternationalstudies/internationalstudies_ba/%20https://www.globalstudies.uci.edu/)) for a list of approved courses. Although some courses are listed in more than one focus, students may not double count a course for both their geographic and global focus areas. Study abroad counts as one course in the geographic focus.

<sup>3</sup> Majors are encouraged to study abroad through the University's Education Abroad Program (UCEAP) or the Independent Programs, which are available for periods of a quarter, year, or summer. When this is not possible, work overseas (through Independent Programs) or a domestic internship with the UCDC Internship Program, the UCI Washington D.C. Academic Internship Program, or Social Science Internship Program (SOC SCI 197) with an international focus may be substituted. Study abroad counts as one course in the regional focus.

## Honors Program in International Studies

The Honors Program allows International Studies majors to engage in research leading to the completion of an honors thesis. The topic for the honors thesis is selected by the student, in consultation with a faculty advisor, and should reflect a theme consistent with the student's module in the International Studies major.

The honors program is open to all junior and senior International Studies majors with an overall GPA of 3.0 and a 3.5 GPA in the major.

During the spring quarter of the junior year or during the summer before the senior year, students formally apply to the honors program. Students will be notified of their selection to the honors program by September 1. In the fall quarter, students enroll in International Studies INTL ST H180, Honors Research Seminar. In this course, each student formulates a written research plan (i.e., prospectus) for the honors thesis. Students also select a faculty member who agrees to supervise the research, evaluate the written work, and approve the honors thesis. In the winter quarter, students enroll in International Studies INTL ST H190, Honors Thesis, with their faculty advisor. The faculty advisor supervises and evaluates data collection and analysis and reads and edits chapter drafts. In the spring quarter, students enroll in a second quarter of INTL ST H190, Honors Thesis, with their faculty advisor. The thesis is to be completed by the student and approved by the advisor prior to the end of the quarter.

Honors students must also demonstrate a high level of language proficiency by completing two courses beyond the 2A level in language, literature, or culture taught in their chosen international language.

International Studies majors are also required to pursue some form of international experience, as explained in major requirement H.

## Sigma Iota Rho: National Honors Society

The National Honor Society in International Studies was established in 1985, and welcomed the University of California, Irvine, designated Gamma Gamma, as a new chapter on November 30, 2006. The Gamma Gamma Chapter was established primarily as a means by which to honor those students who have excelled academically and to foster integrity and creative performance in the understanding of world affairs.

For more information, call the Department of Global and International Studies office at 949-824-0151.

## International Studies, Minor

The minor in international studies provides an interdisciplinary perspective on contemporary global issues, societies, and cultures. International studies minors acquire knowledge that will enable them to understand and contribute to shaping the rapidly evolving global community. The minor in international studies helps prepare students for graduate study or professional careers in a variety of fields in the national and international job markets such as international affairs and public policy, international business and finance, international organizations, and academic research and teaching.

Requirements for the minor include a core set of courses: Introduction to Global Studies, Global Cultures and Society, Global Political Ideologies, Global Political Economy, Human Rights and Global Governance, and Global Environmental Issues. Students also choose both a geographic focus and a global focus to enable them to broaden and deepen areas of knowledge and topics of particular interest. The final requirement is one quarter of the Global and International Studies Forum.

### International Studies Minor Requirements

A. Complete:

INTL ST 1	Introduction to Global Studies
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B. Select one of the following:

INTL ST 11	Global Cultures and Society
INTL ST 12	Global Political Ideologies
INTL ST 15	Global Political Economy
INTL ST 16	Human Rights and Global Governance
INTL ST 17	Global Environmental Issues

C. Geographic Focus: Two upper-division courses in one geographic area <sup>1</sup>

D. Global Focus: Three upper-division courses. At least one must be from Module A.

**Module A:**

INTL ST 100	Global Trials
INTL ST 101A	Global Social Movements
INTL ST 101B	Global Cities and Slums
INTL ST 102A	Global Refugees and Stateless People
INTL ST 103A	Case Studies in Global and Planetary Health
INTL ST 104A	Global Trafficking
INTL ST 104BW	Global Gender and Sexuality
INTL ST 106A	Global Political Ecology
INTL ST 106B	Global Food Environment
INTL ST 150	Racism and Global Apartheid
INTL ST 163	Global Inequalities

**Module B <sup>1</sup>**

E. One quarter of INTL ST 183A

<sup>1</sup> Visit the Global and International Studies website (<https://www.globalstudies.uci.edu/>) for a list of approved courses. Although some courses are listed in more than one focus, students may not double count a course for both their geographic and global focus. Study abroad counts as one course in the geographic focus.

## Department of Language Science

**Lisa Pearl, Department Chair**

2314 Social & Behavioral Sciences Gateway

949-824-2307

<https://www.langsci.uci.edu/>

Language is a system of communication with an extraordinarily intricate structure. The scientific study of the mental representations and biological basis of language involves many questions, including what the nature of this system is, how humans master it so early in their cognitive development, how humans use it to communicate, and how it is implemented in human biology.

The Department offers a B.A. in Language Science, an undergraduate minor, and undergraduate courses.

- Language Science, B.A.
- Language Science, Ph.D.
- Linguistics, Minor

## Faculty

Alyssa Brewer, Ph.D. Stanford University, *Associate Professor of Cognitive Sciences; Language Science* (neuroimaging of visual perception, visual deficits, neurological disorders)

Richard Futrell, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Computer Science; Language Science* (language processing, Bayesian modeling, NLP)

Brandy Gatlin-Nash, Ph.D. Florida State University, *Assistant Professor of Education; Language Science*

Gregory S. Hickok, Ph.D. Brandeis University, *Professor of Cognitive Sciences; Language Science* (neuroanatomy of language, neural plasticity, neuroimaging, cognitive neuroscience)

J. Zoe Klemfuss, Ph.D. Cornell University, *Assistant Professor of Psychological Science; Language Science* (narrative development, children's autobiographical memory, sociocontextual influences on children's narrative, memory and well-being, children's eyewitness abilities)

Judith Kroll, Ph.D. Brandeis University, *Distinguished Professor of Language Science* (psycholinguistics, bilingualism, second language acquisition, language production, lexical processing, reading, visual cognition, gender and science)

Glenn S. Levine, Ph.D. University of Texas at Austin, *German Language Program Director and Professor of German; Education; Language Science* (applied linguistics, foreign language pedagogy, German-Jewish culture and history, Yiddish language and culture, European culinary history)

Virginia Mann, Ph.D. Massachusetts Institute of Technology, *Professor of Language Science; Education* (reading ability: phenome awareness, developmental dyslexia, phonological skills, early intervention, precocious readers; speech perception: context effects, cross-linguistic comparisons)

Lisa Pearl, Ph.D. University of Maryland, College Park, *Professor of Language Science; Cognitive Sciences; Logic and Philosophy of Science* (language development, linguistics, computational sociolinguistics, cognitive modeling)

Elizabeth Pena, Ph.D. Temple University, *Professor of Education; Language Science*

Gregory Scontras, Ph.D. Harvard University, *Assistant Professor of Language Science* (semantics, pragmatics, computational modeling, heritage bilingualism)

Sameer Singh, Ph.D. University of Massachusetts Amherst, *Assistant Professor of Computer Science; Electrical Engineering and Computer Science; Language Science* (artificial intelligence and machine learning, databases and data mining, scientific and numerical computing)

Julio R. Torres, Ph.D. Georgetown University, *Assistant Professor of Spanish and Portuguese; Language Science* (heritage and second language acquisition; multilingualism)

Bernard H. Tranel, Ph.D. University of California, San Diego, *Professor of Language Science*

Kai Wehmeier, Ph.D. University of Münster, *Director, Center for the Advancement of Logic, its Philosophy, History, and Applications and Professor of Logic and Philosophy of Science; Language Science; Philosophy*

## Language Science Courses

### **LSCI 1. Languages of the World. 4 Units.**

The world has over 6,000 languages, with an exuberant variety of sounds, words, grammars. Introduction to a representative (about eight), drawn from every continent. Students not expected to learn these languages, but to explore and study their structure and complexity.

(VIII)

### **LSCI 2. Discovering Language. 4 Units.**

Explores language's pervasiveness and diversity; demonstrates ways linguistics illuminates language's crucial--albeit hidden--societal role. Issues: self- and group-identification, language death, language in legal and educational settings. Illustrations: spoken and signed languages, varieties of English, Native American languages.

(VII)

### **LSCI 3. Introduction to Linguistics. 4 Units.**

Emphasis on the notion that language is a remarkable achievement of the human mind. Current insights into the nature of language. Survey of various subfields of linguistics. Introduction to linguistic analysis.

(III and V.B ).

### **LSCI 10. Introduction to Phonology. 4 Units.**

Basic concepts in phonetic description and phonological analysis.

(III and V.B ).

### **LSCI 20. Introduction to Syntax. 4 Units.**

Basic concepts in syntactic description and grammatical analysis.

Prerequisite: LSCI 3

(III and V.B ).

### **LSCI 43. Introduction to Symbolic Logic. 4 Units.**

An introduction to the symbolism and methods of the logic of statements, including evaluation of arguments by truth tables, the techniques of natural deduction, and semantic tableaux.

Same as LPS 30, PHIL 30.

(Vb)



**LSCI 51. Acquisition of Language. 4 Units.**

What children say, what they mean, and what they understand. Theories about the learning of language by one-, two-, and three-year-olds. Comparison of kinds of data on which these theories are based.

Same as PSYC 56L.

(III)

**LSCI 51B. Foundations of Bilingual Education and Bilingualism. 4 Units.**

Provides a comprehensive overview of current issues in bilingual education and bilingualism. Topics include dimensions of bilingualism, the effects of bilingualism on children's linguistic and cognitive development, bilingual education programs, literacy, special needs, and assessment.

Same as EDUC 52, HUM 52.

**LSCI 68. Introduction to Language and Culture. 4 Units.**

Explores what the study of language can reveal about ourselves as bearers of culture. After introducing some basic concepts, examines how cultural knowledge is linguistically organized and how language might shape our perception of the world.

Same as ANTH 2D.

(III)

**LSCI 99. Special Topics in Language Science. 4 Units.**

Special Topics at lower-division level.

Repeatability: Unlimited as topics vary.

**LSCI 102. Formal Languages and Automata. 4 Units.**

Formal aspects of describing and recognizing languages by grammars and automata. Parsing regular and context-free languages. Ambiguity, nondeterminism. Elements of computability; Turing machines, random access machines, undecidable problems, NP-completeness.

Prerequisite: (ICS 46 or CSE 46) and MATH 2B and ICS 6B and ICS 6D. ICS 46 with a grade of C or better. CSE 46 with a grade of C or better

Same as CS 162.

Restriction: School of Info & Computer Sci students have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment. Language Science Majors have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**LSCI 106M. Computational Models of Language Learning. 4 Units.**

Focuses on using computational models to investigate questions related to language learning. Topics include computational models of language acquisition, principles underlying models of language learning and language change, computational learning theory, and modeling information extraction from language by humans.

Prerequisite: LSCI 151. LSCI 151 with a grade of A- or better

Concurrent with LSCI 206C.

**LSCI 107M. Computational Methods for Language Research. 4 Units.**

Focuses on computational methods useful for language research. Students become familiar with software and programming languages used for extracting information from electronic datasets and for creating basic simulations of linguistic cognition. No prior programming experience assumed.

Prerequisite: PSYC 150 or LSCI 155 or PSYC 156A or LSCI 151

Same as PSYC 157M.

**LSCI 109. Special Topics in Computational Linguistics. 4 Units.**

Topics in computational linguistics.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**LSCI 111. Intermediate Phonology. 4 Units.**

Fundamentals of phonological theory. Intensive practice in phonological analysis.

Prerequisite: Recommended: LSCI 10

Concurrent with LING 211.

**LSCI 115. Introduction to Phonetics. 4 Units.**

Introduces students to fundamental concepts of phonetics. The sound systems of selected languages around the world, including that of English, are described in detail. Students are trained to work with speech sound recognition, phonetic transcription, and language sound production.

Prerequisite: LSCI 3

**LSCI 119. Special Topics in Phonetics/Phonology. 4 Units.**

Topics in Phonetics/Phonology.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**LSCI 121. Intermediate Syntax. 4 Units.**

Examines various phenomena within a generative theory of syntax, focusing on the nature of syntactic rules, representations, and constraints. Introduces methods of experimental syntax, providing students hands-on opportunity to recognize the connection(s) between theory and experiential results.

Prerequisite: LSCI 20

**LSCI 124. Current Topics in Syntactic Theory. 4 Units.**

Research seminar in syntax. Intensive study of a small number of well-defined topics which have had significant impact on the development of syntactic theory.

Repeatability: May be repeated for credit unlimited times.

**LSCI 129. Special Topics in Syntax. 4 Units.**

Topics in Syntax.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**LSCI 139. Special Topics in Morphology. 4 Units.**

Topics in Morphology.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**LSCI 141. Topics in Philosophy of Language. 4 Units.**

Selected topics in the philosophy of language, e.g., the nature of meaning, mechanisms of reference, speech acts.

Repeatability: Unlimited as topics vary.

Same as LPS 145, PHIL 145.

**LSCI 142. Introduction to Logic. 4 Units.**

Introduction to sentence logic, including truth tables and natural deduction; and to predicate logic, including semantics and natural deduction.

Same as LPS 104, PHIL 104.

**LSCI 143. Introduction to Formal Semantics. 4 Units.**

Introduces students to the analytical tools used in the investigation of natural language semantics. Topics include the truth-conditional approach to meaning, compositionality, scope and anaphora, generalized quantifier theory, and intensionality.

Prerequisite: LPS 30 or PHIL 30 or LPS 104 or PHIL 104. LPS 30 with a grade of A- or better. PHIL 30 with a grade of A- or better. LPS 104 with a grade of A- or better. PHIL 104 with a grade of A- or better

**LSCI 145A. Elementary Set Theory. 4 Units.**

An introduction to the basic working vocabulary of mathematical reasoning. Topics include sets, Boolean operations, ordered n-tuples, relations, functions, ordinal and cardinal numbers.

Same as LPS 105A, PHIL 105A.

**LSCI 145B. Metalogic. 4 Units.**

Introduction to formal syntax (proof theory) and semantics (model theory) for first-order logic, including the deduction, completeness, compactness, and Löwenheim-Skolem theorems.

Prerequisite: PHIL 105A

Same as LPS 105B, PHIL 105B.

Overlaps with MATH 150.

**LSCI 145C. Undecidability and Incompleteness. 4 Units.**

Introduction to the formal theory of effective processes, including recursive functions, Turing machines, Church's thesis, and proofs of Gödel's incompleteness theorem for arithmetic, and Church's undecidability theorem for first-order logic.

Prerequisite: PHIL 105B

Same as LPS 105C, PHIL 105C.

Overlaps with MATH 152.

Concurrent with LPS 205C.

**LSCI 149. Special Topics in Semantics. 4 Units.**

Topics in Semantics.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**LSCI 151. Acquisition of Language II. 4 Units.**

Focuses on native language learning, exploring the way in which infants and very young children unconsciously uncover the rich systematic knowledge of their native language. Examines both experimental and computational studies that quantitatively investigate the 'how' of language acquisition.

**LSCI 151B. Bilingual Acquisition. 4 Units.**

Focuses on different forms of bilingualism, including bilingual first language acquisition, early second language acquisition, and late second language acquisition. Research techniques discussed include theoretical, experimental, and computational methods.

Prerequisite: LSCI 151 or PSYC 156A. Placement via consent of the instructor is also accepted.

**LSCI 151S. Second Language Acquisition . 4 Units.**

Examines a number of theoretical perspectives that attempt to explain second language learning with a focus on adult learners. How universal constraints, individual differences, and social factors influence the task of learning a second language as an adult.

Prerequisite: LSCI 3 or SPAN 113B

**LSCI 152. Acquisition of Language III . 4 Units.**

Focuses on native language learning, exploring the way in which infants and very young children unconsciously uncover the rich systematic knowledge of their native language. Examines both experimental and computational studies that quantitatively investigate the 'how' of language acquisition.

**LSCI 155. Psychology of Language. 4 Units.**

Examines language using the tools of experimental psychology. From sounds to words to spoken and written sentences, explores how language is used in real time, and how its use reveals how it is represented in the mind.

Prerequisite: PSYC 7A or PSCI 9 or PSYC 9B or PSCI 11B or LSCI 3

Same as PSYC 150.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Language Science Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**LSCI 158. Language and the Brain . 4 Units.**

Research analysis on biological bases of human linguistic capacity. Development, focusing on hemispheric specialization, plasticity; localization of specific linguistic functions in adults, with emphasis on study of aphasias; relation of linguistic capacity to general cognitive capacity, considering research on retardation.

Prerequisite: (PSYC 7A or PSB 9 or PSYC 9A or PSB 11A) and (PSYC 9B or PSB 11B or BIOL 35 or BIOL N110 or BIOL N115A)

Same as BIOL N160, PSYC 161.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Biological Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**LSCI 159. Special Topics in Psycholinguistics. 4 Units.**

Topics in Psycholinguistics.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**LSCI 164A. Topics in Romance Languages. 4 Units.**

Topics in Romance Languages.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**LSCI 164B. French Phonetics. 4 Units.**

Study of the sound structure of French. Introduction to elements of general phonetics, contrastive (French/English) phonetics, and French phonetics and phonology. Designed to help students improve their pronunciation. Also serves as a preparatory course for language teaching.

Prerequisite: FREN 1C

**LSCI 165B. Structure of Japanese. 4 Units.**

An overview of the linguistic features of modern Japanese. Provides students with a systematic introduction to the nature and characteristics of the language.

Same as EAS 123.

**LSCI 165L. Language Change, Acquisition, and Complexity. 4 Units.**

Focuses on models of language change, acquisition, and complexity, looking at the connections between them to explain empirical data relating to the form of existing languages and how languages change over time. Emphasis is placed on computational and mathematical models.

Prerequisite: PSYC 156A. PSYC 156A with a grade of A- or better

**LSCI 168J. Improvisation, Language, and Culture. 4 Units.**

Addresses improvisation, both in performance and in everyday life. Examines improvisation as the 'flexible regulation' of everyday behavior by exploring different scholarly treatments of language and interaction, and working on developing actual theatrical improvisation skills.

Same as ANTH 151A.

Restriction: Upper-division students only.

**LSCI 168S. Language and Social Cognition. 4 Units.**

Explores the relationship between language and cognition in social and cultural contexts. The overall goal is to think through how language structure and use impact how individuals perceive, think about, and understand the world around them.

Same as ANTH 150A.

Restriction: Anthropology Majors have first consideration for enrollment.

**LSCI 169. Special Topics in Language Studies. 4 Units.**

Topics in Language Studies.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**LSCI 172. History of English. 4 Units.**

Traces the history of English from its roots through its earliest written records and into the present, including fundamental changes in morphology, phonology, syntax, semantics, and vocabulary, as well as social, cultural, and historical forces affecting language.

Prerequisite: LSCI 3

**LSCI 175. Language Origins: Evolution, Genetics, and the Brain. 4 Units.**

Examines how human language(s) may have originated. Studies pertinent techniques (reconstruction) and addresses related questions, including is our language faculty inborn (i.e., genetically encoded)? Can brain imaging and population genetics research help to unlock this mystery of human evolution?.

Same as ANTH 152A, GLBC 105, HIST 135G.

**LSCI 176. Introduction to Pidgins and Creoles. 4 Units.**

Explores the linguistic structures of pidgin and creole languages and examines major theories for the surprisingly high degree of similarity found across pidgin and creole languages. Includes sociolinguistic and field methods.

Prerequisite: LSCI 3 or SPAN 113A

**LSCI 179. Special Topics in Historical Linguistics. 4 Units.**

Topics in Historical Linguistics.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**LSCI 182V. Language and Literacy. 4 Units.**

Addresses the linguistic principles and processes that underlie oral and written language proficiency. Emphasis is on how to use phonology, morphology, orthography, semantics, syntax, and pragmatics to support literacy and oral language development for K-12 students.

Same as EDUC 151, PSCI 192V.

Restriction: Language Science Majors have first consideration for enrollment. Psychological Science Majors have first consideration for enrollment. Education Majors have first consideration for enrollment. Psychology and Social Behavior Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**LSCI 189. Special Topics in Applied Language Science: Writing Skills for Language Science. 4 Units.**

Topics in Applied Language Science.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**LSCI 195A. Language Science Research I. 4 Units.**

Provides students with in-depth experience in different facets of research in language science. It includes theoretical, behavioral, computational, and/or applied language science topics and methodologies.

Prerequisite: Permission of faculty advisor. If this is not the same faculty member as the course instructor, the faculty advisor will coordinate with the course instructor when it comes to assessing the student's research process at the end of each quarter.

Repeatability: May be repeated for credit unlimited times.

**LSCI 195B. Language Science Research II. 4 Units.**

Provides students with in-depth experience in different facets of research in language science. It includes theoretical, behavioral, computational, and/or applied language science topics and methodologies.

Prerequisite: Permission of faculty advisor. If this is not the same faculty member as the course instructor, the faculty advisor will coordinate with the course instructor when it comes to assessing the student's research process at the end of each quarter.

Repeatability: May be repeated for credit unlimited times.

**LSCI 195C. Language Science Research III. 4 Units.**

Provides students with in-depth experience in different facets of research in language science. It includes theoretical, behavioral, computational, and/or applied language science topics and methodologies.

Prerequisite: Permission of faculty advisor. If this is not the same faculty member as the course instructor, the faculty advisor will coordinate with the course instructor when it comes to assessing the student's research process at the end of each quarter.

Repeatability: May be repeated for credit unlimited times.

**LSCI 195W. Writing Skills for Language Science. 4 Units.**

Focuses on written technical communication skills in language science. Topics include the scientific publication process (focusing on research abstracts), how to write for pieces of different lengths, and writing for different audiences.

(Ib)

**LSCI 198. Directed Group Study. 4 Units.**

Directed study with Linguistics faculty.

Repeatability: Unlimited as topics vary.

**LSCI 199. Independent Study. 4 Units.**

Independent research with Linguistics faculty. Students may enroll for only one 199 each quarter.

Repeatability: May be repeated for credit unlimited times.

**LSCI 201A. Language Science Research. 1.3 Unit.**

Involves colloquia and scientific reports by faculty, students, and visitors. Students are exposed to current language science research and gain experience in active listening and scientific discourse.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Language Science Majors only.

**LSCI 201B. Language Science Research . 1.3 Unit.**

Involves colloquia and scientific reports by faculty, students, and visitors. Students are exposed to current language science research and gain experience in active listening and scientific discourse.

Grading Option: In Progress (Letter Grade with S/U).

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Language Science Majors only.

**LSCI 201C. Language Science Research. 1.3 Unit.**

Involves colloquia and scientific reports by faculty, students, and visitors. Students are exposed to current language science research and gain experience in active listening and scientific discourse.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Language Science Majors only.

**LSCI 202A. Skills for Language Science I. 4 Units.**

Focuses on computational skills for language science research. Topics include computational literacy, programming languages, and database interfaces that are useful for language science research, allowing for general scripting and file manipulation, and enabling statistical analysis and data visualization.

Restriction: Graduate students only.

**LSCI 202B. Skills for Language Science II. 4 Units.**

Introduction to the scientific publication process and practice of scientific writing skills.

Prerequisite: LSCI 202A

Restriction: Graduate students only.

**LSCI 202C. Skills for Language Science III. 4 Units.**

Introduction to scientific presentation for audiences of different backgrounds and practice of scientific presentations skills.

Prerequisite: LSCI 202B

Repeatability: May be taken for credit for 4 units as topics vary.

Restriction: Graduate students only.

**LSCI 202D. Advanced Skills for Language Science . 4 Units.**

Practice of advanced professional writing skills, including writing of grants, journal publications, research profiles, academic CVs, teaching statements, and cover letters. Students bring their own academic material to workshop.

Prerequisite: LSCI 202A and LSCI 202B and LSCI 202C. LSCI 202A with a grade of B or better. LSCI 202B with a grade of B or better. LSCI 202C with a grade of B or better

Restriction: Graduate students only.

**LSCI 206C. Computational Models of Language Learning. 4 Units.**

Focuses on computational models of native language learning, exploring how probabilistic learning and inference fare on difficult case studies within language acquisition. In all cases, grounds the learning models in available empirical data and considers their psychological plausibility.

Prerequisite: LSCI 251. LSCI 251 with a grade of B- or better

Same as PSYC 245M.

Restriction: Graduate students only.

Concurrent with LSCI 106M.

**LSCI 209. Special Topics in Computational Linguistics. 1-4 Units.**

Focuses on ongoing research in linguistics. Variable units based on course content, as determined by Department. May be repeated for credit as topic varies.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

Concurrent with LSCI 109.

**LSCI 239. Special Topics in Morphology. 4 Units.**

Topics in morphology.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**LSCI 248M. Modal Logic. 4 Units.**

Introduction to modal logic methods and their application.

Restriction: Graduate students only.

**LSCI 250. Psycholinguistics. 4 Units.**

Examines how language is used in real time, and how its use reveals how it is represented in the mind and the brain.

Restriction: Graduate students only.

**LSCI 250B. Bilingualism. 4 Units.**

Examines how bilingualism interfaces with language representation, language use, and language development.

Restriction: Graduate students only.

**LSCI 250H. Heritage Language Acquisition. 4 Units.**

Examines how heritage languages are represented in speakers' minds, processed in real time, and acquired.

Restriction: Graduate students only.



**LSCI 251. Language Acquisition. 4 Units.**

Focuses on native language learning, exploring the way in which infants and very young children unconsciously uncover the rich systematic knowledge of their native language. Examines both experimental and computational studies that quantitatively investigate the 'how' of language acquisition.

Restriction: Graduate students only.

**LSCI 251A. Atypical Acquisition. 4 Units.**

Focuses on different types of atypical acquisition, including acquisition in special populations and acquisition under atypical circumstances. Research techniques discussed include theoretical, experimental, and computational methods.

Restriction: Graduate students only.

Concurrent with LSCI 151A.

**LSCI 253M. Experimental Methods for Language Research. 4 Units.**

Focuses on experimental methods useful for language research. Students become familiar with software and programming languages used for implementing and analyzing behavioral experiments.

Restriction: Graduate students only.

**LSCI 259. Special Topics in Psycholinguistics. 4 Units.**

Topics in Psycholinguistics. May be repeated for credit as topic varies.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**LSCI 265L. Language Change, Acquisition, and Complexity. 4 Units.**

Focuses on models of language change, acquisition, and complexity, looking at the connections between them to explain empirical data relating to the form of existing languages and how languages change over time. Emphasis is placed on computational and mathematical models.

Restriction: Graduate students only.

Concurrent with LSCI 165L.

**LSCI 281L. Language Learning with Digital Media. 4 Units.**

Provides students with a graduate-level introduction to key issues of digital media in second-language teaching and learning.

Restriction: Graduate students only.

**LSCI 281S. Second Language Acquisition and Teaching. 4 Units.**

Explores the prevailing paradigms that seek to account for how adults learn second languages (L2s) in instructed settings.

Restriction: Graduate students only.

**LSCI 290. Dissertation Research. 4-12 Units.**

Dissertation Research.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**LSCI 299. Independent Study. 1-12 Units.**

Independent study. Research with language science faculty.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

## Linguistics Courses

### LINGUIS 150. Acquisition of Language II. 4 Units.

Focuses on native language learning, exploring the way in which infants and very young children unconsciously uncover the rich systematic knowledge of their native language. Examines both experimental and computational studies that quantitatively investigate the 'how' of language acquisition.

Prerequisite: PSYCH 56L or LINGUIS 51

Same as PSYCH 156A.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

## Language Science, B.A.

The B.A. in Language Science provides students with an interdisciplinary foundation in the scientific study of language, including its mental representations, its development and use, and its biological basis.

Students completing the B.A. in Language Science combine interests in theoretical linguistics, language development and use, the advanced study of natural or formal languages, and some combination of neuroscience, psychology, logic, computer science, anthropology, education, and hearing and speech sciences. In the process of relating these interests to the scientific study of language and its applications, students develop an understanding of the analytical tools of formal language study.

Graduates have an interdisciplinary language science background that makes them attractive for a variety of careers, including teaching, language technology industry positions, teaching English as a second language abroad, interpreting and translation, technical writing, language consulting for legal firms and medical practices, and advertising, among many others.

This foundation in formal and applied language science also prepares graduates for graduate and professional programs in any of the areas related to languages science, including speech-language pathology, linguistics, cognitive science, cognitive neuroscience, developmental psychology, natural language processing, and education.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Core

A. Complete the following:

LSCI 3	Introduction to Linguistics
LSCI 10	Introduction to Phonology
LSCI 20	Introduction to Syntax
LSCI 43	Introduction to Symbolic Logic
LSCI 51	Acquisition of Language

B. Select two courses from the following:

LSCI 164A	Topics in Romance Languages
LSCI 164B	French Phonetics
LSCI 165B	Structure of Japanese
LSCI 172	History of English
SPANISH 113A	Spanish Phonetics
SPANISH 113B	Introduction to Spanish Linguistics
GERMAN 104	Topics in German Linguistics
LSCI 102	Formal Languages and Automata
LSCI 142	Introduction to Logic
LSCI 145A	Elementary Set Theory

Any '3-level' non-English language course or any advanced level non-English language course. <sup>1, 2</sup>

### Additional Core

C. Select five courses from any linguistics course that is not listed in section A, B, or D, including the courses below. At least three courses must be upper-division:

LSCI 1	Languages of the World
LSCI 2	Discovering Language
LSCI 68	Introduction to Language and Culture
LSCI 111	Intermediate Phonology
LSCI 115	Introduction to Phonetics

LSCI 121	Intermediate Syntax
LSCI 143	Introduction to Formal Semantics
LSCI 145B	Metalogic
LSCI 145C	Undecidability and Incompleteness
LSCI 151	Acquisition of Language II
LSCI 158	Language and the Brain
LSCI 168J	Improvisation, Language, and Culture
LSCI 168S	Language and Social Cognition

A 199 course affiliated with the Language Science Program, or a research course, with a minimum 4 unit enrollment requirement. <sup>3</sup>

### Specializations

D. Select four courses from the following. Courses must come from at least two of the categories listed below:

#### I. Theoretical

LSCI 119	Special Topics in Phonetics/Phonology
LSCI 124	Current Topics in Syntactic Theory
LSCI 129	Special Topics in Syntax
LSCI 141	Topics in Philosophy of Language
LSCI 149	Special Topics in Semantics
LSCI 176	Introduction to Pidgins and Creoles
SPANISH 187	Selected Topics in Spanish Linguistics

#### II. Behavioral and Neuroscientific

LSCI 151B	Bilingual Acquisition
LSCI 151S	Second Language Acquisition
LSCI 159	Special Topics in Psycholinguistics
LSCI 165L	Language Change, Acquisition, and Complexity
LSCI 175	Language Origins: Evolution, Genetics, and the Brain

#### III. Computational

LSCI 107M	Computational Methods for Language Research
LSCI 109	Special Topics in Computational Linguistics
COMPSCI 142A	Compilers and Interpreters
COMPSCI 142B	Language Processor Construction
COMPSCI 171	Introduction to Artificial Intelligence
COMPSCI 177	Applications of Probability in Computer Science

#### IV. Applied

PSYCH 131B	Hearing
PSYCH 161H	Hearing and the Brain
PSYCH 141J-PSYCH 141K-PSYCH 141L-PSYCH 141M-PSYCH 141N- PSYCH 141O-PSYCH 141P-PSYCH 141Q-PSYCH 141R	and and and and and and and
MUSIC 158A- 158B- 158C	Diction and Diction and Diction
EDUC 134	Teaching English Internationally
EDUC 151	Language and Literacy
BME 148	Microimplants
DRAMA 35	Speech for the Theatre
CHINESE 100A- 100B- 100C	Classical Chinese and Classical Chinese and Classical Chinese

JAPANESE 100A- 100B

Classical Japanese  
and Classical Japanese

EAS 125

- <sup>1</sup> Advanced non-English language courses are those requiring the highest level course in the relevant sequence as a prerequisite.
- <sup>2</sup> May be used more than once. For example, a student could use 3A and 3B to satisfy both courses in section II. In addition, if a student places out of the 3-level in a language, the the Natural/Formal language requirement is satisfied by the courses placed out of.
- <sup>3</sup> May be a research course, whose numbering varies by department. Individual study may count for up to two of the additional core courses if taken for multiple quarters or with multiple faculty members affiliated with Language Science.

## Language Science, Ph.D.

The Ph.D. program in Language Science provides interdisciplinary training across a broad range of topics relating to the scientific study of language that spans fields such as linguistics, cognitive science, psychology, computer science, philosophy, logic, neuroscience, speech, hearing, education, and engineering.

This integrative approach to the science of language explores interfaces between traditional frameworks, fostering a more complete understanding of the human communication system. Emphasis is placed on modern techniques of theory construction and empirical investigation, and students are prepared for research and teaching careers in academia, industry, and government. Special attention is given to providing hands-on research experience and equipping students with sophisticated quantitative methods and technical communication skills.

While undergraduate training in linguistics is desirable, applications are also welcomed from students with backgrounds in other areas, including cognitive science, psychology, computer science, neuroscience, logic, philosophy, mathematics, engineering, hearing, speech, language studies, education, and anthropology. Decisions on admissions are based on Graduate Record Examination (GRE) scores for tests taken within the past five years, official transcripts of all college coursework, a statement of purpose, at least three letters of recommendation, and at least one sample of technical writing. Applicants whose primary language is not English are required to demonstrate proficiency in English for admission consideration. Information about this requirement is available here (<https://grad.uci.edu/admissions/applying-to-uci/english-proficiency.php>).

### Requirements for the Ph.D.

#### Course Requirements

A. Complete:

LSCI 202A- 202B- 202C- 202D

Skills for Language Science I  
and Skills for Language Science II  
and Skills for Language Science III  
and Advanced Skills for Language Science

B. Complete five content-focused courses. Eligible courses include, but are not limited to, the following:

LSCI 206C	Computational Models of Language Learning
LSCI 209	Special Topics in Computational Linguistics
LSCI 239	Special Topics in Morphology
LSCI 250	Psycholinguistics
LSCI 250B	Bilingualism
LSCI 250H	Heritage Language Acquisition
LSCI 251	Language Acquisition
LSCI 251A	Atypical Acquisition
LSCI 259	Special Topics in Psycholinguistics
LSCI 265L	Language Change, Acquisition, and Complexity
LSCI 281L	Language Learning with Digital Media
LSCI 281S	Second Language Acquisition and Teaching

C. Complete three methods-focused courses. Other courses currently considered Language Science methods-focused courses that are taught in other departments are available at the Language Science graduate website.

LSCI 248M	Modal Logic
LSCI 253M	Experimental Methods for Language Research

D. Complete:

LSCI 201A- 201B- 201C

Language Science Research  
and Language Science Research  
and Language Science ResearchE. Complete the foreign language requirement.<sup>1</sup>

Students must complete 12 courses distributed as follows: five content-focused courses (including theoretical, psycholinguistic, computational, or neurolinguistic areas), three methods courses (including computational, corpus, experimental, neuroscience, or logical methods), and the four course Language Science technical and professional skills sequence. (LSCI 202A-D).

Students must also attend Language Science seminars (LSCI 201A-B-C) and fulfill the Ph.D. program's foreign language requirement.

All requirements for the Ph.D. must be fulfilled within three years after advancement to candidacy. The normative time for advancement to candidacy is three and a half years. The normative time for completion is five years, and the maximum time permitted is six years.

### Research Proposal

Students are required to complete a research proposal by the fall of their second year (fourth quarter).

### Concentration Examination

Students are required to complete a targeted literature review in the area of their concentration by the winter of their second year (sixth quarter), orally presented to a committee of three faculty members.

### Qualifying Research Talk and Paper

Students are required to submit and orally present a research paper of publishable quality by the spring of their third year (ninth quarter).

### Advancement (CADA)

In lieu of a formal admission to candidacy examination, students are required to complete a conceptual analysis of the dissertation area (CADA) by the winter of their fourth year (10<sup>th</sup> quarter), defended orally to a committee of five faculty members. The CADA provides the opportunity for the student to develop a perspective on a body of literature relevant to the dissertation research. This perspective may include discussion of research conducted by the student and potential future research, as it relates to the larger body of literature.

A written document describing the student's CADA must be submitted to the committee prior to advancement. Students are required to advance to candidacy by the end of the winter quarter of their fourth year in the program.

### Dissertation

Students must submit a dissertation describing original publishable research and present a public defense of the dissertation to a committee of three faculty members as the final requirement of the Ph.D. program.

## Linguistics, Minor

Linguistics is the scientific study of this human language ability. It is concerned with describing languages and with understanding our knowledge of language as speakers and how we come to have that knowledge. It is connected to many other fields of study, including psychology, anthropology, sociology, biology, physics, mathematics, computer science, philosophy, and literature.

### Linguistics Minor Requirements

Requirements for the minor in Linguistics are met by taking seven linguistics courses (28 units) as specified below:

A. Complete the following:

LSCI 3	Introduction to Linguistics
LSCI 10	Introduction to Phonology
LSCI 20	Introduction to Syntax

B. Four additional linguistics courses, three of which must be upper-division.

**Residence Requirement:** At least three upper-division courses required for the minor must be completed successfully at UCI.

## Department of Logic and Philosophy of Science

**Simon Huttegger, Department Chair**

785 Social Science Tower

949-824-1520

<http://www.lps.uci.edu/>

The Department of Logic and Philosophy of Science (LPS) brings together faculty and students interested in a wide range of topics loosely grouped in the following areas: general philosophy of science; philosophy of the particular sciences; logic, foundations and philosophy of mathematics; and philosophy of mathematics in application. LPS enjoys strong cooperative relations with UCI's Department of Philosophy; in particular, the two units jointly administer a single graduate program which offers the Ph.D. in Philosophy. LPS also has strong interconnections with several science departments, including Mathematics and Physics, as well as the School of Biological Sciences, the Donald Bren School of Information and Computer Sciences, the Departments of Cognitive Sciences and Economics, and the graduate concentration in Mathematical Behavioral Sciences. The Program in Law and Graduate Studies is a concurrent degree study leading to a J.D. from the School of Law in conjunction with a Ph.D. in the Department of Logic and Philosophy of Science.

## Salzburg Exchange Program

LPS and the Department of Philosophy jointly administer an Exchange Program with the University of Salzburg. The program has two parts. The Scholarly Exchange provides opportunities for faculty and graduate students in LPS and Philosophy to visit Salzburg and for faculty and graduate students from Salzburg to visit one or the other of the UCI units. The Program also sponsors joint conferences, held alternately in Irvine and in Salzburg; these are co-sponsored by Salzburg and the UCI Interdisciplinary Program in the History and Philosophy of Science.

To be eligible for the Salzburg Exchange, a graduate student must have advanced to candidacy. The selected student spends one semester in Salzburg, usually teaching one course in the general area of the thesis topic. An upper-division course may be taught in English, but lower-division courses must be taught in German. (Some previous visitors have learned serviceable German by attending a Goethe institute during the preceding summer.) Typically, a Salzburg visitor will receive a Salzburg Fellowship intended to cover travel expenses, and a stipend; those who teach while in Salzburg will also receive a salary intended to cover living expenses (including health and dental insurance).

Applications from LPS graduate students (including a curriculum vita and syllabi for courses that might be taught) should be sent to the LPS Salzburg Exchange Director by November 1.

## Program in Law and Graduate Studies (J.D./Ph.D.)

Highly qualified students interested in combining the study of law with graduate research and/or professional qualifications in Logic and Philosophy of Science are invited to undertake concurrent degree study under the auspices of UC Irvine's Program in Law and Graduate Studies (PLGS). Students in this program pursue a coordinated curriculum leading to a J.D. degree from the School of Law in conjunction with a Ph.D. degree in the Department of Logic and Philosophy of Science. Contact the PLGS Program Director's office for additional information at 949-824-4158, or by email to [plgs@law.uci.edu](mailto:plgs@law.uci.edu). A full description of the program, with links to all relevant application information, can be found at the School of Law Concurrent Degree Programs website (<http://www.law.uci.edu/academics/interdisciplinary-studies/concurrent-degrees.html>) and in the School of Law School section of the *Catalogue*.

- Philosophy, Ph.D. (School of Humanities)
- Philosophy, Political Science, and Economics, M.A. (4+1)

## Faculty

Jeffrey A. Barrett, Ph.D. Columbia University, *Professor of Logic and Philosophy of Science; Philosophy*

Jean-Paul Carvalho, Ph.D. Oxford University, *Associate Professor of Economics; Logic and Philosophy of Science; Religious Studies*

Matthew Foreman, Ph.D. University of California, Berkeley, *Distinguished Professor of Mathematics; Logic and Philosophy of Science* (ergodic theory and dynamical systems, logic and foundations)

Steven A. Frank, Ph.D. University of Michigan, *Distinguished Professor and Donald Bren Professor of Ecology and Evolutionary Biology; Logic and Philosophy of Science*

Isaac Goldbring, Ph.D. University of Illinois at Urbana-Champaign, *Associate Professor of Mathematics; Logic and Philosophy of Science* (logic and foundations)

Jeremy Heis, Ph.D. University of Pittsburgh, *Associate Professor of Logic and Philosophy of Science; Philosophy*

Simon Huttegger, Ph.D. University of Salzburg, *Department Chair and Professor of Logic and Philosophy of Science*

Arthur D. Lander, Ph.D. University of California, San Francisco, *Donald Bren Professor and Professor of Developmental and Cell Biology; Biomedical Engineering; Logic and Philosophy of Science* (systems biology of development, pattern formation, growth control)

David B. Malament, Ph.D. The Rockefeller University, *Professor Emeritus of Logic and Philosophy of Science*

John Manchak, Ph.D. University of California, Irvine, *Professor of Logic and Philosophy of Science; Religious Studies*

Michael T. McBride, Ph.D. Yale University, *Professor of Economics; Logic and Philosophy of Science; Religious Studies*

James L. McGaugh, Ph.D. University of California, Berkeley, *Research Professor and Professor Emeritus of Neurobiology and Behavior; Logic and Philosophy of Science*

Toby Meadows, Ph.D. University of Melbourne, *Assistant Professor of Logic and Philosophy of Science*

Richard Mendelsohn, Ph.D. Massachusetts Institute of Technology, *Adjunct Professor of Logic and Philosophy of Science*

Louis E. Narens, Ph.D. University of California, Los Angeles, *Professor of Cognitive Sciences; Logic and Philosophy of Science* (measurement, logic, metacognition)

Riley D. Newman, Ph.D. University of California, Berkeley, *Professor Emeritus of Physics and Astronomy; Logic and Philosophy of Science; Physics and Astronomy*

Cailin O'Connor, Ph.D. University of California, Irvine, *Associate Professor of Logic and Philosophy of Science*

Lisa Pearl, Ph.D. University of Maryland, College Park, *Professor of Language Science; Cognitive Sciences; Logic and Philosophy of Science* (language development, linguistics, computational sociolinguistics, cognitive modeling)

Lauren Ross, Ph.D. University of Pittsburgh, *Assistant Professor of Logic and Philosophy of Science*

Donald G. Saari, Ph.D. Purdue University, *UCI Distinguished Professor Emeritus of Economics; Logic and Philosophy of Science; Mathematics*

Barbara W. Sarnecka, Ph.D. University of Michigan, *Professor of Cognitive Sciences; Logic and Philosophy of Science* (cognitive development, language development, number concepts, conceptual change, individual cognitive development, historical development of science and mathematics)

Jonas Schultz, Ph.D. Columbia University, *Professor Emeritus of Physics and Astronomy; Logic and Philosophy of Science*

Brian Skyrms, Ph.D. University of Pittsburgh, *UCI Distinguished Professor of Logic and Philosophy of Science; Economics; Philosophy*

P. Kyle Stanford, Ph.D. University of California, San Diego, *Professor of Logic and Philosophy of Science; Philosophy*

James O. Weatherall, Ph.D. Stevens Institute of Technology, *Professor of Logic and Philosophy of Science*

Kai Wehmeier, Ph.D. University of Münster, *Director, Center for the Advancement of Logic, its Philosophy, History, and Applications and Professor of Logic and Philosophy of Science; Language Science; Philosophy*

Daniel Whiteson, Ph.D. University of California, Berkeley, *Professor of Physics and Astronomy; Logic and Philosophy of Science*

Martin Zeman, Ph.D. Humboldt University of Berlin, *Professor of Mathematics; Logic and Philosophy of Science* (logic and foundations)

## Courses

### **LPS 29. Critical Reasoning. 4 Units.**

Introduction to analysis and reasoning. The concepts of argument, premise, and conclusion, validity and invalidity, consistency and inconsistency. Identifying and assessing premises and inferences. Deductive versus inductive reasoning, and introduction to the probability calculus. Evaluating definitions. Informal fallacies.

Same as PHIL 29.

**(II and Vb ).**

### **LPS 30. Introduction to Symbolic Logic. 4 Units.**

An introduction to the symbolism and methods of the logic of statements, including evaluation of arguments by truth tables, the techniques of natural deduction, and semantic tableaux.

Same as LSCI 43, PHIL 30.

**(Vb)**

### **LPS 31. Introduction to Inductive Logic. 4 Units.**

Philosophical questions concerning the foundations of scientific inference, e.g., the traditional problem of induction, the Goodman paradox, the concept of cause, Mill's method of inductive reasoning, probability calculus, different interpretations of probability, and their interaction in inductive reasoning.

Same as PHIL 31.

**(II, Va)**



**LPS 40. The Nature of Scientific Inquiry. 4 Units.**

Investigates the nature, scope, and status of scientific knowledge and the methods used to acquire it. Uses concrete historical examples from a variety of scientific fields to identify distinctive features of the scientific enterprise and explore their significance.

(II)

**LPS 60. The Making of Modern Science. 4 Units.**

Surveys the history of science and mathematics since the Scientific Revolution, examining central developments both chronologically and thematically, as well as investigating their significance for contemporary philosophical debates about the role and status of current scientific theories.

Same as HIST 60.

(GE II or GE IV ).

**LPS H80. Scientific Realism and Instrumentalism. 4 Units.**

Explores competing views of the character and status of theoretical knowledge in science, including challenges to and defenses of the view that contemporary scientific theories offer straightforward and accurate descriptions of how things stand in otherwise inaccessible domains of nature.

Restriction: Campuswide Honors Collegium students only.

(II)

**LPS H81. What is Space? . 4 Units.**

Historical, philosophical, scientific exploration of the concept of 'space.' Questions of interest include: What kind of a thing is space? How can we know what space is like? How is space different from time.

Restriction: Campuswide Honors Collegium students only.

(II)

**LPS 91. The Philosophy of Sex. 4 Units.**

Discusses the origins of biological sex, dynamics of sexual selection, sex differences in humans, and the construction of gender in human societies. Seeks to understand the role social values play in the creation of science.

Same as PHIL 91.

Overlaps with LPS H91.

(III)

**LPS H91. The Philosophy and Biology of Sex. 4 Units.**

Covers the origins of biological sex, dynamics of sexual selection, the evolution and cultural creation of sexual behavior in humans, and the construction of gender in human societies.

Restriction: Campuswide Honors Collegium students only.

(II and III ).

**LPS H95. Jurisprudence and Constitutional Law. 4 Units.**

Applies competing theories of the nature of law and legal reasoning to evaluate decisions of the U.S. Supreme Court in controversial areas of constitutional law such as free speech, privacy, sexual conduct, affirmative action, and political campaign contributions.

Restriction: Campuswide Honors Collegium students only.

(III)

**LPS 100W. Writing Philosophy. 4 Units.**

Discussion of those aspects of writing of special importance in philosophy, e.g., philosophical terminology, techniques for evaluating arguments, philosophical definitions and theories. At least 4,000 words of assigned composition based on philosophical readings.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as PHIL 100W.

Restriction: Upper-division students only.

(Ib)

**LPS 102. Introduction to the Theory of Knowledge. 4 Units.**

A study of one or more of the basic issues in epistemology, e.g., the role of perception in the acquisition of knowledge, the nature of evidence, the distinction between belief and knowledge, and the nature of truth and certainty.

Same as PHIL 102.

**LPS 104. Introduction to Logic. 4 Units.**

Introduction to sentence logic, including truth tables and natural deduction; and to predicate logic, including semantics and natural deduction.

Same as LSCI 142, PHIL 104.

**LPS 105A. Elementary Set Theory. 4 Units.**

An introduction to the basic working vocabulary of mathematical reasoning. Topics include sets, Boolean operations, ordered n-tuples, relations, functions, ordinal and cardinal numbers.

Same as LSCI 145A, PHIL 105A.

**LPS 105B. Metalogic. 4 Units.**

Introduction to formal syntax (proof theory) and semantics (model theory) for first-order logic, including the deduction, completeness, compactness, and Löwenheim-Skolem theorems.

Prerequisite: PHIL 105A

Same as LSCI 145B, PHIL 105B.

Overlaps with MATH 150.

**LPS 105C. Undecidability and Incompleteness. 4 Units.**

Introduction to the formal theory of effective processes, including recursive functions, Turing machines, Church's thesis, and proofs of Gödel's incompleteness theorem for arithmetic, and Church's undecidability theorem for first-order logic.

Prerequisite: PHIL 105B

Same as LSCI 145C, PHIL 105C.

Overlaps with MATH 152.

Concurrent with LPS 205C.

**LPS 106. Topics in Logic . 4 Units.**

Selected topics in mathematical or philosophical logic.

Prerequisite: PHIL 105B or LPS 105B

Repeatability: Unlimited as topics vary.

Same as PHIL 106.

**LPS 108. Topics in Induction, Probability, and Decision Theory. 4 Units.**

Selected topics in induction, probability, and decision theory.

Repeatability: Unlimited as topics vary.

Same as PHIL 108.

**LPS 113. Topics in Modern Philosophy. 4 Units.**

Focuses on the works of central philosophical figures of modern Philosophy (e.g., Descartes, Leibniz, Hobbes, Locke, Hume, Kant) or on the treatment of one or more central philosophical problems by a number of these figures.

Repeatability: Unlimited as topics vary.

Same as PHIL 113.

**LPS 115. Topics in History of Analytic Philosophy. 4 Units.**

Review of central theories or figures in the history of analytic philosophy. Emphasis on writings of Frege, Russell, Schlick, Carnap, and Quine. Topics include the nature of meaning and truth, the synthetic/analytic distinction, and scientific knowledge.

Repeatability: Unlimited as topics vary.

Same as PHIL 115.

**LPS 120. Topics in Metaphysics. 4 Units.**

Examines central philosophical questions concerning our own fundamental nature and that of the world around us (e.g., causation and necessity, determination, free will, personal identity, the mind-body problem).

Repeatability: Unlimited as topics vary.

Same as PHIL 120.

**LPS 121. Topics in the Theory of Knowledge . 4 Units.**

One or more topics in the theory of knowledge, e.g., the nature of rational justification, of perceptual knowledge, of a priori knowledge.

Repeatability: Unlimited as topics vary.

Same as PHIL 121.

**LPS H123. What is Disease?. 4 Units.**

Explores philosophical issues associated with scientific efforts to understand and explain disease.

Restriction: Campuswide Honors Collegium students only.

**(II)****LPS H125. What Is Time? . 4 Units.**

Engages the question 'what is time?' by drawing on physics, philosophy, fiction, film, and psychology. Organized around understanding and addressing the tension between time as represented in physics and our immediate temporal experience.

Restriction: Campuswide Honors Collegium students only.

**(III)****LPS 140. Topics in Philosophy of Science. 4 Units.**

Selected topics in contemporary philosophy of science, e.g., the status of theoretical entities, the confirmation of theories, the nature of scientific explanation.

Repeatability: Unlimited as topics vary.

Same as PHIL 140.

**LPS 141A. Topics in Philosophy of Physics. 4 Units.**

Selected topics in the philosophy of physics, e.g., the interpretation of quantum mechanics, the nature of spacetime, the problem of quantum field theories.

Repeatability: Unlimited as topics vary.

Same as PHIL 141A.

**LPS 141B. Geometry and Spacetime. 4 Units.**

An examination of the foundations of the special theory of relativity, with emphasis on the geometry of Minkowski spacetime, and its relation to both Euclidean and non-Euclidean (hyperbolic) plane geometries.

Prerequisite: MATH 2D and (MATH 3A or MATH 6G)

Same as PHIL 141B.

**LPS 141C. Philosophy of Quantum Mechanics. 4 Units.**

An examination of the standard von Neumann-Dirac formulation of quantum mechanics. The quantum measurement problem is discussed along with several proposed solutions, including GRW, many-worlds, man-minds, and Bohm's theory.

Same as PHIL 141C.

**LPS 141D. Probability and Determinism. 4 Units.**

An examination of a cluster of interrelated issues concerning probability, determinism, logic, and the foundations of quantum mechanics.

Prerequisite: MATH 2D and (MATH 3A or MATH 6G)

Same as PHIL 141D.

**LPS H141. Honors Philosophy of Quantum Mechanics. 4 Units.**

An examination of the standard von Neumann-Dirac formulation of quantum mechanics. The quantum measurement problem is discussed along with several proposed solutions, including GRW, many-worlds, man-minds, and Bohm's theory.

Overlaps with LPS 141C.

Restriction: Campuswide Honors Collegium students only.

**LPS 142W. Writing/Philosophy of Biology. 4 Units.**

Philosophy of biology, e.g., scientific method in biology, the structure of evolutionary theory, teleology, ethics, and evolution. Course work includes one 4,000-word and four 1,000-word papers.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as PHIL 142W, BIOL E142W.

Restriction: Juniors only.

**(Ib)**

**LPS 143. Topics in Philosophy of Psychology. 4 Units.**

Selected topics in the philosophy of psychology, e.g., the nature of psychological explanation, reductionism, issues in cognitive, behavioral, and neuroscience.

Repeatability: Unlimited as topics vary.

Same as PHIL 143, PSYC 123P.

Restriction: Psychology Majors have first consideration for enrollment. Philosophy Majors have first consideration for enrollment.

**LPS 144. Topics in Philosophy of Social Science. 4 Units.**

Selected topics in the philosophy of the social sciences, e.g., Is their goal to understand behavior or to predict and control it?; Are they normative and the natural sciences not?; Do they incorporate philosophical doctrines about language and mind?.

Repeatability: May be taken for credit for 4 units as topics vary.

Same as PHIL 144.

**LPS 145. Topics in Philosophy of Language. 4 Units.**

Selected topics in the philosophy of language, e.g., the nature of meaning, mechanisms of reference, speech acts.

Repeatability: Unlimited as topics vary.

Same as LSCI 141, PHIL 145.

**LPS 146. Topics in Philosophy of Logic. 4 Units.**

Selected topics in the philosophy of logic, e.g., the nature of logical truth and our knowledge of it, the status of propositions, definite descriptions, and existential presuppositions.

Repeatability: Unlimited as topics vary.

Same as PHIL 146.

**LPS 147. Topics in Philosophy of Mathematics. 4 Units.**

Selected historical and contemporary topics in the philosophy of mathematics, e.g., mathematical truth and ontology, mathematical knowledge, the nature and role of proof, the workings of mathematics in application.

Repeatability: Unlimited as topics vary.

Same as PHIL 147.

**LPS 199. Independent Study. 1-4 Units.**

Independent research with Logic and Philosophy of Science faculty.

Repeatability: May be taken for credit for 12 units.

**LPS 200. Topics in Logic and Philosophy of Science. 4 Units.**

Studies in selected areas of Logic and Philosophy of Science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**LPS 205A. Set Theory. 4 Units.**

The basic working vocabulary of mathematical reasoning. Topics include: sets, Boolean operations, ordered n-tuples, relations, functions, ordinal and cardinal numbers.

Same as PHIL 205A.

**LPS 205B. Metalogic. 4 Units.**

Formal syntax (proof theory) and semantics (model theory) for first-order logic, including the deduction, completeness, compactness, and Loewenheim-Skolem theorems.

Prerequisite: PHIL 205A or LPS 205A

Same as PHIL 205B.

**LPS 205C. Undecidability and Incompleteness. 4 Units.**

Formal theory of effective processes, including recursive function, Turing machines, Church's thesis, proofs of Goedel's incompleteness theorem for arithmetics, and Church's undecidability for first-order logic.

Prerequisite: PHIL 205B or LPS 205B

Same as PHIL 205C.

Restriction: Graduate students only.

Concurrent with LPS 105C.

**LPS 206. Topics in Logic . 4 Units.**

Studies in selected areas of logic. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 206.

**LPS 213. Topics in Modern Philosophy. 4 Units.**

Studies in selected areas of modern philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 213.

**LPS 215. Topics in Analytic Philosophy. 4 Units.**

Studies in selected areas of analytic philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 215.

**LPS 220. Topics in Metaphysics. 4 Units.**

Studies in selected areas of metaphysics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 220.

**LPS 221. Topics in Epistemology. 4 Units.**

Studies in selected areas of epistemology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 221.

**LPS 221A. Medical Epistemology. 4 Units.**

Analysis of epistemological issues concerning medical research and healthcare. Topics may include medical evidence, transmission of medical knowledge in the doctor-patient interaction, medical expertise, epistemology of medical disagreement, classification of illness, well-being, philosophy of pain, or medical decision making.

Same as PHIL 221A.

Restriction: Graduate students only.

**LPS 232. Topics in Political and Social Philosophy. 4 Units.**

Studies in selected areas of political and social philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 232.

**LPS 240. Topics in Philosophy of Science. 4 Units.**

Studies in selected areas of philosophy of science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 240.

**LPS 241. Topics in Philosophy of Physics. 4 Units.**

Studies in selected areas of philosophy of physics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 241.

**LPS 242. Topics in Philosophy of Biology. 4 Units.**

Studies in selected areas of philosophy of biology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 242.

**LPS 243. Topics in Philosophy of Psychology. 4 Units.**

Selected topics in the philosophy of psychology, e.g., the nature of psychological explanation, reductionism, issues in cognitive, behavioral, and neuroscience.

Repeatability: Unlimited as topics vary.

Same as PHIL 243, PSYC 231P.

**LPS 244. Topics in Philosophy of Social Science. 4 Units.**

Studies in selected areas of philosophy and social science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 244.

**LPS 245. Topics in Philosophy of Language. 4 Units.**

Studies in selected areas of philosophy of language. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 245.

**LPS 246. Topics in Philosophy of Logic. 4 Units.**

Studies in selected areas of philosophy of logic. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 246.

**LPS 247. Topics in Philosophy of Mathematics. 4 Units.**

Studies in selected areas of philosophy of mathematics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHIL 247.

**LPS 289. Logic and Philosophy of Science Workshop. 1-4 Units.**

A two- or three-quarter-long workshop on selected topics in logic and philosophy of science.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**LPS 298. Independent Study. 4-12 Units.**

Independent research with Logic and Philosophy of Science Faculty.

Repeatability: May be taken for credit for 12 units.

**LPS 299. Directed Research. 1-12 Units.**

Directed study with Logic and Philosophy of Science Faculty.

Repeatability: May be repeated for credit unlimited times.

**LPS 399. University Teaching. 4-12 Units.**

Required of and limited to Teaching Assistants.

Repeatability: May be taken for credit for 12 units.

## Philosophy, Ph.D. (School of Social Sciences)

The Department of Logic and Philosophy of Science and the Department of Philosophy jointly administer a Ph.D. program in Philosophy with two independent tracks: the Philosophy track and the LPS track. Both tracks begin from a common core of requirements in standard philosophical fields (e.g., history of philosophy, logic, ethics, metaphysics/epistemology) and branch off thereafter; both tracks offer the Ph.D. in Philosophy. Applicants are advised to apply to the unit whose faculty areas of specialization and curriculum correspond best with their interests. Students are expected to reside in the same unit as their primary advisor, but faculty in both units are available for all other academic purposes (course work, independent studies, committee membership, and more). See the Department of Philosophy in the School of Humanities for a description of the Philosophy track.

The M.A. in Philosophy may also be awarded to Ph.D. students who complete the necessary requirements.

Applicants for the LPS track must have a bachelor's degree, but there is no formal requirement as to the field of that degree. The most natural undergraduate majors for LPS graduate students would be philosophy, mathematics or the sciences, but those with other degrees who are interested in the LPS fields should feel free to apply.

Complete applications must include GRE scores, transcripts, letters of recommendation and a writing sample. The deadline for application is December 1.

Several forms of incoming fellowships are available on a competitive basis; these include a stipend, student fees, tuition and nonresident supplemental tuition (for out-of-state students). In subsequent years, some additional fellowship funding is available, but students in good standing are most often supported with teaching assistantships.

All required courses must be completed with a grade of B or better.

The **History of Philosophy Requirement** provides a broad perspective. Graduate courses in three out of the following four areas—Modern Rationalism, Modern Empiricism, Kant, and Twentieth Century—must be completed by the end of the seventh quarter in residence.

The **Logic Requirement** acquaints students with the fundamentals of modern logic: elementary set theory, metalogic, effective procedures and Gödel's incompleteness theorems. LPS 205A, LPS 205B, and LPS 205C must be completed by the end of the seventh quarter in residence.

The **Field Requirement** provides exposure to a range of philosophical disciplines. One graduate course in moral philosophy and one graduate course in metaphysics/epistemology must be completed by the end of the seventh quarter in residence. (These courses may not also be used to satisfy the History Requirement.)

The **Philosophy of Science Requirement** provides exposure to a range of philosophy of science, from general philosophy of science to the philosophies of particular sciences (e.g., physics, biology), to the philosophies of mathematics and logic. Three selected courses from LPS 240–247



must be completed by the end of the seventh quarter in residence. (These courses may be repeated as topics vary.) Courses used to satisfy the Philosophy of Science Requirement may also be used to satisfy the History or Field Requirements.

The **Tools of Research Requirement** provides some flexibility for students with various levels of interest in pursuing the philosophy of a particular science. So, for example, a student most interested in historical issues in the philosophy of mathematics might benefit most from the study of German, while a student most interested in the philosophy of quantum mechanics should take a series of graduate courses in physics. (Students wishing to specialize further in the philosophy of a particular science might wish to pursue more demanding options; see the Emphases in Mathematics, Physics, and Biology and the Behavioral Sciences, below.) To satisfy this requirement, a student must pass an examination on an appropriate foreign language or receive a grade of B or better in three appropriate graduate courses in a discipline or disciplines outside philosophy by the end of the ninth quarter in residence. Though the discipline(s) here must be outside philosophy, they might be taught by Philosophy or LPS faculty. The two-hour language examination will be administered by an LPS faculty member and will require the student to translate (with the aid of a dictionary) a passage or passages from philosophical or scientific authors.

The **Portfolio Requirement** ensures that students have acquired dissertation-level skills in the writing of philosophy: e.g., the ability to isolate, understand and evaluate arguments in the philosophical literature; the ability to assimilate secondary literature; the ability to formulate and defend an original philosophical thesis. The portfolio is designed to display these skills. To satisfy this requirement, a student must submit an extended writing sample, most often consisting of several individual papers, that demonstrates the skills necessary to write a Ph.D. dissertation. (A successful portfolio typically consists of several papers totaling around 80 pages. These may be revisions of term papers. Each paper should present and defend a definite thesis and should be accessible to faculty members unfamiliar with the literature in question. The papers in the portfolio need not be of publishable quality, but they must, collectively, demonstrate the specified skills.) Portfolios will be evaluated by the entire LPS faculty. (LPS track students may request that relevant Philosophy Department faculty also be present at the evaluation meeting.) Portfolios must be submitted by the end of the fourth week of the seventh quarter.

The **Candidacy Examination** demonstrates that the student has a viable dissertation topic and an adequate grasp of related literature. To satisfy this requirement, a student must prepare and be examined on a reading list of canonical literature in the area of the dissertation and a brief (15–20 page) dissertation proposal. The reading list should in effect define the context of the proposed dissertation. The examination must be completed by the end of the tenth quarter in residence. The normative time for advancement to candidacy is 3.3 years.

**Dissertation Defense.** Students must pass a final oral examination focusing on the content of the dissertation administered by the Dissertation Committee. The normative time for completion of the Ph.D. is six years, and the maximum time permitted is seven years.

### **LPS Track Emphasis in Mathematics**

In addition to the LPS track described above, students may elect to pursue the more demanding option of the Mathematics emphasis. Faculty in the UCI and UCLA Departments of Mathematics participate in the Mathematics emphasis. Students in the emphasis take courses and receive advising from these participating Mathematics professors, as well as from the faculty of LPS and the Philosophy Department. Mathematics emphasis students must satisfy the following requirement in addition to the usual LPS track requirements:

#### **Mathematics Requirement**

A student must receive a grade of B or better in six graduate courses in mathematics. (Though the courses here are in mathematics, some might be taught by LPS faculty. They may also be used to satisfy the Tools of Research requirement.)

### **LPS Track Emphasis in Physics**

In addition to the LPS track described above, students may elect to pursue the more demanding option of the Physics emphasis. Physics emphasis students must satisfy the following requirement in addition to the usual LPS track requirements:

#### **Physics Requirement**

A student must receive a grade of B or better in three sections of PHILOS 241, as well as in three additional graduate courses in Physics or Mathematics. (Though the courses here are in physics or mathematics, they might be taught by LPS faculty. They may also be used to satisfy the Tools of Research requirement, but not the Philosophy of Science requirement.)

### **LPS Track Emphasis in Biology and the Behavioral Sciences**

In addition to the LPS track described above, students may elect to pursue the more demanding option of the Emphasis in Biology and the Behavioral Sciences. Emphasis students must satisfy the following requirement in addition to the usual LPS track requirements.

#### **Biology/Behavioral Sciences Requirement**

A student must receive a grade of B or better in six graduate courses, each of which is in biology or the behavioral sciences. (In some cases, with the approval of the student's advisor and the DGS, courses taught by LPS faculty may satisfy the emphasis requirements. Emphasis courses may also be used to satisfy the Tools of Research requirement, but not the Philosophy of Science requirement.)

## **Philosophy, Political Science, and Economics, M.A. (4+1)**

The goal of this program is to train students in three critically important and related approaches to understanding the social world around us. Philosophy develops analytic rigor and trains students to reason logically. Political science provides an understanding of how institutions impact modern societies

and helps students evaluate the choices that such institutions regularly make. And economics is the study of how individuals, firms, and governments make decisions which together determine how resources are allocated. An appreciation of economics has increasingly become crucial for an understanding of institutional policy making. The objective of the M.A. in PPE is to prepare students for careers in government, law, private or public corporations, and non-profit organizations.

In order to be admitted to the program, undergraduate students must submit an application in the winter quarter of their third year. More information on the application process can be found on the LPS Department Graduate Program website (<http://www.lps.uci.edu/grad/ppe.php>).

The program of study can be divided into three stages: pre-requirements that must be met for admission into the program, undergraduate requirements to be completed before the end of the fourth year, and graduate requirements to be completed by the end of the fifth year.

### Pre-Requirements

- MATH 2A and MATH 2B.
- Advancement toward completing a B.A. in one of the associated disciplines.

### Undergraduate Requirements

- Completion of a B.A. in one of the associated disciplines.
- Three additional courses - including at least one upper-division course - in each of the two disciplines that are not the student's major.

### Graduate Requirements

- Proseminar in PPE I, II, III.
- Six graduate courses approved by the director of the PPE program, two in each of the three areas.

The normative time to degree is four years in undergraduate study and one additional year as graduate students. A full description of the program can be found on the LPS Department Graduate Program website (<http://www.lps.uci.edu/grad/ppe.php>).

## Department of Political Science

### Department Chair

5225 Social Science Plaza B  
949-824-4012  
<http://www.polisci.uci.edu/>

The Department of Political Science offers a wide variety of courses at the introductory, lower-division and more specialized upper-division levels. The curriculum is organized into four areas: American Politics, Political Theory, International Relations, and Comparative Politics. In addition to the traditional fields of political science, the department offers an introductory course in Law and a variety of upper-division courses where students can explore specialized areas in Law. The department also offers an Honors Program in Political Science for juniors and seniors, culminating in a senior honors thesis.

The department is composed of a strong and diverse faculty especially interested in analyzing central questions of political science related to such topics as policy-making, political structures, participation, conflict, change and development, transition to democracy, voting theory, power and authority, and interstate relations. The faculty has particular strength in interdisciplinary approaches, in comparative analysis, and in democratic theory.

### Program in Law and Graduate Studies (J.D./Ph.D.)

Highly qualified students interested in combining the study of law with graduate research and/or professional qualifications in political science are invited to undertake concurrent degree study under the auspices of UC Irvine's Program in Law and Graduate Studies (PLGS). Students in this program pursue a coordinated curriculum leading to a J.D. degree from the School of Law in conjunction with a Ph.D. degree in political science. Additional information is available from the PLGS program director's office, 949-824-4158, or by email to [plgs@law.uci.edu](mailto:plgs@law.uci.edu). A full description of the program, with links to all relevant application information, can be found at the School of Law Concurrent Degree Programs website (<http://www.law.uci.edu/academics/interdisciplinary-studies/concurrent-degrees.html>).

- Philosophy, Political Science, and Economics, M.A. (4+1)
- Political Science, B.A.
- Political Science, Minor
- Political Science, Ph.D.

### Faculty

Edwin Amenta, Ph.D. University of Chicago, *Professor of Sociology; Political Science* (political sociology, historical and comparative sociology, social movements, social policy)

Matthew N. Beckmann, Ph.D. University of Michigan, *Associate Professor of Political Science* (presidency, congress, interest groups, mass media, and politics)

Graeme T. Boushey, Ph.D. University of Washington, *Associate Professor of Political Science; Urban Planning and Public Policy* (California politics and statewide elections, American politics, state and federal policy-making, ballot measures and the initiative process)

Daniel R. Brunstetter, Ph.D. University of California, Davis, *Associate Professor of Political Science; European Languages and Studies* (political theory, international relations, French political thought)

Alejandro E. Camacho, J.D., LL.M. Harvard University, Georgetown University, *Professor of School of Law; Political Science*

David O. Carter, J.D. University of California, Los Angeles, *Lecturer of Political Science*

Simone Chambers, Ph.D. Columbia University, *Professor of Political Science* (democratic theory, ethics, secularism, rhetoric, civility, and the public sphere)

James N. Danziger, Ph.D. Stanford University, *Professor Emeritus of Political Science*

Louis DeSipio, Ph.D. University of Texas at Austin, *Professor of Chicano/Latino Studies; Political Science* (ethnic politics, Latino politics, immigration, naturalization, U.S. electoral politics)

David Feldman, Ph.D. University of Missouri-Columbia, *Professor of Urban Planning and Public Policy; Political Science*

Mark J. Fisher, M.D. University of Cincinnati, *Professor of Neurology; Anatomy and Neurobiology; Political Science*

David John Frank, Ph.D. Stanford University, *Professor of Sociology; Education; Political Science* (globalization, sexuality, the natural environment, higher education)

Howard A. Gillman, Ph.D. University of California, Los Angeles, *Chancellor and Professor of Political Science; Criminology, Law and Society; History; School of Law*

Sara Goodman, Ph.D. Georgetown University, *Associate Professor of Political Science; European Languages and Studies* (citizenship policy, immigration, immigrant integration, ethnic diversity in democracies, diaspora)

Bernard N. Grofman, Ph.D. University of Chicago, *Professor of Political Science; Economics* (public choice, mathematical models of collective decision making, formal democratic theory, politics of small groups, representation, voting rights)

Heidi Hardt, Ph.D. Graduate Institute of International and Development Studies, *Assistant Professor of Political Science* (international security, international organizations, NATO, European Union, African Union, crisis management, organizational learning)

Richard L. Hasen, J.D. University of California, Los Angeles, *UCI Chancellor's Professor of School of Law; Political Science*

Marek Kaminski, Ph.D. University of Maryland, College Park, *Associate Professor of Political Science; Economics* (voting models, democratization, political consequences of electoral laws)

Pamela A. Kelley, J.D. Yale University, *Lecturer of Political Science* (civil rights law, constitutional law, gender discrimination, legal profession, leadership, ethics)

Claire J. Kim, Ph.D. Yale University, *Professor of Asian American Studies; Political Science*

Jeffrey Kopstein, Ph.D. University of California, Berkeley, *Professor of Political Science; Religious Studies* (comparative politics, dictatorship and democracy, ethnic politics, political violence, post-communism)

Ines Levin, Ph.D. California Institute of Technology, *Assistant Professor of Political Science* (elections, voting, statistics)

Erin Lockwood, Ph.D. Northwestern University, *Assistant Professor of Political Science* (financial derivatives, financial regulation, international political economy, political theory, risk and uncertainty)

Cecelia M. Lynch, Ph.D. Columbia University, *Professor of Political Science; Religious Studies* (international relations (theory, organization, law) religion and ethics, social movements and civil society actors (on peace, security, globalization, humanitarianism, and religion)

Richard Matthew, Ph.D. Princeton University, *Professor of Urban Planning and Public Policy; Political Science*

Mary McThomas, Ph.D. University of California, Los Angeles, *Associate Professor of Political Science* (immigration, theories of citizenship, feminist political theory, gender and politics)

Carrie Menkel-Meadow, J.D. University of Pennsylvania, *UCI Chancellor's Professor of Political Science; School of Law*

David S. Meyer, Ph.D. Boston University, *Professor of Sociology; Political Science; Urban Planning and Public Policy* (social movements, public policy, peace and war, social justice)

Kristen R. Monroe, Ph.D. University of Chicago, *UCI Chancellor's Professor of Political Science* (ethics, international relations, political and moral psychology, normative political theory, politics of difference, conflict resolution)

Kevin E. Olson, Ph.D. Northwestern University, *Professor of Political Science; Culture and Theory; European Languages and Studies* (political theory, history of political thought, legal theory, philosophy of the social sciences)

Davin Phoenix, Ph.D. University of Michigan, *Assistant Professor of Political Science* (racial attitudes, affect and behavior, public opinion, political communication, urban politics, mobilization of marginalized groups)

Shawn W. Rosenberg, M.Litt. University of Oxford, *Professor of Political Science* (political psychology, deliberative democracy, ideology, social theory, social and development psychology)

Kamal Sadiq, Ph.D. University of Chicago, *Associate Professor of Political Science* (comparative politics, immigration and citizenship in developing countries, India and southeast Asia, Asian security)

William R. Schonfeld, Ph.D. Princeton University, *Professor Emeritus of Political Science*

Sherilyn K. Sellgren, M.B.A. University of California, Irvine, *Lecturer of Political Science*

Caesar D. Sereseres, Ph.D. University of California, Riverside, *Associate Professor of Political Science* (U.S. foreign policy, U.S. Latin American relations, Mexican-American politics)

Gregory Shaffer, J.D. Stanford University, *Director, Center of Globalization, Law and Society and UCI Chancellor's Professor of School of Law; Political Science*

Stergios Skaperdas, Ph.D. Johns Hopkins University, *Clifford S. Heinz Chair and Professor of Economics; Political Science*

Charles Smith, Ph.D. University of California, San Diego, *Professor of Political Science; Criminology, Law and Society* (law and legal institutions, comparative and international law)

Etel Solingen, Ph.D. University of California, Los Angeles, *Thomas T. and Elizabeth C. Tierney Chair in Global Peace and Conflict Studies and Professor of Political Science* (international relations theory, international political economy, international cooperation, macropolitics/institutions, comparative politics, world politics and regional orders)

Dorothy J. Solinger, Ph.D. Stanford University, *Professor Emeritus of Political Science* (Chinese domestic politics and political economy, comparative politics, East Asian politics)

Rein Taagepera, Ph.D. University of Delaware, *Professor Emeritus of Political Science*

Michael Tesler, Ph.D. University of California, Los Angeles, *Associate Professor of Political Science* (American politics, race, ethnicity and politics, quantitative methods)

Danielle M. Thomsen, Ph.D. Cornell University, *Assistant Professor of Political Science* (American politics, U.S. congress, political parties, gender and politics)

Keith Topper, Ph.D. University of California, Los Angeles, *Associate Professor of Political Science; Culture and Theory* (political theory, critical theory, poststructuralism, theories of power, language and politics, theory and politics of interpretation, politics of culture, philosophy of the social sciences)

Rodolfo D. Torres, Ph.D. Claremont Graduate University, *Professor of Urban Planning and Public Policy; Political Science*

Carole J. Uhlaner, Ph.D. Harvard University, *Professor Emeritus of Political Science* (comparative political behavior, formal theory/social choice)

Robert M. Uriu, Ph.D. Columbia University, *Associate Professor of Political Science* (international relations, international political economy, international politics of East Asia/Japan, U.S. foreign policy toward East Asia)

Samantha Vortherms, Ph.D. University of Wisconsin, Madison, *Assistant Professor of Political Science* (comparative political economy, development, social welfare)

Martin P. Wattenberg, Ph.D. University of Michigan, *Professor of Political Science* (American and comparative political behavior)

Christopher A. Whytock, J.D. Georgetown University, *Professor of School of Law; Political Science*

Tiffany Willoughby-Herard, Ph.D. University of California, Santa Barbara, *Associate Professor of African American Studies; Comparative Literature; Culture and Theory; Political Science* (South Africa, poor whites, race in foreign policy, diaspora, comparative racial politics, third world feminisms, feminist pedagogy, black political thought)

## Courses

### **POL SCI 10A. Probability and Statistics in Political Science I. 4 Units.**

Introduction to the variety of statistical applications in the social sciences. Descriptive statistics. Measures of central tendency and dispersion. Percentile ranks. Standardization and normal approximation. Basic probability theory focuses on application to statistical inference and binomial distribution. Laboratory required.

Prerequisite: SOC SCI 3A

Overlaps with ANTHRO 10A, ECON 15A, PSYCH 10A, SOCECOL 13, SOC SCI 9A, SOCIOL 10A.

Restriction: Lower-division students only.

(Va)

### **POL SCI 10B. Probability and Statistics in Political Science II. 4 Units.**

Introduction to statistical inference, sampling distribution, standard error. Hypothesis tests for proportions and means. Inferential techniques for nominal variables including chi-square, study measures of strengths, significance of relationships between variables, assumptions, data requirements, and types of error in significance tests.

Prerequisite: POL SCI 10A

Overlaps with ANTHRO 10B, ECON 15B, PSYCH 10B, SOCECOL 13, SOC SCI 9B, SOC SCI 10B.

(Va)

### **POL SCI 10C. Probability and Statistics in Political Science III. 4 Units.**

Focus on correlation, regression, and control for effects of variables. One-way and two-way factorial analysis of variance. A priori and a posteriori comparisons. Introduction to repeated measures design and non-parametric statistics. Discusses use of statistics in newspapers and popular magazines.

Prerequisite: POL SCI 10B

Overlaps with ANTHRO 10C, PSYCH 10C, SOCECOL 13, SOC SCI 9C, SOC SCI 10C, SOCIOL 10C.

(Vb)

### **POL SCI 11A. Introduction to Political Science: Political Analysis. 4 Units.**

Presents various modes of understanding politics. Emphasis on basic approaches to political analysis, their uses in constructing theories, and their application to particular national political systems.

(III and VIII ).

### **POL SCI 11C. Introduction to Political Science: Micropolitics. 4 Units.**

Introduction to political behavior of individuals and groups within national systems. Three questions addressed: How do individuals come to understand the political world? How do individuals behave within this world? How do groups and individuals engage in the political process.

(III)

### **POL SCI 21A. Introduction to American Government. 4 Units.**

Introduction to American political processes and institutions. Topics include elections, political participation, parties, interest groups, the Presidency, Congress, the bureaucracy, and the judiciary.

(III)

### **POL SCI 31A. Introduction to Political Theory. 4 Units.**

Types of questions: What is politics? What are the theoretical and philosophical bases for different types of political arrangements? How do these perspectives get translated into reality? Among others, the works of Rousseau, Locke, Mill, and Marx are read.

(III)

### **POL SCI 32A. Dilemmas of Diversity. 4 Units.**

Focuses on racial, ethnic, and gender diversity, multiculturalism, and their impact on our social and political ideals. Traces the sources of ideas about difference, equality, and toleration, and examines tensions that occur when forms of identity conflict with one another.

Same as INTL ST 32A.

(VII)

**POL SCI 41A. Introduction to International Relations. 4 Units.**

Analysis of political relations between and among nations with emphasis on explanations of conflict and cooperation. The role of ideologies and their relation to international problems are also examined.

Same as INTL ST 14.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

(III and VIII ).

**POL SCI 44B. Global Political Ideologies. 4 Units.**

An overview of the major political ideologies shaping the current world order and global conflict. Topics include liberalism, democracy, nationalism, capitalism, communism, socialism, fascism, neoliberalism, clash of civilizations, sectarian violence, populist nationalism, and de-globalization.

Same as INTL ST 12, SOC SCI 12.

Restriction: International Studies Majors have first consideration for enrollment.

(III and VIII ).

**POL SCI 45A. Human Rights and Global Governance. 4 Units.**

Historical development of civil, political rights and the rise of human rights in international law. Explores role, and limitations, of the UN, ICJ, and ICC in global governance. Reconceptualizing democracy and political representation in a postnational 21st century.

Same as INTL ST 16, SOC SCI 16.

Restriction: International Studies Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

(III and VIII ).

**POL SCI 49. Lower-Division Special Topics in International Relations. 4 Units.**

Studies in selected areas of international relations. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**POL SCI 51A. Introduction to Politics Around the World. 4 Units.**

Introduces comparative politics. Compares political systems in a variety of countries. Includes elections, parties, parliaments, presidents, protest movements, and other aspects of national politics. Addresses how to make meaningful comparisons across countries.

(III, VIII)

**POL SCI 61A. Introduction to Race and Ethnicity in Political Science. 4 Units.**

Examines major theories that attempt to explain the roles of race and ethnicity in U.S. politics.

Same as CHC/LAT 64.

(III and VII ).

**POL SCI 71A. Introduction to Law. 4 Units.**

An introduction to the study of judicial politics. Questions include: what is law?; what is a court?; who are the judges? Analysis of a wide range of judicial decisions illustrates the political importance of courts in the U.S. and elsewhere.

(III)

**POL SCI 79. Lower-Division Special Topics in Law. 4 Units.**

Studies in selected areas of law. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**POL SCI H80. Globalization and Human Security. 4 Units.**

Emerging issues of human security in the globalized world, including personal human security, physical integrity, human trafficking, global climate change, food. Challenges of these complex human security problems for a multi-scalar system (international, national, local).

Restriction: Campuswide Honors Collegium students only.

(III, VIII)



**POL SCI 120. Public Opinion. 4 Units.**

Theories concerning sources of public opinion, processes by which it is altered, organization of citizens' belief systems, and role of public opinion in government policy. Students analyze survey data as a research project.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 121A. The American Presidency. 4 Units.**

Presents a comprehensive survey of the American presidency and considers the question of political power.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 121C. U.S. Elections and Voting Behavior. 4 Units.**

Examines how voters evaluate political parties, candidates, and issues in electoral campaigns to reach their decisions. Numerous controversies concerning the degree of issue voting, sophistication of candidate evaluations, and the decline of political parties are discussed.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 121F. Presidents Since World War II. 4 Units.**

Reviews the actions and character of presidents from Harry Truman through Bill Clinton. Each week a different president is examined from a variety of perspectives. Students are expected to write a substantial original research paper.

Prerequisite: POL SCI 21A

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 121G. American Public Policy. 4 Units.**

Focuses on the development and implementation of public policy in the United States. Lectures cover theoretical models of the policy process as well as significant problems facing contemporary American decision-makers.

Same as PUBHLTH 132, SOC SCI 152C, UPPP 129.

**POL SCI 121HW. Writing for the President of the United States. 4 Units.**

Imagines how White House staffers can help presidents with clear, focused, and effective writing. Through a variety of formats, students study, hone, and practice writing skills that will prove useful- in and out of the White House.

Prerequisite: POL SCI 21A

(Ib)

**POL SCI 122A. American Metropolitan Politics. 4 Units.**

Explores the politics of urban and suburban America, including the policy making process; the exercise of political power; local politics, federalism and the problems of metropolitanism; and major policy problems facing urban areas.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 122B. California Politics. 4 Units.**

Examines the structure and function of California government, traces historical development of political power, with constantly changing casts of power-brokers and seekers. Explores California exceptionalism and the roles played by the electorate, legislature, executive, and organized interests in policy making.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 122BW. California Politics. 4 Units.**

Examines the structure and function of California government, traces historical development of political power, with constantly changing casts of power-brokers and seekers. Explores California exceptionalism and the roles played by the electorate, legislature, executive, and organized interests in policy making.

Prerequisite: Satisfactory completion of the Lower-Division writing requirement.

Restriction: Political Science Majors have first consideration for enrollment.

(Ib)



**POL SCI 123B. Representation. 4 Units.**

Deals with classical theories of representation: issues of racial and political representation in U.S. legislatures and city councils; proportional representation models; and comparative election systems.

Prerequisite: SOC SCI 3A or SOC SCI 10A or SOC SCI 10B

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 124A. The Politics of Protest. 4 Units.**

Examines the Civil Rights, Black Power, and women's movements in relationship to the Asian American movement. Uses social movement theories to illuminate the cases, and the cases to critique and revise the theories.

Same as ASIANAM 144.

**(VII)****POL SCI 124B. Latinos in U.S. Politics. 4 Units.**

Comparing the political issues facing Latino groups by examining their migration histories, voting behavior, nonelectoral participation, and policy issues. Latino issues are examined on the national, state, and local levels, including formal representation, immigration, affirmative action, and language policy.

Same as CHC/LAT 151.

**(VII)****POL SCI 124C. Comparative Minority Politics. 4 Units.**

Examines the political experiences of Blacks, Latinos, and Asian Americans in the United States from roughly 1950 to the present. Focuses on how each group has pursued political empowerment via both conventional political channels and social movements.

Same as AFAM 151, CHC/LAT 147, ASIANAM 132.

**POL SCI 124E. African American Politics. 4 Units.**

Examines politics of African Americans in order to gain a broader perspective of the American political process. Major developments in African American politics (including the civil rights movement, Black presidential bids), continuing problem of racism, responsiveness of key governing institutions.

Same as AFAM 152.

**POL SCI 125A. The United States Congress. 4 Units.**

Does the Congress do a good job of representing the American citizenry? Is it the most appropriate mechanism for the creation, resolution, and implementation of public policy.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 125CW. Constitutional Convention. 4 Units.**

Analyzes the Constitution, its amendments, and periods of Constitutional reform as a foundation for a critical evaluation of the Constitution with an eye both to necessary reforms and to elements of the Constitution that should be maintained.

Prerequisite: POL SCI 21A. Satisfactory completion of the Lower-Division Writing requirement.

**(Ib)****POL SCI 126C. U.S. Immigration Policy. 4 Units.**

Examines selected immigration policy debates since the nineteenth century, rationale and consequences of immigration law since 1965, problems of administration, implementation and enforcement, impact of immigration policy on foreign relations, and contemporary debate regarding the future of U.S. policy.

Same as CHC/LAT 163.

**(VII)****POL SCI 126D. Urban Politics and Policy. 4 Units.**

Examines economic limits of cities and welfare policy. Addresses such issues as why are the poor concentrated in the central cities? Which anti-poverty programs will work best in cities? Which level of government can best combat poverty in the U.S.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 126F. Politics of Animal Rights. 4 Units.**

Examines animal rights/welfare movement's efforts to transform moral, practical, and legal standing of nonhuman animals in contemporary U.S. Explores intersection of racism, sexism, and speciesism informed by theories of race and ethnicity, including Asian American Studies.

Same as ASIANAM 168.

Restriction: Political Science Majors have first consideration for enrollment. Asian American Studies Majors have first consideration for enrollment.

**POL SCI 128BW. Political Ideologies: The Way We View Our World. 4 Units.**

Politics has become divisive and ideological. But ideologies are poorly understood and have become mere labels for identifying friends and enemies. Course analyzes the nature of ideology, focusing on liberalism, conservatism, fascism, socialism, and contemporary 'liberation' ideologies.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(lb)

**POL SCI 128C. Political Psychology. 4 Units.**

Examination of how psychological theory and research may be used to better understand political thought and behavior. Drawing on theories of learning, cognition, and personality, discusses such topics as the formation of political attitudes, and the process of political decision-making.

Same as PSYCH 176A.

Restriction: Majors only. POL SCI 128C may not be taken for credit if taken after POL SCI 137C.

**POL SCI 129. Special Topics in American Politics and Society. 4 Units.**

Studies in selected areas of American politics and society. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 130A. Game Theory and Politics I. 4 Units.**

Introduction to game theory and a survey of its political applications. Examples of topics covered include voting in small committees, legislatures, and mass elections; interest group activities and environmental issues; institutional design, and the evolution of cooperative behavior.

Same as SOCIOL 134, SOC SCI 103A.

Restriction: Social Policy/Public Service Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**POL SCI 130B. Game Theory and Politics II. 4 Units.**

More advanced game theory and its political applications, beginning where Game Theory and Politics I ends. Examples of topics covered include revolutions; arms race; spatial models of party competition; political manipulation; political coalitions and their power.

Prerequisite: POL SCI 130A or ECON 116A

Same as SOC SCI 103B.

Restriction: Social Policy/Public Service Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 131C. Modern Political Theory. 4 Units.**

Examines major thinkers and intellectual movements in the political thought of the 17th and 18th centuries.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 131F. Twentieth Century Political Theory. 4 Units.**

Examines major thinkers and intellectual movements in the political thought of the 20th Century.

Prerequisite: POL SCI 31A

**POL SCI 134F. Social and Political Theory. 4 Units.**

Focus is on recent major work in social and political theory. An in-depth analysis of a relatively small body of writing. Authors discussed include Jurgen Habermas, Anthony Giddens, and Richard Rorty.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 135A. Origins of Liberalism. 4 Units.**

Examines the ideals, social forces, and historical events that gave rise to liberal political theory. Topics include patriarchal authority, the divine right of kings, religious toleration, slavery, colonialism, political economy, the evolution of law, and tensions between liberty and equality.

Prerequisite: POL SCI 31A

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 135B. Just War Revisited. 4 Units.**

Examines the evolution of the doctrine of the just war across the history of Western political thought, the importance of changes in the doctrine and whether it applies today; examines international relations case studies to determine today's relevancy.

Same as INTL ST 131A.

**POL SCI 136B. Cannibals and Conquistadores: The Philosophy of the Other. 4 Units.**

Examines critically the notion of the 'other' by looking at the philosophical challenges difference poses in the context of the European discovery of the New World. Seeks to understand the naissence of the concept of human rights and tolerance.

**POL SCI 136BW. Cannibals and Conquistadores: The Philosophy of the Other. 4 Units.**

Examines critically the notion of the 'other' by looking at the philosophical challenges difference poses in the context of the European discovery of the New World. Seeks to understand the naissence of the concept of human rights and tolerance.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Overlaps with POL SCI 136B.

(Ib)

**POL SCI 137BW. Types of Political Representation. 4 Units.**

Political representation plays an important role in democratic systems, but is elusive once examined closely. Students delve into the concept and relate different views to political life. Half of the course is spent on writing instruction.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Recommended: Upper-Division students. Political Science majors have first consideration for enrollment.

(Ib)

**POL SCI 138A. The Moral of the Story: Introductory Seminar in Ethics. 4 Units.**

Introduces major theories and classic texts in ethics, from Plato and Aristotelian virtue ethics to utilitarianism and Kant and contemporary moral psychology.

**POL SCI 138AW. Moral of the Story: Introduction to Ethics. 4 Units.**

Focuses on how we learn about ethics from stories, in the form of fables, bedtime stories, religious stories, soap operas, television, and movies as adults. Students bring in stories that informed their own ethical development.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**POL SCI 138CW. Ethics of Difference. 4 Units.**

Examines differences traditionally judged politically salient—race, ethnicity, religion, gender. Personal interviews with an elderly person encourage students to understand the social construction of difference and to reexamine their own attitudes by putting themselves in the place of another.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Political Science Majors have first consideration for enrollment.

(Ib)

**POL SCI 138DW. The Moral Life During War. 4 Units.**

Can people keep their humanity during war? What does the term humanity signify when simply surviving requires faith, courage, and desperation? When facing wartime brutality, must we abrogate morality? What does it mean to compose a moral life during war?.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Political Science Majors have first consideration for enrollment.

Concurrent with POL SCI 238D.

**(Ib)**

**POL SCI 139. Special Topics in Political Theory and Methods. 4 Units.**

Studies in selected areas of political theory and methods. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 141B. International Political Economy. 4 Units.**

Examination of problems in global political-economic relations through competing conceptual lenses or grand theories: mercantilism, liberalism, and Marxism. Surveys North-North and North-South issues relating power and wealth.

Same as INTL ST 114A.

**(VIII)**

**POL SCI 141C. International Political Economy of East Asia. 4 Units.**

Integration of theoretical perspectives in international political economy with the study of economic development in East Asia, with special emphasis on regional integration.

**(VIII)**

**POL SCI 141E. U.S. Foreign Policy Toward Asia. 4 Units.**

U.S. policy toward the countries of East Asia: bilateral and regional security relationships, U.S. economic relations with the major Asian countries, the development of regional institutions, and human rights.

Same as INTL ST 142G.

**POL SCI 142B. The International Relations of East Asia. 4 Units.**

Surveys various aspects of relations between the nations of East Asia. Topics include the historical development of the region; current political and security relations, including the impact of the American military presence.

Same as INTL ST 142D.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 142D. U.S. Foreign Policy I: Globalism and Cold War. 4 Units.**

Looks at changing international perspectives, policy responses, and military strategies of presidential administrations from Truman to Reagan. In assessing the motives and objectives of U.S. foreign policy leaders during the "Cold War" era, the concept of "national interest" is examined.

Same as INTL ST 142A.

Restriction: International Studies Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment.

**POL SCI 142G. U.S. Coercive Diplomacy. 4 Units.**

Examines the theory of compellence and the U.S. practice of coercive diplomacy--the power to change behavior of other governments. Specific case examples: the Cuban missile crisis, bombing of North Vietnam, the Nicaraguan Contras, Desert Shield/Desert Storm, and Libya.

Same as INTL ST 142E.

Restriction: Upper-division students only. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 142J. U.S. Intervention in Latin America. 4 Units.**

Explores political, economic, social, and cultural ties that bind Latin America to the United States. Focuses on U.S. intervention and Latin American response from early nineteenth century to present day. Case studies include Mexico, Guatemala, Cuba, Chile, and Central America.

Same as HISTORY 166, INTL ST 177D, CHC/LAT 150.

**POL SCI 143G. Homeland Security . 4.0 Units.**

Examines the 9/11 origins of the concept of homeland security; assess the evolution, structure, and operations of the Department of Homeland Security; critically examines the evolution of threat assessment to the U.S. and the utilization of risk management methodologies.

Same as INTL ST 141B.

**POL SCI 144A. Approaches to International Relations. 4 Units.**

Reviews theoretical and methodological approaches to the study of international relations using contending perspectives to analyze power and influence, capabilities, interdependence, reciprocity, international regimes, anarchy, cooperation, imperialism, and hegemony.

Same as INTL ST 140A.

Restriction: Upper-division students only. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 145A. Ethics in an Age of Terror and Genocide. 4 Units.**

Original sources document personal impact of wars on genocides, from World War II to the Bosnian and Rwandan genocides and current wars in Iraq and Afghanistan. Students train for and conduct personal interviews with someone who lived through a war.

Same as INTL ST 154C.

**POL SCI 146B. Religion and World Politics. 4 Units.**

Examines the relationship between religion and world politics historically and today, focusing on connections with peace/war, democracy, human rights, secularism(s), and globalization. Covers major debates, scholarship, concepts, and theories through class exercises, exams, and essays.

Prerequisite: POL SCI 41A or INTL ST 11 or INTL ST 12 or REL STD 5A or REL STD 5B or REL STD 5C

Same as REL STD 115, INTL ST 151B.

**POL SCI 147CW. International Humanitarianism. 4 Units.**

Examines, analyzes, and evaluates the humanitarian phenomenon, the actors involved in it (including states, international organizations (IOs), and nongovernmental organizations (NGOs)), the rise of a body of international humanitarian law, and the problems and debates associated with international humanitarianism today.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as INTL ST 147CW.

**(Ib)****POL SCI 147D. International Organizations. 4 Units.**

Active learning course that examines origins, decision-making processes, activities, and evolution of leading international organizations (e.g. U.N., NATO, EU, AU, WTO, World Bank, IMF). Activities include drafting reforms, applying theory, assessing dysfunctions, and participating in U.N. negotiation simulations.

Same as INTL ST 147D.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 147E. Critical Investigations into Humanitarianism in Africa. 4 Units.**

Explores the complex phenomenon of aid to Africa (emergency and development aid), and the representational, cultural, historical, and other reasons why some participants and many observers critique it. Students occasionally engage with peers and faculty in African institutions.

**(VIII)****POL SCI 149. Special Topics in International Relations. 4 Units.**

Studies in selected areas of international relations. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 151B. Introduction to Chinese Politics. 4 Units.**

Background to the Chinese revolution, rise of the communist party; and institutions, ideology, and structure of Communist party rule from 1949-present.

Same as INTL ST 176C.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 151C. Chinese Politics: Policy, Leadership, and Change. 4 Units.**

Examines major policies from 1949 to the present, and considers the changing role of the Communist Party and its shifting treatment of various social groups; the era of Mao Zedong, reforms under Deng, and post-Deng politics.

Same as INTL ST 176D.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 151H. Voting and Political Manipulation. 4 Units.**

Introduction to social choice and cooperative games. Topics include majority rule, types of voting methods, apportionment and proportional representation, agenda manipulation, coalition formation, voting power, political consequences of electoral laws.

Same as INTL ST 156A, SOC SCI 121T, ECON 154.

Restriction: International Studies Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment. Business Economics Majors have first consideration for enrollment.

**POL SCI 152F. West European Politics. 4 Units.**

Explores four main themes: (1) thinking scientifically about politics; (2) understanding the linkages between different political structures and spheres of activity; (3) evaluating some theories about politics; (4) learning about three countries: Britain, France, and Germany.

Same as INTL ST 176I.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 152K. Immigration Politics in Western Europe. 4 Units.**

Examines immigration politics in Western Europe, analyzing trends and policy from the postwar period through to today. Topics include citizenship, immigrant integration, asylum, the far-right, and a rotating focus on contemporary issues, e.g., terrorism, Islamophobia.

Same as INTL ST 178A.

Overlaps with POL SCI 141D.

**POL SCI 153B. Canadian Politics. 4 Units.**

Addresses the basic structures and processes of contemporary Canadian government and politics. Additional topics may include regionalism, federalism, western alienation and oil, Canadian solutions to social welfare policy questions, developments in Quebec, and other issues associated with French-English relations.

Same as INTL ST 176L.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 153E. Human Rights. 4 Units.**

Examines the causes and consequences of human rights violations with a focus on Latin America. What are human rights? When and where are they violated? What political mechanisms are available to deal with human rights problems? How effective are they.

Same as INTL ST 154B.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 153G. Cuban Society and Revolution. 4 Units.**

Explores the causes, development, and legacy of the 1959 Revolution. Themes include economic dependency, democracy, race, gender, culture, and the always volatile relations between Cuba and the United States.

Same as INTL ST 177E, HISTORY 166C, CHC/LAT 157.

**POL SCI 154C. Comparative Politics: Four Nations, Three Continents. 4 Units.**

Studies four countries in a comparative fashion: their respective political histories and cultural traditions; actual differences among their superficially similar party, parliamentary, and executive institutions; contemporary economic policy. The countries represent three continents and varying levels of economic development.

Same as INTL ST 144A.

Restriction: Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment.

**POL SCI 154F. Peoples and Cultures of Post-Soviet Eurasia. 4 Units.**

Examines the cultures and political conflicts of the more than 130 indigenous ethnic groups in the European and Asian territories of the former U.S.S.R. Emphasis is on the theoretical issues of ethnicity, nationalism, and conflict management.

Same as INTL ST 162B, ANTHRO 164P.

**(VIII)****POL SCI 154G. Conflict Resolution in Cross-Cultural Perspective. 4 Units.**

Examines theories of conflict management. Analyzes how conflict is mitigated in diverse cultures: at the interpersonal level, between groups, and on the international scale. Students discuss readings, hear from conflict management practitioners, and simulate negotiations.

Same as ANTHRO 136D, SOC SCI 183E, INTL ST 183E.

**(VIII)****POL SCI 154J. Jews and Power. 4 Units.**

Examines the relationship between the Jewish people and political power over a 3500 year period. How have Jews preserved their communal interests and personal safety? How have they defined the proper relationship of the people to political authority.

Same as HISTORY 130F, REL STD 130F.

**POL SCI 154KW. US Government in Comparative Perspective. 4 Units.**

Introduction to the United States in comparative perspective, covering general features of the United States and other countries, such as institutional design and policy choices. Addresses the debates about American exceptionalism and American decline.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Political Science Majors have first consideration for enrollment.

**(Ib)****POL SCI 155C. Organizations. 4 Units.**

How bureaucracies, formal organizations, and voluntary associations work, how/why they grow, and where they are going. History and structure of organizational rationality; dynamics of organized groups; behavior in organizations; limits of bureaucratization and attempts to overcome these limits through decentralization.

Same as SOCIOL 141.

Restriction: Sociology Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment.

**POL SCI 156A. Political Participation. 4 Units.**

The ways in which people in various political systems take part in politics, especially in activities directed toward affecting outcomes. Who is active, what they do, why they do it, and what difference it makes.

**POL SCI 156D. Protests, Movements, and Revolutions. 4 Units.**

A survey of models of collective action drawn from sociology, economics, psychology, and political science. Focus on areas such as social movements, strikes, crowd psychology, cults, fads, fashions, public opinion, and symbolic and mythical elements in collective culture.

Prerequisite: SOCIOL 1 or POL SCI 11A or ECON 1

Same as SOCIOL 174.

Restriction: Political Science Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.



**POL SCI 157B. International Divided Cities. 4 Units.**

Investigates urban divisions in international cities where deep-seated nationalistic ethnic differences create pressures for intergroup conflicts, autonomy, or territorial separation, and can incite violence. Urban political polarization as it is manifest in the urban setting.

Same as UPPP 178, SOCIOL 176.

**POL SCI 158D. Introduction to Contemporary Middle East Politics. 4 Units.**

An overview of basic issues that shape the politics of the Middle East and North Africa. Themes include implication of the colonization era, nation-state formation, inter-Arab relations, nationalism, Arab-Israel conflict, Islamic resurgence, and more.

Same as SOC SCI 188A, INTL ST 165.

**POL SCI 159. Special Topics in Comparative Politics. 4 Units.**

Studies in selected areas of comparative politics. Topics addressed vary each quarter.

Repeatability: May be repeated for credit unlimited times.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 169. Special Topics in Race and Ethnicity Politics. 4 Units.**

Studies in selected areas of race and ethnicity. Topics vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 171AW. Law and Society. 4 Units.**

Law and its various roles in society. The nature and meaning of law; legality and power in the American system; law as a mechanism for social change; the role of law in dispute processing, social control, compliance with judicial decisions.

Prerequisite: POL SCI 71A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Political Science Majors have first consideration for enrollment.

**(Ib)**

**POL SCI 171CW. Comparative Constitutional Politics. 4 Units.**

Examines the impact of constitutional courts on politics and policy-making in Canada, France, Germany, and the United States. Cases may focus on the constitutional politics of free speech, abortion, rights to property, and the conduct of foreign relations.

Prerequisite: POL SCI 71A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Political Science Majors have first consideration for enrollment.

**(Ib)**

**POL SCI 171D. American Constitutional Law. 4 Units.**

American constitutional interpretation of cases involving separation of powers, federal-state relations, rights of property, free expression, privacy, criminal due process, political participation, and equality. Includes legal research methods, development of judicial review, legal reasoning, and impact of Supreme Court decisions.

Prerequisite: POL SCI 71A

Overlaps with CRM/LAW C122.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 171F. Law in the Twenty-First Century. 4 Units.**

Examines the complex relationship between law, the social sciences, and modern society. Lectures explore such issues as the interplay between technology and constitutional rights, the impact of science on law, and the evolving roles of attorneys and judges.

Same as SOC SCI 172D.

Restriction: Political Science Majors have first consideration for enrollment. Social Science Majors have first consideration for enrollment.

**POL SCI 171G. Legal Implications of the Drug Trade. 4 Units.**

Examines United States policy to combat domestic and international narcotics trafficking. Analyzes the national drug policy and program implementation by federal and state agencies. Considers the effects of these policies on our individual constitutional rights and the criminal justice system.

**POL SCI 172A. International Law. 4 Units.**

Examination of the origin, changing structure, application of international law, and the role of legal norms in regulating the behavior of states and maintaining international order.

Prerequisite: POL SCI 71A

Same as INTL ST 145A.

**(VIII)****POL SCI 174A. Civil Liberties. 4 Units.**

Political analysis of selected Supreme Court cases involving claims under the Bill of Rights and the Fourteenth Amendment. Topics include: race, sex, and other forms of discrimination; criminal justice; privacy; freedom of speech and related claims.

Prerequisite: POL SCI 71A

Overlaps with CRM/LAW C122.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 174C. U.S. Supreme Court. 4 Units.**

Overview and analysis of the role played by the U.S. Supreme Court in the American political system. Judicial review, appointment of justices, judicial activism and judicial restraint, process of case selection, court deliberation, and decision-making, impact of Supreme Court decisions.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI 174CW. U.S. Supreme Court. 4 Units.**

Overview and analysis of the role played by the U.S. Supreme Court in the American political system. Judicial review, appointment of justices, judicial activism and judicial restraint, process of case selection, court deliberation, and decision-making, impact of Supreme Court decisions.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Political Science Majors have first consideration for enrollment.

**(Ib)****POL SCI 175. The Bill of Rights in Film. 4 Units.**

Focuses on ways American cinema has portrayed, represented, and analyzed U.S. Bills of Rights. Juxtaposes cinematic presentations on specific Bill of Rights clauses, treating films as cultural texts, with pertinent judicial decisions and more scholarly appraisals of those same provisions.

**POL SCI 179. Special Topics in Public Law. 4 Units.**

Studies in selected areas of public law. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Political Science Majors have first consideration for enrollment.

**POL SCI H180D. Honors Seminar in Political Science. 2-4 Units.**

Course for students enrolled in the Honors Program in Political Science.

Prerequisite: Only open to students in the Political Science Honors Program.

Repeatability: May be repeated for credit unlimited times.

**POL SCI H182A. Honors Thesis Workshop. 4 Units.**

A weekly seminar/workshop to facilitate the exchange of ideas and research strategies among students and to review their progress in writing the thesis.

Restriction: Open only to students in the Political Science Senior Thesis program.

**POL SCI 190W. Senior Thesis. 4 Units.**

Thesis research with Political Science faculty.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Repeatability: May be taken for credit 3 times.

**(Ib)**

**POL SCI 197. Field Study. 1-4 Units.**

Field study with Political Science faculty.

Repeatability: Unlimited as topics vary.

**POL SCI 198. Directed Group Study. 1-4 Units.**

Directed group study with Political Science faculty.

Repeatability: Unlimited as topics vary.

**POL SCI 199. Independent Study. 1-4 Units.**

Independent study or research with a Political Science faculty member.

Repeatability: May be repeated for credit unlimited times.

**POL SCI 209A. Study of Democracy Colloquium. 1.33 Unit.**

Skills critical to professional success. Students learn and practice professional presentation skills, develop substantive knowledge in the field by attending talks and panels, and interact with scholars and professionals in the field.

Restriction: Graduate students only. POL SCI 209A may not be taken for credit if taken after SOCIOL 229.

**POL SCI 209B. Study of Democracy Colloquium. 1.33 Unit.**

This colloquium teaches students skills critical to professional success. Students learn and practice professional presentation skills and develop substantive knowledge in the field by attending talks and panels and interacting with scholars and professionals in the field.

Restriction: Graduate students only. POL SCI 209B may not be taken for credit if taken after SOCIOL 229 Democracy.

**POL SCI 209C. Study of Democracy Colloquium . 1.34 Unit.**

This colloquium teaches students skills critical to professional success. Students learn and practice professional presentation skills and develop substantive knowledge in the field by attending talks and panels and interacting with scholars and professionals in the field.

Restriction: Graduate students only. POL SCI 209C may not be taken for credit if taken after SOCIOL 229 Democracy.

**POL SCI 210A. Colloquium. 1.3 Unit.**

Doctoral training requires more than learning substantive debates and research methods; it also requires students learn professional practices, routines, and expectations. This year-long workshop offers students a mix of professional development, outside speakers, and casual conversations with departmental faculty.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**POL SCI 210B. Colloquium. 1.3 Unit.**

Doctoral training requires more than learning substantive debates and research methods; it also requires students learn professional practices, routines, and expectations. This year-long workshop offers students a mix of professional development, outside speakers, and casual conversations with departmental faculty.

Prerequisite: POL SCI 210A

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**POL SCI 210C. Colloquium. 1.4 Unit.**

Doctoral training requires more than learning substantive debates and research methods; it also requires students learn professional practices, routines, and expectations. This year-long workshop offers students a mix of professional development, outside speakers, and casual conversations with departmental faculty.

Prerequisite: POL SCI 210B

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**POL SCI 212A. Public Opinion. 4 Units.**

Introduction to the study of U.S. public opinion. Provides an overview of the theories regarding opinion formation, the methodologies employed, and the role of public opinion in democratic governments.

Restriction: Graduate students only.

**POL SCI 212B. Ethics Workshop. 4 Units.**

Students find an important question in ethics, search literature to assess topic's importance, post question to be researched, propose method of analysis and type of data, analyze data, and note how their works contribute to knowledge in the field.

**POL SCI 219. Special Topics in Politics and Society. 4 Units.**

Current research in politics and society.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**POL SCI 221A. Public Policy. 4 Units.**

Explores different approaches to public policy analysis, the diverse conceptions of the goals and objectives that should be served by policy, and the appropriate role of the policy analyst. Policy consequences are traced to indirect and subtle incentives and disincentives.

Same as CRM/LAW C255, UPPP 221.

Restriction: Graduate students only.

**POL SCI 223A. Theories of Power and Empowerment. 4 Units.**

Studies different ways of thinking about power and its uses. Explores theories of power that inform various notions of empowerment, including resistance, participatory democracy, and workplace empowerment.

Same as MGMTPHD 297R, UPPP 279.

Restriction: Graduate students only.

**POL SCI 229. Special Topics in American Politics. 4 Units.**

Current research in American Politics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**POL SCI 231A. Political Epistemology. 4 Units.**

Focuses on fundamental issues of knowledge in the study of politics, especially interconnections and tensions between politics and knowledge. Counts as the Field Seminar in Political Theory.

Restriction: Graduate students only.

**POL SCI 231B. Theories of Textual Interpretation. 4 Units.**

Examination of different theories of textual interpretation, including Straussian, hermeneutical, poststructuralist, feminist, postcolonial, and critical race theories. Key questions include: How does one go about the task of interpreting texts? What makes one interpretation better or more insightful than another.

Restriction: Graduate students only.

**POL SCI 232A. Introduction to Voting Theory. 4 Units.**

Introduction to voting modules. Substantive topics include majority rule, voting methods and their properties, apportionment and proportional representation, agenda manipulation, coalition formation, voting power, political consequences of electoral laws.

Restriction: Graduate students only.

**POL SCI 238D. The Moral Life During War. 4 Units.**

Can people keep their humanity during war? What does the term humanity signify when simply surviving requires faith, courage, and desperation? When facing wartime brutality must we abrogate morality? What does it mean to compose a moral life during war?

Restriction: Graduate students only. Political Science Majors have first consideration for enrollment.

Concurrent with POL SCI 138DW.

**POL SCI 239. Special Topics in Political Theory. 4 Units.**

Current research in political theory. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**POL SCI 241B. Seminar in International Relations Theory. 4 Units.**

Overview of the major theories guiding research and scholarship in international relations. Focus on major conceptual approaches (realism, neoliberalism, marxism) and levels of analysis (systemic, state, and subnational), as well as on methodological/epistemological debates engulfing the field.

Restriction: Graduate students only.

**POL SCI 241E. Research Design in International Relations. 4 Units.**

Surveys research design primarily through substantive readings in international relations. The purpose is to familiarize students with choices/dilemmas relevant to IR-specific research. Students at various stages in the graduate program and with different methodological orientations are welcome.

**POL SCI 249. Special Topics in International Relations. 4 Units.**

Current research in international relations. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**POL SCI 252G. Theories and Practice of Migration and Citizenship. 4 Units.**

Examines theories of migration and citizenship. In examining these themes, the course includes discussion of theory development, multi-method testing, and case study comparison with a focus on Western Europe and other advanced democratic receiving states.

**POL SCI 254A. Introduction to Game Theory. 4 Units.**

Introduction to non-cooperative games. The prisoner's dilemma, Nash equilibrium, sequential games, subgame perfection. Applications include collective action, agenda-setter models, spatial competition of political parties, models of revolution and arms race.

Restriction: Graduate students only.

**POL SCI 259. Special Topics in Comparative Politics. 4 Units.**

Current research in comparative politics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**POL SCI 260B. Political Participation. 4 Units.**

Examines theoretical approaches to the explanation of the pattern of participation and consideration of the results of empirical studies of such activity by mass publics (mainly in Europe and North America). Addresses issues in both comparative politics and political behavior.

Restriction: Graduate students only.

**POL SCI 273A. Advanced Qualitative Methods: Analyzing Qualitative Data. 4 Units.**

Introduction to the theory and practice of analyzing qualitative data. Students must have already learned about data collection and research design for qualitative research and must have qualitative data they can analyze.

Same as MGMTPHD 297K, UPPP 213.

Restriction: Graduate students only.

**POL SCI 276. Predictive Models in Social Sciences. 4 Units.**

Basic numeracy (logarithms, fixed-exponent and exponential formats, graphing). Models based on ignorance and logical constraints. Logical quantitative models (how things should be) to complement and guide statistical analysis (how things are).

**POL SCI 285A. Introduction to Political Psychology I. 4 Units.**

Reviews theoretical questions regarding the relationship between the analytical and normative and the polity. Considers relationships between the analytical and normative concerns of psychology and political science, addressing empirical literatures on political socialization, ideology and public opinion, identity and nationality.

**POL SCI 290. Dissertation Research. 1-12 Units.**

Dissertation research with Political Science faculty.

Repeatability: Unlimited as topics vary.

**POL SCI 299. Independent Study. 1-12 Units.**

Independent research with Political Science faculty.

Repeatability: Unlimited as topics vary.

## Political Science, B.A.

As a political science major at UCI, you explore how politics works at the individual, group, national, and international levels. Students are introduced to the findings and the methods for gathering information about political behavior and political processes. Course work emphasizes the development of analytic thinking and clear writing skills. Upper-division courses are organized around general areas of study, including American society and politics, comparative politics, international relations, public law, and political theory.

Students have many opportunities to pursue special topics in political science through independent study courses, field studies, the department's honors program and internships. Many political science majors participate in such programs as the UC/DC Internship Program, in Washington, D.C. and the University's Education Abroad Program. Political science majors learn how to understand politics and acquire the skills for effective performance in many professional fields.

To major in the program, contact the Social Science Undergraduate Student Affairs. ([http://undergraduatestudies.ss.uci.edu/ugs\\_usa\\_contact/](http://undergraduatestudies.ss.uci.edu/ugs_usa_contact/))

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Departmental Requirements for the Major

School requirements must be met and must include 12 courses (48 units) as specified below:

A. Select four lower-division (one or two digit) POL SCI courses below. One must be the introductory course for the module selected under II below.

POL SCI 11A	Introduction to Political Science: Political Analysis
POL SCI 11B	
POL SCI 11C	Introduction to Political Science: Micropolitics
POL SCI 21A	Introduction to American Government
POL SCI 31A	Introduction to Political Theory
POL SCI 41A	Introduction to International Relations
POL SCI 51A	Introduction to Politics Around the World
POL SCI 61A	Introduction to Race and Ethnicity in Political Science
POL SCI 71A	Introduction to Law

Complete any one additional lower-division POL SCI course (not used above) (4 units)

B. Seven upper-division POL SCI courses (28 units) chosen from among the POL SCI modules numbered 120–179. Three of these courses must be from one module.

American Politics and Government (POL SCI 120-129)
Political Theory and Methods (POL SCI 130-139)
International Relations (POL SCI 140-149)
Comparative Politics (POL SCI 150-159)
Public Law (POL SCI 170-179)

The Honors Program in Political Science is open to all senior political science majors who meet the minimum academic qualifications (3.5 GPA in political science courses and 3.2 GPA overall). Students submit an application to the department office before the end of their junior year. In addition to satisfying the requirements for the major in political science, honors program participants must complete additional course work as specified below.

During the year prior to the year in which the thesis will be written, a prospective honors program student should identify a Department of Political Science faculty member who is willing to supervise the student's thesis. Students are ordinarily expected to take an upper-division political science course or a POL SCI 199 Independent Study course with the advisor prior to their senior year.

During their senior year, students must enroll in the Honors Thesis Workshop (POL SCI H182A), offered during the fall quarter. This course is in addition to the seven upper division courses required for the regular major. Honors students also enroll in three quarters of the senior thesis course (POL SCI 190W) with their advisor, which are independent study courses for writing the thesis. The POL SCI 190W courses do not count toward the upper-division political sciences courses required for the major although they are counted as 'other' upper-division social science courses towards graduation requirements. Students write their senior thesis, which is designed and completed under their faculty advisor's supervision. Upon successful completion of the program, including approval of their senior honors thesis by the faculty advisor and a GPA of at least 3.5 in their political science courses, the students will graduate with honors in Political Science and their transcripts note that they were in the Honors Program in Political Science.

## Political Science, Minor

Are you interested in studying Political Science but do not want to major in it? You may want to consider the minor in Political Science. The program enables you to explore the field beyond the introductory level but in less depth than the major.

To minor, contact the Social Sciences Undergraduate Student Affairs Office ([http://undergraduatestudies.ss.uci.edu/ugs\\_usa\\_contact/](http://undergraduatestudies.ss.uci.edu/ugs_usa_contact/)).

### Political Science Minor Requirements

Requirements for the minor in Political Science are met by taking seven political science courses (28 units) as specified below:

A. Select one of the following:

POL SCI 11A	Introduction to Political Science: Political Analysis
POL SCI 11B	
POL SCI 11C	Introduction to Political Science: Micropolitics
POL SCI 21A	Introduction to American Government
POL SCI 31A	Introduction to Political Theory
POL SCI 41A	Introduction to International Relations
POL SCI 51A	Introduction to Politics Around the World
POL SCI 61A	Introduction to Race and Ethnicity in Political Science
POL SCI 71A	Introduction to Law

B. Select six additional Political Science courses, four of which must be upper-division.

## Political Science, Ph.D.

The Department of Political Science offers a Ph.D. program in Political Science. The department has attained a reputation for producing the very best innovative and interdisciplinary scholarship. Faculty are engaged in the study of such key questions as the politics of advanced and democratizing societies, international cooperation and peace, the politics of racial and ethnic minority groups, and the origins of altruism and morality and their impact on world politics.

Graduate students can pursue concentration in public choice and specializations in democracy studies, international relations, and race and minority politics. The Ph.D. program offers big payoffs to graduate students, in fact, because of the extended range of inquiry an interdisciplinary program affords.

Political science faculty members are regular participants in and help direct several research units on campus. The Center for the Study of Democracy, an Organized Research Unit at UCI, sponsors research and education aimed at improving the democratic process in the United States and expanding democracy around the world. The UCI Interdisciplinary Center for the Scientific Study of Ethics and Morality explores questions concerning the origins and causes of morality. The Center for Global Peace and Conflict Studies (CGPACS), housed in the School of Social Sciences, is a multidisciplinary program dedicated to promoting scholarly, student and public understanding of international conflict and cooperation. The Institute for Mathematical Behavioral Sciences, also located in the School of Social Sciences, offers opportunities for participation in ongoing faculty research, notably with faculty members engaged in fields of public choice and political economy.

The deadline for application for fall quarter admission is December 1. Applications received after the deadline may be considered, although it is not guaranteed they will be reviewed. Students are admitted for winter or spring quarters only under exceptional circumstances. Additional information is available in the general section on admission to social science graduate programs. Please note especially the required examinations.

### Requirements

During the first two years in the doctoral program, students must complete three of the following five seminars: Field Seminar in American Politics, Field Seminar in Comparative Politics, Field Seminar in International Relations, Field Seminar in Political Theory, and Foundations of Political Science. Prior to advancement to Ph.D. candidacy, doctoral students must complete two fields of study, one of which must come from the following list: American Politics, Comparative Politics, International Relations, or Political Theory. Each student must complete a second field, which may come (1) from one of the four listed above; (2) from an area of faculty strength, such as democracy studies, methodology and modeling, critical theory, ethics, political psychology, political economy/public choice, race and ethnicity, or public law; or (3) from a specialized area of interdisciplinary study. If the student chooses the specialized area of interdisciplinary study (3), this area must be approved by the student's advisor and the graduate committee. Students must complete four or five courses in their first field and three–five courses in their second field. The precise number is to be determined in each field by the field faculty. The field seminar in each field counts as one of the required courses.

Students are expected to have successfully completed course work resulting in knowledge of basic introductory statistics. Students who do not have this preparation must acquire the equivalent background during their first or second year in graduate school. Undergraduate statistics courses are considered to be remedial, and thus will not count toward graduate course credit needed for the Ph.D. Competence in a foreign language is required. Students may substitute mastery of an advanced research skill or an advanced qualitative skill in place of a foreign language. To acquire such a quantitative skill (which could involve course work in such disciplines as economics, mathematics and computer science, or statistics), students must complete at least one year of upper-level, undergraduate course work in mathematics, economics, or computer science or one year in graduate-level



statistics beyond the required minimum of two quarters of introductory statistics. To acquire a qualitative skill, students must complete at least one year of graduate-level course work in qualitative or interpretative research methods. A student electing to meet the foreign language requirement should select a foreign language which is useful for research in his or her dissertation or in which there is a substantial body of scholarly literature.

### Reviews and Examinations

Students ordinarily are expected to maintain a grade point average of 3.5 or better. At the completion of the first year, a review of performance in the graduate program will be conducted for each student by the political science faculty.

Students must complete two qualifying papers. The first qualifying paper must be completed and approved by the end of the winter quarter of a student's second year in the program; the second qualifying paper must be completed and approved by the winter quarter of a student's third year in the program. There must be two faculty readers on each qualifying paper, and only one faculty reader may serve as a reader on both papers. Upon successful completion of these papers and demonstration of competence in a foreign language, mastery of an advanced quantitative skill, or an advanced qualitative skill, a candidacy committee is appointed to oversee the qualifying examination and the formal advancement to candidacy. Students are expected to advance to candidacy by the end of their eighth quarter in the Ph.D. program. All students must pass the advancement to candidacy examination by the end of the tenth quarter in the Ph.D. program.

After the student advances to candidacy, the doctoral committee, usually composed of three members of the candidacy committee, reviews a dissertation prospectus and supervises work toward completion of the dissertation. Within six months of the oral qualifying examination (the formal advancement to candidacy), students are expected to meet with their doctoral committee, in order to discuss with the members a dissertation prospectus.

The normative time for completion of the Ph.D. is six years, and the maximum time permitted is seven years.

### Ph.D. in Political Science with a Concentration in Public Choice/Political Economy

Public choice is an interdisciplinary field, at the intersection of political science and economics, which draws on sophisticated quantitative tools to model the functioning of political institutions. Public choice examines such areas as theories of voter and party choice; the theory of constitutions; the theory of committees and elections; models of regulation; problems of public goods and externalities; rent-seeking models; and issues in social choice, social welfare, and demand revelation.

This concentration is administered by an interdisciplinary committee of faculty from the Departments of Political Science and Economics.

### Requirements

Students who elect this concentration are admitted under the normal procedures for the program in political science and must fulfill all the requirements for the political science degree, with the following modifications:

1. Students must complete the three-quarter core sequence in public choice, which is taught jointly by political science and economics faculty. This sequence is usually taken in the student's second or third year.
2. Students must complete three additional graduate-level, four-unit courses in related fields with the consent of their graduate advisor, chosen from a set of courses designated by the interdisciplinary committee. The courses chosen are to be tailored to the individual interests and academic background of the student and usually will include at least two economics courses (such as Econometrics, Game Theory, and Law and Economics) and one political science course (such as those on electoral systems, party systems, constitutions, courts).
3. Students are expected to write their dissertation on a topic related to public choice. Usually the dissertation advisor will be a political science member of the interdisciplinary committee.

### Program in Law and Graduate Studies (J.D./Ph.D.)

Highly qualified students interested in combining the study of law with graduate research and/or professional qualifications in political science are invited to undertake concurrent degree study under the auspices of UC Irvine's Program in Law and Graduate Studies (PLGS). Students in this program pursue a coordinated curriculum leading to a J.D. degree from the School of Law in conjunction with a Ph.D. degree in political science. Additional information is available from the PLGS program director's office, 949-824-4158, or by email to [plgs@law.uci.edu](mailto:plgs@law.uci.edu). A full description of the program, with links to all relevant application information, can be found at the School of Law Concurrent Degree Programs website (<http://www.law.uci.edu/academics/interdisciplinary-studies/concurrent-degrees.html>).

## Department of Sociology

### Department Chair

4211 Social Science Plaza B

949-824-6800

<http://www.sociology.uci.edu/>

Sociology involves the study of societies and human groups. It examines social conflict and cooperation, inequality and the social organization of families, communities, workplaces and nations. The program at UCI covers the breadth of the discipline while giving students opportunities to conduct independent research, participate in an Honors Program, and to take advantage of departmental opportunities in such areas as business, economy

and organizations; diversity and inequality; global and international sociology; and social problems and public policy. All students take basic courses on social institutions, theory and methods. Students then take more specialized courses such as race and ethnicity, social psychology, sociology of gender, or political sociology. Courses are enriched by ongoing faculty research on such topics as the work and family of immigrants to the U.S., economic change in Asia, the relation between women and men in different social classes and ethnic groups, and attitudes on sexual behavior.

In addition to developing students' ability to critically analyze and understand social patterns, the major is relevant to professional careers in education, social work, urban planning, law, business, public health, non-governmental organization, and government service. It also provides training for advanced graduate work in sociology and related fields.

## Program in Law and Graduate Studies (J.D./Ph.D.)

Highly qualified students interested in combining the study of law with graduate research and/or professional qualifications in Sociology are invited to undertake concurrent degree study under the auspices of UC Irvine's Program in Law and Graduate Studies (PLGS). Students in this program pursue a coordinated curriculum leading to a J.D. from the School of Law in conjunction with a Ph.D. in Sociology. Additional information is available from the PLGS director's office, 949-824-4158, or by email to [plgs@law.uci.edu](mailto:plgs@law.uci.edu). A full description of the program, with links to all relevant application information, can be found at the School of Law Concurrent Degree Programs website (<http://www.law.uci.edu/academics/interdisciplinary-studies/concurrent-degrees.html>).

- Sociology, B.A.
- Sociology, Minor
- Sociology, Ph.D.

## Faculty

Edwin Amenta, Ph.D. University of Chicago, *Professor of Sociology; Political Science* (political sociology, historical and comparative sociology, social movements, social policy)

Stanley Bailey, Ph.D. University of California, Los Angeles, *Professor of Sociology; Religious Studies* (race and ethnicity, religion, immigration, Latin America)

Nina Bandelj, Ph.D. Princeton University, *Professor of Sociology* (economic sociology, culture, organizations, social networks, political economy, globalization, social change, central and eastern Europe)

Frank D. Bean, Ph.D. Duke University, *UCI Distinguished Professor of Sociology; Economics; Education* (international migration, demography, Mexican immigration, racial and ethnic relations, economic sociology, family)

Catherine I. Bolzendahl, Ph.D. Indiana University, *Associate Professor of Sociology* (gender, gender and sexuality studies, the welfare state, political sociology, comparative sociology, family, quantitative methodology)

Susan K. Brown, Ph.D. University of Washington, *Professor of Sociology; Religious Studies* (immigration, inequality, urban sociology)

Carter Butts, Ph.D. Carnegie Mellon University, *Professor of Sociology; Computer Science; Electrical Engineering and Computer Science; Statistics* (mathematical sociology, social networks, quantitative methodology, human judgment and decision making, economic sociology)

Katherine Faust, Ph.D. University of California, Irvine, *Professor of Sociology* (social networks, animal social organization, population processes and social networks, research methods)

David John Frank, Ph.D. Stanford University, *Professor of Sociology; Education; Political Science* (globalization, sexuality, the natural environment, higher education)

Rachel E. Goldberg, Ph.D. Brown University, *Assistant Professor of Sociology* (health, social demography, family, children and youth, gender, migration)

Ann Hironaka, Ph.D. Stanford University, *Professor of Sociology; Asian American Studies* (political sociology, war and peace, environmental sociology, ethnic and racial conflict)

Matthew L. Huffman, Ph.D. University of California, Santa Barbara, *Professor of Sociology* (inequality, organizations, work and employment, research methods)

Julia C. Lerch, Ph.D. Stanford University, *Assistant Professor of Sociology* (sociology of education, global and transnational sociology, civic education, humanitarian emergencies, international organizations)

Shampa Mazumdar, Ph.D. Northeastern University, *Lecturer of Sociology; Religious Studies* (religion, immigration, Asian American, urban sociology)

David S. Meyer, Ph.D. Boston University, *Professor of Sociology; Political Science; Urban Planning and Public Policy* (social movements, public policy, peace and war, social justice)

Andrew Penner, Ph.D. University of California, Berkeley, *UCI Chancellor's Fellow and Professor of Sociology* (gender, inequality, education, family, race)

Francesca Polletta, Ph.D. Yale University, *Professor of Sociology* (social movements, democracy, culture, sociology of law, political sociology, social theory)

Charles C. Ragin, Ph.D. University of North Carolina at Chapel Hill, *UCI Chancellor's Professor of Sociology* (comparative and historical sociology, social inequality, political sociology, quantitative methodology, qualitative methodology)

Belinda Robnett, Ph.D. University of Michigan, *Professor of Sociology* (social movements, race and ethnicity, gender, social change, African Americans)

Rocio Rosales, Ph.D. University of California, Los Angeles, *Assistant Professor of Sociology; Chicano/Latino Studies* (international migration, immigrant and ethnic economics, urban sociology, ethnography, Latino/a studies, race and ethnicity, immigrant detention)

Ruben G. Rumbaut, Ph.D. Brandeis University, *Distinguished Professor of Sociology; Chicano/Latino Studies; Criminology, Law and Society; Education* (international migration, immigration laws, criminalization, incarceration, social inequality and mobility, race and ethnicity)

David Schaefer, Ph.D. University of Arizona, *Associate Professor of Sociology* (social networks, social psychology, criminology, health, human development)

Evan Schofer, Ph.D. Stanford University, *Professor of Sociology* (comparative political sociology, sociology of education, quantitative methods and statistics, globalization, sociology of the environment, organizations, sociology of science)

Tonya L. Schuster, Ph.D. University of California, Riverside, *Lecturer of Sociology* (sociology of medicine and alternative medicine, social relationships and health social psychology, research design)

David A. Smith, Ph.D. University of North Carolina at Chapel Hill, *Professor of Sociology; Urban Planning and Public Policy* (world systems analysis, urbanization, development, comparative-historical sociology, dependent development in east Asia)

David A. Snow, Ph.D. University of California, Los Angeles, *Professor Emeritus of Sociology* (collective behavior, protest and social movements, framing processes, social psychology and culture, homelessness and social problems, qualitative methods)

Judith Stepan-Norris, Ph.D. University of California, Los Angeles, *Professor of Sociology* (labor unions, sociology of work, political sociology, American society, research methods, historical-comparative methods, class formation)

Sabrina Strings, Ph.D. University of California, San Diego, *Assistant Professor of Sociology* (race, gender, embodiment, sociology of medicine, sociology of media)

Yang Su, Ph.D. Stanford University, *Associate Professor of Sociology* (social movements and collective action, political sociology, China's political transition)

Judith Treas, Ph.D. University of California, Los Angeles, *UCI Chancellor's Professor of Sociology* (gender, inequality, family, aging and life course, social demography)

Kristin E. Turney, Ph.D. University of Pennsylvania, *Associate Professor of Sociology; Criminology, Law and Society* (social inequality, family demography, population health, incarceration and punishment, intergenerational transmission of disadvantage, child well-being)

Irene I. Vega, Ph.D. University of California, Los Angeles, *Assistant Professor of Sociology* (international migration, socio-legal studies, race/ethnicity, educational inequality)

Feng Wang, Ph.D. University of Michigan, *Professor of Sociology* (contemporary demographic, economic, and social processes, social inequality in state socialisms, contemporary China)

## Affiliate Faculty

Richard Arum, Ph.D. University of California, Berkeley, *Dean of the School of Education and Professor of Education; Criminology, Law and Society; Sociology*

Gilberto Q. Conchas, Ph.D. University of Michigan, *Professor of Education; Asian American Studies; Sociology* (urban education, sociology of education, comparative race and ethnicity)

Laura Enriquez, Ph.D. University of California, Los Angeles, *Assistant Professor of Chicano/Latino Studies; Asian American Studies; Sociology* (undocumented 1.5 generation young adults, immigration, citizenship, Latino families)

George Farkas, Ph.D. Cornell University, *UCI Distinguished Professor of Education; Sociology* (educational achievement gaps, interventions, educational policy)

Martha S. Feldman, Ph.D. Stanford University, *Roger W. and Janice M. Johnson Chair in Civic Governance and Public Management and Professor of Urban Planning and Public Policy; Paul Merage School of Business; Sociology* (organization theory and behavior, stability and change in organizations, decision-making and information processing, public management, qualitative research methods)

Glenda M. Flores, Ph.D. University of Southern California, *Associate Professor of Chicano/Latino Studies; Sociology* (Latina/o sociology, gender and work, middle-class minorities, education, urban ethnography)

Michael R. Gottfredson, Ph.D. University at Albany, State University of New York, *Chancellor's Professor of Criminology, Law and Society; School of Law; Sociology* (criminology, juvenile delinquency, crime theory, public policy)

John R. Hipp, Ph.D. University of North Carolina at Chapel Hill, *Professor of Criminology, Law and Society; Sociology; Urban Planning and Public Policy* (community context of crime, household decisions and neighborhood change, research methods)

Valerie Jenness, Ph.D. University of California, Santa Barbara, *Distinguished Professor of Criminology, Law and Society; Sociology* (links between deviance and social control [especially law], the politics of crime control and criminalization, social movements and social change, corrections and public policy)

Sharon Koppman, Ph.D. University of Arizona, *Assistant Professor of Paul Merage School of Business; Sociology* (work and occupations, sociology of culture, creative industries)

Charis E. Kubrin, Ph.D. University of Washington, *Professor of Criminology, Law and Society; Sociology* (crime, neighborhood effects and social processes, race/ethnicity and violence, immigration and crime)

James W. Meeker, J.D., Ph.D. State University of New York at Buffalo, *Professor Emeritus of Criminology, Law and Society; Sociology* (sociology of law, criminal justice, research methodology, statistics, access to civil justice)

Walter Nicholls, Ph.D. University of California, Los Angeles, *Associate Professor of Urban Planning and Public Policy; Sociology* (urban sociology, politics and policy, social movements, immigration, comparative urbanism, theory, planning conflicts)

Andrew Noymer, Ph.D. University of California, Berkeley, *Associate Professor of Program in Public Health; Sociology*

Henry N. Pontell, Ph.D. State University of New York at Stony Brook, *Professor Emeritus of Criminology, Law and Society; Sociology* (white-collar and corporate crime, criminology, criminal justice, deviance and social control, sociology of law)

Maria G. Rendón, Ph.D. Harvard University, *Assistant Professor of Urban Planning and Public Policy; Sociology* (urban sociology, immigration, race/ethnicity, sociology of education and social policy)

Naomi Sugie, Ph.D. Princeton University, *Associate Professor of Criminology, Law and Society; Sociology* (sociology of crime and punishment, inequality, families, demography, methods, new technologies for data collection)

Bryan Sykes, Ph.D. University of California, Berkeley, *Associate Professor of Criminology, Law and Society; Program in Public Health; Sociology* (demography, criminology, research methods, health, social inequality, statistics)

Shauhin A. Talesh, J.D., Ph.D. University of Connecticut, University of California, Berkeley, *Director, Law and Graduate Studies Program and Professor of School of Law; Criminology, Law and Society; Sociology*

Linda T. Vö, Ph.D. University of California, San Diego, *Professor of Asian American Studies; Culture and Theory; Sociology; Urban Planning and Public Policy* (race and ethnic relations, immigrants and refugees, gender relations, community and urban studies)

Kirk Williams, Ph.D. University of Arizona, *Professor of Criminology, Law and Society; Sociology* (family violence, youth violence, homicide studies, risk assessment, violence prevention program evaluation)

## Courses

### **SOCIOL 1. Introduction to Sociology. 4 Units.**

Considers major sociological concepts, theories, and research findings illuminating processes of interpersonal interaction, social differentiation and stratification, integration and conflict, and change, with attention to variation in class, race/ethnic, gender, multicultural, and cross-national perspectives and experiences.

(III, VII)

**SOCIOL 2. Globalization and Transnational Sociology. 4 Units.**

Examines globalization and international issues from the perspective of sociology and related fields. Issues include economic globalization and global inequality, international environmental problems, international politics, trends in global culture, and global conflict.

(III, VIII)

**SOCIOL 3. Social Problems. 4 Units.**

Focuses on how institutional and organizational features of societies generate problems for people. Particular attention directed at a set of problems related to political and economic inequality: poverty, racism, sexism, urban and population problems, the environment, the criminal justice system.

(III, VII)

**SOCIOL 10A. Probability and Statistics. 4 Units.**

An introduction to probability and statistics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Emphasizes examples from sociology, anthropology, and related social science disciplines.

Same as ANTHRO 10A.

Overlaps with PSYCH 10A, SOCECOL 13, SOC SCI 10A, POL SCI 10A.

Restriction: Anthropology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

(Va)

**SOCIOL 10B. Probability and Statistics. 4 Units.**

An introduction to probability and statistics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Emphasizes examples from sociology, anthropology, and related social science disciplines.

Prerequisite: SOCIOL 10A or ANTHRO 10A

Same as ANTHRO 10B.

Overlaps with PSYCH 10B, SOCECOL 13, SOC SCI 10B, POL SCI 10B.

Restriction: Anthropology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

(Va)

**SOCIOL 10C. Probability and Statistics. 4 Units.**

An introduction to probability and statistics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Emphasizes examples from sociology, anthropology, and related social science disciplines.

Prerequisite: SOCIOL 10B or ANTHRO 10B

Same as ANTHRO 10C.

Overlaps with PSYCH 10C, SOCECOL 13, SOC SCI 10C, POL SCI 10C.

Restriction: Anthropology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

(Vb)

**SOCIOL 19. Special Topics: Methods. 4 Units.**

Studies in selected areas of methods. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**SOCIOL 29. Special Topics: Theory. 4 Units.**

Studies in selected areas of theory. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: May be repeated for credit unlimited times.

**SOCIOL 31. Self-Identity and Society. 4 Units.**

Studies sociological contributions to theory and research in social psychology, with focus on the social influences on personality, attitudes, beliefs, and behavior; socialization, human groups, and social interaction.

Same as PSYCH 78A.

(III)

**SOCIOL 39. Special Topics: Social Psychology. 4 Units.**

Studies in selected areas of social psychology. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**SOCIOL 41. Small Group Dynamics. 4 Units.**

Deals with models for understanding behavior in small groups, including coalition formation, socialization, group norms and decision rules, leadership, conformity, group structure, and communication processes.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 43. City and Community. 4 Units.**

Examines nature, causes, and consequences of urbanization along with changing scale and complexity, demographic/ecological city growth patterns, quality of life in urban areas, processes of decision-making, and bearing of sociological investigation on public policy concerns in contemporary urban society.

Overlaps with UPPP 40.

**SOCIOL 44. Births, Deaths, and Migration. 4 Units.**

Introduction to the analysis of human population including fertility, mortality dispersion, sex distribution. Attention is focused on the effects of these variables on, e.g., over-population, social disorganization, and the stability of social institutions.

(VIII)

**SOCIOL 49. Special Topics: Structures. 4 Units.**

Studies in selected areas of structures. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**SOCIOL 51. Asian American Family & Community. 4 Units.**

Briefly examines the history of different Asian American groups and provides an in-depth analysis of issues related to family composition, mate selection, changing gender roles, and intergenerational conflict.

(VII)

**SOCIOL 56. Religion and Society. 4 Units.**

A critical and personal examination of the varieties of religious and spiritual experiences human beings are undergoing in contemporary society. The role of conscious understanding and unconscious conditioning regarding religion and spirituality.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 59. Special Topics: Social Institutions and Culture. 4 Units.**

Studies in selected areas of social institutions and culture. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**SOCIOL 62. Families and Intimate Relations. 4 Units.**

Sociological theories/research on marriage, kinship, intimacy, and divorce. Emphasis on comparing family patterns in different social classes, ethnic groups, and societies, and on relating family life to the economy and other social institutions. Topics include gender roles, child-rearing, historical change. Materials fee.

(III)

**SOCIOL 63. Race and Ethnicity. 4 Units.**

Focuses on racial and ethnic relations in the United States and compares them with those found in other societies. Analyzes the conditions that favor either cooperation and integration or rivalry, tension, and conflict. Appraises strategies for reducing and resolving conflicts.

Same as SPPS 70A.

(VII)

**SOCIOL 64. Sociology of Sexuality. 4 Units.**

Provides an introduction to and overview of the sociology of sex and sexuality. Considers the social meanings of sex and sexuality, the social contexts of sex and sexuality, and the social regulations of sex and sexuality.

(VII)

**SOCIOL 68. Gender and Race Inequality in the Workplace. 4 Units.**

Analysis of current state and trends in major inequality measures including the wage gap, occupational segregation, and access to managerial positions. Theories that purport to explain such differences, and the related empirical evidence, are also covered.

**SOCIOL 68A. Ethnic and Immigrant America. 4 Units.**

Focusing on Asian, Latino, and Black immigrant groups, examines the second generation's experience of straddling two cultures and growing up American. Covers topics such as assimilation, bilingualism, race relations, education, bicultural conflicts, interracial marriage, and multiracial identities.

Same as CHC/LAT 65.

(VII)

**SOCIOL 69. Special Topics: Age, Gender, Race, and Ethnicity. 4 Units.**

Studies in selected areas of age, gender, race, and ethnicity. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**SOCIOL 79. Special Topics: Societies and Social Inequality. 4 Units.**

Studies in selected areas of societies and social inequality. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**SOCIOL 110. Research Methods. 4 Units.**

Methods of data collection and analysis used by sociologists. Experimental methods, surveys, and interviews, field research and participant observation, demographic methods, historical and comparative approaches.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 119. Special Topics: Methods. 4 Units.**

Studies in selected areas of methods. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 120. Sociological Theory. 4 Units.**

What a theory of society is and is not. Historical and contemporary models, perspectives, and schools.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 120W. Sociological Theory. 4 Units.**

What a theory of society is and is not. Historical and contemporary models, perspectives, and schools.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Sociology Majors have first consideration for enrollment.

(Ib)



**SOCIOL 129. Special Topics: Theory. 4 Units.**

Studies in selected areas of theory. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 134. Game Theory and Politics I. 4 Units.**

Introduction to game theory and a survey of its political applications. Examples of topics covered include voting in small committees, legislatures, and mass elections; interest group activities and environmental issues; institutional design, and the evolution of cooperative behavior.

Same as POL SCI 130A, SOC SCI 103A.

Restriction: Social Policy/Public Service Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment. International Studies Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**SOCIOL 135. Social Psychology of Networks. 4 Units.**

Review of network methods used in small group and organizational research. Discussion of social psychological literature relevant to the network of study of cognitive social structure, exchange/communication, identity negotiation, and social control. Case study of network datasets exemplifies research issues.

Same as PSYCH 178N.

Restriction: Sociology Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**SOCIOL 136. Religious Traditions of Asian Americans. 4 Units.**

Studies the religious traditions of Asian Americans, focusing on the transplantation of religious institutions, establishment of sacred spaces, celebration of religious holidays, socialization of children, as well as birth, marriage, gender relations, death, family.

Same as ASIANAM 143.

**SOCIOL 138. Business Decisions. 4 Units.**

Surveys normative and descriptive models of decision-making behavior, with an emphasis on organizational and policy contexts. Topics include rational choice theory, biases and heuristics, framing effects, and overconfidence. Management fads, panics, and herd behavior are also discussed.

Prerequisite: (ANTHRO 10A and ANTHRO 10B and ANTHRO 10C) or (SOCIOL 10A and SOCIOL 10B and SOCIOL 10C) or (SOC SCI 10A and SOC SCI 10B and SOC SCI 10C) or (MATH 2A and MATH 2B and (STATS 7 or MGMT 7)) or (STATS 120A and STATS 120B and STATS 120C) or (ECON 15A and ECON 15B)

Same as ECON 148.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 139. Special Topics: Social Psychology. 4 Units.**

Studies in selected areas of social psychology. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 141. Organizations. 4 Units.**

How bureaucracies, formal organizations, and voluntary associations work, how/why they grow, and where they are going. History and structure of organizational rationality; dynamics of organized groups; behavior in organizations; limits of bureaucratization and attempts to overcome these limits through decentralization.

Same as POL SCI 155C.

Restriction: Sociology Majors have first consideration for enrollment. Political Science Majors have first consideration for enrollment.

**SOCIOL 142. White-Collar Crime. 4 Units.**

Examines criminal activity in business and corporate enterprise, organizations, and the professions. Theories regarding the causes and control of white-collar and corporate crime are covered as well as the numerous definitions of these terms.

Same as CRM/LAW C142.

Restriction: Sociology Majors have first consideration for enrollment. Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment.

**SOCIOL 143. Social Networks and Social Support. 4 Units.**

Examines the manner in which behaviors/attitudes of individuals are affected by their network ties to others. How are peoples' opportunities and well-being increased/decreased by their social networks? May include studies in mental/physical health, job seeking, separation and loss, and aging.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 144. Politics, Power, and Society. 4 Units.**

Includes an examination of the major theoretical approaches to political sociology, and the application of these ideas to the politics of advanced capitalist societies. Also considers stability and change in power structures.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 145. Occupations and Professions. 4 Units.**

What makes some jobs satisfying and others boring? How does technology influence the workplace? What changes are coming in the U.S. job market? Sociology and psychology of occupations. Students interview workers and study aspects of their occupations.

Restriction: Upper-division students only. Sociology Majors have first consideration for enrollment.

**SOCIOL 145W. Occupations and Professions. 4 Units.**

What makes some jobs satisfying and others boring? How does technology influence the workplace? What changes are coming in the U.S. job market? Sociology and psychology of occupations. Students interview workers and study aspects of their occupations.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Sociology Majors have first consideration for enrollment.

**(Ib)****SOCIOL 149. Special Topics: Structures. 4 Units.**

Studies in selected areas of structures. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 150. Sociological Lens on Religion. 4 Units.**

Examines the effects of religious beliefs, belonging, and institutions on social dynamics, including class, gender, and racial stratification, politics, and social movements. Additional topics: the sociological significance of conversion, commitment, and secularization/sacralization.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 151. Social Inequalities and Health. 4 Units.**

Introduces ways in which social inequalities produce health disparities. Begins with general perspectives on social causation of health, and then considers how particular individual attributes (e.g., gender, SES, race/ethnicity, nativity) and social contexts (e.g., neighborhoods) can get "under the skin."

**SOCIOL 154. Medical Sociology. 4 Units.**

Current problems in U.S. health-care system and proposals for reform. Examines financial barriers to access; problem of patient dumping; underinsurance; prenatal and perinatal care; child services; preventative care and needs of the elderly; minorities; low-income people; undocumented.

Same as PUBHLTH 135.

Restriction: Upper-division students only. Sociology Majors have first consideration for enrollment.

**SOCIOL 154W. Medical Sociology. 4 Units.**

Current problems in U.S. health-care system and proposals for reform. Examines financial barriers to access; problem of patient dumping; underinsurance; prenatal and perinatal care; child services; preventative care and needs of the elderly; minorities; low-income people; undocumented.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Sociology Majors have first consideration for enrollment.

(Ib)

**SOCIOL 155B. Baseball and Society. 4 Units.**

An examination of baseball's role in American social life over the last 150 years. Issues of fraternal organizations, national development, capitalism, rationalization, race and ethnicity, gender, economic organization, labor relations, and politics are discussed.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 155BW. Baseball and Society. 4 Units.**

An examination of baseball's role in American social life over the last 150 years. Issues of fraternal organizations, national development, capitalism, rationalization, race and ethnicity, gender, economic organization, labor relations, and politics are discussed.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Sociology Majors have first consideration for enrollment.

(Ib)

**SOCIOL 156. Deviance. 4 Units.**

Perspectives on deviance and criminality in behavior, institution, community, and myth. The suitability of contemporary theories of deviant behavior.

Same as CRM/LAW C107, PSYCH 177D.

Restriction: Criminology, Law and Society Majors have first consideration for enrollment. Social Ecology Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

**SOCIOL 157A. Sociology of Education. 4 Units.**

Focuses on education's role in creating and redressing inequality, and in shaping how we understand our place in society. Education from cross-national and historical perspectives, and education as a vehicle for examining and solving social problems. Course may be offered online.

**SOCIOL 157AW. Sociology of Education. 4 Units.**

Focuses on education's role in creating and redressing inequality, and in shaping how we understand our place in society. Education from cross-national and historical perspectives, and education as a vehicle for examining and solving social problems.

Overlaps with SOCIOL 157A.

(Ib)

**SOCIOL 157C. Comparing European and US Societies. 4 Units.**

Society, culture, institutions of U.S. and European countries. Fertility to football, guns to government, work to welfare, health to housework. Cross-national approaches for understanding the world and thinking critically about taken-for-granted practices. Policies the U.S. might borrow for social issues.

Same as INTL ST 157C.

**SOCIOL 158C. Money, Work, and Social Life . 4 Units.**

Sociological perspective on issues related to money and work. Consumption practices and lifestyles, jobs and organizations, issues of money in intimate relations, marriage, and households, illegal work, discrimination, economic globalization are discussed.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 158CW. Money, Work, and Social Life. 4 Units.**

Sociological perspective on issues related to money and work. Consumption practices and lifestyles, jobs and organizations, issues of money in intimate relations, marriage, and households, illegal work, discrimination, economic globalization are discussed.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Sociology Majors have first consideration for enrollment.

(Ib)

**SOCIOL 159. Special Topics: Social Institutions and Culture. 4 Units.**

Studies in selected areas of social institutions and culture. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 161. Sociology of Sex and Gender. 4 Units.**

Explores complex processes contributing to social construction of gender and sexuality in the U.S. with focus on intersection of gender, race, ethnicity, sexuality, and class; evaluates how men and women are differentially constituted in family, education, work, politics, media, language.

**SOCIOL 161W. Sociology of Sex and Gender. 4 Units.**

Explores complex processes contributing to social construction of gender and sexuality in the U.S. with focus on intersection of gender, race, ethnicity, sexuality, and class; evaluates how men and women are differentially constituted in family, education, work, politics, media, language.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

(Ib)

**SOCIOL 164. Sociology of Aging . 4 Units.**

Introduction to sociology of age, aging, and the aged. Problems posed by aging population. Life course transitions and how social organizations influence the life course. Addresses work, health, and family in later life.

Overlaps with SOCIOL 164W.

Restriction: Upper-division students only. Sociology Majors have first consideration for enrollment.

**SOCIOL 164W. Sociology of Aging . 4 Units.**

Introduction to sociology of age, aging, and the aged. Problems posed by aging population. Life course transitions. How social organizations influence the life course. Work, health, family in later life.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Sociology Majors have first consideration for enrollment.

(Ib)

**SOCIOL 166. Immigration and Inequality. 4 Units.**

Explores immigration, ethnicity, and inequality as interconnected social forces. International migration, propelled by global inequalities, plays a central role in the formation of multinational societies, shapes inter-group relations and patterns of ethnic inequality, and transforms the immigrants themselves.

Same as SOC SCI 168B.

**SOCIOL 167A. Racial and Ethnic Relations in the United States. 4 Units.**

Examines central questions and issues in the field of race and ethnicity; the emergence, maintenance, and consequences of the ethnic and racial stratification system in the United States; the future of racial and ethnic relations; and relevant public policy issues.

Same as CHC/LAT 148.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**SOCIOL 167AW. Racial and Ethnic Relations in the United States. 4 Units.**

Examines central questions and issues in the field of race and ethnicity; the emergence, maintenance, and consequences of the ethnic and racial stratification system in the United States; the future of racial and ethnic relations; and relevant public policy issues.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as CHC/LAT 148W.

Restriction: Chicano/Latino Studies Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

(Ib)

**SOCIOL 169. Special Topics in Age, Gender, Race, and Ethnicity. 4 Units.**

Studies in selected areas of age, gender, race, and ethnicity. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 170A. Vietnam War. 4 Units.**

Examines social structures and social changes in Vietnamese and U.S. societies through the study of the Vietnam War.

Same as INTL ST 143A.

**SOCIOL 170B. U.S. War on Terrorism. 4.0 Units.**

Analyzes the United States war on terrorism by focusing on terrorism, the U.S. wars in Afghanistan and Iraq, and changes in police powers through the Patriot Act, as well as the political leadership which directs the war.

Same as INTL ST 175A.

**SOCIOL 171. Environment and Society. 4 Units.**

Examines society's changing relationship to the natural world. Delineates different models of 'nature' and then explores their institutional roots, the social responses they have generated, and their implications for social inequality.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 172. Revolution and Social Transformation in China. 4 Units.**

Introduces the major political events in Mao's communist revolution and the social transformations afterward. Helps students understand the historic and political landscape from which China is now departing.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 173. Social Inequality. 4 Units.**

Sources, functions, and dynamics of the unequal distribution of wealth, prestige, knowledge, and power in American and other societies.

Overlaps with SOCIOL 173W.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 173W. Social Inequality. 4 Units.**

Sources, functions, and dynamics of the unequal distribution of wealth, prestige, knowledge, and power in American and other societies.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Overlaps with SOCIOL 173.

Restriction: Upper-division students only.

**(Ib)**

**SOCIOL 174. Protests, Movements, and Revolutions. 4 Units.**

A survey of models of collective action drawn from sociology, economics, psychology, and political science. Focus on areas such as social movements, strikes, crowd psychology, cults, fads, fashions, public opinion, and symbolic and mythical elements in collective culture.

Prerequisite: SOCIOL 1 or POL SCI 11A or ECON 1

Same as POL SCI 156D.

Restriction: Political Science Majors have first consideration for enrollment. Sociology Majors have first consideration for enrollment.

**SOCIOL 175B. China in the Global Age. 4 Units.**

Chinese society from 1949 to present. Social change in the context of political control and ideological considerations. Focus on the power structure, political decision processes, and ideological legitimation, and interplay with the Chinese community and its culture.

Same as INTL ST 158D.

**SOCIOL 176. International Divided Cities. 4 Units.**

Investigates urban divisions in international cities where deep-seated nationalistic ethnic differences create pressures for intergroup conflicts, autonomy, or territorial separation, and can incite violence. Urban political polarization as it is manifest in the urban setting.

Same as POL SCI 157B, UPPP 178.

**SOCIOL 177. Immigration and Social Policy. 4 Units.**

Explains how people decide to migrate and how they are incorporated into a host society (both historically and currently), examines the effects of immigration on the U.S., analyzes how the framing of immigration shapes the discourse about the issue.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 177C. Undocumented Immigrant Experiences. 4 Units.**

Examines the experiences of undocumented immigrants and the policies that structure their educational, economic, social, and political participation.

Same as ASIANAM 130, CRM/LAW C187, CHC/LAT 164A.

(III and VII ).

**SOCIOL 177W. Immigration and Social Policy. 4 Units.**

Explains how people decide to migrate and how they are incorporated into a host society (both historically and currently), examines the effects of immigration on the U.S., analyzes how the framing of immigration shapes the discourse about the issue.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Sociology Majors have first consideration for enrollment.

(Ib)

**SOCIOL 179. Special Topics: Societies and Social Inequality. 4 Units.**

Studies in selected areas of societies and social inequality. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 180A. Sociology Majors Seminar. 4 Units.**

Students learn sociology by doing it. A modest-sized research project is planned and implemented by each student.

Prerequisite: SOCIOL 110

Restriction: Sociology Majors only.

**SOCIOL 180AW. Sociology Majors Seminar. 4 Units.**

Students learn sociology by doing it. A modest-sized research project is planned and implemented by each student.

Prerequisite: SOCIOL 110. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Sociology Majors only.

(Ib)

**SOCIOL 188BW. Honors Research and Thesis. 4 Units.**

Focuses on the design and implementation of individual research projects undertaken by senior Sociology majors. Writing projects consist of a proposal and paper on some empirical research.

Prerequisite: SOCIOL H188A. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Sociology Honors students only.

(Ib)

**SOCIOL H188A. Honors Research and Thesis. 4 Units.**

Focuses on the design and implementation of individual research projects undertaken by senior Sociology majors. Writing projects consist of a proposal and paper on some empirical research.

Restriction: Sociology Honors students only.

**SOCIOL 189. Special Topics: Honors Sequence. 4 Units.**

Independent honors research with Social Sciences faculty.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Sociology Majors have first consideration for enrollment.

**SOCIOL 197. Field Study. 4 Units.**

Field study with Sociology faculty.

Repeatability: May be repeated for credit unlimited times.

**SOCIOL 198. Directed Group Study . 4 Units.**

Directed study with Sociology faculty.

Repeatability: May be repeated for credit unlimited times.

**SOCIOL 199. Independent Study. 1-4 Units.**

Independent research with Sociology faculty.

Repeatability: May be repeated for credit unlimited times.

**SOCIOL 202A. Proseminar I in Sociology. 1 Unit.**

Introduces first-year graduate students in Sociology to the current research interests of Sociology faculty, as well as to other aspects of graduate life at UCI and to the profession of sociology more generally.

Restriction: Graduate students only.

**SOCIOL 202B. Proseminar II in Sociology. 4 Units.**

Focus is on second-year research projects, design, development, data gathering, analysis, and preparing oral and written presentations of the results. Students learn analytic and writing skills, gain experience with research processes, and become socialized about professional standards, customs, and institutions.

Restriction: Graduate students only.

**SOCIOL 210A. Classical Social Theory. 4 Units.**

Examines the development of classical sociological theory through the writings of Karl Marx, Emile Durkheim, Max Weber, Georg Simmel, and George Herbert Mead.

Restriction: Graduate students only.

**SOCIOL 210B. Contemporary Social Theory. 4 Units.**

Familiarizes students with 20th-century developments in social thought that have influenced sociological research, suggesting 'what is living and what is dead' in the 'classics' and offering an overview of the main outlines of recent sociological theorizing.

Restriction: Graduate students only.

**SOCIOL 211A. Sociology of Gender. 4 Units.**

An introduction to the sociology of gender in the U.S. and globally. The social construction of gender and sexuality; theoretical perspectives and feminist frameworks. Theories of economy, patriarchy, and race, and the social positions of women and men.

Restriction: Graduate students only.

**SOCIOL 212. Network Theory. 4 Units.**

An introduction to theoretical work in the field of social networks. Topics include baseline models, homophily, and propinquity, exchange and power, balance theory, diffusion and social influence, equivalence, and cohesion. Deductive use of theory to make novel predictions is emphasized.

Restriction: Graduate students only.



**SOCIOL 219. Special Topics: Theory. 2-4 Units.**

Studies in selected areas of theory. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 220A. Research Design. 4 Units.**

Data collection, organization, and analysis in ethnographic or quasi-experimental settings, including interviewing, participant observations, behavior observations, and questionnaires. Research design issues include sampling, longitudinal research, and comparative research. Emphasis on the integration of qualitative and quantitative data.

Overlaps with SOCIOL 265.

Restriction: Graduate students only.

**SOCIOL 221A. Graduate Statistics I. 4 Units.**

Statistics with emphasis on applications in sociology and anthropology. Examines exploratory uses of statistical tools in these fields as well as univariate, bivariate, and multivariate applications in the context of the general linear model.

Restriction: Graduate students only.

**SOCIOL 221B. Graduate Statistics II. 4 Units.**

Statistics with emphasis on applications in sociology and anthropology. Examines exploratory uses of statistical tools in these fields as well as univariate, bivariate, and multivariate applications in the context of the general linear model.

Prerequisite: SOCIOL 221A

Restriction: Graduate students only.

**SOCIOL 221C. Graduate Statistics III. 4 Units.**

Statistics with emphasis on applications in sociology and anthropology. Examines exploratory uses of statistical tools in these fields as well as univariate, bivariate, and multivariate applications in the context of the general linear model.

Prerequisite: SOCIOL 221A and SOCIOL 221B

Restriction: Graduate students only.

**SOCIOL 222A. Comparative and Historical Sociological Methods. 4 Units.**

Topics include the logic of comparative and historical analysis techniques and the examination of exemplar works in representative problem areas.

Restriction: Graduate students only.

**SOCIOL 224. Interview Methods . 4 Units.**

Hands-on introduction to the use of interviews in social scientific research. Topics include when to use interviews and/or focus groups; how to design an interview-based study, how to conduct interviews, analyze interview data, and write up and publish interview-based results.

Restriction: Graduate students only.

**SOCIOL 226A. Methods of Demographic Analysis. 4 Units.**

Introduces basic demographic methods used in social science and public health research. Topics include sources and limitations of demographic data; components of population growth; measures of nuptiality, fertility, mortality, and population mobility projection methods; and demographic models.

Same as PUBHLTH 209.

Restriction: Graduate students only.

**SOCIOL 227A. Seminar Ethnographic & Qualitative Field Methods. 4 Units.**

Comprehensive and critical discussion of the traditions of qualitative fieldwork; detailed examination of the collection, coding, analysis, and presentation of ethnographic/qualitative field data; and close mentoring of student projects culminating in an original research paper.

Grading Option: In Progress (Letter Grade with S/U).

Restriction: Graduate students only.

**SOCIOL 227B. Seminar Ethnographic & Qualitative Field Methods. 4 Units.**

Comprehensive and critical discussion of the traditions of qualitative fieldwork; detailed examination of the collection, coding, analysis, and presentation of ethnographic/qualitative field data; and close mentoring of student projects culminating in an original research paper.

Prerequisite: SOCIOL 227A

Restriction: Graduate students only.

**SOCIOL 229. Special Topics: Methods . 1-4 Units.**

Studies in selected areas of methods. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 230A. Race and Ethnicity. 4 Units.**

An examination of central questions and issues in the field of race and ethnicity through a critical analysis and discussion of the principal theoretical perspectives and paradigms that have framed much of the scholarship in the area.

Restriction: Graduate students only.

**SOCIOL 232. Inequality. 4 Units.**

Theoretical and empirical approaches to the study of social and economic inequality, with special attention to race/ethnicity, class, and gender.

Restriction: Graduate students only.

**SOCIOL 234. Ethnic America. 4 Units.**

Examines critically the meaning and measurement of ethnicity, race, and nation in sociological theory and research. Theories of ethnicity are explored, along with empirical studies of the construction of ethnic and pan-ethnic identities in historical and contemporary contexts.

Same as CHC/LAT 223.

Restriction: Graduate students only.

**SOCIOL 235. Poverty and Development . 4 Units.**

Examines competing conceptualizations, methods of measurement, and poverty alleviation strategies widely used in developing countries. Focuses on poverty conceptualized as economic deprivation, well-being, vulnerability, and social exclusion.

Same as UPPP 251.

Restriction: Graduate students only.

**SOCIOL 237. Educational Inequality. 4 Units.**

Focuses on macro-level explanations of inequality of schooling, particularly in the U.S. context. Explores traditional models, such as conflict, functionalism, status-attainment, cultural reproduction, and newer synthetic accounts. Emphasis on higher education access and the intersection of education and work.

Restriction: Graduate students only.

**SOCIOL 239. Special Topics: Social Inequality. 2-4 Units.**

Studies in selected areas of social inequality. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 240A. Social Movements. 4 Units.**

A survey of the field of Social Movements, oriented around critical themes in the major theoretical traditions and contemporary exemplars.

Restriction: Graduate students only.

**SOCIOL 241A. Political Sociology. 4 Units.**

Begins with an examination of the three major orientations to the State (Pluralist, Elitist, and Class). Next considers current topics in political sociology including the Welfare State, the New Deal, political behavior, social movements, participation, and democracy.

Restriction: Graduate students only.

**SOCIOL 242. Sociology of Culture. 4 Units.**

Major perspectives in the sociology of culture. Topics include the role of cultural dynamics in the reproduction of inequality, collective action, political and organizational decision making, emotional experience, and the social impacts of new technologies.

**SOCIOL 249. Special Topics: Political Sociology and Social Movements. 2-4 Units.**

Studies in selected areas of political sociology and social movements. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 252A. Global Urbanization. 4 Units.**

Examines the spread of cities worldwide in the 20th century. What are the political and economic causes of this process? What are the social-cultural, political, and economic effects? How is contemporary urbanization linked to global restructuring of other kinds.

Same as UPPP 273.

Restriction: Graduate students only.

**SOCIOL 259. Special Topics: Global Studies and Comparative Development. 2-4 Units.**

Studies in selected areas of global studies and comparative development. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 262A. Population. 4 Units.**

Introduces the interrelationships between population and social organization. Considers measurement and explanation of historical and contemporary trends in birth rates, death rates, migration, and marriage and divorce. Case material is drawn primarily from the U.S. and other industrialized nations.

Restriction: Graduate students only.

**SOCIOL 264. Immigrant America. 4 Units.**

The study of the causes and consequences of international migration has become one of the most vital fields of sociological theory and research. Examines principal theoretical perspectives and empirical research on contemporary immigration flows and the processes of incorporation.

Same as CHC/LAT 224.

Restriction: Graduate students only.

**SOCIOL 265. DASA Research Design. 4 Units.**

Data collection, organization, and analysis in population studies and demography. Research design issues include sampling, longitudinal research, and comparative research.

Prerequisite: Enrollment in DASA program.

Overlaps with SOCIOL 220A.

Restriction: Graduate students only.

**SOCIOL 268. Crimmigration. 4 Units.**

Examines the criminalization of immigration, with an emphasis on U.S. enforcement procedures and outcomes. Analyzes the devolution of federal immigration law to local authorities, the rise in immigrant detention and deportation, and the militarization of the U.S.-Mexico border.

Same as CHC/LAT 225, CRM/LAW C258.

Restriction: Graduate students only.

**SOCIOL 269. Special Topics: Social Demography. 4 Units.**

Studies in selected areas of social demography. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 279. Special Topics: Social Organizations and Institutions. 2-4 Units.**

Studies in selected areas of social organizations and institutions. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 280. Analysis of Social Network Data. 4 Units.**

Overview and application of methods for analyzing social network data. Topics include: data structures, visualization, graph theory, centrality, subgroups, positions, blockmodels, local properties, and statistical models. Social network analysis software is used to analyze a range of examples.

Restriction: Graduate students only.

**SOCIOL 281. Introduction to Social Networks. 4 Units.**

Provides a broad overview of the history, concepts, and applications of social networks. Students have the opportunity to delve deeply into applications of the network approach in their individual areas of interest.

Restriction: Graduate students only.

**SOCIOL 282. Theorizing Illegality and the Experiences of Undocumented Immigrants. 4 Units.**

Examines theories of illegality and citizenship, historical and contemporary undocumented immigrant experiences, and methodological concerns in this area of study.

Same as CHC/LAT 222.

Restriction: Graduate students only.

**SOCIOL 289. Special Topics . 2-4 Units.**

Studies in selected areas of Social Sciences. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**SOCIOL 290. Dissertation Research. 1-12 Units.**

Dissertation research with Sociology faculty.

Repeatability: May be taken for credit 10 times.

Restriction: Graduate students only.

**SOCIOL 299. Independent Study. 1-12 Units.**

Independent research with Sociology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Sociology, B.A.

Sociology studies patterns of relationships among people, how behavior is shaped by these patterns of relationships, and how conflicts and cooperation among groups affect social structure and effect social change. Sociology majors are introduced to the most important ideas, methods, and findings of sociology in the introductory courses, explore basic subareas of sociology in the lower division courses, and pursue specialized study in the upper-division courses.

In research and teaching, the Department's faculty emphasize empirical sociological research in such areas as small groups, organizations, work, art, world systems, gender, family, and social networks.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

**Departmental Requirements for the Major**

School requirements must be met and must include 12 courses (48 units) as specified below:

A. Complete the following:

SOCIOL 1	Introduction to Sociology
SOCIOL 2	Globalization and Transnational Sociology

or SOCIOL 3	Social Problems
B. Complete one course in methods and one in theory:	
SOCIOL 110	Research Methods
SOCIOL 120	Sociological Theory
C. Complete one course in research design and implementation:	
SOCIOL 180A	Sociology Majors Seminar
D. Complete seven SOCIOL courses, of which no more than three may be lower-division.	
E. Complete three additional School of Social Sciences courses, of which no more than one may be lower-division.	

The Honors Program in Sociology is open to outstanding Sociology majors during their junior or senior year. To gain admission to the program, potential honors students normally take Sociology courses in theory (SOCIOL 120), methods (SOCIOL 110), statistics (SOCIOL 10A-SOCIOL 10B-SOCIOL 10C or equivalent) and at least two Sociology core courses. Students who receive an average grade of 3.5 or better in these courses are eligible for the honors program. In addition, honors students should have a grade point average of 3.2 or better in all courses taken at UCI. Majors who are transfers may petition for entry into the program based on their grades from their former schools.

During their junior or senior year, honors program students write a thesis, designed and carried out under faculty supervision. projects normally entail some empirical analysis of sociological data. Students meet regularly in a two-quarter honors seminar to design and carry out these projects, to exchange ideas, and to help analyze each other's work (SOCIOL H188A-SOCIOL 188BW satisfies Sociology major requirement C: Honors students do *not* have to take SOCIOL 180A). In addition, honors students are required to attend at least six Sociology colloquia and subsequent meetings to discuss relevant sociological issues. Upon successful completion of the program, including approval of an honors thesis by the faculty mentor and honors instructor and receiving a grade of B+ or higher in SOCIOL 188BW, students graduate with honors in Sociology.

## Sociology, Minor

Sociology studies patterns of relationships among people, how behavior is shaped by these patterns of relationships, and how conflicts and cooperation among groups affect social structure and effect social change.

### Sociology Minor Requirements

Requirements for the minor are met by taking seven Sociology courses (28 units) as specified below:

A. Complete the following:	
SOCIOL 1	Introduction to Sociology
SOCIOL 2	Globalization and Transnational Sociology
or SOCIOL 3	Social Problems
B. Complete one course in methods and one in theory:	
SOCIOL 110	Research Methods
SOCIOL 120	Sociological Theory
C. Select three SOCIOL courses, of which no more than two may be lower-division.	
<b>Lower-Division Courses</b>	
SOCIOL 2-79 <sup>1</sup>	
<b>Upper-Division Courses</b>	
SOCIOL 112-199 <sup>2</sup>	
SOCIOL 121-179 <sup>2</sup>	

<sup>1</sup> Cannot count SOCIOL 2 if used to complete section A., or cannot count SOCIOL 3 if used to complete section A.

<sup>2</sup> SOCIOL 110 and SOCIOL 120 cannot be used to fulfill this requirement.

## Sociology, Ph.D.

The Department of Sociology offers a Ph.D. program in Sociology. Particular emphases include social networks, gender, race/ethnicity, labor, social movements, family, migration, population, political economy, and states and global transformation. The program provides structured training in sociological theory, statistics, and qualitative and quantitative research methods. While the core of the program is sociological, it may also include an interdisciplinary component, incorporating links to anthropology, education, law, political science, history, criminology, and urban planning. Small entering cohorts ensure personalized attention for each student and guarantee access to professors, allowing for close mentorship relationships. Program faculty take diverse theoretical and methodological approaches to a variety of substantive issues, are committed to empirical research addressing central sociological issues, and are open to intellectual cross-pollination from cognate disciplines.

Graduate students have the opportunity to participate in a variety of interdisciplinary research units, including the Center for the Study of Democracy; the Center for Global Peace and Conflict Studies; the Center for Research on Immigration, Population and Public Policy; and the Center for Demographic

and Social Analysis. The Sociology Department maintains ties with Gender and Sexuality Studies and various ethnic studies programs, such as Asian American studies, Chicano/Latino studies, and African American studies. Research and funding opportunities are also available through UC-wide programs like Pacific Rim Studies and the Humanities Research Institute located on the UCI campus.

Students in the program come from diverse educational, ethnic, geographical, and social backgrounds. The deadline for applications to receive full funding consideration for fall admission is December 1. Students are admitted for winter and spring quarter only under exceptional circumstances. Admission is based on application materials and evidence of scholarly potential, including grade point average, GRE scores, statement of purpose, and letters of recommendation.

Students must complete a two-quarter proseminar, a course in research design, a three-quarter statistics sequence, one seminar each in classical and contemporary theory, an advanced sociological methodology course, and nine Sociology seminars selected in consultation with the student's advisor, in order to build competency in two areas of specialization in the discipline. Course work prepares students to complete an independent research project, which is presented in oral and written form during the winter quarter of their second year. Students must pass a formal evaluation at the end of their second year involving assessment of course work and the second-year research project and evaluation of teaching or research experience.

Knowledge of one foreign language is required. All required course work must be completed prior to advancement to candidacy. The normative time to advance to candidacy is four years. The advancement-to-candidacy examination is based on field examinations in two broad areas of sociology and an oral defense of a dissertation research prospectus, contextualized in the appropriate literature and including a discussion of data collection and methods of analysis. In preparation, students usually take at least the required one quarter of the Dissertation Seminar course during the third year. After advancing to candidacy, students are expected to work in close consultation with their advisor and dissertation committee. Committee approval of a satisfactory dissertation follows a final oral defense of the document. The normative time for completion of the Ph.D. is six years, and the maximum time permitted is eight years.

### Program in Law and Graduate Studies (J.D./Ph.D.)

Highly qualified students interested in combining the study of law with graduate research and/or professional qualifications in Sociology are invited to undertake concurrent degree study under the auspices of UC Irvine's Program in Law and Graduate Studies (PLGS). Students in this program pursue a coordinated curriculum leading to a J.D. from the School of Law in conjunction with a Ph.D. in Sociology. Additional information is available from the PLGS director's office, 949-824-4158, or by email to [plgs@law.uci.edu](mailto:plgs@law.uci.edu). A full description of the program, with links to all relevant application information, can be found at the School of Law Concurrent Degree Programs website (<http://www.law.uci.edu/academics/interdisciplinary-studies/concurrent-degrees.html>).

## Social Policy and Public Service, B.A.

**Jeanett Castellanos, Director**

2231 Social Science Plaza B

949-824-6298

<http://www.spps.socsci.uci.edu/>

The major in Social Policy and Public Service (SPPS) provides an interdisciplinary perspective on the study of policies and society at the individual and group levels. Students can select one of three focus areas while completing their upper-division work: (1) Education, (2) Governance, or (3) Health. The curriculum emphasizes social welfare, social structures, and public policy to facilitate in-depth analysis of complex social issues while generating real-world skills and application capacities. Centered in a scientist-practitioner model, field placements at local non-profit and government agencies, community action research, and internships offer valuable experiential learning that promotes critical decision-making and problem-solving skills.

The curriculum for the major exposes students to various social science methods and topics, teaching applied computer-based research and statistical analyses; internship experiences in community, public, and educational organizations; and a more in-depth understanding of social science research and methodology. To ensure competency in a specific area of interest, students choose one of three focus areas: (1) Education, (2) Governance, or (3) Health.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Requirements for the Major

School requirements must be met and must include 15 courses (60 units) as specified below. Students must take all required courses for the major for a letter grade.

A. An understanding of the fundamental concepts, analytical tools, and methods of social science:

SOC SCI 1A	Principles in the Social Sciences
SOC SCI 2A	Introduction to Social Science Analysis
SOC SCI 3A	Computer-Based Research in the Social Sciences

B. One course in Introduction to Social Policy and Public Service:

SOC SCI 40	Social Policy and Public Service
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## C. One course in Cultural Competency:

SOC SCI 70C or SOCIOL 63	Comparing Cultures Race and Ethnicity
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## D. One course in Leadership:

SOC SCI 181A	Ethical Leadership
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## E. Two courses in Research Methods:

SOC SCI 102A	Introduction to Geographic Information Systems in Social Sciences
SOC SCI 170A	Research Methods in the Social Sciences

## F. Three quarters of Field Studies:

SOC SCI 193A- 193B- 193C	Field Studies in Social Policy and Public Service and Field Studies in Social Policy and Public Service and Field Studies in Social Policy and Public Service (must be taken consecutively)
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## G. Four units of off-campus internship experience:

SOC SCI 194A	Public Service Internship
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## H. Functional Focus: 12 units in one of the following areas:

**Education:**

EDUC 124	Multicultural Education in K-12 Schools
EDUC 126	Ethics and Education
EDUC 132	Reading and Writing Enrichment for After-School Programs
EDUC 150	Changing the High School Experience
EDUC 157	Educational Research and Evaluation
EDUC 175	Foundations of Education
EDUC 180	Interdisciplinary Topics in Education
CHC/LAT 189	Special Topics in Educational Policy and Issues
ECON 158	Economics of Education
PSYCH 141J-PSYCH 141K-PSYCH 141L	and and
SOC SCI 196	Global Connect

**Governance:**

ANTHRO 121G	Political Anthropology
ANTHRO 121J	Urban Anthropology
INTL ST 161A	Political Islam
INTL ST 165	Introduction to Contemporary Middle East Politics
INTL ST 177C	Revolution in Latin America
INTL ST 177E	Cuban Society and Revolution
POL SCI 122A	American Metropolitan Politics
POL SCI 122B	California Politics
POL SCI 124A	The Politics of Protest
POL SCI 124B	Latinos in U.S. Politics
POL SCI 124C	Comparative Minority Politics
POL SCI 124E	African American Politics
POL SCI 125A	The United States Congress
POL SCI 126C	U.S. Immigration Policy
POL SCI 126D	Urban Politics and Policy
POL SCI 130A	Game Theory and Politics I
POL SCI 130B	Game Theory and Politics II
POL SCI 137B	
POL SCI 142D	U.S. Foreign Policy I: Globalism and Cold War
POL SCI 151H	Voting and Political Manipulation
POL SCI 171A	
POL SCI 171D	American Constitutional Law
POL SCI 171F	Law in the Twenty-First Century



POL SCI 172A	International Law
POL SCI 174A	Civil Liberties
POL SCI 174C	U.S. Supreme Court
POL SCI 179	Special Topics in Public Law
SOC SCI 152A	Non-Government Organization (NGO) Fundamentals
SOC SCI 188A	Introduction to Contemporary Middle East Politics
SOCIOL 138	Business Decisions
SOCIOL 141	Organizations
SOCIOL 144	Politics, Power, and Society
SOCIOL 177W	Immigration and Social Policy
<b>Health:</b>	
ANTHRO 128B	Race, Gender, and Science
ANTHRO 132A	Psychological Anthropology
ANTHRO 134A	Medical Anthropology
ANTHRO 134G	HIV/AIDS in a Global Context
CHC/LAT 168	Chicano/Latino Social Psychology
CHC/LAT 179	Special Topics in Health, Medicine, and Psychosocial Dynamics
PSYCH 120A	Abnormal Psychology
PSYCH 120D	Developmental Psychology
PSYCH 121S	Psychology of Sleep and Consciousness
PSYCH 174E	African American Psychology
SOCIOL 135	Social Psychology of Networks
SOCIOL 154	Medical Sociology

NOTE: Certain special topics courses may be applicable to this major; students should see their undergraduate advisor prior to enrolling in a special topics course to ensure that it meets the requirements. SOC SCI 184A Sage Leader Research I-SOC SCI 184B Sage Leader Research II may not be used to satisfy school requirements.

## Honors Program

The honors program allows majors to engage in research leading to the completion of an honors thesis. The topic for the honors thesis, reflecting a social science theme, is determined by the student in consultation with a faculty advisor. In addition to satisfying the requirements for the major, honors program participants must complete additional course work as specified below.

The honors program is composed of three four-unit courses: SOC SCI H190A Honors Research Workshop, SOC SCI H190B Honors Thesis Research, and SOC SCI H190C Honors Thesis. Satisfactory completion of the honors thesis course also satisfies the upper-division writing requirement. The honors program is open to all junior and senior Social Policy and Public Service majors with an overall GPA of 3.20 and a 3.50 GPA in at least five Social Science courses.

The schedule of courses for the honors program is as follows:

1. During the spring quarter of the junior year or the summer prior to the senior year, students formally apply to the honors program through the School of Social Sciences Undergraduate Student Affairs Office.
2. In the fall quarter of the senior year, students enroll in SOC SCI H190A. This course ends with each student writing a research plan for the honors thesis. Students also select a faculty mentor who has agreed to supervise the research and evaluate the final version of their honors thesis.
3. In the winter quarter of the senior year, students enroll in SOC SCI H190B, attend class and work with their faculty mentor, who supervises and evaluates data collection and analysis.
4. In the spring quarter of the senior year, students enroll in SOC SCI H190C, attend class and work with their faculty mentor to complete the final version of their honors thesis.

## Pi Gamma Mu: International Honor Society

The International Honor Society in Social Sciences is the oldest and preeminent honor society in the social sciences with over 150 active chapters in the United States and overseas. The mission of Pi Gamma Mu at UC Irvine is to foster and honor superior scholarship in the Social Sciences and to encourage cooperation and social service among its members. The organization champions its members to pursue further education in their field and provides information and opportunities to help them achieve students achieve their professional goals. Its mission is to encourage and recognize superior scholarship in social science disciplines and to foster cooperation and social service among its members. For more information, call 949-824-9229.

## Social Science, M.A.

In addition to the departmental graduate programs, the School offers the M.A. in Social Science with concentrations in Demographic and Social Analysis and Medicine, Science and Technology Studies (<http://www.anthropology.uci.edu>).

### M.A. in Social Science with a Concentration in Demographic and Social Analysis

<http://www.demography.uci.edu>

The M.A. in Social Science with a concentration in Demographic and Social Analysis offers specialized training in the research skills to address practical problems confronting society, business, government, and the nonprofit sector. The concentration emphasizes the Pacific Rim and issues defining Southern California's population, such as immigration, changing household and family structure, racial and economic inequalities, and the impact of local and regional population growth. Informed by the interdisciplinary field of demography, the program draws on faculty and courses in the Schools of Social Sciences and Social Ecology.

#### Admission

Students are admitted to the program in the fall quarter. Students must hold a B.A. or B.S., normally in a social science or related field, and should have had at least four units of undergraduate statistics or equivalent mathematics courses. Students must meet the general admission requirements for graduate studies, which include official transcripts of all college course work, Graduate Record Examination scores for tests taken within the past five years, and three letters of recommendation. Applicants whose first language is not English must also take the Internet-based Test of English as a Foreign Language (TOEFL) and achieve a score of at least 80 out of 120. The International English Language Testing System (IELTS) examination may be used instead, in which case a minimum overall score of 7 out of 9 is required, with a score of not less than 6 out of 9 on any individual module.

#### Requirements

The M.A. requires 36 units of study and an oral exit examination. All students must complete 20 units of required courses which include one course in research design, one in demographic methods, one in populations, and two in statistics. In addition, students must complete 16 units of elective courses in population issues or research methods. No more than four units may be internship, independent study, directed readings, or thesis courses (to prepare for the oral examination). One or two electives may be upper-division undergraduate courses, with the remainder being graduate courses. All courses must be completed with a grade of B or better.

The M.A. in Social Science with a concentration in Demographic and Social Analysis may also be awarded to Ph.D. students who complete the necessary requirements.

For a list of the graduate courses in Social Science click on the 'Courses' tab above and scroll down to SOC SCI 209.

<http://www.anthropology.uci.edu>

**NOTE: Admission to the terminal M.A. in Medicine, Science, and Technology Concentration is currently closed. For more information,** visit the program website (<https://grad.uci.edu/academics/degree-programs/academic-masters/SocialScience-MedicineScienceandTechStudiesMA.php>).

The Department of Anthropology offers a Masters of Arts concentration in the School of Social Sciences focused on Medicine, Science, and Technology Studies, informally known as the M.A. in MSTs. Students who complete the program will earn an M.A. in Social Sciences (Medicine, Science, and Technology Studies).

This degree is the only terminal M.A. degree in either medical anthropology or science and technology studies in the University of California system. The program recognizes that these two fields and the social phenomena they examine are inextricably linked, and flexible course offerings provide students with an opportunity to pursue projects that focus on either field or that bridge both areas of study.

Ethnographers of medicine, science, and technology are in high demand, and the M.A. in MSTs will enable students to respond to the significant and rapidly changing impact of medicine, science, and technology upon economies and societies around the world. The program helps to prepare students for a range of employment opportunities in academia, public health, technology industries, and the nonprofit sector.

Students admitted for Fall 2014 will form the program's first cohort and will be enrolled in courses with current Ph.D. and possibly B.A. students. The program is administered by the Department of Anthropology, but draws on the expertise of faculty across the Irvine campus.

#### Requirements

##### Course Requirements

The M.A. in MSTs is a one-year program. Students will take three courses per quarter for a total of nine courses (36 units). All courses must be completed with a grade of B or better.

Required courses include:

1. ANTHRO 204A Proseminar in Medicine, Science, and Technology (4 units)
2. Eight elective courses (32 units) that may include:

- Approved graduate courses in the Anthropology department
- An internship, independent study, or directed reading (up to 4 units)
- Up to two electives may be approved upper-division undergraduate courses in the Anthropology department
- Up to two electives may be approved courses taken outside the Anthropology department
- Up to two electives may be Anthropology methods courses

### **Comprehensive Examination**

In addition to completing the required coursework, students must successfully complete a written comprehensive examination administered each year by the program committee.

### **Optional: Master's with Honors Paper**

In addition to the comprehensive exam, students in the program who wish to produce a written analysis larger than those created in conjunction with specific graduate courses may also complete the "Master's with Honor's Paper" option.

Students must declare their intention to earn a "Master's with Honors Paper" in the fall quarter of the program. The "Master's with Honors paper" involves combining two or three graduate seminar papers into a longer comprehensive thesis under the supervision of a program faculty member. Papers from undergraduate courses cannot be used for this option.

After completing this option, students may list the approved Honors Paper on their curricula vitae.

### **Course Offerings**

#### **Approved Graduate Courses in the Anthropology Department**

The following Anthropology graduate courses may be counted as electives toward the M.A. in MSTs:

ANTHRO 229A Anthropology of Knowledge  
 ANTHRO 232B Medical Anthropology  
 ANTHRO 249A Humanism and Posthumanism  
 ANTHRO 250A The Cultural Politics of Visual Representation  
 ANTHRO 250B Digital Technologies, Culture, and Media  
 ANTHRO 253A Design, Aesthetics, and Social Life  
 ANTHRO 257A Natures and Environments  
 ANTHRO 289 Other Knowledges  
 ANTHRO 289 Technomethods for Language and Culture  
 ANTHRO 289 Engaging Contradictions: Activist Scholarship

#### **Approved Upper-Division Undergraduate Courses in the Anthropology Department**

Up to two of the following Anthropology undergraduate courses may be counted as electives toward the M.A. in MSTs:

ANTHRO 125B Ecological Anthropology  
 ANTHRO 125F Humans and Other Animals  
 ANTHRO 128B Race, Gender, and Science  
 ANTHRO 128C Digital Cultures  
 ANTHRO 132A Psychological Anthropology  
 ANTHRO 134A Medical Anthropology  
 ANTHRO 134C Medicine, Food, and Health  
 ANTHRO 134G HIV/AIDS in a Global Context  
 ANTHRO 134F Anthropology of the Body  
 ANTHRO 139 Anthropology of Biomedicine and Biotechnology

Students may petition for additional courses to be counted as electives.

## **Social Science, Ph.D.**

Potential graduate students should apply to the Office of Research and Graduate Studies for admission to the Ph.D. program in Mathematical Behavioral Sciences.

<http://www.imbs.uci.edu/graduate> (<http://www.imbs.uci.edu/graduate/>)

The concentration in Mathematical Behavioral Sciences offers a program of interdisciplinary and mathematical approaches to the study of human behavior, providing high levels of training in current mathematical modeling and in mathematics and software use and programming. The program is

administered by an interdisciplinary group of faculty. Within the concentration, two optional emphases are available: Social Networks; and Games, Decisions, and Dynamical Systems. Specific requirements are detailed below.

## Admission

Admission to the concentration in Mathematical Behavioral Sciences requires evidence of appreciable mathematical skill and knowledge. As an absolute minimum, a candidate should have taken one full year of calculus, including calculus of several variables, and one course in linear algebra, and should also provide evidence of additional mathematical depth. This depth can be manifested in a number of different ways including, but not restricted to, an undergraduate degree in mathematics or physical science, a high score on the quantitative section of the GRE general test, or a strong undergraduate minor in mathematics. In addition, students should have some exposure to a behavioral science field. Especially useful is some experience with behavioral science modeling.

Those students interested in either the emphasis in Social Networks or the emphasis in Games, Decisions, and Dynamical Systems should make this clear in their application. A student is free at any time after admission to move into or out of either emphasis, but will be subject to the requirements in effect at the time of original admission to the concentration in Mathematical Behavioral Sciences.

## General Requirements

Four major classes of requirements must be fulfilled. Since a number of options are available, the student will, in consultation with an advisor, develop a plan of study.

**Quantitative/Mathematical.** To be completed by the end of the third year:

1. one course each in analysis beyond calculus, abstract algebra beyond linear algebra, and logic; and
2. two quarters of mathematical statistics, with calculus as a prerequisite and covering the fundamentals of probability and random variables.

A list of courses eligible for satisfying the Quantitative/Mathematical requirement is available at the Institute for Mathematical Behavioral Sciences website (<http://www.imbs.uci.edu/graduate/masters.php>).

**Language/Computer.** All students must be sufficiently familiar with various computer programs and languages to be able to conduct serious research in their field of interest and must submit either proposed courses or some demonstration of competency as part of their plan of study. In addition, students must either

1. attain proficiency in reading social science technical publications in one foreign language with a substantial relevant technical literature or
2. demonstrate proficiency in computer programming considerably beyond that of the standard computer requirement.

Because of the continually changing nature of computer languages and software, the conditions for fulfilling this additional computer expertise requirement is left to the judgment of the faculty subcommittee on computers of the Ph.D. program.

**Substantive Minor.** Students are expected to develop considerable expertise in some substantive field and in the application of models to it. This requires the completion of three courses at the upper-division or graduate level that do not necessarily entail extensive modeling, and three courses or seminars in which the primary thrust is mathematical modeling.

**Research Papers and Colloquia.** At the end of the second year, a 10–20-page paper reporting original research or a penetrating analysis of some subtopic of mathematical behavioral science (or either social networks, or games, decisions, and dynamical systems with a formal or mathematical component) is expected. An oral presentation will be given to faculty and graduate students. Two faculty members are assigned to read and evaluate the paper and talk.

Students are required to take for credit four quarters of the Mathematical Behavioral Sciences Colloquium, SOC SCI 211A--SOC SCI 211C, during their first three years. Although not a formal requirement, students are expected to attend the colloquium on a regular basis whenever in residence.

**Time to Degree.** Students must advance to candidacy in their fourth year. The normative time for completion of the Ph.D. is six years. The maximum time permitted is seven years.

## Emphasis in Social Networks

The requirements for the emphasis in Social Networks are the same as the general requirements noted above, with the following exceptions:

Students may choose to complete the first part of the Quantitative/Mathematical requirement with one course each in discrete mathematics, graph theory, and logic.

Social Networks students are required to attend about 75 percent of the Mathematical Behavioral Sciences Colloquia, including all that are designated as Social Networks Colloquia, and also must attend occasional colloquia, usually of local faculty and graduate students, which are separate from the general Mathematical Behavioral Sciences Colloquia.

### Emphasis in Games, Decisions, and Dynamical Systems

The requirements for the emphasis in Games, Decisions, and Dynamical Systems are the same as the general requirements noted above, with the following exceptions:

Students must complete eight graduate courses emphasizing game theory, decision theory, or dynamical systems. Examples of such courses are:

ANTHRO 289	Special Topics in Anthropology (when topics are Networks and Social Evolution; Cognition, Technology, and Genes; Dynamical Processes.)
ECON 243A	Game Theory
ECON 270A- 270B- 270C	Political Economy I and Political Economy II and Political Economy III

These courses will count toward the substantive minor requirement.

Students are required to attend about 75 percent of the Mathematical Behavioral Sciences Colloquia, including all that are designated as Games, Decisions, and Dynamical Systems colloquia, and must also must attend occasional colloquia, usually of local faculty and graduate students, which are separate from the general Mathematical Behavioral Sciences Colloquia.

## The Curriculum in Geography

The curriculum in geography promotes critical and creative thinking about the earth's physical and social elements. Providing a strong background on geographic issues, the curriculum addresses topics such as the evolution of the landscape, arrangement of urban centers, the internal structure of cities, and the arrangement of industrial and agricultural activities. Social elements addressed include the pattern of movement of people, goods and ideas, and relationships between humans and the environment.

### Courses in Geography

SOC SCI 5A	Introduction to Human Geography
SOC SCI 5B	Introduction to Physical Geography
SOC SCI 5D	US & World Geography
SOC SCI 119	Special Topics in Geography

# Schools and Programs

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Claire Trevor School of the Arts  
School of Biological Sciences  
The Paul Merage School of Business  
School of Education  
The Henry Samueli School of Engineering  
School of Humanities  
Donald Bren School of Information and Computer Sciences  
Interdisciplinary Studies  
School of Law  
School of Medicine  
Sue and Bill Gross School of Nursing  
Department of Pharmaceutical Sciences  
School of Physical Sciences  
Program in Public Health  
School of Social Ecology  
School of Social Sciences

# Sue and Bill Gross School of Nursing

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## Adey Nyamathi, Dean

252 Berk Hall  
949-824-1514  
<http://www.nursing.uci.edu/>  
[nssao@uci.edu](mailto:nssao@uci.edu)

The Sue and Bill Gross School of Nursing offers a B.S., M.S., and Ph.D. in Nursing Science, and a Doctor of Nursing Practice (D.N.P.). The baccalaureate degree is a scholarly, evidence-based, clinical practice program, preparing students to take the NCLEX-RN licensing examination upon graduation. The M.S. prepares graduate nurses with research and evidence-based practice competency; expertise in specialized concentrations of nursing practice; leadership role preparation; and health policy and advocacy skills for health promotion and disease prevention to support underserved populations. Currently, we have a Master's Entry Program in Nursing (MEPN) with a concentration in Community and Population Health Nursing. The Ph.D. prepares academic nurse scholars for research and teaching careers. The Ph.D. program advances the scholarly discipline of nursing through development of theory and empirical research; contributes to the growing body of knowledge in the field of nursing; and creates the future academic leaders of the nursing profession. The Doctor of Nursing Practice degree program is a professional practice-focused doctorate designed to develop competencies for advanced clinical leadership roles in nursing and healthcare. Nurses who complete the D.N.P. program will be prepared for career opportunities in an increasingly complex and changing healthcare environment. The program design and curriculum is geared toward working nurses and capitalizes on the educational richness of the College of Health Sciences.

- Doctor of Nursing Practice (D.N.P.)
- Nursing Science, B.S.
- Nursing Science, M.S.
- Nursing Science, Ph.D.

## Faculty

Stephanie Au, M.S.N. California State University, Long Beach, *Health Sciences Assistant Clinical Professor of Nursing*

Miriam Bender, Ph.D. University of San Diego, *Assistant Professor of Nursing*

Jill Berg, Ph.D. University of Pittsburgh, *Professor Emerita of Nursing*

Nakia C. Best, Ph.D. University of North Carolina at Chapel Hill, *Assistant Professor of Nursing*

Sara Brown, Ed.D. College of Saint Mary, *Health Sciences Assistant Clinical Professor of Nursing*

Leanne Burke, Ed.D. Southern Connecticut State University, *Health Sciences Associate Clinical Professor of Nursing*

Candace Burton, Ph.D. University of California, San Francisco, *Assistant Professor of Nursing*

Sarah Campbell, M.S. University of California, Irvine, *Health Sciences Assistant Clinical Professor of Nursing*

Lorraine S. Evangelista, Ph.D. University of California, Los Angeles, *Professor Emerita of Nursing*

Michelle A. Fortier, Ph.D. University of Nebraska Lincoln, *Associate Professor of Nursing; Nursing; Psychological Science*

Yuqing Guo, Ph.D. University of Washington, *Assistant Professor of Nursing*

E. Alison Holman, Ph.D. University of California, Irvine, *Associate Professor of Nursing*

Jung-Ah Lee, Ph.D. University of Washington, *Associate Professor of Nursing*

Ruth A. Mulnard, D.N.Sc. University of San Diego, *Professor Emerita of Nursing*

Tiffany K. Nielsen, D.N.P. Brandman University, *Health Sciences Assistant Clinical Professor of Nursing*

Adeline Nyamathi, Ph.D. Case Western Reserve University, *Founding Dean and Distinguished Professor of Nursing*

Ellen Olshansky, Ph.D. University of California, San Francisco, *Professor Emerita of Nursing*

Jung In Park, Ph.D. University of Minnesota, *Assistant Professor of Nursing*

Susanne J. Phillips, D.N.P. Yale University, *Health Sciences Clinical Professor of Nursing*



Melissa Pinto, Ph.D. University of Louisville, *Associate Professor of Nursing*

Amir M. Rahmani, Ph.D. University of Turku, Finland, *Assistant Professor of Nursing*

Vanessa Rodriguez, M.S.N. Samuel Merritt University, *Health Sciences Assistant Clinical Professor of Nursing*

Sanghyuk Shin, Ph.D. University of California, San Diego, San Diego State University, *Assistant Professor of Nursing*

Elizabeth Symanski, M.S.N. University of California, Irvine, *Health Sciences Clinical Instructor of Nursing*

Susan M. Tiso, D.N.P. George Washington University, *Health Sciences Clinical Professor of Nursing*

## Courses

### **NUR SCI 90. Introduction to Pain Medicine. 2 Units.**

Gives students introductory knowledge in pain medicine.

### **NUR SCI 92. Compassion in Health Care. 1 Unit.**

An overview of the importance of compassion in health care, providing examples from a variety of health care professions through lectures and discussion.

Grading Option: Pass/no pass only.

### **NUR SCI 110W. Frameworks for Professional Nursing Practice. 5 Units.**

Conceptual frameworks for professional practice. Scope of professional nursing, jurisprudence and ethics, professional interpersonal relationships, and health care delivery systems in the context of the social, political, and economic environments. Socialization of the student for professional roles in nursing.

Corequisite: NUR SCI 112LA and NUR SCI 114A and NUR SCI 118A

Prerequisite: BIO SCI D170 and BIO SCI E109. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Upper-division students only. Nursing Science Majors only.

### **(Ib)**

### **NUR SCI 112LA. Foundations of Professional Practice. 3 Units.**

Development of skills in communication, interviewing, functional and physical health assessment across the life span, the art and science of human care, and clinical judgment.

Corequisite: NUR SCI 110W and NUR SCI 114A and NUR SCI 118A

Prerequisite: BIO SCI E109 and BIO SCI D170

Restriction: Nursing Science Majors only.

### **NUR SCI 112LB. Foundations of Professional Practice. 4 Units.**

Development of skills in communication, interviewing, functional and physical health assessment across the life span, the art and science of human care, and clinical judgment.

Corequisite: NUR SCI 114B and NUR SCI 118B and NUR SCI 125 and NUR SCI 135

Prerequisite: NUR SCI 112LA and NUR SCI 110W and NUR SCI 114A and NUR SCI 118A

Restriction: Nursing Science Majors only.

### **NUR SCI 114A. Applied Pharmacology I. 2 Units.**

Presents principles of pharmacology applied to interventions in pathophysiologic states across the life span. Discussion of the major drug groups with implications for monitoring, drug administration, toxicity, and patient education are included.

Corequisite: NUR SCI 110W and NUR SCI 118A and NUR SCI 112LA

Prerequisite: BIO SCI E109 and BIO SCI D170

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 264A.

**NUR SCI 114B. Applied Pharmacology II. 2 Units.**

Presents principles of pharmacology applied to interventions in pathophysiologic states across the life span. Discussion of the major drug groups with implications for monitoring, drug administration, toxicity, and patient education are included.

Corequisite: NUR SCI 118B and NUR SCI 112LB and NUR SCI 125 and NUR SCI 135

Prerequisite: NUR SCI 114A and NUR SCI 118A and NUR SCI 110W and NUR SCI 112LA

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 264B.

**NUR SCI 116. Human Growth and Development through the Lifespan. 4 Units.**

Examines theories and concepts of typical human development throughout the life cycle, from the time of conception through adulthood, and familiarizes students with the many forces that shape individual development, including family, society, and culture.

Prerequisite: PSYCH 7A or PSY BEH 9. PSYCH 7A with a grade of C or better. PSY BEH 9 with a grade of C or better

Repeatability: May be taken for credit 2 times.

Restriction: Program in Nursing Science students only.

**NUR SCI 118A. Human Health and Disease I. 2 Units.**

Presents content on pathologic alterations in physiologic processes in cells, tissues, organs, and systems across the life span. Emphasis on critical thinking, application of concepts to clinical practice, and related research.

Corequisite: NUR SCI 114A and NUR SCI 112LA and NUR SCI 110W

Prerequisite: BIO SCI E109 and BIO SCI D170

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 268A.

**NUR SCI 118B. Human Health and Disease II. 2 Units.**

Presents content on pathologic alterations in physiologic processes in cells, tissues, organs, and systems across the life span. Emphasis on critical thinking, application of concepts to clinical practice, and related research.

Corequisite: NUR SCI 114B and NUR SCI 112LB and NUR SCI 125 and NUR SCI 135

Prerequisite: NUR SCI 112LA and NUR SCI 114A and NUR SCI 118A and NUR SCI 110W

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 268B.

**NUR SCI 120. Adult Health Care. 8 Units.**

Restorative, perioperative, supportive care of adults with acute/chronic alterations in oxygenation, regulation, immune response, elimination, metabolism, mobility, cognition, and substance abuse. Concurrent practicum occurs in inpatient medical-surgical units, perioperative units and outpatient clinics utilizing critical thinking and research skills.

Corequisite: NUR SCI 140

Prerequisite: NUR SCI 112LB and NUR SCI 114B and NUR SCI 118B and NUR SCI 125 and NUR SCI 135

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 266.

**NUR SCI 125. Research Methods and Applications in Health Care. 4 Units.**

Foundational concepts of research in health care. Emphasizes critical evaluation and interpretation of research for application in practice.

Corequisite: NUR SCI 112LB and NUR SCI 114B and NUR SCI 118B and NUR SCI 135

Prerequisite: NUR SCI 110W and NUR SCI 112LA and NUR SCI 114A and NUR SCI 118A. And a basic statistics course.

Restriction: Nursing Science Majors only.

**NUR SCI 130. Maternity and Women's Health Care. 8 Units.**

Provides didactic and clinical experiences in nursing management of women's wellness across the lifespan, the childbirth process, and newborn care. Incorporates concepts of family-centered care, teamwork and collaboration, patient safety, quality improvement and informatics, utilizing an evidence-based practice approach.

Corequisite: NUR SCI 132

Prerequisite: NUR SCI 120 and NUR SCI 140 and PSYCH 120D

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 273.

**NUR SCI 132. Pediatrics: Care of Children and Families. 7 Units.**

Provides didactic and clinical experiences in nursing management of infants, children, and adolescents with acute, chronic and/or life-threatening conditions. Incorporates concepts of family-centered care, teamwork and collaboration, patient safety, quality improvement and informatics, utilizing an evidence-based practice approach.

Corequisite: NUR SCI 130

Prerequisite: NUR SCI 120 and NUR SCI 140 and PSYCH 120D

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 272.

**NUR SCI 133. Complementary and Integrative Health . 2 Units.**

Complementary and integrative healthcare emphasized a holistic, patient-focused approach to healthcare and wellness. Key research is critically evaluated and applications for improving patient care emphasized. Knowledge and skills are developed through lectures, guest speakers, and discussion.

**NUR SCI 135. Older Adult Health Care. 2 Units.**

Theories of aging and application of principles of gerontology in health maintenance of older adults. Concepts and principles of rehabilitation and palliative care.

Corequisite: NUR SCI 112LB and NUR SCI 114B and NUR SCI 118B and NUR SCI 125

Prerequisite: NUR SCI 112LA and NUR SCI 114A and NUR SCI 118A and NUR SCI 110W

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 265.

**NUR SCI 140. Human Behavior and Mental Health Care. 7 Units.**

Biopsychosocial and cultural influences on promotion and restoration of mental health in adults and adolescents. Assessment, classification, and care of clients with mental health problems and/or substance abuse. Concurrent practicum in adult/adolescent inpatient psychiatric units and outpatient mental health clinics.

Corequisite: NUR SCI 120

Prerequisite: NUR SCI 112LB and NUR SCI 114B and NUR SCI 118B and NUR SCI 125 and NUR SCI 135

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 267.

**NUR SCI 150. Critical and Specialty Health Care. 6 Units.**

Delivery of patient-centered care for individuals with life-threatening alterations in health status utilizing technology and pharmacology for life support. Concurrent practicum in critical care units emphasizes collaboration, team work, and quality improvement in safe care delivery.

Corequisite: NUR SCI 160 and NUR SCI 179A

Prerequisite: NUR SCI 130 and NUR SCI 132

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 274.

**NUR SCI 160. Leadership and Management in Health Care. 4 Units.**

Principles, concepts, and theories related to organizations, management, leadership, decision-making, and group process applied to the delivery of health care. The professional nurse using evidenced-based practice, collaboration, and informatics is incorporated in concurrent practicum emphasizing safe patient care delivery.

Corequisite: NUR SCI 150 and NUR SCI 179A

Prerequisite: NUR SCI 130 and NUR SCI 132

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 276.

**NUR SCI 170. Community-Based Health Care. 6 Units.**

Epidemiology, primary health care promotion, and disease prevention applied to nursing care of individuals, families, groups, and communities. Includes sociocultural, political, economic, and environmental influences. Concepts and methods of assessing populations and communities incorporated in concurrent practicum.

Corequisite: NUR SCI 175L and NUR SCI 179BW

Prerequisite: NUR SCI 150 and NUR SCI 160 and NUR SCI 179A

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 271.

**NUR SCI 175L. Clinical Preceptorship. 6 Units.**

Independent study course focusing on critical thinking skills for nursing practice in selected clinical areas of interest to the student. The clinical experience focuses on core competencies: patient-centered care, evidence-based practice, quality improvement, safety, and informatics.

Corequisite: NUR SCI 170 and NUR SCI 179BW

Prerequisite: NUR SCI 150 and NUR SCI 160 and NUR SCI 179A

Grading Option: Pass/no pass only.

Restriction: Nursing Science Majors only.

Concurrent with NUR SCI 275.

**NUR SCI 179AW. Scholarly Concentration I. 2 Units.**

Focuses on analysis and use of evidence to improve nursing practice. Emphasis is to develop critical analysis skills synthesizing a body of research evidence for clinical issues on a formal, collaborative written paper.

Corequisite: NUR SCI 150 and NUR SCI 160

Prerequisite: NUR SCI 130 and NUR SCI 132

Restriction: Nursing Science Majors only.

**(Ib)**

**NUR SCI 179B. Scholarly Concentration II. 2 Units.**

Continuation of evidence-based research and application for nursing practice. Emphasis is to develop a collaborative quality improvement project with clinical nurses applying the evidence to improve nursing practice.

Corequisite: NUR SCI 170 and NUR SCI 175L

Prerequisite: NUR SCI 179A

Restriction: Nursing Science Majors only.

**NUR SCI 199. Independent Study in Nursing Science. 1-4 Units.**

Original research with Nursing Science faculty.

Repeatability: May be repeated for credit unlimited times.

**NUR SCI 200. Research Methods and Evaluation for Evidence-Based Practice. 3 Units.**

Clinical research methods and evaluation procedures relevant to evidence-based advanced nursing practice.

Prerequisite: Undergraduate statistics course; undergraduate nursing research course.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 210. Advanced Pathophysiology. 3 Units.**

Principles of normal body functioning and pathophysiologic changes that occur as a result of compensatory mechanisms and disease. Physical and psychological aspects of altered health are explored from the cellular to the level of the total body system.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 212. Philosophy of Science for Nursing Scholarship. 4 Units.**

Development of philosophy of science in relation to nursing science, scholarship, and practice; emphasis on inquiry, scientific reasoning, and contemporary philosophical thought; historical and contemporary influences on nursing science theory development; evaluation/analysis of interdisciplinary theory and application to nursing research.

Restriction: Graduate students only.

**NUR SCI 215. Health Promotion/Disease Prevention. 3 Units.**

Covers the evidence-based national clinical preventive services guidelines for health promotion and disease prevention. Emphasizes counseling about personal health behaviors, screening tests for the early detection of risk factors and disease, immunizations and chemo-prophylaxis.

Restriction: Graduate students only.

**NUR SCI 220. The Ecology of Healthy Communities. 2 Units.**

Nursing science research contributions and opportunities as they pertain to the ecology of health in local, national, and global communities. Emphasis on methodological and ethical issues, research gaps, and clinical translational opportunities.

Restriction: Graduate students only.

**NUR SCI 222A. Seminar in Clinical Translational Science. 2 Units.**

Discussion of clinical translational science methods in the context of nursing science research. Emphasis placed on interdisciplinary and community participatory research approaches.

Prerequisite: Consent of the instructor is required.

Restriction: Graduate students only.

**NUR SCI 222B. Seminar in Clinical Translational Science. 2 Units.**

Discussion of clinical translational science methods in the context of nursing science research. Emphasis placed on interdisciplinary and community participatory research approaches. Course may be offered online.

Prerequisite: NUR SCI 222A

Restriction: Graduate students only.

**NUR SCI 223A. Biostatistics for Health Sciences I. 4 Units.**

Helps students to develop skills necessary for applying statistical principles and practices in health research. This is achieved through in-depth review of existing research articles and hands-on statistical programming exercises.

Restriction: Graduate students only.

**NUR SCI 223B. Biostatistics for Health Sciences II. 4 Units.**

Introduces advanced methods of statistical analysis and research design used in health research. These include linear, logistic, Poisson regression, and a brief introduction to regression models for correlated data.

Prerequisite: NUR SCI 223A

Restriction: Graduate students only.

**NUR SCI 224. Research Designs in Nursing Science. 4 Units.**

Provides an introduction to qualitative and quantitative research designs, methods, and analyses in nursing science. Evaluation of measurement and population issues, data management, ethics, analytical approaches, mixed methods work, and translational potential in the context of research.

Restriction: Graduate students only. Nursing Science Majors only.

**NUR SCI 225A. Advanced Pharmacology I. 3 Units.**

Principles of pharmacology that serve as a foundation for the pharmacotherapeutic management of patients evaluated and treated by advanced practice nurses. Emphasis includes the application of pharmacokinetic and pharmacodynamic principles.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 225B. Advanced Pharmacology II. 2 Units.**

Principles of pharmacology that serve as a foundation for the pharmacotherapeutic management of patients evaluated and treated by advanced practice nurses. Emphasis includes the application of pharmacokinetic and pharmacodynamic principles.

Prerequisite: NUR SCI 225A. NUR SCI 225A with a grade of B or better

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 226. Theoretical and Conceptual Frameworks. 4 Units.**

Explores the history, roles, and uses of theory in nursing and health scholarship. Students examine, analyze, and utilize the components of theory, theory construction, concept analysis, and theory evaluation.

Restriction: Graduate students only.

**NUR SCI 227A. Grant Writing I. 4 Units.**

Introduction to the principles and methods of proposal writing used in preparing grant proposals. Provides content on the process for good proposal development, key elements and sections of proposal, necessary information to include in grant proposal and development of budget.

Prerequisite: NUR SCI 212 and NUR SCI 233 and NUR SCI 226 and NUR SCI 246 and NUR SCI 247

Restriction: Graduate students only.

**NUR SCI 227B. Grant Writing II. 2 Units.**

Provides a continuation of skill building in preparing a grant proposal, with emphasis on developing the educational training plan, budget and budget justification, the IRB and ethics component, and letters of support for a career-development grant.

Prerequisite: NUR SCI 227A. NUR SCI 227A with a grade of B or better

Restriction: Graduate students only.

**NUR SCI 230. Advanced Health and Physical Assessment. 3 Units.**

Application of theoretical concepts related to comprehensive health assessment of patients across the lifespan. Analysis, synthesis, and application of comprehensive health assessment data.

Corequisite: NUR SCI 230L

Restriction: Graduate students only.

**NUR SCI 230L. Advanced Health and Physical Assessment Laboratory. 1 Unit.**

Clinical laboratory course for the application of concepts related to comprehensive health assessment of patients across the lifespan.

Corequisite: NUR SCI 230

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 231. DNP Prologue . 2 Units.**

An onsite 2 ½ day immersive experience that provides an introduction to DNP scholarship and foundations essential for academic success in a doctoral program. Preparatory activities and onsite individual and group assignments are completed.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 232. Leadership and Professional Collaboration in Healthcare. 4 Units.**

Explore and debate the relationship between various leadership and collaboration models, theories health care practice, and outcomes. Prepares DNP graduates to assume leadership roles across the healthcare spectrum.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 233. Appraisal and Translation of Evidence for Practice . 3-4 Units.**

Provides advanced concepts on research methods and measurement strategies that are applicable to support the advanced practice nurse to access, evaluate, and utilize data from various sources including research, quality improvement initiatives, and information technology origins to achieve improvements.

Prerequisite: Consent of the instructor is required.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 234. Health Politics and Policy. 4 Units.**

Participants will analyze, apply, and evaluate current health policy-related literature, engage in the process of health policy development within professional, regulatory, or administrative environments, and develop an evidence-based health policy proposal across the spectrum of health care systems.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 235. DNP Scholarly Project I: Conceptualization and Planning . 1 Unit.**

Students gain the knowledge, skills, and abilities necessary to develop an evidence-based project plan and proposal. Structured didactic content and application of the Student's DNP Scholarly Project. First of four DNP Scholarly Project courses.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 236. Social Determinants of Health and Health Equity . 3 Units.**

The four components of the Clinical Prevention and Population Health Framework: evidence-based practice, clinical preventive service and health promotion, health systems and policy, and population health and community aspects of practice with emphasis on ethical care delivery.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 237. DNP Intersession. 2 Units.**

Provides DNP students an opportunity to present and receive faculty and peer feedback on their DNP project plan. Recommendations related to practical data collection and information gathering approaches and data analysis are also emphasized.

Prerequisite: NUR SCI 235. NUR SCI 235 with a grade of B or better

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.



**NUR SCI 238. Foundations of Health Systems and Health Economics. 3 Units.**

Foundational understanding of how healthcare is financed in the U.S. Explores economic theories and policies, various types of healthcare organizations, and healthcare delivery systems. Healthcare finance is discussed at national and practice levels.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 239. The Science of Change, Quality Improvement, and Program Evaluation. 4 Units.**

Intro to science of quality improvement and program evaluation. Focus on info system technology and its application in quality improvement. Focus placed on the role of the advanced practice nurse leader in developing and leading clinical quality and safety initiatives.

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**NUR SCI 240. DNP Scholarly Project II: Proposal. 1 Unit.**

Developing a full proposal that reflects synthesis of the student's knowledge from prior coursework and work in an area of interest or expertise under the direction of a faculty mentor. Second of four DNP Scholarly Project course sequence.

Prerequisite: NUR SCI 237. NUR SCI 237 with a grade of B or better

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 241. DNP Scholarly Project III: Implementation and Evaluation. 1 Unit.**

Continued development of knowledge, skills, and abilities to implement the chosen DNP proposal. Students receive direction from a faculty mentor and peer feedback as they become engaged in the microsystem where they are implementing their DNP Scholarly Project.

Prerequisite: NUR SCI 240. NUR SCI 240 with a grade of B or better

Restriction: Graduate students only.

**NUR SCI 242. DNP Scholarly Project IV: Implications . 1 Unit.**

Selection and implementation of evidence-based interventions supported through informatics and technological advances and measurement of outcomes in a selected practicum site as applicable. Includes reflection and mapping of the DNP Scholarly Project with DNP Essentials as published.

Prerequisite: NUR SCI 241. NUR SCI 241 with a grade of B or better

Restriction: Graduate students only.

**NUR SCI 243. DNP Epilogue. 2 Units.**

DNP students develop DNP competency through the presentation of their project and development of a professional manuscript. Individual direction from the DNP Project Team and peer feedback are provided throughout the course.

Prerequisite: NUR SCI 242. NUR SCI 242 with a grade of B or better

Restriction: Graduate students only.

**NUR SCI 245. Primary Care Adult/Gerontology Acute Common Conditions . 3 Units.**

Assessment and management of acute or episodic problems affecting patients and families across the lifespan. Diagnostics, pharmacology, pathophysiology, and therapeutics are integrated. Concepts of quality health care, resource management, and shared-decision making are emphasized.

Prerequisite: NUR SCI 210 and NUR SCI 230. NUR SCI 210 with a grade of B or better. NUR SCI 230 with a grade of B or better

Restriction: Graduate students only.

**NUR SCI 246. Qualitative Research Designs in Nursing Science. 4 Units.**

Seminar in qualitative research philosophies, methods, and analysis in nursing science clinical research. Consideration of population access and sampling, ethics, data management, analytical approaches, and translational potential.

Restriction: Graduate students only.

**NUR SCI 247. Quantitative Research Designs in Nursing Science. 4 Units.**

Seminar in experimental and survey research designs, methods, and analysis in nursing science clinical research. Consideration of measurement issues, mixed methods models, population access and sampling, data management, analytical approaches, and translational potential.

Prerequisite: NUR SCI 212

Restriction: Graduate students only.

**NUR SCI 248. Curricular Design for the Health Professions. 3 Units.**

Introduces students to the theoretical foundations, essential components, and accreditation standards for curriculum development at the program level. Outcome competencies are addressed as they apply to the development and evaluation of an educational program to meet society's diverse healthcare needs.

Restriction: Graduate students only.

**NUR SCI 249. Transformational Leadership in Education for the Health Professions. 4 Units.**

Students are introduced to the role of the nurse educator as change agent, leader, and scholar and provided experience in planning learner-centered learning activities that are engaging and effective in achieving desired student performance.

Restriction: Graduate students only.

**NUR SCI 250. Primary Care Women's Health. 2 Units.**

Primary health care needs of women including adolescent, adult, and aging adults. Emphasizes assessment, diagnosis, prevention, management, and education of common gynecologic and family planning health care needs.

Prerequisite: NUR SCI 210 and NUR SCI 230. NUR SCI 210 with a grade of B or better. NUR SCI 230 with a grade of B or better

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 251. Nursing Informatics . 4 Units.**

Provides an overview of nursing informatics topics for practice.

Restriction: Graduate students only.

**NUR SCI 255. Primary Care Obstetrics. 2 Units.**

Assessment and management of women during pregnancy. Diagnostics, pharmacology, pathophysiology and therapeutics are integrated. Includes assessment, differential diagnosis, management, patient/family education, and counseling related to normal pregnancy care.

Prerequisite: NUR SCI 210 NUR SCI 230. NUR SCI 210 with a grade of B or better. NUR SCI 230 with a grade of B or better

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 260A. Primary Care Adult/Gerontology Chronic Conditions . 3 Units.**

Assessment and management of acute or episodic problems affecting adult and geriatric patients and their families. Diagnostics, pharmacology, pathophysiology, and therapeutic are integrated.

Prerequisite: NUR SCI 245. NUR SCI 245 with a grade of B or better

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 262. Foundations of Professional Nursing Practice. 4 Units.**

Focuses on the development of skills in therapeutic communication, interviewing, functional assessment across the lifespan, the art and science of human care, and clinical judgment. Faculty-facilitated, participatory peer group, and self-learning laboratory activities are included.

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

**NUR SCI 263. Frameworks for Professional Nursing Practice. 4 Units.**

A theory-intensive course focused on conceptual frameworks for professional nursing practice. Topics address the professional, political, and economic contexts of nursing practice, with an emphasis on jurisprudence and ethics, professional interpersonal relationships, and nursing's role in the care delivery system.

Restriction: Graduate students only.

**NUR SCI 264A. Applied Pharmacology I. 2 Units.**

Principles of pharmacology applied to intervention in pathophysiologic states across the life span. Discussion of the major drug groups with implications for monitoring, drug administration, toxicity, and patient education included. Physical, psychological, social, and cultural factors affecting drug administration.

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 114A.

**NUR SCI 264B. Applied Pharmacology II. 2 Units.**

Principles of pharmacology applied to intervention in pathophysiologic states across the life span. Discussion of the major drug groups with implications for monitoring, drug administration, toxicity, and patient education included. Physical, psychological, social, and cultural factors affecting drug administration.

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 114B.

**NUR SCI 265. Older Adult Health Care. 2 Units.**

Analyzes the interaction of physical, pathophysiological, psychological, social, cultural, and health care policy factors influencing the health and health care of older adults. Topics include health risk factors, health assessment, acute illness and chronic conditions, and ethical issues.

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 135.

**NUR SCI 266. Adult Health Care . 8 Units.**

Focuses on the restorative, peri-operative, and supportive nursing management of adults with acute or chronic alterations in oxygenation, regulation, immune response, elimination, metabolism, mobility, cognition, and substance abuse. Diagnostics, pharmacology, pathophysiology, and therapeutics will be integrated.

Prerequisite: NUR SCI 200 and NUR SCI 262 and NUR SCI 264A and NUR SCI 264B and NUR SCI 268A and NUR SCI 268B and NUR SCI 265 and NUR SCI 281

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 120.

**NUR SCI 267. Human Behavior and Mental Health Nursing . 7 Units.**

Focuses on nursing management of individuals across the lifespan with alterations in mental health. Mental health promotion and crisis intervention, chemical dependency, acute and chronic care for psychiatric conditions, rehabilitation, and recovery will be addressed.

Prerequisite: NUR SCI 200 and NUR SCI 262 and NUR SCI 264A and NUR SCI 264B and NUR SCI 268A and NUR SCI 268B and NUR SCI 265 and NUR SCI 281

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 140.

**NUR SCI 268A. Pathophysiology I . 2 Units.**

Focuses on pathologic alterations in physiologic processes in cells, tissues, organs, and systems across the life span. Content includes disease processes, linkage of relevant physiology to disease states, and factors that influence epidemiology and pathophysiology.

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 118A.

**NUR SCI 268B. Pathophysiology II . 2 Units.**

Focuses on pathologic alterations in physiologic processes in cells, tissues, organs, and systems across the life span. Content includes disease processes, linkage of relevant physiology to disease states, and factors that influence epidemiology and pathophysiology.

Prerequisite: NUR SCI 268A

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 118B.

**NUR SCI 270. Primary Care Pediatrics. 2 Units.**

Assessment and management of acute or episodic problems affecting pediatric patients and their families. Diagnostics, pharmacology, pathophysiology, and therapeutics are integrated.

Prerequisite: NUR SCI 210 and NUR SCI 230. NUR SCI 210 with a grade of B or better. NUR SCI 230 with a grade of B or better

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 271. Community-Based Health Care . 6 Units.**

Epidemiology, primary health care promotion, and disease prevention applied to nursing care of individuals, families, groups, and communities. Includes sociocultural, political, economic, and environmental influences. Concepts and methods of assessing populations and communities incorporated in concurrent practicum.

Prerequisite: NUR SCI 215 and NUR SCI 274 and NUR SCI 276

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 170.

**NUR SCI 272. Pediatrics: Care of Children and Families. 7 Units.**

Provides didactic and clinical experiences in nursing management of infants, children, and adolescents with acute, chronic, and/or life-threatening conditions. Incorporates concepts of family-centered care, teamwork and collaboration, patient safety, quality improvement and informatics, utilizing an evidence-based practice approach.

Prerequisite: NUR SCI 266 and NUR SCI 267

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 132.

**NUR SCI 273. Maternity and Women's Health Care. 8 Units.**

Provides didactic and clinical experiences in nursing management of women's wellness across the lifespan, the childbirth process, and newborn care. Incorporates concepts of family-centered care, teamwork and collaboration, patient safety, quality improvement and informatics, utilizing an evidence-based practice approach.

Prerequisite: NUR SCI 266 and NUR SCI 267

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 130.

**NUR SCI 274. Critical and Specialty Health Care. 6 Units.**

Focuses on the restorative, supportive care of individuals with life-threatening alterations in health status utilizing technology and pharmacology for life support. The course includes pathophysiology, diagnostics, monitoring, pharmacology, therapeutics, and evidence-based management interventions will be integrated.

Prerequisite: NUR SCI 272 and NUR SCI 273

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 150.

**NUR SCI 275. Clinical Preceptorship. 6 Units.**

Independent study course focusing on in-depth clinical nursing practice in a selected clinical area of interest to the graduate student. Students are mentored by a preceptor who is an expert clinician in the area.

Prerequisite: NUR SCI 215 and NUR SCI 274 and NUR SCI 276

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 175L.

**NUR SCI 276. Leadership and Management in Health Care. 4 Units.**

Explores the professional nurse as leader and manager of a health care team. Principles and theories related to organizations, leadership, decision-making, and group process are applied to the delivery of health care at the individual and population levels.

Prerequisite: NUR SCI 272 and NUR SCI 273

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

Concurrent with NUR SCI 160.

**NUR SCI 279A. Frameworks for the Advanced Practice Registered Nursing Role: Nurse Practitioner . 2 Units.**

Orientation to the scope and standards of advanced practice registered nursing pertinent to the APRN role. Principles of jurisprudence, ethics, and advocacy will be introduced along with conceptual frameworks for advanced nursing practice.

Restriction: Graduate students only.

**NUR SCI 281. Professional Issues in Nursing . 3 Units.**

Provides an orientation to the scope and standards of professional nursing practice for master's students. The social, political, and economic environments affecting health care delivery systems and the ethics of professional nursing practice are analyzed.

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

**NUR SCI 282. Compassionate Care with Underserved Populations. 2-3 Units.**

Addresses theory/research on health risk factors (e.g., psychiatric illness, sociocultural and economic characteristics) that impact patient health and well-being across the lifespan. Emphasis is on cultural awareness, lifestyle modification, community resources, and communication/coping strategies to promote well-being.

Restriction: Graduate students only.

**NUR SCI 283. Primary Care Procedures. 2 Units.**

Introduces the theoretical basis for common procedures performed in primary care clinical practice. Focus includes EKG interpretation, x-ray interpretation, minor surgery, and orthopaedic procedures.

Prerequisite: NUR SCI 245. NUR SCI 245 with a grade of B or better

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 284. Scholarly Concentration. 3 Units.**

Independent study focusing on critique, analysis, and synthesis of research evidence as a basis for graduate practice nursing in an area of interest to the student.

Prerequisite: NUR SCI 200

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

**NUR SCI 285. DNP APRN Practicum I. 2 Units.**

Clinical application of theory and research related to the advanced assessment and health promotion of patients across the lifespan.

Prerequisite: NUR SCI 210 and NUR SCI 230 and (NUR SCI 230L or NUR SCI 231L). NUR SCI 210 with a grade of B or better. NUR SCI 230 with a grade of B or better. NUR SCI 230L with a grade of B or better. NUR SCI 231L with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**NUR SCI 286. DNP APRN Practicum II. 2 Units.**

Clinical field study applying theory, research, and developing clinical skills related to the provision of care to patients and their families in increasingly complex clinical situations.

Prerequisite: NUR SCI 285. NUR SCI 285 with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 287. DNP APRN Practicum III. 6 Units.**

Clinical application of theory and research through clinical experiences in selected primary care settings designed to provide students with competencies in the assessment, diagnosis, management, and education/counseling in selected populations.

Prerequisite: NUR SCI 286. NUR SCI 286 with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 288. DNP APRN Practicum IV. 7 Units.**

Continued clinical application of theory and research through clinical experiences in selected primary care settings designed to provide students with competencies in the assessment, diagnosis, management, and education/counseling in selected populations.

Prerequisite: NUR SCI 287. NUR SCI 287 with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 289. DNP APRN Practicum V. 8 Units.**

Culminating clinical experience serves as a transition from the student role to that of the advanced practice nurse.

Prerequisite: NUR SCI 288. NUR SCI 288 with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 290. DNP APRN Practicum VI. 4 Units.**

Through continued clinical experience, students demonstrate increased responsibility and accountability for performance as an advanced practice nurse and clinical scholar, synthesizing knowledge of pathophysiology and disease management, evidence-based guidelines, anticipatory guidance, models of provider-patient communication, and provision of educational resources.

Prerequisite: NUR SCI 289. NUR SCI 289 with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 291. DNP Practicum I. 4-8 Units.**

Implementation and evaluation of an evidence-based, DNP project in an area of advanced practice in partnership with a selected agency or organization that solves a practice problem or improves population health, educational, or performance outcomes.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

**NUR SCI 292. DNP Practicum II. 5-10 Units.**

Implementation and evaluation of an evidence-based, DNP project in an area of advanced practice in partnership with a selected agency or organization that solves a practice problem or improves population health, educational, or performance outcomes.

Prerequisite: NUR SCI 291. NUR SCI 291 with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 293. DNP Practicum III. 4-8 Units.**

Implementation and evaluation of an evidence-based, DNP project in an area of advanced practice in partnership with a selected agency or organization that solves a practice problem or improves population health, educational, or performance outcomes.

Prerequisite: NUR SCI 292. NUR SCI 292 with a grade of B or better

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Consent of instructor required to enroll.

**NUR SCI 294. Directed Study in Vulnerable Populations. 1-4 Units.**

Independent study that focuses on individually designed clinical learning experiences and goals within a selected vulnerable population, such as the homeless, veterans, minority groups, etc. Students work in a clinical setting addressing health care needs of the vulnerable population(s).

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 2 times.

Restriction: Nursing Science, Community and Population Health Nursing Majors only.

**NUR SCI 296. Doctoral Dissertation Reading and Writing. 4-12 Units.**

Dissertation research with Nursing Sciences faculty.

Prerequisite: Advancement to candidacy.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**NUR SCI 298. Directed Studies in Nursing Science. 1-12 Units.**

Directed study with Nursing Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**NUR SCI 299. Independent Study in Nursing Science. 1-12 Units.**

Independent research with Nursing Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**NUR SCI 399. University Teaching. 4 Units.**

Limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Doctor of Nursing Practice (D.N.P.)

The Doctor of Nursing Practice (D.N.P.) degree program is a professional practice-focused doctorate designed to develop competencies for advanced clinical and leadership roles in nursing and healthcare. The D.N.P. program increases opportunities for nurses to meet the demands of an increasingly complex and changing healthcare landscape. The program and innovative curriculum capitalize on the educational richness of the College of Health Sciences.

This program utilizes a hybrid educational delivery platform.

**DNP - Family Nurse Practitioner Track**

The DNP Family Nurse Practitioner track is designed for students who have a B.S. or M.S. in nursing and are seeking a terminal practice-focused nursing degree and certification as a family nurse practitioner (FNP); this track can be completed in 11 quarters.

**DNP (Post-Master's) Track**

The DNP (Post-Master's) Track is designed for students who have an M.S. in nursing and are seeking a terminal practice-focused nursing degree without certification as a nurse practitioner (NP); this track can be completed in seven quarters.

**DNP - Family Nurse Practitioner**

Applicants must have:

- Earned a bachelor's or master's degree in nursing from an accredited program
- An active, unrestricted California RN license
- At least one year full-time work (or equivalent) as a registered nurse in the U.S. prior to the start of program entry
- Completed a course in descriptive and inferential statistics with a grade of B or better within five years of admission to the program



- A complete application file including the application form, official transcripts, three letters of recommendation, and a resume or curriculum vitae
- Applicants must meet the general requirements of the UCI Graduate Division. A personal interview is required of all applicants considered for admission. The GRE is not required.

### **DNP (Post-Master's)**

Applicants must have:

- Earned a master's degree in nursing from an accredited program
- An active, unrestricted RN license in the state where D.N.P. practicum work will occur
- At least one year fulltime work (or equivalent) as registered nurse in the U.S. prior to the start of program entry
- Completed a course in descriptive and inferential statistics with a grade of B or better within five years admission to the program.
- A complete application file including the application form, official transcripts, three letters of recommendation, and a resume or curriculum vitae
- Applicants must meet the general requirements of the UCI Graduate Division
- A personal interview is required of all applicants considered for admission. The GRE is not required.

Students enrolled in the DNP - Family Nurse Practitioner track complete 98 units and 1020 hours of clinical practice. Students enrolled in the DNP (Post-Master's) track complete 53 units and 540 hours of clinical practice. There is no foreign language requirement; proficiency in a language other than English is desirable but not required.

In lieu of a thesis or dissertation, a Scholarly Project will be required for this professional degree. In preparation for developing this D.N.P. Scholarly Project, students will complete a D.N.P. Project Proposal and present this to their D.N.P. Scholarly Project Team during the D.N.P. Scholarly Project II: Proposal course. Once approved by the Team, the student begins implementation of their D.N.P. Scholarly Project. The D.N.P. Scholarly Project requires students to demonstrate a synthesis of evidence-based practice in a practice area specific to their specialty and interest.

The students provide a final presentation of the completed work to the D.N.P. Team and invited University and community guests in their last quarter, at the conclusion of the D.N.P. epilogue course. Development of a formal manuscript suitable for publication is also required.

The normative time to degree for the DNP - Family Nurse Practitioner track is three years, with a maximum time permitted of five years. The normative time to degree for the DNP (Post-Master's) track is two years, with a maximum time permitted of four years.

### **DNP - Family Nurse Practitioner Requirements**

A. Complete:

NUR SCI 200	Research Methods and Evaluation for Evidence-Based Practice
NUR SCI 210	Advanced Pathophysiology
NUR SCI 215	Health Promotion/Disease Prevention
NUR SCI 222A	Seminar in Clinical Translational Science
NUR SCI 225A	Advanced Pharmacology I
NUR SCI 225B	Advanced Pharmacology II
NUR SCI 230	Advanced Health and Physical Assessment
NUR SCI 230L	Advanced Health and Physical Assessment Laboratory
NUR SCI 231	DNP Prologue
NUR SCI 232	Leadership and Professional Collaboration in Healthcare
NUR SCI 233	Appraisal and Translation of Evidence for Practice
NUR SCI 234	Health Politics and Policy
NUR SCI 235	DNP Scholarly Project I: Conceptualization and Planning
NUR SCI 236	Social Determinants of Health and Health Equity
NUR SCI 237	DNP Intersession
NUR SCI 238	Foundations of Health Systems and Health Economics
NUR SCI 239	The Science of Change, Quality Improvement, and Program Evaluation
NUR SCI 240	DNP Scholarly Project II: Proposal
NUR SCI 241	DNP Scholarly Project III: Implementation and Evaluation
NUR SCI 242	DNP Scholarly Project IV: Implications
NUR SCI 243	DNP Epilogue
NUR SCI 245	Primary Care Adult/Gerontology Acute Common Conditions
NUR SCI 250	Primary Care Women's Health
NUR SCI 255	Primary Care Obstetrics

NUR SCI 260A	Primary Care Adult/Gerontology Chronic Conditions
NUR SCI 270	Primary Care Pediatrics
NUR SCI 279A	Frameworks for the Advanced Practice Registered Nursing Role: Nurse Practitioner
NUR SCI 282	Compassionate Care with Underserved Populations
NUR SCI 283	Primary Care Procedures
NUR SCI 285	DNP APRN Practicum I
NUR SCI 286	DNP APRN Practicum II
NUR SCI 287	DNP APRN Practicum III
NUR SCI 288	DNP APRN Practicum IV
NUR SCI 289	DNP APRN Practicum V
NUR SCI 290	DNP APRN Practicum VI

B. If additional units are needed, select from the following:

NUR SCI 248	Curricular Design for the Health Professions
NUR SCI 249	Transformational Leadership in Education for the Health Professions

### DNP (Post-Master's) Requirements

A. Complete:

NUR SCI 231	DNP Prologue
NUR SCI 232	Leadership and Professional Collaboration in Healthcare
NUR SCI 222A	Seminar in Clinical Translational Science
NUR SCI 233	Appraisal and Translation of Evidence for Practice
NUR SCI 234	Health Politics and Policy
NUR SCI 235	DNP Scholarly Project I: Conceptualization and Planning
NUR SCI 236	Social Determinants of Health and Health Equity
NUR SCI 237	DNP Intersession
NUR SCI 238	Foundations of Health Systems and Health Economics
NUR SCI 239	The Science of Change, Quality Improvement, and Program Evaluation
NUR SCI 240	DNP Scholarly Project II: Proposal
NUR SCI 241	DNP Scholarly Project III: Implementation and Evaluation
NUR SCI 242	DNP Scholarly Project IV: Implications
NUR SCI 243	DNP Epilogue
NUR SCI 248	Curricular Design for the Health Professions
NUR SCI 249	Transformational Leadership in Education for the Health Professions
NUR SCI 291	DNP Practicum I
NUR SCI 292	DNP Practicum II
NUR SCI 293	DNP Practicum III

## Nursing Science, B.S.

Nurse professionals are members of interdisciplinary teams who work with people of all ages, cultural backgrounds, and lifestyles to help them achieve the highest level of wellness possible. The Bachelor of Science degree program in Nursing Science prepares graduates to function as generalists in professional nursing practice and to collaborate with other health care providers in clinics, hospitals, and community health settings. The undergraduate curriculum is designed to provide theory and research-based clinical experiences that integrate critical thinking, compassion, and caring behaviors that build clinical expertise. Students who successfully complete the B.S. degree in Nursing Science are eligible to take the licensure examination to become a registered nurse.

Most of the courses required for the major require completion of prerequisites. The sample program shown is a preferred sequence that accounts for all prerequisites. Most required courses are offered in sequence and only once a year. Full-time enrollment is required.

All students interested in the Nursing Science major should be aware that they will be required to do the following: (1) meet the physical and mental requirements necessary to perform nursing practice functions as outlined in Chapter 6, Article 2, Item 2725 of the *Business and Professions Code of California*; (2) complete a criminal background check prior to entering the clinical portion of the major in the junior year as required by health care facilities in which students will have clinical experiences; (3) purchase uniforms and other required equipment such as stethoscopes; (4) have access to transportation for off-campus clinical experiences beginning in the junior year.

Meeting the UCI admission criteria does not guarantee admission into the major. The admission process is competitive due to limited enrollment.

**Freshmen:** Preference will be given to those who rank the highest using the selection criteria as stated in the Admissions section of the *Catalogue*.

**Transfer students:** Admission to the major is limited and selective. Junior-level applicants with the highest grades overall and who satisfactorily complete course prerequisites will be given preference for admission to the Nursing Science major. The following list of prerequisites is required for transfer students applying for fall 2019 entry and beyond. All applicants must complete the following with grades of B or better: one year of general chemistry equivalent to UCI's CHEM 1A - CHEM 1B - CHEM 1C; one quarter/semester of organic chemistry equivalent to UCI's CHEM 51A; one quarter/semester of genetics equivalent to UCI's BIO SCI 97; one quarter/semester of biochemistry equivalent to UCI's BIO SCI 98; one quarter/semester of human physiology with laboratory equivalent to UCI's BIO SCI E109 and BIO SCI E112L; one quarter/semester of microbiology with laboratory equivalent to UCI's BIO SCI M122 and BIO SCI M118L; one quarter/semester of human anatomy with laboratory equivalent to UCI's BIO SCI D170; one quarter/semester of philosophy equivalent to UCI's PHILOS 4 or PHILOS 5; one quarter/semester of psychology equivalent to UCI's PSYCH 7A/PSCI 9; one quarter/semester of public health equivalent to UCI's PUBHLTH 1; one quarter/semester of sociology equivalent to UCI's SOCIOL 1; and one quarter/semester of statistics equivalent to UCI's STATS 7 or STATS 8. Applicants must have a cumulative GPA of 3.0 or higher to be considered.

**Change of Major:** Due to strict limits on the number of students who can be admitted to the program and rigid sequencing of much of the upper-division curriculum, change-of-major students need to apply in the month of November for winter quarter admission, at the earliest in sophomore year. Students should review the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>) and the Sue and Bill Gross School of Nursing website (<http://www.nursing.uci.edu/>) for information regarding change of major admission requirements, application instructions, and selection criteria. Change-of-major students who are intending to apply to the Sue and Bill Gross School of Nursing should be aware that the School cannot waive course prerequisites for any School of Biological Sciences or School of Physical Sciences courses, prior to admission into the Nursing Science major. As such, change of major students must adhere to the course prerequisites that these Schools have established and have published in the course descriptions that appear in the *Catalogue*.

All major requirements must be passed with a C or better if taken at UCI. Students are required to take all lower- and upper-division science courses required for the major at UCI once they have matriculated at UCI. Non-science, lower-division courses required for the major that have been taken at another institution must be completed with a B or better. General education courses (not required for the major) taken at another institution must be completed with a C or better. All Nursing Science courses must be taken at UCI. Students must maintain a 2.75 GPA in their upper-division Nursing Science courses to remain in good standing. If Nursing Science students fail any courses required for the major, they should contact Student Affairs for the repeat policy. Students interested in studying abroad should contact Student Affairs.

**All students must meet the University Requirements.**

### Major Requirements

#### Complete the following courses:

BIO SCI 97	Genetics
BIO SCI 98	Biochemistry
BIO SCI D170	Applied Human Anatomy
BIO SCI E109	Human Physiology
BIO SCI E112L	Physiology Laboratory
BIO SCI M122	General Microbiology
BIO SCI M118L	Experimental Microbiology Laboratory
CHEM 1A- 1B- 1C	General Chemistry and General Chemistry and General Chemistry
CHEM 51A	Organic Chemistry
PHILOS 4 or PHILOS 5	Introduction to Ethics Contemporary Moral Problems

#### Select one of the following:

PSCI 9	Introduction to Psychology
PSCI 11A	Psychology Fundamentals
PSCI 11B	Psychology Fundamentals
PSCI 11C	Psychology Fundamentals
PSYCH 7A	Introduction to Psychology
PSYCH 9A	Psychology Fundamentals
PSYCH 9B	Psychology Fundamentals
PSYCH 9C	Psychology Fundamentals
PSYCH 78A	Self-Identity and Society

**Select one of the following:**

ANTHRO 2A	Introduction to Sociocultural Anthropology
ANTHRO 2D	Introduction to Language and Culture
ANTHRO 41A	Global Cultures and Society
SOC SCI 1A	Principles in the Social Sciences
SOCIOL 1	Introduction to Sociology
SOCIOL 2	Globalization and Transnational Sociology
SOCIOL 3	Social Problems
SOCIOL 31	Self-Identity and Society
SOCIOL 44	Births, Deaths, and Migration
SOCIOL 62	Families and Intimate Relations

**Select one of the following:**

PSYCH 10A	Probability and Statistics in Psychology I
SOC SCI 10A	Probability and Statistics in Social Sciences I
SOCIOL 10A	Probability and Statistics
STATS 7	Basic Statistics
STATS 8	Introduction to Biological Statistics

**Complete the following course:**

PUBHLTH 1	Principles of Public Health
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**Complete the following Nursing Science courses:**

NUR SCI 110W	Frameworks for Professional Nursing Practice
NUR SCI 112LA	Foundations of Professional Practice
NUR SCI 112LB	Foundations of Professional Practice
NUR SCI 114A	Applied Pharmacology I
NUR SCI 114B	Applied Pharmacology II
NUR SCI 116	Human Growth and Development through the Lifespan
NUR SCI 118A	Human Health and Disease I
NUR SCI 118B	Human Health and Disease II
NUR SCI 120	Adult Health Care
NUR SCI 125	Research Methods and Applications in Health Care
NUR SCI 130	Maternity and Women's Health Care
NUR SCI 132	Pediatrics: Care of Children and Families
NUR SCI 135	Older Adult Health Care
NUR SCI 140	Human Behavior and Mental Health Care
NUR SCI 150	Critical and Specialty Health Care
NUR SCI 160	Leadership and Management in Health Care
NUR SCI 170	Community-Based Health Care
NUR SCI 175L	Clinical Preceptorship
NUR SCI 179AW	Scholarly Concentration I
NUR SCI 179B	Scholarly Concentration II

NOTE: Double majors with Nursing Science, Pharmaceutical Sciences, Public Health Sciences, Biomedical Engineering: Premedical, or with any of the School of Biological Sciences majors are not permitted. Students majoring in Nursing Science may not minor in Biological Sciences.

Honors at graduation, e.g., *cum laude*, *magna cum laude*, *summa cum laude*, are awarded to approximately the top 16 percent of the graduating seniors. To be eligible for honors, a general criterion is that students must have completed at least 72 units in residence at a University of California campus. Other important factors are considered (see Honors Recognition).

**Freshman**

Fall	Winter	Spring
CHEM 1A	CHEM 1B	CHEM 1C
PSYCH 7A or PSCI	SOCIOL 1	WRITING 39C

PUBHLTH 1	WRITING 39B	General Education/ Elective	
	General Education/ Elective	General Education/ Elective	
<b>Sophomore</b>			
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>	<b>Summer</b>
BIO SCI 97	BIO SCI 98	BIO SCI D170	BIO SCI E112L
CHEM 51A	BIO SCI E109	BIO SCI M122	
PHILOS 4 or 5	STATS 7 or 8	BIO SCI M118L	
General Education/ Elective	General Education/ Elective		
<b>Junior</b>			
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>	
NUR SCI 110W	NUR SCI 112LB	NUR SCI 120	
NUR SCI 112LA	NUR SCI 114B	NUR SCI 140	
NUR SCI 114A	NUR SCI 118B		
NUR SCI 116	NUR SCI 125		
NUR SCI 118A	NUR SCI 135		
<b>Senior</b>			
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>	
NUR SCI 130	NUR SCI 150	NUR SCI 170	
NUR SCI 132	NUR SCI 160	NUR SCI 175L	
	NUR SCI 179AW	NUR SCI 179B	

## Nursing Science, M.S.

The Master of Science (M.S.) in Nursing Science at the University of California, Irvine is a graduate degree program that prepares students to lead innovations in health care delivery and elevated nursing care across practice settings. The program course work is designed to prepare graduate-educated nurses with: (1) research and evidence-based practice competency; (2) expertise in specialized concentrations of nursing practice; (3) leadership role preparation, including collaborative inter-professional team building; and (4) leadership skills in health policy to become advocates for health promotion and disease prevention efforts supporting population health. The M.S. provides students with a foundation for seamless progression into a research or practice-focused doctoral program.

### Concentration in Community and Population Health Nursing (CPHN)

The MEPN Program offers graduates of non-nursing baccalaureate programs direct entry into an accelerated master's degree program, with the ability to autonomously practice nursing as an M.S.-prepared nurse upon graduation. Graduates of the program will qualify to take the national licensing examination (NCLEX) for registered nurses, be eligible for certification as a Public Health Nurse and earn a Master of Science. The master's degree program also prepares students for future research or practice-focused doctoral studies.

Consistent with the Sue and Bill Gross School of Nursing mission to provide strong research-based academic and professional programs, the new program aims to prepare excellent researchers, educators, and clinicians. Goals of the CPHN concentration are to prepare graduate nurses to lead and expand care to under-served populations in the following areas:

- Generalist nursing practice across a wide variety of healthcare settings, from acute care to community, home, and transition management;
- Nursing scholarship and evidence-based practice;
- Leadership in interprofessional health care teams;
- Innovative advancements in health care delivery, quality improvement, and improved access to care in our underserved communities.

The CPHN curriculum was designed to ensure that the nine essential core areas delineated by the American Association of Colleges of Nursing (AACN) – the umbrella organization that provides national accreditation through their Commission on Collegiate Nursing Education (CCNE) – are met throughout the program. In addition, the Quad Council and the Core Competencies for Public Health Professionals competencies for public health practice are incorporated throughout the curriculum.

Community and Population Health Nursing concentration applicants must have earned a bachelor's degree in a non-nursing university program and have a 3.0 cumulative grade point average (on a 4.0 scale). In addition, they must have completed courses in the following subjects with a C or better: statistics, psychology (preferably human development lifespan), sociology/cultural anthropology, anatomy, physiology, and microbiology with labs, and chemistry. Applicants must meet the general requirements of the UCI Graduate Division. The GRE is not required for admission to the Sue and Bill Gross School of Nursing.

**Core Curriculum**

A. Complete the following:

NUR SCI 200	Research Methods and Evaluation for Evidence-Based Practice
NUR SCI 215	Health Promotion/Disease Prevention
NUR SCI 263	Frameworks for Professional Nursing Practice
NUR SCI 281	Professional Issues in Nursing
NUR SCI 282	Compassionate Care with Underserved Populations
NUR SCI 284	Scholarly Concentration

**Community and Population Health Nursing Concentration Courses:**

NUR SCI 200	Research Methods and Evaluation for Evidence-Based Practice
NUR SCI 215	Health Promotion/Disease Prevention
NUR SCI 262	Foundations of Professional Nursing Practice
NUR SCI 263	Frameworks for Professional Nursing Practice
NUR SCI 264A	Applied Pharmacology I
NUR SCI 264B	Applied Pharmacology II
NUR SCI 265	Older Adult Health Care
NUR SCI 266	Adult Health Care
NUR SCI 267	Human Behavior and Mental Health Nursing
NUR SCI 268A	Pathophysiology I
NUR SCI 268B	Pathophysiology II
NUR SCI 271	Community-Based Health Care
NUR SCI 272	Pediatrics: Care of Children and Families
NUR SCI 273	Maternity and Women's Health Care
NUR SCI 274	Critical and Specialty Health Care
NUR SCI 275	Clinical Preceptorship
NUR SCI 276	Leadership and Management in Health Care
NUR SCI 281	Professional Issues in Nursing
NUR SCI 282	Compassionate Care with Underserved Populations
NUR SCI 284	Scholarly Concentration
NUR SCI 294	Directed Study in Vulnerable Populations

Successful completion of required course work will advance students to M.S. candidacy the quarter prior to scheduled completion of the program. All M.S. concentration students complete a Scholarly Concentration project in an area of interest culminating in a major paper and oral presentation. Full-time M.S. students are expected to complete the program within two years.

## Nursing Science, Ph.D.

The Doctor of Philosophy (Ph.D.) in Nursing Science is designed to prepare nurse scientists with expertise in clinical-translational research methods to advance the scholarly discipline and to contribute to the growing body of knowledge in the field of nursing. The program emphasizes the combination of translational science methods with traditional models for research to comprehensively address health and healthcare needs of local, national and global communities.

To be considered for admission, applicants must have a Bachelor or Master of Science degree in Nursing from a regionally and CCNE accredited institution with degree standards equivalent to the University of California. Degrees from international programs must have accreditations satisfactory to the Graduate Division and the Sue and Bill Gross School of Nursing and be equivalent to UC educational requirements.

Applicants are required to submit transcripts showing a minimum grade point average (GPA) of 3.2 for undergraduate work or 3.5 for graduate work from an accredited institution and a scholarship record commensurate with requirements of the Graduate Division and the Sue and Bill Gross School of Nursing. Previous education at the undergraduate and/or graduate levels will be evaluated for equivalency of design, theory, and intensity as a means of determining whether the prior degree standards are equivalent to those required by the UC system. If English is not the applicant's first language, the applicant must demonstrate proficiency in English prior to admission commensurate with that identified by the Graduate Division for the Test of English as a Foreign Language (TOEFL) or TOEFL Internet-Based (TOEFL iBT).

Applicants who did not have a course in descriptive and inferential statistics within the last five years must complete a course similar to STATS 7 prior to admission. Applicants must have an undergraduate- or graduate-level research course in order to apply. Applicants who have had intensive research



experience may submit a request to waive this prerequisite; there are no guarantees that this request will be granted. Each applicant's file will be reviewed on a case-by-case basis.

In addition, applicants are required to submit:

- A statement of objectives for graduate study compatible with the areas of focus below (please see the Ph.D. section of the School of Nursing website (<http://www.nursing.uci.edu/doctor-philosophy.asp>) for more details);
- A resume or *Curriculum Vitae* detailing educational background, professional work, previous research, and volunteer work as well as other relevant information such as fluency in another language;
- Examples of scholarly work;
- Three letters of recommendation submitted on the Graduate Division Recommendation Form from persons in a supervisory role who are able to comment on academic abilities, research-related abilities/capabilities, and/or work-related experiences; and
- Evidence of licensure as a registered nurse.

A personal interview will be required of applicants considered for admission. Acceptance is based on materials submitted, research interests related to those of faculty, and results of the interview process.

The specific field of emphasis for the Ph.D. program is Nursing Science. Generally, this involves increasing the quality of life for the community that nurses serve. Consistent with faculty research expertise, the Ph.D. program will specifically promote the development of scientific and theoretical expertise that contributes to scholarly endeavors in six key areas: integrative health and wellness promotion, community health, philosophical and theoretical foundations in nursing, health services and practice, digital technology and health, health disparities and diversity. These areas of research emphasis intersect as they contribute to healthy communities. Emphasis will be placed on building expertise in the use of translational science methods in conjunction with traditional models for research. Research emphasis areas are described below.

**Integrative Health and Wellness Promotion.** Integrative health is an approach to care that puts the patient at the center and addresses the full range of physical, emotional, mental, social, spiritual, and environmental influences that affect a person's health. Employing a personalized strategy that considers the patient's unique conditions, needs and circumstances, integrative health uses the most appropriate interventions from an array of scientific disciplines to heal illness and disease and help people regain and maintain optimum health and wellness. Students choosing this focus may work with UCI faculty (Nursing Science and others) on stress and coping, women's health, whole person health and wellness, the distribution of health-related events and social determinants of health influencing these events, to name a few specific areas.

**Community Health.** Community health is a blend of primary health care and nursing practice with public health nursing to provide care that is preventive, curative, and rehabilitative. The philosophy of care is based on the belief that care directed to the individual, the family, and the group contributes to the health care of the population as a whole. Students choosing this focus will have an opportunity to study the development of community activities that contribute to the promotion of, education about, and maintenance of good health. These activities require comprehensive health programs that pay special attention to social and ecological influences and specific populations at risk.

**Philosophical and Theoretical Foundations in Nursing.** While empirical scholarship is a critical element of nursing, generating evidence for sound interventions that improve the health of patients, families, and communities, philosophical/theoretical scholarship is also vital for the development of the discipline. Students choosing this focus will have the opportunity to work with leading scholars to advance understanding of the nature of nursing science and practice.

**Health Services and Practice.** Health policy and the economics of delivering health care are important issues affecting health outcomes. Students choosing this focus will have an opportunity to examine the implications of a variety of policies and services on health and health system outcomes. There will be opportunities to study with researchers who have expertise in health care system management, law, organizational theory and behavior, and quality of care.

**Digital Technology and Health.** Digital technology is the integrated use of electronic information and telecommunications technology to support remote clinical health care, patient and professional health-related education, public health and health administration to deliver relevant and up-to-date, real-time, information to researchers in a more efficient way, given the sheer amount of data being produced every day. Students choosing this focus may work with UCI faculty (Nursing Science and others) on support and enhancement of a collaborative informatics community; promotion of software standards for interoperability; growth of collaborative innovation across informatics tools, methods and processes; data science education for clinicians and researchers; and development of novel methods and tools for the evaluation of the impact of these activities to enhance health care through data and informatics.

**Health Disparities and Diversity.** The focus on Health Disparities acknowledges that there are individuals, families, and communities who are not equally treated in the quest for health. Many do not have equal access to quality health care nor the means to achieve an equal level of desired health outcomes. The emphasis will examine these health disparities among diverse populations who encounter differences in treatment and outcomes. Students choosing this focus will have an opportunity to work with diverse community members in Orange County and beyond, and they will be mentored by researchers who study the experiences of these community members.

Ph.D. students are required to complete 50 quarter units of formal course work selected in part by consultation with the faculty advisor, subject to review by a faculty oversight committee. These courses will cover the necessary fundamental and methodological principles, and accommodate cross-



disciplinary themes in nursing science. Students will also be required to participate in the educational mission of the Sue and Bill Gross School of Nursing as teaching assistants for two quarters.

Students will have two formal examinations along the process toward writing their thesis. First they will write a comprehensive examination following completion of required course work and electives (50 required quarter units). The next benchmark will be the proposal defense (qualifying exam), in which students will advance to candidacy upon successful presentation of an original dissertation research proposal and oral defense of the proposal. Ph.D. completion requires submission of an acceptable dissertation and oral defense. The normative time to degree is five years, and the maximum time permitted is seven years.

#### Required Courses

NUR SCI 212	Philosophy of Science for Nursing Scholarship
NUR SCI 223A	Biostatistics for Health Sciences I
NUR SCI 224	Research Designs in Nursing Science
NUR SCI 226	Theoretical and Conceptual Frameworks
NUR SCI 227A	Grant Writing I
NUR SCI 296	Doctoral Dissertation Reading and Writing

#### Elective Courses

At least 20 units of elective courses contributing to the area of proposed research must be taken. Elective courses may be taken inside or outside of the School of Nursing and must be chosen in consultation with the student's faculty advisor.

Examples of potential electives:

NUR SCI 223B	Biostatistics for Health Sciences II
NUR SCI 227B	Grant Writing II
NUR SCI 233	Appraisal and Translation of Evidence for Practice
NUR SCI 246	Qualitative Research Designs in Nursing Science
NUR SCI 247	Quantitative Research Designs in Nursing Science
NUR SCI 251	Nursing Informatics

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Department of Art

Department of Dance

Department of Drama

Department of Music (<http://catalogue.uci.edu/clairetrevorschoolofthearts/departmentofmusic//clairetrevorschoolofthearts/departmentofmusic/>)

**School of Biological Sciences**

Department of Developmental and Cell Biology

Department of Ecology and Evolutionary Biology

Department of Molecular Biology and Biochemistry

Department of Neurobiology and Behavior

**The Paul Merage School of Business****School of Education****The Henry Samueli School of Engineering**

Department of Biomedical Engineering

Department of Chemical and Biomolecular Engineering

Department of Civil and Environmental Engineering

Department of Electrical Engineering and Computer Science

Department of Materials Science and Engineering

Department of Mechanical and Aerospace Engineering

**School of Humanities**

Department of African American Studies

Department of Art History

Department of Asian American Studies

Department of Classics

Department of Comparative Literature

Emphasis in Critical Theory

Graduate Program in Culture and Theory

Department of East Asian Studies

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Department of European Languages and Studies

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# The Henry Samueli School of Engineering

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## Michael Green, Dean

5200 Engineering Hall

Undergraduate Counseling: 949-824-4334

Graduate Counseling: 949-824-8090

<http://www.eng.uci.edu/>

With engineering as the driving force in economic areas such as health care, communications, and sustainability, it is critical to rethink what it means to be an engineer. While there has been strength in the conventional engineering disciplines for centuries, today's global complexity is placing new demands on how we live, learn, and work. With this in mind, our strategic plan for the Samueli School places leadership and innovation as foundational elements for educating tomorrow's engineers.

The academic mission of the Samueli School is to advance engineering discovery through the creation of original scholarship and research applied to societal grand challenges, to educate and train the next generation of global innovators, and to provide a technological edge to industry by facilitating technology transfer and talent acquisition. The school includes six academic departments: biomedical engineering; chemical and biomolecular engineering; civil and environmental engineering; electrical engineering and computer science; materials science and engineering; and mechanical and aerospace engineering.

We offer undergraduate degrees in a wide range of traditional and emerging fields. Students have choices and can take advantage of the many opportunities available to them. The first year of study for each engineering major is similar, designed to allow exploration of the foundations of engineering and selection of a program that best fits each student's individual interests.

All engineering programs combine science, engineering fundamentals, design principles and application, and a culminating design experience. Students are encouraged to participate in research and hands-on engineering design opportunities to develop the practical skills needed for graduate study or employment.

The school is also committed to increasing diversity in engineering. The Office of Access and Inclusion supports the recruitment, retention, and graduation of undergraduate and graduate students from populations underrepresented in engineering.

The Samueli School's faculty members are leaders in their disciplines who have achieved worldwide recognition for their research and dedicated teaching. Faculty quality has remained high while increasing steadily in number and diversity over the past few years, giving students a remarkable range of expertise in engineering and with it, a large number of different advanced courses and research opportunities.

The School offers undergraduate majors in Aerospace Engineering (AE), Biomedical Engineering (BME), Biomedical Engineering: Premedical (BMEP), Chemical Engineering (ChE), Civil Engineering (CE), Computer Engineering (CpE), Computer Science and Engineering (CSE, a jointly administered program with the Donald Bren School of Information and Computer Sciences), Electrical Engineering (EE), Engineering (a general program, GE), Environmental Engineering (EnE), Materials Science and Engineering (MSE), and Mechanical Engineering (ME). The undergraduate majors in Aerospace, Biomedical, Chemical, Civil, Computer, Computer Science and Engineering, Electrical, Environmental, Materials Science and Engineering, and Mechanical Engineering are accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>; Computer Science and Engineering (CSE) is also accredited by the Computing Accreditation Commission of ABET, <http://www.abet.org>. The undergraduate major in Biomedical Engineering: Premedical (BMEP) is not designed to be accredited, therefore is not accredited by ABET.

**Aerospace Engineering** considers the flight characteristics, performance, and design of aircraft and spacecraft. An upper-division series of courses in aerodynamics, propulsion, structures, and control follows a common core with Mechanical Engineering. The skills acquired in those courses are integrated in the capstone aerospace design course. The intent of the program is to produce highly proficient engineers who can tackle the aerospace engineering challenges of the future.

**Biomedical Engineering** applies engineering principles to solve complex medical problems and focuses at improving the quality of health care by advancing technology and reducing costs. Examples include advanced biomedical imaging systems, the design of microscale diagnostic systems, drug delivery systems, and tissue engineering. Specializations are available that focus student's technical expertise on biophotonics or biomems.

**Biomedical Engineering: Premedical** shares introductory engineering courses with Biomedical Engineering, but replaces senior engineering laboratories and design courses with biology and organic chemistry courses required by medical schools for admission. The intent of the program is to produce students with a basic engineering background who are qualified to enter medical school.

**Chemical Engineering** applies the knowledge of chemistry, mathematics, physics, biology, and humanities to solve societal problems in areas such as energy, health, the environment, food, textiles, shelter, semiconductors, and homeland security. Employment opportunities exist in various industries such as chemical, petroleum, polymer, pharmaceutical, food, textile, fuel, consumer products, and semiconductor, as well as in local, state, and federal governments.

**Civil Engineering** addresses the challenges of large-scale engineering projects of importance to society as a whole, such as water distribution, transportation, and building design. Specializations are provided in General Civil Engineering, Environmental Hydrology and Water Resources, Structural Engineering, and Transportation Systems Engineering.

**Computer Engineering** addresses the design and analysis of digital computers, including both software and hardware. Computer design includes topics such as computer architecture, VLSI circuits, data base, software engineering, design automation, system software, and data structures and algorithms. Courses include programming in high-level languages such as Python, Java, C, C++; use of software packages for analysis and design; design of system software such as operating systems and hardware/software interfaces; application of computers in solving engineering problems, and laboratories in both hardware and software experiences.

**Computer Science and Engineering** is designed to provide students with the fundamentals of computer science, both hardware and software, and the application of engineering concepts, techniques, and methods to both computer systems engineering and software system design. The program gives students access to multidisciplinary problems in engineering with a focus on total systems engineering. Students learn the computer science principles that are critical to development of software, hardware, and networking of computer systems. From that background, engineering concepts and methods are added to give students exposure to circuit design, network design, and digital signal processing. Elements of engineering practice include systems view, manufacturing and economic issues, and multidisciplinary engineering applications. The program is administered jointly by the Department of Electrical Engineering and Computer Science in The Henry Samueli School of Engineering and by the Department of Computer Science in the Donald Bren School of Information and Computer Sciences.

**Electrical Engineering** is one of the major contributors to the modernization of our society. Many of the most basic and pervasive products and services are either based on or related to the scientific and engineering principles taught at the Department of Electrical Engineering and Computer Science. Students specialize in Electronic Circuit Design; Semiconductors and Optoelectronics; RF, Antennas and Microwaves; Digital Signal Processing; or Communications.

**The major in Engineering** is a special program of study for upper-division students who wish to combine the study of engineering principles with other areas such as the physical and biological sciences, social and behavioral science, humanities, and arts. Students may construct their own specialization. Click on the 'Undergraduate Study' tab above for information about this major.

**Environmental Engineering** concerns the development of strategies to control and minimize pollutant emissions, to treat waste, and to remediate polluted natural systems. Emphasis areas include air quality and combustion, water quality, and water resources engineering.

**Materials Science and Engineering** is concerned with the generation and application of knowledge relating the composition, structure, and synthesis of materials to their properties and applications. During the past two decades, Materials Science and Engineering has become an indispensable component of modern engineering education, partly because of the crucial role materials play in national defense, the quality of life, and the economic security and competitiveness of the nation; and partly because the selection of materials has increasingly become an integral part of almost every modern engineering design. Emphasis in the Materials Science and Engineering curriculum is placed on the synthesis, characterization, and properties of advanced functional materials; analysis, selection, and design related to the use of materials; the application of computers to materials problems; and the presence of an interdisciplinary theme that allows a qualified student to combine any engineering major with the Materials Science and Engineering major.

**Mechanical Engineering** considers the design, control, and motive power of fluid, thermal, and mechanical systems ranging from microelectronics to spacecraft to the human body. Specializations allow students to focus their technical electives in the areas of Aerospace Engineering, Energy Systems and Environmental Engineering, Flow Physics and Propulsion Systems, and Design of Mechanical Systems.

The School offers M.S. and Ph.D. degrees in Biomedical Engineering; Chemical and Biomolecular Engineering; Civil Engineering; Electrical and Computer Engineering, with concentrations in Computer Engineering and Electrical Engineering; Engineering, with concentrations in Environmental Engineering, and Materials and Manufacturing Technology; Materials Science and Engineering; and Mechanical and Aerospace Engineering. Specialized research opportunities are available within each of these programs. In Biomedical Engineering, areas of research include micro/nanoscale biomedical devices for diagnostics and therapeutics, biophotonics, systems/synthetic bioengineering, tissue/organ engineering, cardiovascular engineering, cancer biotechnology, and neuroengineering. Bioreaction and bioreactor engineering, recombinant cell technology, and bioseparation processes are research areas in Biochemical Engineering. In Civil Engineering, research opportunities are provided in structural/earthquake engineering, reliability engineering, transportation systems engineering, environmental engineering, and water resources. Research opportunities in Electrical and Computer Engineering are available in the areas of parallel and distributed computer systems, VLSI design, computer architecture, image and signal processing, communications, control systems, and optical and solid-state devices. Research in combustion and propulsion sciences, laser diagnostics, supersonic flow, direct numerical simulation, computer-aided design, robotics, control theory, parameter identification, material processing, electron microscopy, and ceramic engineering are all available in Mechanical and Aerospace Engineering. The School also offers the M.S. degree in Engineering Management, a joint degree program with the Paul Merage School of Business; and the M.S. degree in Biotechnology Management, a joint degree program with the School of Biological Sciences and The Paul Merage School of Business.

Additional information about undergraduate and graduate academic study and research opportunities are available through the Samueli School of Engineering website ([engineering.uci.edu](http://engineering.uci.edu)), and directly from the Departments of Biomedical Engineering, Chemical and Biomolecular Engineering, Civil and Environmental Engineering, Electrical Engineering and Computer Science, Materials Science and Engineering, and Mechanical and Aerospace Engineering.

- Department of Biomedical Engineering
- Department of Chemical and Biomolecular Engineering
- Department of Civil and Environmental Engineering
- Department of Electrical Engineering and Computer Science
- Department of Materials Science and Engineering
- Department of Mechanical and Aerospace Engineering

## Requirements for the Bachelor's Degree

All students in The Henry Samueli School of Engineering must fulfill the following requirements.

**All students must meet the University Requirements.**

**All students must meet the School Requirements:**

The following are minimum subject-matter requirements for graduation:

*Mathematics and Basic Science Courses:* Students must complete a minimum of 48 units of college-level mathematics and basic sciences.

*Engineering Topics Courses:* Students must complete a minimum of 72 units of engineering topics. *Engineering topics* are defined as courses with applied content relevant to the field of engineering.

**Design Units:** All undergraduate Engineering courses indicate both a total and a design unit value. Design unit values are listed at the end of the course description. Each student is responsible for the inclusion of courses whose design units total that required by the program of study.

**The Academic Plan and Advising Requirements:** To remain affiliated with The Henry Samueli School of Engineering, all students enrolled in the School are required to meet annually with their designated faculty for advising and mentoring and to have an academic plan on file with the Student Affairs Office which has been approved by their academic counselor. Students who do not have a plan on file, or deviate from this plan without approval from an academic counselor will be subject to probation. Students on probation for two consecutive quarters who do not have a plan on file, or deviate from this plan without approval from an academic counselor will be subject to disqualification. Students who fail to meet with a faculty advisor each year will have a hold placed on their enrollment for the upcoming term.

**Duplication of Subject Material:** Students who take courses which involve considerable duplication of subject material may not receive full graduation credit for all units thus completed.

**Residence Requirement:** In addition to the University residence requirement, at least 36 upper-division engineering units specified by each major must be completed successfully at University of California.

**Variations:** Variations from the general School degree requirements may be made subject to the approval of the faculty of the School. Students wishing to obtain variances should submit petitions to the School's Student Affairs Office via <http://undergraduate.eng.uci.edu/forms>. (<http://undergraduate.eng.uci.edu/forms/>)

- Aerospace Engineering, B.S.
- Biomedical Engineering, B.S.
- Biomedical Engineering, M.S.
- Biomedical Engineering, Minor
- Biomedical Engineering, Ph.D.
- Biomedical Engineering: Premedical, B.S.
- Biotechnology Management, M.S.
- Chemical and Biomolecular Engineering, M.S.
- Chemical and Biomolecular Engineering, Ph.D.
- Chemical Engineering, B.S.
- Civil and Environmental Engineering, M.S.
- Civil and Environmental Engineering, Ph.D.
- Civil Engineering, B.S.
- Computer Engineering, B.S.
- Computer Science and Engineering, B.S.
- Electrical and Computer Engineering, M.S.
- Electrical and Computer Engineering, Ph.D.
- Electrical Engineering, B.S.
- Engineering Management, M.S.



- Engineering, B.S.
- Engineering, M.S. (Concentration in Materials and Manufacturing Technology)
- Engineering, Ph.D. (Concentration in Materials and Manufacturing Technology)
- Environmental Engineering, B.S.
- Master of Engineering
- Materials Science and Engineering, B.S.
- Materials Science and Engineering, M.S.
- Materials Science and Engineering, Minor
- Materials Science and Engineering, Ph.D.
- Mechanical and Aerospace Engineering, M.S.
- Mechanical and Aerospace Engineering, Ph.D.
- Mechanical Engineering, B.S.

## Undergraduate Study

**Michael M Green, Associate Dean for Undergraduate Student Affairs**

Student Affairs Office

305 Rockwell Engineering Center

949-824-4334

## Admissions

The sequential nature of the Engineering program and the fact that many courses are offered only once a year make it beneficial for students to begin their studies in the fall quarter. Applicants wishing to be admitted for the fall quarter, 2021, must have submitted their completed application forms during the priority filing period (November 1 - November 30, 2020).

**High school students** wishing to enter the UCI Engineering program must have completed four years of mathematics through pre-calculus or math analysis and are advised to have completed one year each of physics and chemistry. That preparation, along with honors courses and advanced placement courses, is fundamental to success in the Engineering program and is vital to receiving first consideration for admittance to an Engineering major during periods of restricted enrollments. Students applying for admission for fall quarter should complete their examination requirements during May or June of their junior year or during their senior year, but no later than the December test date. (Typically, this means that students will take the SAT or the ACT Plus Writing Test in October or November. Applicants are strongly encouraged to take a math or science AP or SAT exam. Applicants should favor the Math Level 2 SAT Subject Test over the Math Level 1 Test. Applicants must apply for admission to a specific Engineering major or Engineering Undeclared.

If enrollment limitations make it necessary, unaccommodated Engineering applicants may be offered alternative majors at UCI.

**Transfer students** may be admitted to The Henry Samueli School of Engineering either from another major at UCI or from another college or university. A student seeking admission to The Henry Samueli School of Engineering from colleges and schools other than UCI must satisfy University requirements for admission with advanced standing and should complete appropriate prerequisites for their major of choice. Applicants should prioritize completing subject requirements (math, science, engineering) over completion of IGETC or UCI general education and lower-division requirements prior to transfer. IGETC is not considered in transfer selection while subject requirements contribute directly to reducing time to graduate. Since requirements vary from major to major, those contemplating admission with advanced standing to the School should consult each Department's *Catalogue* section and the UCI Office of Undergraduate Admissions, 949-824-6703, for the specific requirements of each program. All transfer students should arrange for early consultation with The Henry Samueli School of Engineering Student Affairs Office at 949-824-4334.

**Change of Major:** Students who wish to change their major to one offered by the School should contact the Engineering Student Affairs Office for information about change-of-major requirements, procedures, and policies. Interested students must attend a change of major workshop. Information is also available at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>).

## Engineering Gateway Freshman-Year Curriculum

Students who know that they want to major in engineering but who are unsure of the specific major should apply for the Engineering Gateway Curriculum and follow the Sample Engineering Gateway Curriculum. Students following the Engineering Gateway Curriculum are required to meet with an academic advisor every quarter and are strongly encouraged to declare a major as soon as possible and then follow the appropriate sample program of study for that major.

### Sample Engineering Gateway Curriculum - Freshman <sup>1</sup>

Freshman		
Fall	Winter	Spring
MATH 2A	MATH 2B	MATH 2D
ENGR 7A	ENGR 7B	PHYSICS 7D
ENGR 1A or CHEM 1A	CHEM 1B	PHYSICS 7LD

Select one of the following:

EECS 10

EECS 12

ENGRMAE 10

I&C SCI 31<sup>2</sup>

PHYSICS 7C

PHYSICS 7LC

Select one of the following:

CHEM 1C- 1LC

or General Education

- <sup>1</sup> Students who choose to major in Biomedical Engineering or Biomedical Engineering: Premedical should enroll in BME 1 in the fall quarter of the sophomore year. Students who choose to major in Computer Engineering should enroll in EECS 20 by the spring or summer quarter preceding their sophomore year.
- <sup>2</sup> Students who are considering the Computer Science and Engineering major should enroll in I&C SCI 31

Students who choose certain majors during the first year may replace Chemistry courses with required major courses.

Students should choose a major by the end of the spring quarter of their freshman year or earlier. Some modification in the program of study might be appropriate if the student chooses a major before the end of the freshman year. In any case, when the major is chosen, the student must meet immediately with an academic counselor to plan the program of study.

## Minors/Concentrations of Interest to Engineers

### Minor in Earth and Atmospheric Sciences

The minor in Earth and Atmospheric Sciences focuses on the application of physical, chemical, and biological principles to understanding the complex interactions of the atmosphere, ocean, and land through climate and biogeochemical cycles. See the minor in Earth and Atmospheric Sciences page for more information.

### Minor in Global Sustainability

The interdisciplinary minor in Global Sustainability trains students to understand the changes that need to be made in order for the human population to live in a sustainable relationship with the resources available on this planet. See the minor in Global Sustainability page for more information.

### Concentration: Engineering and Computer Science in the Global Context

The globalization of the marketplace for information technology services and products makes it likely that The Henry Samueli School of Engineering graduates will work in multicultural settings or be employed by companies with extensive international operations, or customer bases. The goal of the concentration is to help students develop and integrate knowledge of the history, language, and culture of a country or geographic region outside the United States, through course work both at UCI and an international host campus, followed by a technology-related internship in the host country.

All of The Henry Samueli School of Engineering majors in good standing may propose an academic plan that demonstrates the ability to complete the concentration (a minimum of eight courses) and other requirements for graduation in a reasonable time frame. It is expected that a student's proposal will reflect a high degree of planning that includes the guidance of academic counselors and those at the UCI Study Abroad Center regarding course selection, as well as considerations related to internship opportunities, housing, and financial aid. Each student's proposed program of study must be approved by the Associate Dean for Student Affairs in The Henry Samueli School of Engineering. The Associate Dean will be available to assist qualified students with the development of a satisfactory academic plan, as needed.

The concentration consists of the following components:

1. A minimum of eight courses at UCI or at the international campus with an emphasis on the culture, language (if applicable and necessary), history, literature of the country that corresponds to the international portion of the program, international law, international labor policy, global issues, global institutions, global conflict and negotiation, and global economics;
2. A one- or two-semester sequence of technical courses related to the major and, possibly, culture, history, and literature courses taken at an international university;
3. A two-month or longer technical internship experience in the same country as the international educational experience.

More information about the requirements for the concentration is available in The Henry Samueli School of Engineering Student Affairs Office.

The concentration in Engineering and Computer Science in the Global Context is open to students in Aerospace Engineering, Biomedical Engineering, Biomedical Engineering: Premedical, Chemical Engineering, Civil Engineering, Computer Engineering, Engineering (General), Electrical Engineering, Environmental Engineering, Materials Science and Engineering, and Mechanical Engineering.

## Academic Advising

Academic advising is available from academic counselors and peer advisors in the School's Student Affairs Office, 305 Rockwell Engineering Center. *Students must realize, however, that ultimately they alone are responsible for the planning of their own program and for satisfactory completion of the graduation requirements.* Students are encouraged to consult with the academic counselors in the Engineering Student Affairs Office whenever they desire to change their program of study. All Engineering majors are required to meet with their faculty advisor at least once each year.

Some engineering students will need *more than four years* to obtain their B.S., particularly if part-time employment or extracurricular activities make heavy demands on their time. Normally, such students can stay on track, and are encouraged to do so, by enrolling in summer sessions at UCI or at other institutions when a petition has been approved in advance.

High-achieving students may declare a second major. Early consultation with the School is advisable. However, students are not eligible to declare a second major until they have successfully completed two years with a minimum 3.0 GPA in engineering-related courses.

Required courses may be replaced by other courses of equivalent content if the student substantiates the merits of the courses in the program of study and obtains prior approval from faculty in the School.

Students should be aware that most Engineering courses require the completion of prerequisites. The sample programs shown in each departmental description constitute preferred sequences which take into account all prerequisites.

School policy does not permit the deletion of Engineering courses after the second week or addition of Engineering courses after the second week of the quarter without the Associate Dean's approval.

Undergraduate students who have high academic standing, who have completed the necessary prerequisites, and who have obtained permission from the School may qualify to take certain graduate-level courses.

Students are required to complete UCI's lower-division writing requirement (see the Requirements for a Bachelor's Degree section) during the first two years. Thereafter, proficiency in writing and computing (using a higher-level language such as Python, C, C++, Java, or MATLAB) is expected in all Engineering courses.

The Pass/Not Pass option is available to encourage students to enroll in courses outside their major field. Pass/Not Pass option cannot be used to satisfy specific course requirements of the students school and major. Students must take courses to fulfill the UC Entry Level Writing requirement for a grade. For more complete information, see the Academic Regulations and Procedures section of this *Catalogue*.

## Career Advising

The UCI Division of Career Pathways provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See the Division of Career Pathways website (<https://career.uci.edu/>) for additional information. In addition, special career planning events are held throughout the year including four annual Career Fairs. Individual career counseling is available, and students have access to the Career Library which contains information on graduate and professional schools in engineering, as well as general career information.

## Proficiency Examinations

A student may take a course by examination with the approval of the faculty member in charge of the course and the Dean of the School. Normally, ability will be demonstrated by a written or oral examination; if a portion of the capability involves laboratory exercises, the student may be required to perform experiments as well. The proficiency examination is not available for any course a student has completed at UCI.

## Honors

**Graduation with Honors.** Undergraduate honors at graduation in The Henry Samueli School of Engineering are computed by using 50 percent of the overall UCI GPA and 50 percent of the upper-division Engineering GPA. A general criterion is that students must have completed at least 72 units in residence at a University of California campus. Approximately 2 percent of the graduating class shall be awarded *summa cum laude*, 4 percent *magna cum laude*, and 10 percent *cum laude*, with no more than 16 percent being awarded honors. To learn more about the other important factors that are considered, visit Honors Recognition.

**Dean's Honor List.** The quarterly Dean's Honor List is composed of students who have received a 3.5 GPA while carrying a minimum of 12 graded units.

**Gregory Bogaczyk Memorial Scholarship.** This scholarship was established in memory of Gregory Bogaczyk, a former UCI Mechanical Engineering student, and is contributed by the Bogaczyk family and friends. An award is given each year to a junior or senior Mechanical Engineering student.

**Haggai Memorial Endowed Scholarship.** This memorial fund was established in honor of Ted Haggai, an electrical engineer. This scholarship is awarded to an outstanding senior electrical engineering student and member of Tau Beta Pi. Primary consideration will be given to members of Tau Beta Pi who have contributed outstanding service to both UCI and The Henry Samueli School of Engineering.

**Christine Jones Memorial Scholarship.** This scholarship was established in memory of Christine Jones, an Electrical Engineering graduate, Class of 1989. The primary focus of this scholarship is to provide financial support to a female undergraduate student in The Henry Samueli School of Engineering.

**Deborah and Peter Pardoen Memorial Scholarship.** This scholarship is awarded each year to a graduating senior in Mechanical Engineering or in Aerospace Engineering. The scholarship is based on outstanding service to The Henry Samueli School of Engineering and the community.

**Henry Samueli Endowed Scholarship.** This premier scholarship, established by Henry Samueli, is awarded to outstanding freshmen and transfer students in The Henry Samueli School of Engineering. Recipients are chosen by the School based on their academic excellence. The award is renewable up to four years for freshmen and up to two years for transfer students.

Additional awards in other categories are made throughout the academic year.

## Office of Access and Inclusion

200A Rockwell Engineering Center; 949-824-7134  
Sharnnia Artis, Assistant Dean for Access and Inclusion

The Office of Access and Inclusion (OAI) facilitates and supports the recruitment, retention, and graduation of undergraduate and graduate students from historically excluded populations who are currently underrepresented in the Samueli School of Engineering and the Donald Bren School of Information and Computer Sciences. Services include mentoring, tutoring, career and academic workshops and coaching, and assistance for students looking to conduct undergraduate research or prepare for graduate school.

## Special Programs and Courses

### Campuswide Honors Collegium

The Campuswide Honors Collegium is available to selected high-achieving students from all academic majors from their freshman through senior years. For more information contact the Campuswide Honors Collegium, 1200 Student Services II; 949-824-5461; [honors@uci.edu](mailto:honors@uci.edu); or visit the Campuswide Honors Collegium website (<http://www.honors.uci.edu/>).

### Engineering 199

Every undergraduate student in The Henry Samueli School of Engineering has the opportunity to pursue independent research under the direct supervision of a professor in the School. Interested students should consult with a faculty member to discuss the proposed research project. If the project is agreed upon, the student must fill out a 199 Proposal Form and submit it to the Engineering Student Affairs Office.

### Undergraduate Research Opportunities Program

The Undergraduate Research Opportunities Program (UROP) encourages and facilitates research and creative activities by undergraduates. Research opportunities are available not only from every discipline, interdisciplinary program, and school, but also from many outside agencies, including national laboratories, industrial partners, and other universities. UROP offers assistance to students and faculty through all phases of the research activity: proposal writing, developing research plans, resource support, conducting the research and analyzing data, and presenting results of the research at the annual spring UCI Undergraduate Research Symposium. Calls for proposals are issued in the fall and spring quarters. Projects supported by UROP may be done at any time during the academic year and/or summer, and the research performed must meet established academic standards and emphasize interaction between the student and the faculty supervisor. In addition, all students participating in faculty-guided research activities are welcome to submit their research papers for faculty review and possible publication in the annual *UCI Undergraduate Research Journal*. For more information, contact the UROP Office, 1100 Student Services II; 949-824-4189; [urop@uci.edu](mailto:urop@uci.edu); or visit the Undergraduate Research Opportunities Program website (<http://www.urop.uci.edu/>).

### Accelerated M.S. or Ph.D. Status Program in The Henry Samueli School of Engineering

Exceptionally promising UCI undergraduate Engineering students may, during their junior or senior year, petition for streamlined admissions into a graduate program within The Henry Samueli School of Engineering. Accelerated M.S. Status would allow a student to petition for exemption from UCI's Graduate Record Examination (GRE) requirement for graduate school admission. (The exemption applies only to current UCI students applying for admission to one of the M.S. programs in The Henry Samueli School of Engineering; other graduate schools may still require the GRE.) A current UCI undergraduate student whose ultimate goal is a Ph.D. may apply for Accelerated Status, however, a GRE score must be submitted.

Accelerated Status applicants would in all other ways be evaluated in the same manner as other applicants to the School's graduate programs. Occasionally, a candidate for Accelerated Status may be required by the faculty to submit GRE scores in support of the graduate application.

Students who successfully petition for Accelerated Status, upon matriculation to the graduate degree program, may petition to credit toward the M.S. degree up to 18 units (with a grade of B or better) of graduate-level course work completed in excess of requirements for the UCI bachelor's degree.

Visit the UCI Undergraduate Accelerated Status website (<https://www.eng.uci.edu/admissions/graduate/accelerated-status-program/>) for more detailed information about this program and its eligibility requirements.

### UC Education Abroad Program

Engineering students may participate in a number of programs which offer unique opportunities for education and training abroad. The University's Education Abroad Program (UCEAP) offers engineering course work for UCI academic credit at a number of universities. Some of the UCEAP-affiliated engineering schools require proficiency in the host country's language, while others are English speaking. Study abroad may postpone the student's graduation for one or two quarters, depending primarily on the student's language preparation (which can begin in the freshman year), but the added experience can add to the student's maturity and professional competence. UCEAP students pay regular UCI fees and tuition and keep any scholarships they may have. Visit the Study Abroad Center website (<http://www.studyabroad.uci.edu>) for additional information.

## Student Participation and Organizations

Faculty and committee meetings (except those involving personnel considerations) are open meetings; in addition to designated student representatives, all students are encouraged and expected to participate in the development of School policy. Student evaluation of the quality of instruction for each course is requested each quarter.

Engineering students may join any of a number of student organizations. Most of these organizations are professionally oriented and in many instances are local chapters of national engineering societies. A primary function of these groups is to provide regular technical and social meetings for students with common interests. Most of the groups also participate in the annual Engineering Week activities and in other School functions.

**Associated General Contractors (AGC).** A student chapter of the national organization, AGC at UCI is an academic engineering club for students interested in the construction field.

**American Indian Science & Engineering Society (AISES).** The mission of AISES is to increase the representation of American Indians in engineering, science, and technology. Chapters emphasize education as a tool that will facilitate personal and professional growth opportunities through mentor programs, leadership training, scholarships, conferences, and summer job opportunities.

**American Institute of Aeronautics and Astronautics (AIAA).** The AIAA is a technical society of 40,000 professional and student members devoted to science and engineering in the field of aerospace. The local chapter's primary activities include seminars, tours of industries, and mentoring for students by professional members.

**American Institute of Chemical Engineers (AIChE).** AIChE, a student chapter of the national organization, provides Chemical Engineering majors with the opportunity to interact with faculty and professionals in the field.

**American Society for Civil Engineers (ASCE).** One of the larger engineering clubs, ASCE at UCI is a student chapter of the national organization. The ASCE focuses its efforts on interactions with professional engineers, sponsorship of Engineering Week activities, and participation in the annual ASCE Southwest Conference.

**American Society for Materials (ASM).** The student chapter of ASM at UCI provides the opportunity for Materials Science and Engineering (MSE) students to meet engineers and scientists from local industry, attend seminars organized by the Orange Coast Chapter of ASM International, and organize discussion sessions that focus on progress and advances in the MSE field and that promote interactions between MSE students and materials faculty.

**American Society of Mechanical Engineers (ASME).** The student chapter of ASME at UCI provides the opportunity for Mechanical Engineering majors to meet with professors, organize social events, and participate in events and competitions supported by the ASME national organization.

**Biomedical Engineering Society (BMES).** The student chapter of BMES at UCI is an academic club for students in the field of Biomedical Engineering.

**Chi Epsilon.** This organization is a national engineering honor society which is dedicated to the purpose of promoting and maintaining the status of civil engineering as an ideal profession. Chi Epsilon was organized to recognize the characteristics of the individual that are fundamental to the successful pursuit of an engineering career.

**Electric Vehicle Association/UCI (EVA/UCI).** EVA/UCI gives students an opportunity for hands-on work on electric car conversions coupled with design experience.

**Engineering Student Council (ESC).** The ESC is the umbrella organization that provides a voice for all Engineering student chapters. A significant activity of the Council is organizing UCI's annual Engineering Week celebration.

**Engineers Without Borders (EWB).** This humanitarian organization combines travel with the idea that engineers can play an instrumental role in addressing the world's assorted challenges. Through the implementation of equitable, economical, and sustainable engineering projects, EWB-UCI works to improve quality of life within developing communities abroad.

**Eta Kappa Nu.** A student chapter of the National Electrical Engineering Honor Society, Eta Kappa Nu's purpose is to promote creative interaction between electrical engineers and give them the opportunity to express themselves uniquely and innovatively to project the profession in the best possible manner.

**Filipinos Unifying Student-Engineers in an Organized Network (FUSION).** Fusion is the merging of diverse, distinct, or separate elements into a unified whole. The mission of FUSION is to promote the academic and professional development of student engineers by providing an organized network of support.

**Institute of Electrical and Electronic Engineers (IEEE).** A student chapter of a multinational organization, IEEE at UCI encompasses academic, professional, and social activities.

**Institute of Transportation Engineers (ITE).** ITE is a student chapter of a national group of transportation engineering professionals. Offering opportunities to meet both professionals and other students, ITE focuses its activities on an annual project with practical applications.



**Mexican-American Engineers and Scientists (MAES) / Latinos in Science and Engineering.** Open to all students, MAES is a student and professional organization with the purpose of aiding students in their academic, professional, and social endeavors.

**National Society of Black Engineers (NSBE).** The NSBE, with almost 6,000 members, is one of the largest student-managed organizations in the country. The Society is dedicated to the realization of a better tomorrow through the development of intensive programs to increase the recruitment, retention, and successful graduation of underrepresented students in engineering and other technical majors.

**Omega Chi Epsilon.** The student chapter of the National Chemical Engineering Honor Society aims to recognize and promote high scholarship, original investigation, and professional service in chemical engineering.

**Phi Sigma Rho.** This national sorority is open to women in engineering, engineering technology, and STEM majors. Its purpose is to provide social opportunities, promote academic excellence, and provide encouragement and friendship.

**Pi Tau Sigma.** The mechanical engineering honor society, Pi Tau Sigma, is committed to recognizing those of high achievement. The goal of the organization is to promote excellence in academic, professional, and social activities.

**Sigma Gamma Tau.** The aerospace engineering honor society, Sigma Gamma Tau, is committed to recognizing those of high achievement. The goal of the organization is to promote excellence in academic, professional, and social activities.

**Society of Hispanic Professional Engineers (SHPE).** SHPE is both a student and professional organization. The UCI SHPE chapter works to recruit, retain, and graduate Latino engineers by providing a comprehensive program which includes high school visitations, coordinated study sessions, and industry speakers and tours. At the professional level there are opportunities for career positions and scholarships for members who are enrolled in undergraduate and graduate engineering and computer science programs.

**Society of Automotive Engineers (SAE).** Members of the SAE chapter at UCI participate in technical expositions, mini-Baja buggy races, student competitions, and social activities.

**Society of Women Engineers (SWE).** SWE is a national service organization dedicated to the advancement of women in engineering. UCI's student chapter encourages academic and social support, and membership is open to both men and women in technical majors interested in promoting camaraderie and in helping to make engineering study a positive experience.

**Structural Engineers Association of Southern California (SEAOSC).** The UCI student chapter of SEAOSC introduces students to the field of structural engineering through tours, speakers, and SEAOSC dinners with professional members of the organization.

**Sustainable Energy Technology Club (SETC).** With the common theme of energy, club members explore how science and technology can be used as a driving force behind making changes in society with respect to a cleaner environment and less wasteful lifestyles.

**Tau Beta Pi.** The national Engineering honor society, Tau Beta Pi acknowledges academic excellence in the wide variety of engineering disciplines. Tau Beta Pi at UCI sponsors community service activities, social events, and technical and nontechnical seminars.

**Theta Tau.** This is a national fraternity of men and women studying engineering. The goals are to promote the social and professional development of its members during and after their college years.

**Triangle.** This national social fraternity is open to men majoring in engineering, architecture, and the physical, mathematical, biological, and computer sciences. Its purpose is to develop balanced men who cultivate high moral character, foster lifelong friendships, and live their lives with integrity.

## Graduate Study

**Fadi J. Kurdahi, Associate Dean for Graduate and Professional Studies**

Graduate and Professional Studies  
204 Rockwell Engineering Center  
949-824-8090

## Admissions

For information on requirements for admission to graduate study at UCI, contact the appropriate Engineering department, or Graduate and Professional Studies in The Henry Samueli School of Engineering. Additional information is available in the *Catalogue's* Graduate Division section. Admission to graduate standing in The Henry Samueli School of Engineering is generally accorded to those possessing a B.S. in engineering or an allied field obtained with an acceptable level of scholarship from an institution of recognized standing. Those seeking admission without the prerequisite scholarship record may, in some cases, undertake remedial work; if completed at the stipulated academic level, they will be considered for admission. Those admitted from an allied field may be required to take supplementary upper-division courses in basic engineering subjects. The Graduate Record Examination (GRE) General Test is required of all applicants.

## Financial Support

Financial assistance is available to Ph.D. students in the form of fellowships, teaching assistantships, and research assistantships. Students should contact the Department to learn more about fellowships and teaching assistantships. Research assistantships are available through individual faculty members. Although not required, it is beneficial for applicants to contact the faculty member directly to establish the potential for research support.

## Part-Time Study

Domestic students may pursue the M.S. on a part-time basis, carrying fewer units per quarter. Since University residency requirements necessitate the successful completion of a minimum number of units in graduate or upper-division work in each of at least three regular University quarters, part-time students should seek the advice of a counselor in The Henry Samueli School of Engineering Graduate and Professional Studies and the approval of the Graduate Advisor in their program. Students taking courses in UCI Division of Continuing Education prior to enrollment in a graduate program should consult the following section on Transfer of Courses.

## Biomedical Engineering Courses

### **BME 1. Introduction to Biomedical Engineering. 3 Units.**

Introduction to the central topics of biomedical engineering. Offers a perspective on bioengineering as a discipline in a seminar format. Principles of problem solving, design, engineering inventiveness, entrepreneurship, information access, communication, ethics, teamwork, and social responsibility are emphasized.

(Design units: 1)

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.

### **BME 3. Engineering Innovations in Treating Diabetes. 4 Units.**

Innovations in diabetes treatment from the 1800s until the present: purification of insulin, measuring and control of blood glucose, recombinant DNA, clinical trials, and ethics. Solving optimization problems in engineering with Excel.

(II and VA ).

### **BME 50A. Cell and Molecular Engineering. 4 Units.**

Molecular, structural, genetic, biophysical, and cellular principles of life and bioengineering. Introduction to molecular bioengineering, genetic engineering, synthetic biology, and cell biology. Applications to genetic and biomolecular design.

(Design units: 1)

Corequisite: BME 1

Prerequisite: CHEM 1C or CHEM H2C

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

### **BME 50B. Cell and Molecular Engineering. 4 Units.**

Physiological function from a cellular, molecular, and biophysical perspective. Introduction to genetics, neuronal signaling, and cell cycle control.

(Design units: 1)

Prerequisite: BME 50A

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment.

### **BME 60A. Engineering Analysis/Design: Data Acquisition. 4 Units.**

Fundamentals of LabVIEW programming, basics of computer-based experimentation, establishing interface between computer and data acquisition instrumentation, signal conditioning basics. Materials fee.

(Design units: 2)

Prerequisite: PHYS 7D

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.



**BME 60B. Engineering Analysis/Design: Data Analysis. 4 Units.**

Overview of MATLAB; numeric, cell, and structure arrays; file management; plotting and model building; solving linear algebraic equations; signal and image processing. Materials fee.

(Design units: 1)

Prerequisite: MATH 3A

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.

**BME 60C. Engineering Analysis/Design: Computer-Aided Design. 4 Units.**

Introduction to SolidWorks and Computer-Aided Design software; design; analysis; rapid prototyping; visualization and presentation; manufacturing planning. Materials fee.

(Design units: 2)

Prerequisite or corequisite: BME 1

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.

**BME 60D. Engineering Analysis/Design: Finite-Element Simulation. 4 Units.**

Introduction to finite-element simulation; fundamentals of Multiphysics simulation;.

(Design units: 2)

Prerequisite: BME 60B and BME 60C

**BME 110A. Biomechanics I. 4 Units.**

Introduction to statics and dynamics. Topics include rigid bodies, analysis of structures, forces in beams, moments of inertia, friction, kinetics, work, and energy.

(Design units: 1)

Prerequisite: PHYS 7C and MATH 3A and MATH 3D and BME 60B and BME 60C

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**BME 110B. Biomechanics II. 4 Units.**

Introduction to biomechanics from subcellular to tissue levels. Introduction to stress, strain, and constitutive laws of cells and tissues. Emphasis is placed on biosolids. Introduction to elastic and viscoelastic behaviors with emphasis on the standard linear model of viscoelasticity.

(Design units: 1)

Prerequisite: BME 110A

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**BME 110C. Biomechanics III. 4 Units.**

Introduction to human biomechanics with emphasis on cardiovascular biomechanics and biofluid mechanics.

(Design units: 0)

Prerequisite: BME 110B

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BME 111. Design of Biomaterials. 4 Units.**

Natural and synthetic polymeric materials. Metal and ceramics implant materials. Mechanical properties, degradation, surface characterization, and design of materials. Wound repair, blood clotting, foreign body response, biocompatibility of material. Artificial organs and medical devices. Government regulations.

(Design units: 3)

Corequisite: BME 50B or BIO SCI 99.

Prerequisite: CHEM 1C

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**BME 114. Genetic Engineering and Synthetic Biology. 4 Units.**

Exploring how biological function can be engineered and 'synthesized' from the DNA level up.

(Design units: 0)

Prerequisite: (CHEM 1C or CHEM H2C) and MATH 3D and BME 50A and BME 50B

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BME 120. Sensory Motor Systems. 4 Units.**

A quantitative and systems approach to understanding physiological systems. Systems covered include the nervous and musculoskeletal systems.

(Design units: 2)

Prerequisite: (BME 60B or EECS 10 or EECS 12 or CEE 20 or MAE 10) and MATH 3D and PHYS 7D

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

Concurrent with BME 220.

**BME 121. Quantitative Physiology: Organ Transport Systems. 4 Units.**

A quantitative and systems approach to understanding physiological systems. Systems covered include the cardiopulmonary, circulatory, and renal systems.

(Design units: 1)

Prerequisite: (BME 60B or EECS 10 or EECS 12 or CEE 20 or MAE 10) and MATH 3D

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment.

**BME 130. Biomedical Signals and Systems. 4 Units.**

Analysis of analog and digital biomedical signals; Fourier Series expansions; difference and differential equations; convolutions. System models: discrete-time and continuous-time linear time-invariant systems; Laplace and Fourier transforms. Analysis of signals and systems using computer programs.

(Design units: 1)

Corequisite: BME 60B

Prerequisite: (MATH 3A or ICS 6N) and MATH 3D. Recommended: STAT 8.

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.

**BME 132. Introduction to Computational Biology. 4 Units.**

The use of theories and methods based on computer science, mathematics, and physics in molecular biology and biochemistry. Basics in biomolecular modeling. Analysis of sequence and structural data of biomolecules. Analysis of biomolecular functions.

Prerequisite: MATH 2D or MATH 3A or STAT 7 or STAT 8

Same as BIOL M123, CS 183.

Concurrent with MBB 223 and BME 232.

**BME 135. Photomedicine. 4 Units.**

Studies the use of optical and engineering-based systems (laser-based) for diagnosis, treating diseases, manipulation of cells and cell function. Physical, optical, and electro-optical principles are explored regarding molecular, cellular, organ, and organism applications.

(Design units: 0)

Prerequisite: PHYS 3C or PHYS 7D

Same as BIOL D130.

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BME 136. Engineering Medical Optics. 4 Units.**

Principles of optics and photonics, integration of optical components into systems and devices, and analysis of physiological signals obtained from Biophotonics measurements.

(Design units: 3)

Prerequisite: BME 130 and (BME 135 or BIOL D130)

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

Concurrent with BME 251.

**BME 137. Introduction to Biomedical Imaging. 4 Units.**

Introduction to imaging modalities widely used in medicine and biology, including X-ray, computed tomography (CT), nuclear medicine (PET and SPET), ultrasonic imaging, magnetic resonance imaging (MRI), optical tomography, imaging contrast, imaging processing, and complementary nature of the imaging modalities.

(Design units: 1)

Prerequisite: BME 130 or EECS 50 or EECS 150

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BME 138. Spectroscopy and Imaging of Biological Systems. 4 Units.**

Principles of spectroscopy; absorption; molecular orbitals; multiphoton transitions; Jablonski diagram; fluorescence anisotropy; fluorescence decay; quenching; FRET; excited state reactions; solvent relaxations; instruments; microscopy: wide field, LSM, TPE; fluorescent probes, fluctuations spectroscopy; optical resolution and super-resolution; CARS and SHG microscopy.

(Design units: 1)

Prerequisite: (MATH 3A or ICS 6N) and MATH 3D. Recommended: STAT 8.

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.

Concurrent with BME 238.

**BME 140. Design of Biomedical Electronics. 4 Units.**

Analog and digital circuits in bioinstrumentation. AC and DC circuit analysis, design and construction of filter and amplifiers using operational amplifier, digitization of signals and data acquisition, bioelectrical signals, design and construction of ECG instrument, bioelectrical signal measurement and analysis. Materials fee.

(Design units: 3)

Prerequisite: BME 60A and BME 130

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BME 142. Microfabrication. 4 Units.**

Essentials of photolithography, soft-lithography, microfabrication, Microelectromechanical Systems (MEMS), BioMEMS; applications in biomedical engineering.

(Design units: 2)

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BME 147. Microfluidics and Lab-on-a-Chip. 4 Units.**

Introduction to principles of microfluidics and state-of-the-art micro Total Analysis Systems (uTAS). Lab-on-a-Chip for biomolecular assays with device design principles for microscale sample preparation, flow transport, biomolecular manipulation, separation and detection, and the technologies for integrating these devices into microsystems.

(Design units: 1)

Prerequisite: BME 110C

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

Concurrent with BME 260.

**BME 148. Microimplants. 4 Units.**

Essential concepts of biomedical implants at the micro scale. Design, fabrication, and applications of several microimplantable devices including cochlear, retinal, neural, and muscular implants.

(Design units: 1)

Prerequisite: BME 111

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

Concurrent with BME 262.

**BME 149. Biomedical Microdevices . 4 Units.**

In-depth review of microfabricated devices designed for biological and medical applications. Studies of the design, implementation, manufacturing, and marketing of commercial and research bio-medical devices.

(Design units: 0)

Concurrent with BME 261.

**BME 150. Biotransport Phenomena. 4 Units.**

Fundamentals of heat and mass transfer, similarities in the respective rate equations. Emphasis on practical application of fundamental principles.

(Design units: 0)

Prerequisite: (BME 60B or CEE 20) and (MATH 3A or ICS 6N) and MATH 3D

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.

**BME 160. Tissue Engineering. 4 Units.**

Quantitative analysis of cell and tissue functions. Emerging developments in stem cell technology, biodegradable scaffolds, growth factors, and others important in developing clinical products. Applications of bioengineering.

(Design units: 2)

Prerequisite: (BME 50B or BIOL 99) and BME 111 and BME 121 and BME 150

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment.

**BME 170. Biomedical Engineering Laboratory. 4 Units.**

Measurement and analysis of biological systems using engineering tools and techniques. Laboratory experiments involve living systems with the emphasis on measuring physiological parameters. Materials fee.

(Design units: 1)

Prerequisite: BME 50B and BME 120 and BME 130

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BME 171. Cell and Tissue Engineering Laboratory. 4 Units.**

Techniques in molecular, cellular, and tissue engineering. Topics include bacterial and mammalian cell culture, DNA cloning and gene transfer, fabrication of biomaterial scaffolds, and immunassays and microscopy techniques for cell-based assays.

(Design units: 0)

Prerequisite: BME 160

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.

**BME 180A. Biomedical Engineering Design. 3 Units.**

Design strategies, techniques, tools, and protocols commonly encountered in biomedical engineering; industrial design experience in group projects; ethics, economic analysis, and FDA product approval. Materials fee.

(Design units: 3)

Prerequisite: (BME 60B or MAE 10 or EECS 10) and (BME 60C or MAE 52 or EECS 31L) and (BME 140 or MAE 106 or EECS 170B). BME 180A, BME 180B, and BME 180C must be taken in the same academic year.

Grading Option: In progress only.

Restriction: Seniors only. Biomedical Engineering Majors only.

**BME 180B. Biomedical Engineering Design. 3 Units.**

Design strategies, techniques, tools, and protocols commonly encountered in biomedical engineering; industrial design experience in group projects; ethics, economic analysis, and FDA product approval. Materials fee.

(Design units: 3)

Prerequisite: BME 180A. BME 180A, BME 180B, and BME 180C must be taken in the same academic year.

Grading Option: In progress only.

Restriction: Seniors only. Biomedical Engineering Majors only.

**BME 180C. Biomedical Engineering Design. 3 Units.**

Design strategies, techniques, tools, and protocols commonly encountered in biomedical engineering; industrial design experience in group projects; ethics, economic analysis, and FDA product approval. Materials fee.

(Design units: 3)

Prerequisite: BME 180B. BME 180A, BME 180B, and BME 180C must be taken in the same academic year.

Restriction: Seniors only. Biomedical Engineering Majors only.

**BME 195. Special Topics in Biomedical Engineering. 1-4 Units.**

Studies in selected areas of Biomedical Engineering. Topics addressed vary each quarter.

(Design units: 1-4)

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**BME 197. Seminars in Biomedical Engineering. 2 Units.**

Presentation of advanced topics and reports of current research efforts in Biomedical Engineering.

(Design units: 1-2)

Restriction: Seniors only. Biomedical Engineering Majors have first consideration for enrollment.

Concurrent with BME 298.

**BME 199. Individual Study. 1-4 Units.**

Independent research conducted in the lab of a biomedical engineering core faculty member. A formal written report of the research conducted is required at the conclusion of the quarter.

(Design units: 1-4)

Prerequisite: BIOL 194S

Repeatability: May be taken for credit for 8 units.

**BME 199P. Individual Study. 1-4 Units.**

Supervised independent reading, research, or design for undergraduate Engineering majors. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**BME 210. Molecular and Cellular Engineering. 4 Units.**

Engineering of physiological function at the genetic, cellular, and tissue scales. Topics include cloning and genetic engineering, extracellular matrix biomaterials, principles of regenerative medicine and tissue engineering, and experimental design.

Restriction: Graduate students only.

**BME 211. Microscale Tissue Engineering. 4 Units.**

Engineering of physiological function at the scale of individual cells. Topics include cell micropatterning, microfluidic tissue culture, engineering the cellular microenvironment, and microphysiological systems.

Restriction: Graduate students only.

**BME 212. Cardiovascular Mechanobiology. 4 Units.**

Advanced topics in cellular engineering and mechanobiology, with focus on the cardiovascular system. Tools and techniques used to manipulate and measure mechanical forces at the molecular, cellular, tissue, and organ levels, and their applications in cardiovascular devices and tissue engineering.

Restriction: Graduate students only.

**BME 213. Systems Cell and Developmental Biology. 4 Units.**

Introduces concepts needed to understand cell and developmental biology at the systems level, i.e., how the parts (molecules) work together to create a complex output. Emphasis on using mathematical/computational modeling to expand/modify insights provided by intuition.

Same as DEVB 232.

Restriction: Graduate students only.

**BME 215. Linking Modeling and Experiments in Bioengineering. 4 Units.**

Overview of modeling based on experimental techniques in bioengineering. Construct and evaluate models of varying complexity and to relate them to experimental data.

Prerequisite: BME 220 and BME 221

Restriction: Graduate students only.

**BME 220. Sensory Motor Systems. 4 Units.**

A quantitative and systems approach to understanding physiological systems. Systems covered include the nervous and musculoskeletal systems.

Restriction: Graduate students only.

Concurrent with BME 120.

**BME 221. Organ Transport Systems. 4 Units.**

A quantitative and systems approach to understanding physiological systems. Systems covered include the cardiopulmonary, circulatory, and renal systems.

Restriction: Graduate students only.

**BME 222. Biofluid Mechanics . 4 Units.**

Introduces principles of biofluid mechanics in a research oriented scheme and approaches a wide spectrum of biofluid related problems in human body and solutions that involves engineering concepts.

Restriction: Graduate students only.

**BME 224. Molecular and Cellular Biophotonics. 4 Units.**

Principles underlying the application of photonic technologies to biomolecular and cellular systems. Sample technologies Optical Tweezers, Linear and Nonlinear Optical Microscopy and Fluorescence Lifetime and Correlation Methods, and their use to investigate emergent problems in Molecular, Cellular, and Developmental Biology.

Same as CHEM 224.

Restriction: Graduate students only.

**BME 225. Tissue and Organ Biophotonics. 4 Units.**

Principles underlying the application of photonic technologies to tissues, organs, organisms. Sample technologies include Optical Coherence Tomography, Optical Speckle Imaging, Optoacoustic Imaging, Wide-Field Spectroscopic Imaging, Diffuse Optical Spectroscopy. Addressing the use of these technologies to detect/monitor disease and physiological processes.

**BME 230A. Applied Engineering Mathematics I. 4 Units.**

Analytical techniques applied to engineering problems in transport phenomena, process dynamics and control, and thermodynamics.

**BME 230B. Applied Engineering Mathematics II. 4 Units.**

Focuses on biomedical system identification. Includes fundamental techniques of model building and testing such as formulation, solution of governing equations, sensitivity theory, identifiability theory, and uncertainty analysis.

Restriction: Graduate students only.

**BME 232. Introduction to Computational Biology. 4 Units.**

The use of theories and methods based on computer science, mathematics, and physics in molecular biology and biochemistry. Basics in biomolecular modeling. Analysis of sequence and structural data of biomolecules. Analysis of biomolecular functions.

Same as MBB 223.

Restriction: Graduate students only.

Concurrent with BIOL M123 and CS 183 and BME 132.

**BME 233. Dynamic Systems in Biology and Medicine. 4 Units.**

Introduces principles of system theory to analyze biological, biochemical, physiological, and bioengineering systems. Analytical and computational tools are used to model and analyze dynamic systems such as population, neuronal and heart dynamics, biochemical and physiological systems, oxygen diffusion and similar.

Restriction: Graduate students only.

**BME 234. Neuroimaging Data Analysis. 4 Units.**

Knowledge and understanding of recent techniques for the analysis of healthy and pathological structure and function in neuroimaging data.

Restriction: Graduate students only.

**BME 234P. Neuroimaging Data Analysis. 4 Units.**

Knowledge and understanding of recent techniques for the analysis of healthy and pathological structure and function in neuroimaging data.

Restriction: Master of Engineering students only. Graduate students only.

**BME 238. Spectroscopy and Imaging of Biological Systems. 4 Units.**

Principles of spectroscopy; absorption; molecular orbitals; multiphoton transitions; Jablonski diagram; fluorescence anisotropy; fluorescence decay; quenching; FRET; excited state reactions; solvent relaxations; instruments; microscopy: wide field, LSM, TPE; fluorescent probes, fluctuations spectroscopy; optical resolution and super-resolution; CARS and SHG microscopy.

Restriction: Graduate students only.

Concurrent with BME 138.



**BME 240. Introduction to Clinical Medicine for Biomedical Engineering. 4 Units.**

An introduction to clinical medicine for graduate students in biomedical engineering. Lectures and rotations through nephrology, gastroenterology, pulmonary, and critical care cardiology.

Restriction: Graduate students only. Biomedical Engineering Majors only.

**BME 251. Engineering Medical Optics. 4 Units.**

Principles of optics and photonics, integration of optical components into systems and devices, and analysis of physiologic signals obtained from Biophotonics measurements.

Restriction: Graduate students only.

Concurrent with BME 136.

**BME 252. Critical Thinking in Biophotonics. 2 Units.**

Critical thematic review of current research papers in the field of Biophotonics.

Prerequisite: BME 224 or BME 225

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**BME 260. Microfluidics and Lab-On-A-Chip. 4 Units.**

Introduction to microfluidics and state-of-the-art micro Total Analysis Systems (uTAS). Lab-on-a-Chip for biomolecular assays with device design principles for microscale sample preparation, flow transport, biomolecular manipulation, separation and detection, and the technologies for integrating these devices into microsystems.

Restriction: Graduate students only.

Concurrent with BME 147.

**BME 262. Microimplants. 4 Units.**

Essential concepts of biomedical implants at the micro scale. Design, fabrication, and applications of several microimplantable devices including cochlear, retinal, neural, and muscular implants.

Restriction: Graduate students only.

Concurrent with BME 148.

**BME 262P. Microimplants. 4 Units.**

Essential concepts of biomedical implants at the micro scale. Design, fabrication, and applications of several microimplantable devices including cochlear, retinal, neural, and muscular implants.

Restriction: Master of Engineering students only. Graduate students only.

**BME 264. Auditory Science and Technology. 2 Units.**

Advanced topics in auditory science and technology from cochlear mechanics to cochlear implants.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**BME 290. Critical Thinking and Writing. 4 Units.**

Critical thinking and writing are essential ingredients for success in scientific research. Examines examples from the scientific literature to extract principles of good scientific reasoning, experimental design, and writing.

Restriction: Graduate students only.

**BME 295. Special Topics in Biomedical Engineering. 1-4 Units.**

Studies in selected areas of Biomedical Engineering. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**BME 295P. Special Topics in Biomedical Engineering. 4 Units.**

Studies in selected areas of Biomedical Engineering. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Master of Engineering students only. Graduate students only.

**BME 296. Master of Science Thesis Research. 1-16 Units.**

Individual research or investigation conducted in the pursuit of preparing and completing the thesis required for the M.S. in Engineering.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**BME 297. Doctor of Philosophy Dissertation Research. 1-16 Units.**

Individual research or investigation conducted in the pursuit of preparing and completing the dissertation required for the Ph.D. in Engineering.

Repeatability: May be repeated for credit unlimited times.

**BME 298. Seminars in Biomedical Engineering. 2 Units.**

Presentation of advanced topics and reports of current research efforts in biomedical engineering. Designed for graduate students in the Biomedical Engineering program.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Concurrent with BME 197.

**BME 299. Individual Research. 1-16 Units.**

Individual research or investigation under the direction of an individual faculty.

Repeatability: May be repeated for credit unlimited times.

## Chemical and Biomolecular Engr Courses

**CBE 40A. Chemical Processes and Material Balances. 4 Units.**

Introduction to chemical engineering and the industries where chemical engineers play vital roles. Problem-solving skills and techniques. Quantitative calculations and applications using mass and energy balances. Stoichiometric equations, multiple bypasses, and others in process industries.

Prerequisite: MATH 2B and PHYS 7C and (CHEM 1B or CHEM H2B)

Restriction: Chemical Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**CBE 40B. Process Thermodynamics. 3 Units.**

Principles of thermodynamics: definitions, basic concepts, and laws; property relationships; construction of thermodynamic charts and tables; energy balances; phase and chemical equilibria; combined mass and energy balances.

Prerequisite: CBE 40A and (MATH 3A or ICS 6N). CBE 40A with a grade of C- or better

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 40C. Chemical Engineering Thermodynamics. 4 Units.**

Elements of chemical engineering thermodynamics, including equilibrium and stability; equations of state; generalized correlations of properties of materials; properties of ideal and non-ideal mixtures; thermodynamics of real solutions; ideal and non-ideal phase equilibria; chemical equilibria for ideal and non-ideal solutions.

Prerequisite: (EECS 10 or EECS 12 or ICS 31 or MAE 10) and MATH 2D and CBE 40B. CBE 40B with a grade of C- or better

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 100. Introduction to Numerical Methods in Engineering. 3 Units.**

An introduction to the fundamentals of numerical analysis and the computer algorithms in MATLAB for the solution of engineering problems, with emphasis on problems arising in chemical engineering thermodynamics, transport phenomena, and reaction engineering.

Prerequisite: CBE 40C

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 105. Engineering Physical Chemistry. 4 Units.**

Provides an integrated view of both classical and molecular perspectives on thermodynamics, thermodynamic potentials, entropy, and the second law. Students learn how to use statistical mechanics to create a bridge between the quantum mechanical world and the familiar macroscopic one.

Prerequisite: CHEM 1C and CBE 40C and (PHYS 7D or PHYS 7E)

Overlaps with CHEM 132A, CHEM 132B, CHEM 132C.

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 110. Reaction Kinetics and Reactor Design. 4 Units.**

Introduction to quantitative analysis of chemical reactions and chemical reactor design. Reactor operations including batch, continuous stirred tank, and tubular reactor. Homogeneous and heterogeneous reactions.

Prerequisite: CHEM 1C and MATH 3D and CBE 40B and CBE 40C and CBE 100. CBE 40B with a grade of C- or better. CBE 40C with a grade of C- or better

Restriction: Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engineering majors have second consideration for enrollment.

**CBE 120A. Momentum Transfer. 4 Units.**

Fluid statics, surface tension, Newton's law of viscosity, non-Newtonian and complex flows, momentum equations, laminar and turbulent flow, velocity profiles, flow in pipes and around objects, piping systems design, pumps and mixing, and other applications to chemical and related industries.

Prerequisite: CBE 40C and MATH 3D. CBE 40C with a grade of C- or better

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 120B. Heat Transfer. 3 Units.**

Principles of conduction, radiation, and convection of heat; phenomenological rate laws, differential and macroscopic energy balances; heat transfer rates, steady state and unsteady state conduction, convection; applications to chemical and related industries.

Prerequisite: CBE 120A. CBE 120A with a grade of C- or better

Restriction: Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engineering majors have second consideration for enrollment.

**CBE 120C. Mass Transfer. 3 Units.**

Molecular and continuum approaches to diffusion and convection in multi-component mixtures; steady state, quasi-steady state and transient mass transfer; effect of reactions on mass transfer; convective mass transfer; simultaneous mass, heat and momentum transfer; applications to chemical and related industries.

Prerequisite: CBE 120B and CBE 100

Restriction: Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engineering majors have second consideration for enrollment.

**CBE 130. Separation Processes. 4 Units.**

Application of equilibria and mass and energy balances for design of separation processes. Use of equilibrium laws for design of distillation, absorption, stripping, and extraction equipment. Design of multicomponent separators.

Prerequisite: CBE 40B and CBE 40C. CBE 40B with a grade of C- or better. CBE 40C with a grade of C- or better

Restriction: Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engineering majors have second consideration for enrollment.

**CBE 140A. Chemical Engineering Laboratory I. 4 Units.**

Experimental study of thermodynamics, fluid mechanics, and heat and mass transfer. Operation and evaluation of process equipment, data analysis. Materials fee.

Prerequisite: CBE 110 and CBE 120C

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 140B. Chemical Engineering Laboratory II. 4 Units.**

Continuation of the CBE 140A covering mass transfer operations such as distillation, absorption, extraction, etc. Rate and equilibria studies in simple chemical systems with and without reaction. Study of chemical process. Materials fee.

Prerequisite: CBE 130 and CBE 145 and CBE 140A

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 145. Chemical Process Control. 4 Units.**

Dynamic responses and control of chemical process equipment, dynamic modeling of chemical processes, linear system analysis, analyses and design of feedback loops and advanced control systems.

Prerequisite: CBE 110 and CBE 120B and CBE 120C

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 150A. Chemical Engineering Design I. 3 Units.**

Introduction to process design; flow sheets for chemical processes; synthesis of multicomponent separation sequences and reaction paths; synthesis of heat exchange networks; computer-aided design and simulation of processes and components pacts.

Prerequisite: CBE 110 and CBE 120C and CBE 130

Restriction: Seniors only. Chemical Engineering Majors only.

**CBE 150B. Chemical Engineering Design II. 3 Units.**

Application of chemical engineering basics to practical design problems; process economics; process safety; environmental impacts; a major team design project with progress reports, oral presentation, and technical report with engineering drawings and economics.

Prerequisite: CBE 150A

Restriction: Seniors only. Chemical Engineering Majors only.

**CBE 160. Engineering Biology. 3 Units.**

First-principle introduction to the modern biochemistry, molecular biology, and cell biology with an engineering language. The goal is to demonstrate that the vastly diverse biological phenomena can be explained by a set of fundamental principles in chemistry, thermodynamics, and kinetics.

**CBE 161. Introduction to Biochemical Engineering. 3 Units.**

Application of engineering principles to biochemical processes. Topics include microbial pathways, energetics and control systems, enzyme and microbial kinetics, and the design and analysis of biological reactors.

Prerequisite: CEMS 110 and (CHEM 1C or CHEM H2C) and MATH 3D

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 163. Kinetics of Biochemical Networks. 4 Units.**

Principles from statistical mechanics, thermodynamics, and chemical kinetics applied to biochemical systems, from fundamental processes such as receptor-ligand binding and enzyme catalysis, to complex cellular functions including signal transduction and gene regulation.

Prerequisite: CBE 120A

Restriction: Chemical Engineering Majors have first consideration for enrollment.

Concurrent with CBE 263.

**CBE 176. Nuclear and Radiochemistry. 4 Units.**

Advanced treatment of nuclear structure, nuclear reactions, and radioactive-decay processes. Introduction to nuclear activation analysis, isotope effects, radiation chemistry, hot-atom chemistry, nuclear age-dating methods, nuclear reactors, and nuclear power.

Prerequisite: (CHEM M3C or CHEM 1C or CHEM H2C) and MATH 2D

Same as CHEM 133.

Overlaps with CHEM 170.

Restriction: Chemistry Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment.

Concurrent with CHEM 233 and CBE 276.

**CBE 181. Polymer Science and Engineering. 4 Units.**

An introduction to physical aspects of polymers, including configuration and conformation of polymer chains and characterization techniques; crystallinity, viscoelasticity, mechanical properties, polymer alloys, processing, and application.

Prerequisite: ENGR 54 and (CBE 110 or MSE 165)

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 183. Surface and Adhesion Science. 4 Units.**

Structure, thermodynamics of, kinetics, and reactions on surfaces. Surface electronic and mechanical properties and characterization of all classes of materials including metals, semiconductors, ceramics, polymers, and soft materials. Adhesion between different materials is also addressed.

Prerequisite: (CBE 110 or MSE 165C) and (MSE 141 or MSE 69)

Same as MSE 176.

Restriction: Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

Concurrent with MSE 276 and CBE 283.

**CBE 187. Semiconductor Device Packaging. 3 Units.**

Introduction to the semiconductor device packaging and assembly process. Electrical, thermal, optical, and mechanical aspects of package design and reliability. Special topics on optoelectronics packaging are covered.

Prerequisite: CBE 40B

Restriction: Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**CBE 195. Special Topics in Chemical Engineering. 1-4 Units.**

Studies in selected areas of Chemical Engineering. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**CBE 198. Group Study. 1-4 Units.**

Group study of selected topics in engineering.

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**CBE 199. Individual Study. 1-4 Units.**

For undergraduate engineering majors in supervised but independent readings, research, or design. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

Repeatability: May be taken for credit for 8 units.

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 199P. Individual Study. 1-4 Units.**

For undergraduate Engineering majors in supervised but independent reading, research, or design. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in The School of Engineering.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**CBE 200. Applied Engineering Mathematics I. 4 Units.**

Analytical techniques applied to engineering problems in transport phenomena, process dynamics and control, and thermodynamics.

Restriction: Graduate students only.

**CBE 210. Reaction Engineering. 4 Units.**

Advanced topics in reaction engineering, reactor stability analysis, diffusional effect in heterogeneous catalysis, energy balance, optimization of reactor operation, dispersed in phase reactors.

Restriction: Graduate students only.

**CBE 220A. Transport Phenomena I. 4 Units.**

Continuum modeling and analysis of heat and mass transfer from an integrated viewpoint. Scaling concepts, relevance of characteristic time- and length-scales, steady- and unsteady-state processes, bounded and unbounded problems, and convective transport, with applications to chemical and biological processes.

Restriction: Graduate students only.

**CBE 220B. Transport Phenomena II. 4 Units.**

Introduces flow of isothermal fluids from a momentum transport viewpoint. Steady- and unsteady-state creeping and laminar flows; viscous and inviscid flows; Navier-Stokes equations; lubrication theory; boundary layer theory; with specific application to complex chemical and biological engineering processes.

Prerequisite: CBE 220A

Restriction: Graduate students only.

**CBE 240. Advanced Engineering Thermodynamics. 4 Units.**

Introduction to modern thermodynamics and applications, with a focus on aspects relevant to chemical and materials engineering. Mathematical tools; equilibrium and stability; microscope rigorous equations of state; molecular-level thermodynamics of real mixtures; and phase and chemical equilibrium.

Restriction: Graduate students only.

**CBE 249. Special Topics in Chemical Engineering. 1-4 Units.**

Studies in selected areas of Chemical Engineering. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**CBE 250. Research Methods and Technical Communication. 4 Units.**

Intended for Ph.D. students to develop critical research skills in creating archival papers, intellectual property and technical proposals, and in analysis of the scientific literature.

Restriction: Graduate students only.

**CBE 261. Molecular Biotechnology. 4 Units.**

Engineering and biological principles important in recombinant cell technology. Host/vector selection; plasmid propagation; optimization of cloned gene expression; metabolic engineering; protein secretion; experimental techniques; modeling of recombinant cell systems.

Restriction: Graduate students only.

**CBE 262. Metabolic Engineering and Synthetic Biology. 4 Units.**

Synthesis of chemicals from renewable carbon and energy sources using.

Restriction: Graduate students only.

**CBE 263. Kinetics of Biochemical Networks . 4 Units.**

Principles from statistical mechanics, thermodynamics, and chemical kinetics applied to biochemical systems, from fundamental processes such as receptor-ligand binding and enzyme catalysis, to complex cellular functions including signal transduction and gene regulation.

Restriction: Graduate students only.

Concurrent with CBE 163.

**CBE 264. Drug Delivery. 4 Units.**

Introduction to design of drug delivery systems. Includes physicochemical and pharmacokinetic considerations in drug formulations, types of therapeutics, routes of administration, biomaterials, and novel drug delivery systems.

**CBE 266. Bioseparation Processes. 4 Units.**

Introduction to design of bioseparation processes. The recovery and purification of biologically produced proteins, chemicals, and particulates are important. Focuses on the use of chemical engineering skills and principles in the analysis and design of biologically-based processes.

Restriction: Graduate students only.

**CBE 276. Nuclear and Radiochemistry. 4 Units.**

Advanced treatment of nuclear structure, nuclear reactions, and radioactive-decay processes. Introduction to nuclear activation analysis, isotope effects, radiation chemistry, hot-atom chemistry, nuclear age-dating methods, nuclear reactors, and nuclear power.

Same as CHEM 233.

Restriction: Graduate students only.

Concurrent with CHEM 133 and CBE 176.

**CBE 277. Detection and Measurement of Radiation. 4 Units.**

Basic principles of detection and measurement of ionizing radiation; both theory and practical aspects of measurement techniques for alpha, beta, gamma, and neutron radiation, properties of different detector materials, electronics and data treatments, and analysis.

Prerequisite: CHEM 233 or CBE 276

Same as CHEM 244.

Restriction: Graduate students only.

**CBE 280. Advanced Polymer Science and Engineering. 4 Units.**

The synthesis, characterization, microstructure, rheology, and properties of polymer materials. Polymers in solution and in the liquid, crystalline and glassy states. Engineering and processing properties, including viscoelasticity and rheology. Forming and processing methods. Environmental issues.

Restriction: Graduate students only.

**CBE 282. Colloid Science and Engineering. 4 Units.**

An introduction to the basic foundations of colloid science, interfacial phenomena, suspensions and complex fluids, and engineering and assembly of colloidal materials.

Restriction: Graduate students only.

**CBE 283. Surface and Adhesion Science. 4 Units.**

Structure, thermodynamics of, kinetics, and reactions on surfaces. Surface electronic and mechanical properties and characterization of all classes of materials including metals, semiconductors, ceramics, polymers, and soft materials. Adhesion between different materials is also addressed.

Same as MSE 276.

Restriction: Graduate students only.

Concurrent with MSE 176 and CBE 183.

**CBE 288. Optoelectronics Packaging. 4 Units.**

Basic and current issues in the packaging of integrated circuits (IC) and fiber-optic devices are discussed.

Restriction: Graduate students only.



**CBE 295. Seminars in Engineering. 1-4 Units.**

Seminars scheduled each year by individual faculty in major field of interest.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**CBE 296. Master of Science Thesis Research. 1-16 Units.**

Individual research or investigation conducted in preparation for the thesis required for the M.S. degree.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CBE 297. Doctor of Philosophy Dissertation Research. 1-16 Units.**

Individual research or investigation conducted in preparation for the dissertation required for the Ph.D. degree.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CBE 298. Seminars in Engineering. 2 Units.**

Presentation of advanced topics and reports of current research efforts in chemical engineering.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CBE 299. Individual Research. 1-16 Units.**

Individual research or investigation under the direction of an individual faculty member.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## **Civil and Environmental Engr Courses**

**ENGRCEE 11. Methods II: Probability and Statistics. 4 Units.**

Modeling and analysis of engineering problems under uncertainty. Engineering applications of probability and statistical concepts and methods.

(Design units: 0)

Prerequisite: (ENGRCEE 20 or EECS 10 or EECS 12 or ENGRMAE 10 or I&C SCI 31) and MATH 3A

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 20. Introduction to Computational Problem Solving. 4 Units.**

Introduction to computer programming within a numerical computing environment (MATLAB or similar) including types of data representation, graphical display of data, and development of modular programs with application to engineering analysis and problem solving.

(Design units: 1)

Corequisite: MATH 3A

Overlaps with BME 60B.

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 21. Computational Problem Solving. 4 Units.**

Engineering analysis and problem solving using MATLAB (or similar), including matrix algebra, solving systems of linear and nonlinear equations, numerical integration of ordinary differential equations (ODEs) and coupled ODEs, and analysis of numerical errors.

(Design units: 1)

Corequisite: MATH 3D

Prerequisite: (ENGRCEE 20 or BME 60B) and (MATH 3A or I&C SCI 6N)

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 30. Statics. 4 Units.**

Addition and resolution of forces, distributed forces, equivalent system of forces centroids, first moments, moments and products on inertia, equilibrium of rigid bodies, trusses, beams, cables. Course may be offered online.

(Design units: 0)

Corequisite: MATH 2D

Prerequisite: MATH 2D and PHYSICS 7C

Same as ENGR 30, ENGRMAE 30.

Restriction: School of Engineering students have first consideration for enrollment.

**ENGRCEE 60. Contemporary and Emerging Environmental Challenges. 4 Units.**

Introduces contemporary and emerging environmental challenges, illustrates links between human behavior, environmental policy, and engineering practices, examines policy options in the context of current institutions, and introduces tools and frameworks to reach sound economic, social, and environmental solutions.

(Design units: 0)

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**(III)****ENGRCEE 80. Dynamics. 4 Units.**

Introduction to the kinematics and dynamics of particles and rigid bodies. The Newton-Euler, Work/Energy, and Impulse/Momentum methods are explored for ascertaining the dynamics of particles and rigid bodies. An engineering design problem using these fundamental principles is also undertaken.

(Design units: 0.5)

Prerequisite: MATH 2D and PHYSICS 7C

Same as ENGR 80, ENGRMAE 80.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 81A. Civil Engineering Practicum I. 3 Units.**

Introduction to civil engineering through presentations on structural, environmental, water, and transportation systems. Introduction to graphics. Graphical visualization and communication using hand and computer sketching. Fundamentals of Computer Aided Design (CAD) using AutoCad. Laboratory sessions. Materials fee.

(Design units: 2)

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 81B. Civil Engineering Practicum II. 3 Units.**

Principles of surveying; fundamentals of Geographic Information Systems (GIS); introduction to the state-of-the-art and future areas of the profession, including applications of advanced technology and computers; Introduction to visualization and communication of design concepts; laboratory sessions. Materials fee.

(Design units: 1)

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 110. Methods III: Modeling, Economics, and Management. 4 Units.**

Analysis, modeling, and management of civil engineering systems. Statistics and system performance studies, probabilistic models and simulation, basic economics and capital investments, project elements and organization, managerial concepts and network technique, project scheduling. Emphasis on real-world examples. Laboratory sessions.

(Design units: 1)

Prerequisite: ENGRCEE 11

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 111. Methods IV: Systems Analysis and Decision-Making. 4 Units.**

Analysis and optimization for decision-making in civil and infrastructural systems. Topics include linear programming formulations and solution algorithms, network models, and logistical models. Emphasis is on project-level and managerial decision-making and selection from alternative designs.

(Design units: 1)

Prerequisite: (MATH 3A or I&C SCI 6N) and MATH 3D

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 114. GIS for Civil and Environmental Engineering. 4 Units.**

GIS for CEE provides an introduction to Geographic Information Systems (GIS) and their various applications in civil and environmental engineering. Topics include GIS data formats, data queries, spatial and attribute data, spatial data analysis, coordinate systems, and raster data analysis.

Concurrent with ENGRCEE 214.

**ENGRCEE 121. Transportation Systems I: Analysis and Design. 4 Units.**

Introduction to analysis and design of fundamental transportation system components, basic elements of geometric and pavement design, vehicle flow and elementary traffic, basic foundations of transportation planning and forecasting. Laboratory sessions.

(Design units: 2)

Prerequisite: ENGRCEE 11 and ENGRCEE 81A

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 122. Transportation Systems II: Operations and Control. 4 Units.**

Introduction to fundamentals of urban traffic engineering, including data collection, analysis, and design. Traffic engineering studies, traffic flow theory, traffic control devices, traffic signals, capacity and level of service analysis of freeways and urban streets. Laboratory sessions.

(Design units: 2)

Prerequisite: ENGRCEE 11 and ENGRCEE 121

Restriction: Civil Engineering Majors have first consideration for enrollment.

Concurrent with ENGRCEE 229A.

**ENGRCEE 123. Transportation Systems III: Planning and Forecasting. 4 Units.**

Theoretical foundations of transportation planning, design, and analysis methods. Theory and application of aggregate and disaggregate models for land use development, trip generation, destination, mode, and route choice. Transportation network analysis. Planning, design, and evaluation of system alternatives.

(Design units: 2)

Corequisite: ENGRCEE 110

Prerequisite: ENGRCEE 121

Restriction: Civil Engineering Majors have first consideration for enrollment.

Concurrent with ENGRCEE 223.

**ENGRCEE 124. Transportation Systems IV: Freeway Operations and Control. 4 Units.**

Fundamentals of traffic on urban freeways, including data collection analysis, and design. Traffic engineering studies, traffic flow theory, freeway traffic control devices, capacity, and level of service analysis of freeways and highways. Laboratory sessions.

(Design units: 2)

Prerequisite: ENGRCEE 121

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 125. Transportation and the Environment. 4 Units.**

Analysis of the impacts of motor vehicle transportation on the environment. Introduction to life cycle analysis applied to transportation. Basic economic tools for transportation externalities. Transportation planning, urban form, health, and the environment. Transportation sustainability.

(Design units: 0)

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 130. Soil Mechanics. 4 Units.**

Mechanics of soils, composition and classification of soils, compaction, compressibility and consolidation, shear strength, seepage, bearing capacity, lateral earth pressure, retaining walls, piles.

(Design units: 0)

Corequisite: ENGRCEE 130L

Prerequisite: ENGRCEE 150 and ENGRCEE 170

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 130L. Soil Mechanics Laboratory. 1 Unit.**

Laboratory procedures of soil testing for engineering problems. Materials fee.

(Design units: 0)

Corequisite: ENGRCEE 130

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 149. Introduction to Earthquake Engineering. 4 Units.**

Plate tectonics. Structural dynamics. Earthquake magnitude, intensity, and frequency. Seismic damage to structures. Earthquake load prediction including response spectra, normal mode, and direct integration techniques. The basis of building code earthquake load requirements for buildings.

(Design units: 2)

Prerequisite: ENGRCEE 11 and ENGRCEE 20 and ENGRCEE 151A

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 150. Mechanics of Materials. 4 Units.**

Stresses and strains, strain-stress diagrams, axial deformations, torsion, bending and shear stresses in beams, shear force and bending moment diagrams, combined stresses, principal stresses, Mohr's circle, deflection of beams, columns.

(Design units: 1)

Prerequisite: ENGRCEE 30 or ENGRMAE 30 or ENGR 30. ENGRCEE 30 with a grade of C- or better

Overlaps with ENGR 150, ENGRMAE 150.

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 150L. Mechanics of Materials Laboratory. 1 Unit.**

Experimental methods and fundamentals for mechanics of materials analysis. Materials fee.

(Design units: 0)

Prerequisite or corequisite: (ENGRCEE 30 or ENGRMAE 30 or ENGR 30) and ENGRCEE 150. ENGRCEE 30 with a grade of C- or better

Overlaps with ENGRMAE 150L.

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 151A. Structural Analysis. 4 Units.**

Fundamentals of structural analysis and loading. Deformation of statically determinate and indeterminate structures. Influence lines. Structural systems.

(Design units: 0)

Prerequisite: ENGRCEE 150 or ENGRMAE 150. ENGRCEE 150 with a grade of C- or better

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 151B. Structural Timber Design. 4 Units.**

Design of timber structures. Beams, columns, beam-columns, roof, and connections.

(Design units: 3)

Prerequisite: ENGRCEE 151A

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 151C. Reinforced Concrete Design. 4 Units.**

Ultimate strength design. Design of reinforced concrete beam sections. Design for shear and deflection. Design of columns. Design of isolated and combined footings. Laboratory sessions. Materials fee.

(Design units: 3)

Prerequisite: ENGRCEE 151A

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 152. Computer Methods in Structural Analysis and Design. 4 Units.**

Matrix techniques for indeterminate framed structures. Computer implementation using the stiffness method. Software packages for design of reinforced concrete, steel, and/or timber structures.

(Design units: 2)

Prerequisite: ENGRCEE 151C

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 155. Structural Steel Design. 4 Units.**

Design in steel of tension members, beams, columns, welded and bolted connections; eccentrically loaded and moment resistant joints; plate girders. Plastic design; load and resistance factor design. Composite construction; introduction to computer-aided design.

(Design units: 4)

Prerequisite: ENGRCEE 151A

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 156. Foundation Design. 4 Units.**

Applications of soil mechanics principles to the analysis and design of shallow foundations, retaining walls, pile foundations, and braced cuts. Design criteria: bearing capacity, working loads and tolerable settlements, structural integrity of the foundation element. Damage from construction operations.

(Design units: 3)

Prerequisite: ENGRCEE 130 and ENGRCEE 151C

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 160. Environmental Processes. 4 Units.**

Introduction to environmental processes in air and water, mass balances, and transport phenomena. Fundamentals of water-quality engineering including water and wastewater treatment.

(Design units: 1)

Prerequisite: (CHEM 1B or CHEM H2B) and ENGRCEE 170

Restriction: Civil Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 162. Introduction to Environmental Chemistry. 4 Units.**

Basic concepts from general, physical, and analytical chemistry as they relate to environmental engineering. Particular emphasis on the fundamentals of equilibrium and kinetics as they apply to acid-base chemistry, gas solubility, and redox reactions. Laboratory sessions. Materials fee.

(Design units: 0)

Prerequisite: (ENGR 1A or CHEM 1A or CHEM H2A) and (CHEM 1B or CHEM H2B) and (CHEM 1LC or CHEM 1LE or CHEM H2LB or CHEM M2LB) and (CHEM 51A or CHEM H52A)

Restriction: Chemical Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 163. Wastewater Treatment Process Design. 4 Units.**

Design of biological treatment processes. Topics include attached and suspended growth, aeration, anaerobic systems, process control, and economics. Design projects included. Materials fee.

(Design units: 4)

Prerequisite: ENGRCEE 160

Restriction: Civil Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 164. Carbon and Energy Footprint Analysis. 4 Units.**

Process design for wastewater treatment. Mass- and energy-balance analysis applied to water and wastewater treatment systems. Case studies include analysis of water supply, treatment, reclamation, and reuse.

(Design units: 2)

Prerequisite: ENGRCEE 160

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

Concurrent with ENGRCEE 264.

**ENGRCEE 165. Physical-Chemical Treatment Processes. 4 Units.**

Theory and dynamics of physical and chemical separation processes in water and wastewater treatment. Topics include coagulation, sedimentation, filtration, gas-transfer, membrane separations, and adsorption.

(Design units: 2)

Prerequisite: ENGRCEE 160 and (ENGRMAE 91 or CBE 40C)

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

Concurrent with ENGRCEE 265.

**ENGRCEE 169. Environmental Microbiology for Engineers. 4 Units.**

Fundamental and applied principles of microbiology. Structures and functions of microorganisms, the microbiology of water, wastewater and soil used in environmental engineering, and the impact of microorganisms on human and environmental health.

(Design units: 0)

Prerequisite: ENGRCEE 160

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 170. Introduction to Fluid Mechanics. 4 Units.**

Thermodynamic and mechanical fluid properties; fluid statics; control volume and differential approaches for mass, momentum, and energy; dimensional analysis and similarity.

(Design units: 1)

Corequisite: MATH 2E and ENGRCEE 20

Prerequisite: PHYSICS 7C

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 171. Water Resources Engineering. 4 Units.**

Principles governing the analysis and design of water resource systems including pressurized pipelines, pipe networks, channels, and ground water. Coverage of fluid mass, momentum and energy conservation, flow resistance, and related laboratory measurements in different systems. Materials fee.

(Design units: 2)

Prerequisite: ENGRCEE 170

Restriction: Chemical Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 172. Groundwater Hydrology. 4 Units.**

Topics include conservation of fluid mass, storage properties of porous media, matrix compressibility, boundary conditions, flow nets, well hydraulics, groundwater chemistry, and solute transport. Design projects and computer applications included.

(Design units: 2)

Prerequisite: ENGRCEE 170 or ENGRMAE 130A or CBE 120A

Restriction: Civil Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

Concurrent with ENGRCEE 272.

**ENGRCEE 173. Watershed Modeling. 4 Units.**

Basic principles of hydrologic modeling are practiced. Concepts of watershed delineation, land use change impact, design studies, and GIS tools are discussed. Focus on the USACE (HEC) software tools (HEC-HMS, and HEC-RAS) along with their associated GIS interfaces.

(Design units: 1)

Prerequisite: ENGRCEE 170 and ENGRCEE 176

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

Concurrent with ENGRCEE 273.

**ENGRCEE 176. Hydrology. 4 Units.**

Elements of the hydrologic cycle including precipitation, infiltration, evapotranspiration, ground water, and runoff. Unit Hydrograph theory and routing methods. Introduction to precipitation/runoff relationship and watershed modeling. Statistical methods and flood frequency analysis.

(Design units: 2)

Prerequisite: ENGRCEE 170 or ENGRMAE 130A

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

Concurrent with ENGRCEE 276.

**ENGRCEE 178. Fluid Mechanics of Open Channels. 4 Units.**

Fundamentals of fluid motion in open channels. Navier-Stokes equations and one-dimensional momentum and energy principles. Topics include rapidly varied flow, flow resistance and turbulence, gradually varied flow, unsteady flow, and computational methods for channel flow modeling.

(Design units: 1)

Prerequisite: (ENGRCEE 20 or BME 60B or ENGRMAE 10) and (ENGRCEE 170 or ENGRMAE 130A or CBEMS 125A)

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.



**ENGRCEE 181A. Senior Design Practicum I. 2 Units.**

Team designs land development project including infrastructural, environmental, circulation aspects. Focus on traffic impact studies, design of roads, geometry, signals, geotechnical and hydrological analysis, design of structural elements, economic analysis. Oral/Written interim and final design reports. Laboratory sessions.

(Design units: 1)

Prerequisite: ENGRCEE 81A and ENGRCEE 81B and ENGRCEE 110 and (ENGRCEE 121 or ENGRCEE 151C or ENGRCEE 162 or ENGRCEE 171). ENGRCEE 181A and ENGRCEE 181B and ENGRCEE 181C must be taken in the same academic year.

Restriction: Seniors only. Civil Engineering Majors only. Environmental Engineering Majors only.

**ENGRCEE 181B. Senior Design Practicum II. 2 Units.**

Team designs land development project including infrastructural, environmental, circulation aspects. Focus on traffic impact studies, design of roads, geometry, signals, geotechnical and hydrological analysis, design of structural elements, economic analysis. Oral/Written interim and final design reports. Laboratory sessions.

(Design units: 2)

Corequisite: ENGRCEE 130

Prerequisite: ENGRCEE 181A. CEE 181A and ENGRCEE 181B and ENGRCEE 181C must be taken in the same academic year.

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Seniors only. Civil Engineering Majors only. Environmental Engineering Majors only.

**ENGRCEE 181C. Senior Design Practicum III. 2 Units.**

Team designs land development project including infrastructural, environmental, circulation aspects. Focus on traffic impact studies, design of roads, geometry, signals, geotechnical and hydrological analysis, design of structural elements, economic analysis. Oral/Written interim and final design reports. Laboratory sessions.

(Design units: 2)

Prerequisite: ENGRCEE 181B. ENGRCEE 181A and CEE 181B and ENGRCEE 181C must be taken in the same academic year.

Restriction: Seniors only. Civil Engineering Majors only. Environmental Engineering Majors only.

**ENGRCEE 195. Special Topics in Civil and Environmental Engineering. 1-4 Units.**

Studies in selected areas of Civil and Environmental Engineering. Topics addressed vary each quarter.

(Design units: 1-4)

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ENGRCEE 198. Group Study. 1-4 Units.**

Group study of selected topics in Civil and Environmental Engineering.

(Design units: 1-4)

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**ENGRCEE 199. Individual Study. 1-4 Units.**

For undergraduate Engineering majors in supervised but independent reading, research, or design. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Repeatability: May be taken for credit for 8 units.

**ENGRCEE 199P. Individual Study. 1-4 Units.**

Supervised independent reading, research, or design for undergraduate Engineering majors. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**ENGRCEE 214. GIS for Civil and Environmental Engineering. 4 Units.**

GIS for CEE provides an introduction to Geographic Information Systems (GIS) and their various applications in civil and environmental engineering. Topics include GIS data formats, data queries, spatial and attribute data, spatial data analysis, coordinate systems, raster data analysis.

Concurrent with ENGRCEE 114.

**ENGRCEE 220A. Travel Demand Analysis I. 4 Units.**

Fundamentals of transportation systems analysis. Theoretical aspects of travel demand. Travel behavior. Modeling of performance characteristics and costs of transportation modes. In-depth presentation of travel demand modeling techniques. Development of travel choice models including mode, route, and destination choice. Equilibrium.

Restriction: Graduate students only.

**ENGRCEE 220B. Travel Demand Analysis II. 4 Units.**

Methods of discrete choice analysis and their applications in the modeling of transportation systems. Emphasis on the development of a sound understanding of theoretical aspects of discrete choice modeling that are useful in many applications in travel demand analysis.

Prerequisite: ENGRCEE 220A

Restriction: Graduate students only.

**ENGRCEE 220C. Travel Demand Analysis III: Activity-based Approaches. 4 Units.**

The methodological underpinnings of activity-based travel demand modeling. Presents methodologies within the context of a generalization of discrete choice modeling approaches, emphasizing the distinctions that separate these two approaches and presenting appropriate mathematical and statistical tools to address these distinctions.

Prerequisite: ENGRCEE 220A

Restriction: Graduate students only.

**ENGRCEE 221A. Transportation Systems Analysis I. 4 Units.**

Introduction to mathematical methods and models to address logistics and urban transportation problems. Techniques include stochastic models, queueing theory, linear programming, and introductory non-linear optimization.

Restriction: Graduate students only.

**ENGRCEE 221B. Transportation Systems Analysis II. 4 Units.**

Advanced mathematical methods and models to address logistics and urban transportation problems. Topics include network flows, advanced optimization techniques, network models, and heuristic algorithms.

Prerequisite: ENGRCEE 221A

Restriction: Graduate students only.

**ENGRCEE 222. Transit Systems Planning. 4 Units.**

Planning methods for public transportation in urban areas. Technological and operating characteristics of vehicles, facilities, and systems. Short-range planning techniques: data collection and analysis, demand analysis, mode choice, operational strategies, financial analysis. Design of systems to improve performance.

Restriction: Graduate students only.

**ENGRCEE 223. Transportation Systems III: Planning and Forecasting. 4 Units.**

Theoretical foundations of transportation planning, design, and analysis methods. Theory and application of aggregate and disaggregate models for land use development, trip generation, destination, mode, and route choice. Transportation network analysis. Planning, design, and evaluation of system alternatives.

Restriction: Graduate students only.

Concurrent with ENGRCEE 123.

**ENGRCEE 224A. Transportation Data Analysis I. 4 Units.**

Statistical analysis of transportation data sources. Analysis of categorical and ordinal data. Regression and advanced multivariate analysis methods such as discriminant analysis, canonical correlation, and factor analysis. Sampling techniques, sample error and bias, survey instrument design.

Restriction: Graduate students only.

**ENGRCEE 225B. Transportation Planning Models II. 4 Units.**

Design and application of comprehensive transportation models. Network development, demand modeling, and equilibrium assignment. Model calibration, validation, prediction, and evaluation. Regional modeling, site impact analysis, and circulation studies. Design of transportation alternatives.

Prerequisite: ENGRCEE 223

Restriction: Graduate students only.

**ENGRCEE 226A. Traffic Flow Theory I. 4 Units.**

Traffic measurement and fundamental speed-density-flow relationships. Kinematic models. Shock waves. Statistical-kinetic theory of traffic. Introductory car-following principles and stability. Gap acceptance. Platoon dispersion. Two-fluid model. Queueing process. Multi-regime and catastrophe models. Higher-order continuum models. Microscopic and macroscopic simulation.

Restriction: Graduate students only.

**ENGRCEE 226B. Traffic Flow Theory II. 4 Units.**

Advanced mathematical analysis of vehicular flow. Detailed treatise on car-following models. Fourier and Laplace analysis of stability problems. Perturbation analysis. Derivation of macroscopic traffic flow relationships from microscopic considerations. Advanced hydrodynamic theory.

Prerequisite: ENGRCEE 226A

Restriction: Graduate students only.

**ENGRCEE 228A. Urban Transportation Networks I. 4 Units.**

Analytical approaches and algorithms to the formulation and solution of the equilibrium assignment problem for transportation networks. Emphasis on user equilibrium (UE) comparison with system optimal, mathematical programming formulation, supply functions, estimation. Estimating origin-destination matrices, network design problems.

Prerequisite: ENGRCEE 220A

Restriction: Graduate students only.

**ENGRCEE 228B. Urban Transportation Networks II. 4 Units.**

Advanced analysis, optimization, and modeling of transportation networks. Topics include advanced static and dynamic traffic assignment algorithms, linear and nonlinear multi-commodity network flow optimization, network simplex, and network control problems.

Prerequisite: ENGRCEE 221A and ENGRCEE 228A

Restriction: Graduate students only.

**ENGRCEE 229A. Traffic Systems Operations and Control I. 4 Units.**

Introduction to operation, control, and analysis of arterial and freeway traffic systems. Control concepts, traffic stream principles, detectors, local controllers, system masters, traffic signal and ramp metering timing principles, traffic measurement technologies, traffic delay principles.

Restriction: Graduate students only.

Concurrent with ENGRCEE 122.

**ENGRCEE 229B. Traffic Systems Operations and Control II. 4 Units.**

Advanced topics related to operation, control, and analysis of arterial and freeway traffic systems. Control concepts, traffic stream principles, detectors, local controllers, system masters, traffic signal and ramp metering timing principles.

Prerequisite: ENGRCEE 229A

Restriction: Graduate students only.

**ENGRCEE 231. Foundation Engineering. 4 Units.**

Essentials for design and analysis of structural members that transmit superstructure loads to the ground. Topics include subsurface investigations, excavation, dewatering, bracing, footing, mat foundations, piles and pile foundations, caissons and cofferdams, other special foundations.

Restriction: Graduate students only.

**ENGRCEE 232. Geotech Earthquake Engineering. 4 Units.**

In-situ and laboratory determination of dynamic soil properties, liquefaction of soil, cyclic softening of clays, seismic compression and settlement analyses, ground improvement methods, seismic slope stability, introduction to soil structure interaction.

Restriction: Graduate students only.

**ENGRCEE 240. High Performance Materials. 4 Units.**

Part I: Linear and nonlinear fracture mechanics, methodology, real-world case studies; Part II: Composite material toughening, underlying micromechanics, materials engineering towards microstructure tailoring and new material design approaches; Part III: Emerging high-performance engineering materials for safety, energy and the environment.

Restriction: Graduate students only.

**ENGRCEE 242. Advanced Strength of Materials. 4 Units.**

Beams on elastic foundations. Combined axial and lateral loads. Curved beams. Unsymmetric bending. Shear center. Stresses and strains. Basic equations for theory of elasticity. Energy principles. Theory of torsion. Combined bending and torsion.

Restriction: Graduate students only.

**ENGRCEE 243. Mechanics of Composite Materials. 4 Units.**

Stress-strain relationship for orthotropic materials; invariant properties of an orthotropic lamina; biaxial strength theory for an orthotropic lamina; mechanics of materials approach to stiffness; elasticity approach to stiffness; classical lamination theory; strength of laminates; statistical theory of fatigue damage.

Restriction: Graduate students only.

**ENGRCEE 247. Structural Dynamics. 4 Units.**

Vibration of discrete and continuous mass elastic systems. Isolation and transmissibility. Dynamic recording instruments. Introduction to nonlinear theory of vibration. Response of structures to earthquake, traffic, and wind loads. Response spectra concepts. Normal mode analysis. Numerical integration techniques.

Restriction: Graduate students only.

**ENGRCEE 249. Earthquake Engineering. 4 Units.**

Earthquake magnitude, intensity, and frequency. Seismic damage to structures. Earthquake load prediction including response spectra, normal mode, and direct integration techniques. The basis of building code earthquake load requirements for buildings. Seismic response of special structures. Lifeline engineering.

Restriction: Graduate students only.

**ENGRCEE 250. Finite Element Method in Structural Engineering. 4 Units.**

Finite element concepts in structural engineering including variational formulations, shape functions, elements assembly, convergence and computer programming. Stiffness of truss, beam, and frame members, two- and three-dimensional solids, plate and shell elements. Static, vibration, stability, and inelastic analysis.

Restriction: Graduate students only.

**ENGRCEE 252. Multiscale Modeling of Materials and Structures. 4 Units.**

Introduction to modeling materials and structures across length.

Restriction: Graduate students only.

**ENGRCEE 254. Advanced Reinforced Concrete Behavior and Design. 4 Units.**

Flexural strength of reinforced concrete elements. Flexural ductility of unconfined and confined members with axial loads. Shear and torsional behaviors. Strength of reinforced concrete ductile frames and shear walls. Reinforced concrete detailing.

Restriction: Graduate students only.

**ENGRCEE 255. Advanced Behavior and Design of Steel Structures. 4 Units.**

Advanced principles of structural steel design. Analysis and design of beam-column members, braced and unbraced frames for buildings, and plate girders. Review of seismic design provisions. Design of connections.

Restriction: Graduate students only.

**ENGRCEE 258. Earthquake Resistant Structural Design. 4 Units.**

Objectives of seismic design. Cyclic load-distortion characteristics of typical structural elements. Desirable structural form. Ductility and methods of achieving it. Use of energy dissipators. Project involving design of multistory, multibay rigid-jointed plane frame.

Restriction: Graduate students only.

**ENGRCEE 260. Desalination. 4 Units.**

Introduction of state of technology, costs and benefits, environmental issues, and implementation issues related to desalination. Emphasis on membrane processes and biofouling prevention.

Restriction: Graduate students only.

**ENGRCEE 261. Applied Environmental Microbiology. 4 Units.**

Microbes in the environment and their impact on human interactions. Microbiological application in solving environmental engineering problems.

Restriction: Graduate students only.

**ENGRCEE 262. Environmental Chemistry II. 4 Units.**

Advanced concepts from physical and organic chemistry as they relate to environmental engineering. Emphasis on equilibrium and kinetics as they apply to redox reactions, coordination, absorption, gas phase reactions, and ion exchange.

Restriction: Graduate students only.

**ENGRCEE 263. Advanced Biological Treatment Processes. 4 Units.**

Analysis of biological processes in natural and engineered systems. Biological treatment processes, both aerobic and anaerobic, with emphasis on suspended growth systems including design consideration. Containment degradation or control covered. Includes laboratory on molecular tools used in wastewater treatment.

Restriction: Graduate students only.

**ENGRCEE 264. Carbon and Energy Footprint Analysis. 4 Units.**

Process design for wastewater treatment. Mass- and energy- balance analysis applied to water and wastewater treatment systems. Case studies include analysis of water supply, treatment, reclamation, and reuse.

Restriction: Graduate students only.

Concurrent with ENGRCEE 164.

**ENGRCEE 265. Physical-Chemical Treatment Processes. 4 Units.**

Theory and dynamics of physical and chemical separation processes in water and wastewater treatment. Topics include coagulation, sedimentation, filtration, gas transfer, membrane separations, and absorption.

Restriction: Graduate students only.

Concurrent with ENGRCEE 165.

**ENGRCEE 266. Drinking Water and Wastewater Biotechnology. 4 Units.**

Water and wastewater microbiology. Engineering principles, molecular aspects, and overview of microorganisms of importance to public health. Topics include aerobic and anaerobic wastewater treatment and disinfection of pathogens in water, wastewaters, and biosolids.

Restriction: Graduate students only.

**ENGRCEE 267. Energy, Climate Change, and Urban Air Quality. 4 Units.**

An introduction to the connection between energy, climate change, and urban air quality. It will focus on air quality and climate implications of energy choices, bringing light to the most important and time-relevant issues.

Restriction: Graduate students only.

**ENGRCEE 269. Beach Dynamics. 4 Units.**

Coastal erosion in California, human and natural influences on southern California beaches, and present-day challenges. Littoral cells and sediment budgets. Water wave theory. Littoral sediment transport and shoreline change modeling. Shoreline stabilization using green and gray infrastructure.

Restriction: Graduate students only.

**ENGRCEE 270. Flood Risk and Modeling. 4 Units.**

Global and national trends in flooding and related impacts including disasters; flood risk management; theory and numerical methods for flood inundation modeling; flood risk communication strategies including flood hazard visualizations.

**ENGRCEE 271. Flow in Unsaturated Porous Media. 4 Units.**

Fluid flow in the unsaturated zone (zone of aeration) of the subsurface. Soil-water physics, flow in regional groundwater systems, miscible displacement, mathematical modeling techniques.

Restriction: Graduate students only.

**ENGRCEE 272. Groundwater Hydrology. 4 Units.**

Topics include conservation of fluid mass, storage properties of porous media, matrix compressibility, boundary conditions, flow nets, well hydraulics, groundwater chemistry, and solute transport. Includes introduction to advanced topics in porous media. Design projects and computer applications included.

Restriction: Graduate students only.

Concurrent with ENGRCEE 172.

**ENGRCEE 273. Watershed Modeling. 4 Units.**

Basic principles of hydrologic modeling are practiced. Concepts of watershed delineation, land use change impact, design studies, and GIS tools are discussed. Focus on the USACE (HEC) software tools (HEC-HMS and HEC-RAS) along with their associated GIS interfaces.

Restriction: Graduate students only.

Concurrent with ENGRCEE 173.

**ENGRCEE 274. Climate Data Analysis. 4 Units.**

Trend analysis; statistical indices for diagnosing and detecting changes in extremes; nonstationary processes; extreme value analysis; multivariate extreme value methods; tail dependence estimation; uncertainties in observed and projected changes in climate extremes.

**ENGRCEE 275. Topics in Coastal Engineering. 4 Units.**

Linear wave theory. Wave properties: particle kinematics, energy propagation, shoaling, refraction, reflection, diffraction, and breaking. Wave statistics and spectra. Selected topics from: design of coastal structures; harbor engineering; littoral transport and shoreline morphology; and hydrodynamics of estuaries.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ENGRCEE 276. Hydrology. 4 Units.**

Elements of the hydrologic cycle including precipitation, infiltration, evapotranspiration, ground water, and runoff. Unit Hydrograph theory and routing methods. Introduction to precipitation/runoff relationship and watershed modeling. Statistical methods and flood frequency analysis. Discussion section covers advanced topics.

Restriction: Graduate students only.

Concurrent with ENGRCEE 176.

**ENGRCEE 277. Hydrologic Transport Fundamentals. 4 Units.**

Process description, mathematical and numerical modeling of transport processes in surface and ground water. Topics include advection, molecular diffusion, Taylor dispersion, mechanical dispersion in porous media, shear flow dispersion in channels, and turbulent jets and plumes.

Restriction: Graduate students only.

**ENGRCEE 279. Environmental Transport Modeling. 4 Units.**

Computational modeling of multi-dimensional flow and scalar transport problems in surface and ground water. Topics include mathematical model formulation, numerical method selection, serial and parallel implementation, model verification and validation.

Restriction: Graduate students only.

**ENGRCEE 281. Structural Reliability. 4 Units.**

Applications of probability theory to reliability analysis of engineering structures. Theory of structural reliability. Estimation of static random loads. Reliability analysis of structural components and system. Monte Carlo simulation.

Restriction: Graduate students only.

**ENGRCEE 283. Mathematical Methods in Engineering Analysis. 4 Units.**

Matrices; vector calculus; eigenvalue problems; Fourier analysis; partial differential equations; special functions; numerical analysis; finite difference method.

**ENGRCEE 289. Analysis of Hydrologic Systems. 4 Units.**

Application of systems theory in hydrologic, land surface, biogeochemical modeling. Design, identification, and calibration of conceptual models. Principles of dynamic systems, modeling approaches, theory of linear systems, mathematical concepts of differential calculus, theoretical concepts of parameter estimation and optimization theory.

**ENGRCEE 290. Merging Models and Data. 4 Units.**

Introduction to optimization and data assimilation methods for model calibration and uncertainty quantification. Local, global and multi-method search. Bayesian analysis using Monte Carlo simulation with Random Walk Metropolis, and adaptive samplers. Filtering methods for recursive inference. Illustration using environmental models.

Restriction: Graduate students only.

**ENGRCEE 291. Hydrologic Remote Sensing. 4 Units.**

Introduction to principles of remote sensing and application in hydrology. Review of sensor systems, thermal and multispectral image processing, and image classification. Examples from remote sensing of hydrologic processes such as precipitation, soil moisture, and vegetation are covered.

Prerequisite: ENGRCEE 276

Restriction: Graduate students only.

**ENGRCEE 292. Wavelets in Hydrology, Engineering, and Geoscience. 4 Units.**

Multiscale analysis of hydrologic, engineering, and earth system processes; energy decomposition in the time-frequency domain via wavelets; applications to fluid flows, climate and mechanical signals for feature extraction, trend analysis, coherent structures, and upscaling/downscaling.

Restriction: Graduate students only.

**ENGRCEE 295. Seminars in Engineering. 1-4 Units.**

Seminars scheduled each year by individual faculty in major field of interest.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ENGRCEE 296. Master of Science Thesis Research. 1-16 Units.**

Individual research or investigation conducted in preparation of the thesis required for the M.S. degree in Engineering.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ENGRCEE 297. Doctor of Philosophy Dissertation Research. 1-16 Units.**

Individual research or investigation conducted in preparation for the dissertation required for the Ph.D. degree in Engineering.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.



**ENGRCEE 298. Special Topics in Civil Engineering. 1-4 Units.**

Presentation of advanced topics and special research areas in civil engineering.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ENGRCEE 299. Individual Research. 1-16 Units.**

Individual research or investigation under the direction of an individual faculty member.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Computer Sci and Engineering Courses

**CSE 90. Systems Engineering and Technical Communications . 2 Units.**

Introduces systems engineering concepts, including specifications and requirements, hardware and software design, integration, testing, and documentation. Emphasizes organization and writing of reports and effective presentations.

Restriction: Computer Science Engineering Majors have first consideration for enrollment.

**CSE 112. Electronic Devices and Circuits. 4 Units.**

A first course in the design of Very Large Scale Integrated (VLSI) systems. Introduction to CMOS technology; MOS transistors and CMOS circuits. Analysis and synthesis of CMOS gates. Layout design techniques for building blocks and systems. Introduction to CAD tools.

(Design units: 4)

Prerequisite: PHYS 7D and (CSE 70A or EECS 70A)

Overlaps with EECS 119, EECS 170D.

Restriction: Computer Science Engineering Majors have first consideration for enrollment.

**CSE 199. Individual Study. 1-4 Units.**

Supervised independent reading, research, or design for undergraduate Engineering majors. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Repeatability: May be taken for credit for 8 units.

## Electrical Engr and Comp Sci Courses

**EECS 1. Introduction to Electrical Engineering and Computer Engineering. 1 Unit.**

Introduction to the fields of Electrical Engineering and Computer Engineering, including possible careers in both traditional and new emerging areas. Background on both the Electrical Engineering and the Computer Engineering majors, curriculum requirements, specializations, and faculty research interests.

(Design units: 0)

Restriction: Electrical Engineering Majors have first consideration for enrollment.

**EECS 10. Computational Methods in Electrical and Computer Engineering. 4 Units.**

An introduction to computers and structured programming. Binary Data Representation. Hands-on experience with a high-level structured programming language. Introduction to algorithm efficiency. Applications of structured programming in solving engineering problems. Programming laboratory.

(Design units: 0)

Corequisite: MATH 2A

Prerequisite: MATH 2A

Overlaps with EECS 12, ICS 31.

Restriction: Electrical Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment.

**EECS 12. Introduction to Programming. 4 Units.**

An introduction to computers and programming. Python programming syntax/style, types. Numbers and sequences. Control flow. I/O and errors/exceptions. Function calling, parameter passing, formal arguments, return values. Variable scoping. Programming laboratory.

(Design units: 0)

Corequisite: MATH 2A

Overlaps with EECS 10, ICS 31.

Restriction: Computer Engineering Majors have first consideration for enrollment.

**EECS 20. Computer Systems and C Programming. 4 Units.**

Introduction to computing systems. Data representation and operations. Simple logic design. Basic computer organization. Instruction set architecture and assembly language programming. Introduction to C. Functions and recursion, data structures, pointers. Programming laboratory.

(Design units: 1)

Prerequisite: EECS 12

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 22. Advanced C Programming. 3 Units.**

C language programming concepts. Control flow, function calls, recursion. Basic and composite data types, static and dynamic data structures. Program modules and compilation units. Preprocessor macros. C standard libraries.

(Design units: 1)

Prerequisite: EECS 10 or EECS 20

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 22L. Software Engineering Project in C Language. 3 Units.**

Hands-on experience with the ANSI-C programming language. Medium-sized programming projects, team work. Software specification, documentation, implementation, testing. Definition of data structures and application programming interface. Creation of program modules, linking with external libraries. Rule-based compilation, version control.

(Design units: 3)

Prerequisite: EECS 22

Restriction: Computer Engineering Majors have first consideration for enrollment.

**EECS 31. Introduction to Digital Systems. 4 Units.**

Digital representation of information. Specification, analysis, design and optimization of combinational and sequential logic, register-transfer components and register-transfer systems with datapaths and controllers. Introduction to high-level and algorithmic state-machines and custom processors.

(Design units: 2)

Prerequisite: ICS 31 or EECS 10 or EECS 12 or MAE 10

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 31L. Introduction to Digital Logic Laboratory. 3 Units.**

Introduction to common digital integrated circuits: gates, memory circuits, MSI components. Operating characteristics, specifications, applications. Design of simple combinational and sequential digital systems (arithmetic processors game-playing machines). Construction and debugging techniques using hardware description languages and CAD tools.

(Design units: 3)

Prerequisite: EECS 31 and (EECS 10 or EECS 12 or ICS 32)

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 40. Object-Oriented Systems and Programming. 4 Units.**

Primitive types and expressions. The class and method definition. Information hiding and encapsulation. Objects and reference. Overloading. Constructors. Inheritance basics. Programming with inheritance. Dynamic binding and polymorphism. Exception handling. An overview of streams and file input/output. Programming laboratory.

(Design units: 2)

Prerequisite: EECS 22L

Restriction: Computer Engineering Majors have first consideration for enrollment.

**EECS 50. Discrete-Time Signals and Systems. 4 Units.**

Analysis of discrete-time linear-time-invariant (DTLTI) systems in the time domain and using z-transforms. Introduction to techniques based on Discrete-Time, Discrete, and Fast Fourier Transforms. Examples of their application to digital signal processing and digital communications.

(Design units: 0)

Prerequisite: EECS 70A

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 55. Engineering Probability. 4 Units.**

Sets and set operations; nature of probability, sample spaces, fields of events, probability measures; conditional probability, independence, random variables, distribution functions, density functions, conditional distributions and densities; moments, characteristic functions, random sequences, independent and Markov sequences.

(Design units: 0)

Prerequisite: MATH 2D

Restriction: Computer Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment.

**EECS 70A. Network Analysis I. 4 Units.**

Modeling and analysis of electrical networks. Basic network theorems. Sinusoidal steady state and transient analysis of RLC networks and the impedance concept.

(Design units: 1)

Corequisite: MATH 3D

Prerequisite: PHYS 7D and (EECS 10 or EECS 12 or MAE 10 or ICS 31 or CEE 20)

Overlaps with MAE 60.

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**EECS 70B. Network Analysis II. 4 Units.**

Laplace transforms, complex frequency, and the s-plane. Network functions and frequency response, including resonance. Bode plots. Two-port network characterization.

(Design units: 1)

Corequisite: EECS 70LB

Prerequisite: (BME 60B or EECS 10 or EECS 12 or ICS 31 or CEE 20 or MAE 10) and EECS 70A

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**EECS 70LA. Network Analysis I Laboratory. 1 Unit.**

Laboratory to accompany EECS 70A.

(Design units: 0)

Corequisite: EECS 70A

Prerequisite: PHYS 7D and (EECS 10 or EECS 12 or BME 60B or CEE 20 or MAE 10)

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 70LB. Network Analysis II Laboratory. 1 Unit.**

Laboratory to accompany EECS 70B. Materials fee.

(Design units: 1)

Corequisite: EECS 70B

Prerequisite: (BME 60B or EECS 10 or EECS 12 or ICS 31 or CEE 20 or MAE 10) and EECS 70A

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 101. Introduction to Machine Vision. 3 Units.**

The use of digital computers for the analysis of visual scenes; image formation and sensing, color, segmentation, shape estimation, motion, stereo, pattern classification, computer architectures, applications. Computer experiments are used to illustrate fundamental principles.

(Design units: 2)

Prerequisite: EECS 150 or EECS 50

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 111. System Software. 4 Units.**

Multiprogramming, interrupt, processes, kernel, parallelism, critical sections, deadlocks, communication, multiprocessing, multilevel memory management, binding, name management, file systems, protection, resource allocation, scheduling. Experience with concurrent programming, synchronization mechanisms, interprocess communication.

(Design units: 2)

Prerequisite: EECS 112 and (ICS 46 or EECS 114)

Overlaps with CS 143A.

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 112. Organization of Digital Computers. 4 Units.**

Building blocks and organization of digital computers, the arithmetic, control, and memory units, and input/output devices and interfaces. Microprogramming and microprocessors.

(Design units: 4)

Prerequisite: EECS 31L

Overlaps with CS 152.

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 112L. Organization of Digital Computers Laboratory. 3 Units.**

Specification and implementation of a processor-based system using a hardware description language such as VHDL. Hands-on experience with design tools including simulation, synthesis, and evaluation using testbenches.

(Design units: 3)

Prerequisite: EECS 112

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 113. Processor Hardware/Software Interfaces. 4 Units.**

Hardware/software interfacing, including memory and bus interfaces, devices, I/O, and compiler code generation/instruction scheduling. Experience microcontroller programming and interfacing. Specific compiler code generation techniques including local variable and register allocations, instruction dependence and scheduling, and code optimization.

(Design units: 3)

Prerequisite: EECS 112

Restriction: Computer Engineering Majors have first consideration for enrollment. Computer Science and Engineering Majors have second consideration for enrollment.

**EECS 114. Engineering Data Structures and Algorithms. 4 Units.**

Introduces abstract behavior of classes data structures, alternative implementations, informal analysis of time and space efficiency. Also introduces classic algorithms and efficient algorithm design techniques (recursion, divide-and-conquer, branch-and-bound, dynamic programming).

(Design units: 2)

Prerequisite: EECS 40

Restriction: Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 116. Introduction to Data Management. 4 Units.**

Introduction to the design of databases and the use of database management systems (DBMS) for applications. Topics include entity-relationship modeling for design, relational data model, relational algebra, relational design theory, and Structured Query Language (SQL) programming.

(Design units: 1)

Prerequisite: ICS 33 or CSE 43 or EECS 114. ICS 33 with a grade of C or better. CSE 43 with a grade of C or better

Same as CS 122A.

Restriction: Computer Science Engineering Majors have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment.

**EECS 117. Parallel Computer Systems. 3 Units.**

General introduction to parallel computing focusing on parallel algorithms and architectures. Parallel models: Flynn's taxonomy, dataflow models. Parallel architectures: systolic arrays, hypercube architecture, shared memory machines, dataflow machines, reconfigurable architectures. Parallel algorithms appropriate to each machine type area also discussed.

(Design units: 1)

Prerequisite: EECS 20 and EECS 114 and EECS 112

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 118. Introduction to Knowledge and Software Engineering. 4 Units.**

Introduction of basic concepts in knowledge engineering and software engineering. Knowledge representation and reasoning, search planning, software life cycle, requirements engineering, software design languages, declarative programming, testing, database and web programming.

(Design units: 2)

Prerequisite: EECS 40

Restriction: Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 119. VLSI. 4 Units.**

Design techniques for Very Large Scale Integrated (VLSI) systems and chips. Review CMOS and related process technologies; primitives such as logic gates and larger design blocks; layout; floor planning; design hierarchy, component interfaces; use of associated CAD tools for design.

(Design units: 4)

Prerequisite: EECS 112 and EECS 170B

Overlaps with EECS 170D, CSE 112.

Restriction: Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 120. Fundamentals of Parallel Computing. 4 Units.**

Fundamentals of parallel computing, focusing on parallel algorithms and architectures. Topics include design of parallel and I/O efficient algorithms, basics of parallel machine architectures, and current/emerging programming models (shared memory, distributed memory, and accelerators).

Prerequisite: (EECS 12 or CS 152) and EECS 114

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 121. System Security. 3 Units.**

Fundamentals and practices of system security. Topics include cryptographic (encryption, decryption, and message authentication), software vulnerabilities (buffer overflow), network security (layer 2-7 attacks and defenses and PKI), web security (XSS and XSRF), and privacy.

Prerequisite: EECS 22 or ICS 45C

**EECS 141A. Communication Systems I. 3 Units.**

Introduction to analog communication systems including effects of noise. Modulation-demodulation for AM, DSB-SC, SSB, VSB, QAM, FM, PM, and PCM with application to radio, television, and telephony. Signal processing as applied to communication systems.

(Design units: 1)

Prerequisite: EECS 55 and EECS 150

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 141B. Communication Systems II. 3 Units.**

Signal space analysis. Optimum receivers for digital communication. Maximum a posteriori and maximum likelihood detection. Matched filter and correlation receiver. PAM, QAM, PSK, FSK, and MSK and their performance. Introduction to equalization, synchronization, information theory, and error control codes.

(Design units: 1)

Prerequisite: EECS 141A

Restriction: Computer Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**EECS 144. Antenna Design for Wireless Communication Links. 4 Units.**

Analysis and synthesis of antennas and antenna arrays. Adaptive arrays and digital beam forming for advanced wireless links. Friis transmission formula. Wireless communication equations for cell-site and mobile antennas, interference, slow and fast fading in mobile communication.

(Design units: 0)

Prerequisite: EECS 180A

**EECS 145. Electrical Engineering Analysis. 4 Units.**

Vector calculus, complex functions, and linear algebra with applications to electrical engineering problems.

(Design units: 0)

Prerequisite: MATH 3D

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering majors have second consideration for enrollment.

**EECS 148. Computer Networks. 4 Units.**

Computer network architectures, protocols, and applications. Internet congestion control, addressing, and routing. Local area networks. Multimedia networking.

(Design units: 2)

Prerequisite: EECS 55 or STAT 67

Same as CS 132.

Restriction: Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**EECS 150. Continuous-Time Signals and Systems. 4 Units.**

Characteristics and properties of continuous-time (analog) signals and systems. Analysis of linear time-invariant continuous-time systems using differential equation convolutional models. Analysis of these systems using Laplace transforms, Fourier series, and Fourier transforms. Examples from applications to telecommunications.

(Design units: 0)

Prerequisite: EECS 70A and EECS 145

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 152A. Digital Signal Processing. 3 Units.**

Nature of sampled data, sampling theorem, difference equations, data holds, z-transform, w-transform, digital filters, Butterworth and Chebychev filters, quantization effects.

(Design units: 2)

Prerequisite: EECS 50

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 152B. Digital Signal Processing Design and Laboratory. 3 Units.**

Design and implementation of algorithms on a DSP processor and using computer simulation. Applications in signal and image processing, communications, radar, etc.

(Design units: 3)

Prerequisite: EECS 152A

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 159A. Senior Design Project I. 3 Units.**

Teaches problem definition, detailed design, integration, and testability with teams of students specifying, designing, building, and testing complex systems. Lectures include engineering values, discussions, and ethical ramifications of engineering decisions.

(Design units: 3)

Prerequisite: EECS 113 or EECS 170C or CS 145

Restriction: Seniors only. Computer Science Engineering Majors only. Electrical Engineering Majors only. Computer Engineering Majors only.

**EECS 159B. Senior Design Project II. 3 Units.**

Teaches problem definition, detailed design, integration, and testability with teams of students specifying, designing, building, and testing complex systems. Lectures include engineering values, discussions, and ethical ramifications of engineering decisions. Materials fee.

(Design units: 3)

Prerequisite: EECS 159A

Restriction: Computer Science Engineering Majors only. Electrical Engineering Majors only. Computer Engineering Majors only.



**EECS 160A. Introduction to Control Systems. 4 Units.**

Modeling, stability, and specifications of feedback control systems. Root locus, Bode plots, Nyquist criteria, and state-space methods for dynamic analysis and design.

(Design units: 2)

Corequisite: EECS 160LA

Prerequisite: (EECS 10 or EECS 12 or MAE 10 or BME 60B or CEE 20) and EECS 150 and EECS 170B and EECS 170LB

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 160LA. Control Systems I Laboratory. 1 Unit.**

Laboratory accompanying EECS 160A. Materials fee.

(Design units: 1)

Corequisite: EECS 160A

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 163. Power Systems. 4 Units.**

Generation, transmission, and use of electrical energy. Fault calculation, protection, stability, and power flow.

(Design units: 1)

Corequisite: EECS 163L

Prerequisite: EECS 70B

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 163L. Power Systems Laboratory. 1 Unit.**

Experiments and field trips relevant to studies in power systems. Materials fee.

(Design units: 0)

Corequisite: EECS 163

Restriction: Computer Science Engineering Majors only. Electrical Engineering Majors only. Computer Engineering Majors only.

**EECS 166A. Industrial and Power Electronics. 4 Units.**

Power switching devices, pulse width modulation (PWM) methods, switching converter topologies, control, and magnetics. Materials fee.

(Design units: 2)

Prerequisite: EECS 170C and EECS 160A

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have second consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

Concurrent with EECS 267A.

**EECS 170A. Electronics I. 4 Units.**

The properties of semiconductors, electronic conduction in solids, the physics and operation principles of semiconductor devices such as diodes and transistors, transistor equivalent circuits, and transistor amplifiers.

(Design units: 1)

Corequisite: PHYS 7E

Prerequisite: PHYS 7D and EECS 70B

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 170B. Electronics II. 4 Units.**

Design and analysis of single-stage amplifiers, biasing circuits, inverters, logic gates, and memory elements based on CMOS transistors.

(Design units: 2)

Corequisite: EECS 170LB

Prerequisite: EECS 70B and EECS 170A and EECS 170LA

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 170C. Electronics III. 4 Units.**

Principles of operation, design, and utilization of integrated circuit modules, including multi-stage amplifiers, operational amplifiers, and logic circuits.

(Design units: 2)

Corequisite: EECS 170LC

Prerequisite: EECS 170B and EECS 170LB

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have second consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 170D. Integrated Electronic Circuit Design. 4 Units.**

Design and fabrication of modern digital integrated circuits. Fabrication of CMOS process, transistor-level design simulation, functional characteristics of basic digital integrated circuits, and different logic families including the static and dynamic logic, layout, and extraction of digital circuits.

(Design units: 4)

Prerequisite: EECS 170C and EECS 170LC

Overlaps with EECS 119, CSE 112.

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have second consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 170E. Analog and Communications IC Design. 4 Units.**

Advanced topics in design of analog and communications integrated circuits. Topics include: implementation of passive components in integrated circuits; overview of frequency response of amplifiers, bandwidth estimation techniques, high-frequency amplifier design; design of radio-frequency oscillators.

(Design units: 3)

Prerequisite: EECS 170C

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have second consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 170LA. Electronics I Laboratory. 1 Unit.**

Laboratory accompanying EECS 170A to perform experiments on semiconductor material properties, semiconductor device physics and operation principles, and transistor amplifiers to improve experimental skills and to enhance the understanding of lecture materials.

(Design units: 1)

Corequisite: EECS 170A and PHYS 7E

Prerequisite: PHYS 7D and EECS 70B

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**EECS 170LB. Electronics II Laboratory. 1 Unit.**

Laboratory accompanying EECS 170B.

(Design units: 1)

Corequisite: EECS 170B

Prerequisite: EECS 170A and EECS 170LA

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 170LC. Electronics III Laboratory. 1 Unit.**

Laboratory accompanying EECS 170C to provide hands-on training in design of digital/analog circuits/subsystems. Materials fee.

(Design units: 1)

Corequisite: EECS 170C

Prerequisite: EECS 170B and EECS 170LB

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have second consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 174. Semiconductor Devices. 4 Units.**

Metal-semiconductor junctions, diodes, bipolar junction transistors, MOS structures, MOSFETs, CMOS technology, LEDs, and laser diodes.

(Design units: 1)

Prerequisite: EECS 170A

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment. Materials Science Engineering Majors have second consideration for enrollment.

**EECS 176. Fundamentals of Solid-State Electronics and Materials. 4 Units.**

Physical properties of semiconductors and the roles materials play in device operation. Topics include: crystal structure, phonon vibrations, energy band, transport phenomenon, optical properties and quantum confinement effect essential to the understanding of electronic, optoelectronic and nanodevices.

(Design units: 1)

Prerequisite: EECS 170A

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**EECS 179. Microelectromechanical Systems (MEMS). 4 Units.**

Small-scale machines, small-scale phenomena, MEMS fabrication, MEMS CAD tools, MEMS devices and packaging, MEMS testing.

(Design units: 2)

Restriction: Upper-division students only. Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment.

**EECS 180A. Engineering Electromagnetics I. 4 Units.**

Electrostatics, magnetostatics, and electromagnetic fields: solutions to problems in engineering applications; transmission lines, Maxwell's equations and phasors, plane wave propagation, reflection, and transmission.

(Design units: 1)

Prerequisite: PHYS 7E and EECS 145

Restriction: Electrical Engineering Majors have first consideration for enrollment. Biomedical Engineering Majors have first consideration for enrollment. Materials Science Engineering Majors have first consideration for enrollment.

**EECS 180B. Engineering Electromagnetics II. 4 Units.**

Time-varying electromagnetic fields, plane waves, polarization, guidance of waves like rectangular waveguides and microstrips, optical fibers resonant cavities, skin effects and losses, spherical waves, radiation and reception of waves, antenna basics.

(Design units: 1)

Prerequisite: EECS 180A

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 180C. Engineering Electromagnetics III. 4 Units.**

Propagation in anisotropic media. Propagation in ferrites and non-reciprocal devices. Scattering and dispersion. Electromagnetic properties of materials. Scattering of small nanoparticles. Spherical waves. Cross section of large and small objects. Radar equation. Coherent and incoherent radiation.

(Design units: 0)

Prerequisite: EECS 180B

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment.

**EECS 182. Monolithic Microwave Integrated Circuit (MMIC) Analysis and Design. 4 Units.**

Design of microwave amplifiers including low-noise amplifiers, multiple stage amplifiers, power amplifiers, and introduction to broadband amplifiers. The goal is to provide the basic knowledge for the design of microwave amplifiers ranging from wireless system to radar system.

(Design units: 3)

Prerequisite: EECS 180A

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment.

**EECS 188. Optical Electronics. 4 Units.**

Photodiodes and optical detection, photometry and radiometry, geometric optics, lens theory, imaging system, EM wave propagation, optical waveguides and fibers, heterojunction structures, laser theory, semiconductor lasers, and optical transmission system.

(Design units: 1)

Prerequisite: EECS 180A

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 195. Special Topics in Electrical and Computer Engineering. 1-4 Units.**

Studies special topics in selected areas of Electrical and Computer Engineering. Topics addressed vary each quarter.

(Design units: 1-4)

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**EECS 198. Group Study. 1-4 Units.**

Group study of selected topics in Electrical and Computer Engineering.

(Design units: 1-4)

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**EECS 199. Individual Study. 1-4 Units.**

For undergraduate Engineering majors in supervised but independent reading, research, or design. Students taking Individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Repeatability: May be taken for credit for 8 units.

**EECS 199P. Individual Study. 1-4 Units.**

For undergraduate Engineering majors in supervised but independent reading, research, or design. Students taking individual study for design credit are to submit a written paper to the instructor and to the Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**EECS 202A. Principles of Imaging. 4 Units.**

Linear systems, probability and random processes, image processing, projecting imaging, tomographic imaging.

Same as PHYS 233A.

Restriction: Graduate students only.

Concurrent with PHYS 147A.

**EECS 202B. Techniques in Medical Imaging I: X-ray, Nuclear, and NMR Imaging. 4 Units.**

Ionizing radiation, planar and tomographic radiographic and nuclear imaging, magnetism, NMR, MRI imaging.

Prerequisite: EECS 202A

Same as PHYS 233B.

Restriction: Graduate students only.

Concurrent with PHYS 147B.

**EECS 202BP. Techniques in Medical Imaging: X-ray, Nuclear, and NMR Imaging. 4 Units.**

Ionizing radiation, planar and tomographic radiographic and nuclear imaging, magnetism, NMR, MRI imaging.

Restriction: Master of Engineering students only. Graduate students only.

**EECS 202C. Techniques in Medical Imaging II: Ultrasound, Electrophysiological, Optical. 4 Units.**

Sound and ultrasound, ultrasonic imaging, physiological electromagnetism, EEG, MEG, ECG, MCG, optical properties of tissues, fluorescence and bioluminescence, MR impedance imaging, MR spectroscopy, electron spin resonance and ESR imaging.

Prerequisite: EECS 202B

Same as PHYS 233C.

Restriction: Graduate students only.

Concurrent with PHYS 147C.

**EECS 203A. Digital Image Processing. 4 Units.**

Pixel-level digital image representation and elementary operations; Fourier and other unitary transforms; compression, enhancement, filtering, and restoration; laboratory experience is provided.

Restriction: Graduate students only.

**EECS 211. Advanced System Software. 4 Units.**

Study of operating systems including interprocess communication, scheduling, resource management, concurrency, reliability, validation, protection and security, and distributed computing support. System software design languages and modeling analysis.

Restriction: Graduate students only.

**EECS 211P. Advanced System Software. 4 Units.**

Study of operating systems including interprocess communication, scheduling, resource management, concurrency, reliability, validation, protection and security, and distributed computing support. System software design languages and modeling analysis.

Prerequisite: Recommended: Undergraduate-level knowledge of system software (e.g. EECS 111) and organization of digital computers (e.g. UCI EECS 112).

Restriction: Master of Engineering students only. Graduate students only.

**EECS 213. Computer Architecture. 4 Units.**

Problems in hardware, firmware (microprogram), and software. Computer architecture for resource sharing, real-time applications, parallelism, microprogramming, and fault tolerance. Various architectures based on cost/performance and current technology.

Restriction: Graduate students only.

**EECS 213P. Computer Architecture. 4 Units.**

Problems in hardware, firmware (microprogram), and software. Computer architecture for resource sharing, real-time applications, parallelism, microprogramming, and fault tolerance. Various architectures based on cost/performance and current technology.

Prerequisite: Recommended: Undergraduate-level knowledge of organization of digital computers (e.g. EECS 112 and EECS 112L).

Restriction: Master of Engineering students only. Graduate students only.

**EECS 215. Design and Analysis of Algorithms. 4 Units.**

Computer algorithms from a practical standpoint. Algorithms for symbolic and numeric problems such as sorting, searching, graphs, and network flow. Analysis includes algorithm time and space complexity.

**EECS 215P. Design and Analysis of Algorithms. 4 Units.**

Computer algorithms from a practical standpoint. Algorithms for symbolic and numeric problems such as sorting, searching, graphs, and network flow. Analysis includes algorithm time and space complexity.

Restriction: Master of Engineering students only. Graduate students only.

**EECS 216. Advanced Application of Algorithms. 4 Units.**

Medium-sized group and individual programming project. Topics include specification requirements documentation, practical implementation of algorithms, and testing/verification of design.

Prerequisite: Recommended: Undergraduate course work in engineering data structures and algorithms.

**EECS 217. VLSI System Design. 4 Units.**

Overview of integrated fabrication, circuit simulation, basic device physics, device layout, timing; MOS logic design; layout generation, module generation, techniques for very large scale integrated circuit design.

Restriction: Graduate students only.

**EECS 220. Advanced Digital Signal Processing Architecture. 4 Units.**

Study the latest DSP architectures for applications in communication (wired and wireless) and multimedia processing. Emphasis given to understanding the current design techniques and to evaluate the performance, power, and application domain of the latest DSP processors.

Prerequisite: EECS 213

Restriction: Graduate students only.

**EECS 220P. Advanced Digital Signal Processing Architecture. 4 Units.**

Study the latest DSP architectures for applications in communication (wired and wireless) and multimedia processing. Emphasis given to understanding the current design techniques and to evaluate the performance, power, and application domain of the latest DSP processors.

Prerequisite: EECS 213P

Restriction: Master of Engineering students only. Graduate students only.

**EECS 221. Topics in Computer Engineering. 4 Units.**

New research results in computer engineering.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EECS 222. Embedded System Modeling. 4 Units.**

Computational models for embedded systems. System-level specification and description languages. Concepts, requirements, examples. Embedded system models at different levels of abstraction. Modeling of test benches, design under test, IP components. Discrete event simulation, semantics, and algorithms. Formerly EECS 222A.

Restriction: Graduate students only.

**EECS 223. Real-Time Computer Systems. 4 Units.**

Time bases, clock synchronization, real-time communication protocols, specification of requirements, task scheduling. Validation of timelines, real-time configuration management.

Prerequisite: EECS 211 and EECS 213

Restriction: Graduate students only.

**EECS 223P. Real-Time Computer Systems. 4 Units.**

Time bases, clock synchronization, real-time communication protocols, specification of requirements, task scheduling. Validation of timelines, real-time configuration management.

Prerequisite: EECS 211P and EECS 213P

Restriction: Master of Engineering students only. Graduate students only.

**EECS 224. High-Performance Computing. 4 Units.**

Fundamentals of high-performance computing, covering both theory and practice. Topics include performance analysis and tuning, design of parallel and I/O efficient algorithms, basics of parallel machine architectures, and current/emerging programming models (shared memory, distributed memory, and accelerators).

Prerequisite: EECS 215 or CS 260

Restriction: Graduate students only.

**EECS 225. Embedded Systems Design. 4 Units.**

Embedded systems design flow and methodology. Design space exploration. Co-design of hardware and software, embedded architecture and network exploration and synthesis. System software/hardware interface generation. Real-time constraints, specification-to-architecture mapping, design tools and methodologies. Formerly EECS 222B.

Restriction: Graduate students only.

**EECS 226. Embedded System Software. 4 Units.**

Embedded system software concepts, requirements, examples, for engineering applications such as multi-media and automotive. Software generation methodology. Algorithmic specification, design constraints. Embedded operating systems. Static, dynamic, real-time scheduling. Input/output, interrupt handling. Code generation, compilation, instruction set simulation. Formerly EECS 222C.

Restriction: Graduate students only.

**EECS 227. Cyber-Physical System Design. 4 Units.**

Model-based design of cyber-physical systems including, e.g., plant, sensing, control, actuation, embedded hardware/software, communication, real-time analysis, various levels of simulation (MILS, SILS, HILS), tools and methodologies for automatic synthesis, and application from various interdisciplinary domains.

Restriction: Graduate students only.

**EECS 229. Low Power SoC Design. 4 Units.**

From an inverter to server centers, low-power design theory and practice in modern systems-on-chip (SoC), energy efficient design time and runtime methods are surveyed at circuit, RTL, and architecture levels. Lab assignments will help students quantify tradeoffs and design practices.

Prerequisite: EECS 217

Restriction: Graduate students only.

**EECS 230. Energy Efficiency. 4 Units.**

Green energy sources for production, transmission, storage, and utilization of electricity, with a special focus on solar, wind, and nuclear energy production. Study of newly developed renewable sources of energy including capital cost, product cost, environmental issues, and technical feasibility.



**EECS 231. Advanced System Security. 4 Units.**

Advanced study about system security. Topics include software vulnerabilities (buffer overflow), vulnerability discovery (fuzzing), network security, side-channel analysis (power analysis and micro-architecture attacks), machine-learning security, IoT security, and privacy (differential privacy).

Restriction: Graduate students only.

**EECS 240. Random Processes. 4 Units.**

Extensions of probability theory to random variables varying with time. General properties of stochastic processes. Convergence. Estimation, including nonlinear and linear minimum mean square error and maximum likelihood. Spectral density and linear filters. Poisson processes and discrete-time Markov chains.

Restriction: Graduate students only.

**EECS 240P. Random Processes. 4 Units.**

Extensions of probability theory to random variables varying with time. General properties of stochastic processes. Convergence. Estimation, including nonlinear and linear minimum mean square error and maximum likelihood. Spectral density and linear filters. Poisson processes and discrete-time Markov chains.

Prerequisite: Recommended: Knowledge of engineering probability (e.g. EECS 55).

Restriction: Master of Engineering students only. Graduate students only.

**EECS 241A. Digital Communications I. 4 Units.**

Concepts and applications of digital communication systems. Baseband digital transmission of binary, multi-amplitude, and multidimensional signals. Introduction to and performance analysis of different modulation schemes.

**EECS 241AP. Digital Communications I. 4 Units.**

Concepts and applications of digital communication systems. Baseband digital transmission of binary, multi-amplitude, and multidimensional signals. Introduction to and performance analysis of different modulation schemes.

Restriction: Master of Engineering students only. Graduate students only.

**EECS 241B. Digital Communications II. 4 Units.**

Concepts and applications of equalization, multi-carrier modulation, spread spectrum and CDMA. Digital communications through fading memory channels.

Prerequisite: EECS 241A

Restriction: Graduate students only.

**EECS 241BP. Digital Communications II. 4 Units.**

Concepts and applications of equalization, multi-carrier modulation, spread spectrum, and CDMA. Digital communications through fading memory channels.

Prerequisite: EECS 241AP

Restriction: Master of Engineering students only. Graduate students only.

**EECS 242. Information Theory. 4 Units.**

Fundamental capabilities and limitations of information sources and information transmission systems. Analytical framework for modeling and evaluating communication systems: entropy, mutual information asymptotic equipartition property, entropy rates of a stochastic process, data compression, channel capacity, differential entropy, the Gaussian channel.

Prerequisite: EECS 240

**EECS 243. Error Correcting Codes. 4 Units.**

Different techniques for error correcting codes and analyzing their performance. Linear block codes; cyclic codes; convolutional codes. Minimum distance; optimal decoding; Viterbi decoding; bit error probability. Coding gain; trellis coded modulation.

Prerequisite: EECS 240

Restriction: Graduate students only.

**EECS 244. Wireless Communications. 4 Units.**

Introduction to wireless communications systems. Wireless channel modeling. Single carries, spread spectrum, and multi-carrier wireless modulation schemes. Diversity techniques. Multiple-access schemes. Transceiver design and system level tradeoffs. Brief overview of GSM, CDMA, (IS-95) and 2.5, 3G cellular schemes.

Prerequisite: EECS 241B

Restriction: Graduate students only.

**EECS 244P. Wireless Communications. 4 Units.**

Introduction to wireless communications systems. Wireless channel modeling. Single carries, spread spectrum, and multi-carrier wireless modulation schemes. Diversity techniques. Multiple-access schemes. Transceiver design and system level tradeoffs. Brief overview of GSM, CDMA, (IS-95) and 2.5, 3G cellular schemes.

Prerequisite: EECS 241BP

Restriction: Master of Engineering students only. Graduate students only.

**EECS 245. Space-Time Coding. 4 Units.**

A fundamental study of: Capacity of MIMO Channels, space-time code design criteria, space-time block codes, space-time trellis codes, differential detection for multiple antennas, spatial multiplexing, BLAST.

Prerequisite: EECS 242

Restriction: Graduate students only.

**EECS 247. Information Storage. 4 Units.**

Storage architecture, storage network and networking algorithms in data centers, principle of storage devices and non-volatile memory, data consistency, data availability and integrity, power management.

Restriction: Graduate students only.

**EECS 248A. Computer and Communication Networks. 4 Units.**

Network architecture of the Internet, telephone networks, cable networks, and cell phone networks. Network performance models. Network performance models. Advanced concepts and implementations of flow and congestion control, addressing, internetworking, forwarding, routing, multiple access, streaming, and quality-of-service.

Prerequisite: EECS 148 or CS 132

Same as CS 232, NSYS 201.

Restriction: Graduate students only.

**EECS 250. Digital Signal Processing I. 4 Units.**

Fundamental principles of digital signal processing, sampling, decimation and interpolation, discrete Fourier transforms and FFT algorithms, transversal and recursive filters, discrete random processes, and finite-word effects in digital filters.

Restriction: Graduate students only.

**EECS 250P. Digital Signal Processing I. 4 Units.**

Fundamental principles of digital signal processing, sampling, decimation and interpolation, discrete Fourier transforms and FFT algorithms, transversal and recursive filters, discrete random processes, and finite-word effects in digital filters.

Prerequisite: Recommended: Knowledge of digital signal processing (e.g. EECS 152A).

Restriction: Master of Engineering students only. Graduate students only.

**EECS 251A. Detection, Estimation, and Demodulation Theory. 4 Units.**

Fundamentals of hypothesis testing and Bayes and Maximum Likelihood Estimation. ARMA and state variable models for random time series analysis. Wiener and Kalman filtering and prediction. Adaptive algorithms for identification and tracking of parameters of time-varying models.

Prerequisite: EECS 240

**EECS 251B. Detection, Estimation, and Demodulation Theory. 4 Units.**

Fundamentals of hypothesis testing and Bayes and Maximum Likelihood Estimation. ARMA and state variable models for random time series analysis. Wiener and Kalman filtering and prediction. Adaptive algorithms for identification and tracking of parameters of time-varying models.

Prerequisite: EECS 240

**EECS 260A. Linear Systems I. 4 Units.**

State-space representation of continuous-time and discrete-time linear systems. Controllability, observability, stability. Realization of rational transfer functions.

Restriction: Graduate students only.

**EECS 261A. Linear Optimization Methods. 4 Units.**

Formulation, solution, and analysis of linear programming and linear network flow problems. Simplex methods, dual ascent methods, interior point algorithms, and auction algorithms. Duality theory and sensitivity analysis. Shortest path, max-flow, assignment, and minimum cost flow problems.

Restriction: Graduate students only.

**EECS 267A. Industrial and Power Electronics. 4 Units.**

Power switching devices, pulse width modulation (PWM) methods, switching converter topologies, control, and magnetics. Materials fee.

Restriction: Graduate students only.

Concurrent with EECS 166A.

**EECS 267B. Topics in Industrial and Power Electronics. 4 Units.**

Practical design of switching converters, electromagnetic compatibility, thermal management, and/or control methods.

Prerequisite: EECS 267A

Restriction: Graduate students only.

**EECS 270A. Advanced Analog Integrated Circuit Design I. 4 Units.**

Basic transistor configurations; differential pairs; active load/current sources; supply/temperature-independent biasing; op-amp gain and output stages; amplifier frequency response and stability compensation; nonidealities in op-amps; noise and dynamic range in analog circuits.

Restriction: Graduate students only.

**EECS 270AP. Advanced Analog Integrated Circuit Design I. 4 Units.**

Basic transistor configurations; differential pairs; active load/current sources; supply/temperature-independent biasing; op-amp gain and output stages; amplifier frequency response and stability compensation; nonidealities in op-amps; noise and dynamic range in analog circuits.

Prerequisite: Recommended: Introductory knowledge of control systems (e.g. EECS 160A) and electronics (e.g. EECS 170C).

Restriction: Master of Engineering students only. Graduate students only.

**EECS 270B. Advanced Analog Integrated Circuit Design II. 4 Units.**

Advanced transistor modeling issues; discrete-time and continuous-time analog Integrated Circuit (IC) filters; phase-locked loops; design of ICs operating at radio frequencies; low-voltage/low-power design techniques; A/D and D/A converters; AGC circuits.

Prerequisite: EECS 270A

Restriction: Graduate students only.

**EECS 270BP. Advanced Analog Integrated Circuit Design II. 4 Units.**

Advanced transistor modeling issues; discrete-time and continuous-time analog Integrated Circuit (IC) filters; phase-locked loops; design of ICs operating at radio frequencies; low-voltage/low-power design techniques; A/D and D/A converters; AGC circuits.

Prerequisite: EECS 270AP

Restriction: Master of Engineering students only. Graduate students only.

**EECS 270C. Design of Integrated Circuits for Broadband Applications. 4 Units.**

Topics include: broadband standards and protocols; high-frequency circuit design techniques; PLL theory and design; design of transceivers; electrical/optical interfaces.

Prerequisite: EECS 270A

Restriction: Graduate students only.

**EECS 270D. Radio-Frequency Integrated Circuit Design. 4 Units.**

Topics include: RF component modeling; matching network design; transmission line theory/modeling; Smith chart and S-parameters; noise modeling of active and passive components; high-frequency amplifier design; low-noise amplifier (LNA) design; mixer design; RF power amplifier.

Prerequisite: EECS 270A

Restriction: Graduate students only.

**EECS 270DP. Radio-Frequency Integrated Circuit Design. 4 Units.**

Topics include RF component modeling; matching network design; transmission line theory/modeling; Smith chart and S-parameters; noise modeling of active and passive components; high-frequency amplifier design; low-noise amplifier (LNA) design; mixer design; RF power amplifier.

Prerequisite: EECS 270AP

Restriction: Master of Engineering students only. Graduate students only.

**EECS 270E. High Frequency (Millimeter-Wave and Terahertz) Circuits. 4 Units.**

Discussion of the new methodologies, circuits, and systems developed at mm-wave and terahertz frequency ranges due to the growing interest in high speed communication and high frequency signal generation.

Restriction: Graduate students only.

**EECS 272. Topics in Electrical Engineering. 4 Units.**

New research results in electronic system design.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EECS 275A. Very Large Scale Integration (VLSI) Project. 4 Units.**

Students create VLSI design projects from conception through architecture, floor planning, detailed design, simulation, verification, and submission for project fabrication. Emphasis on practical experience in robust VLSI design techniques. (Successful students are expected to take EECS 275B.).

Restriction: Graduate students only.

**EECS 275B. Very Large Scale Integration (VLSI) Project Testing. 4 Units.**

Test and document student-created Complementary Metal Oxide Semiconductor (CMOS) Very Large Scale Integration (VLSI) projects designed in EECS 275A. Emphasis on practical laboratory experience in VLSI testing techniques. Materials fee.

Prerequisite: EECS 275A

Restriction: Graduate students only.

**EECS 277A. Advanced Semiconductor Devices I. 4 Units.**

Advanced complementary metal-oxide-semiconductor field-effect transistors (CMOSFET), device scaling, device modeling and fabrication, equivalent circuits, and their applications for digital, analog, RF.

Restriction: Graduate students only.

**EECS 277B. Advanced Semiconductor Devices II. 4 Units.**

Metal-semiconductor field-effect transistors (MESFET), heterojunction bipolar transistors (HBT), microwave semiconductor devices, equivalent circuits, device modeling and fabrication, microwave amplifiers, transmitters, and receivers.

Restriction: Graduate students only.

**EECS 277C. Nanotechnology. 4 Units.**

Fabrication and characterization techniques of electrical circuit elements at the nanometer scale. Quantized conductance, semiconductor quantum dots, single electron transistors, molecular wires, carbon nanotubes, self-assembly of nano-circuit elements, quantum methods of information processing.

Restriction: Graduate students only.

**EECS 278. Micro-System Design. 4 Units.**

Covers the fundamentals of the many disciplines needed for design of Micro-Electro-Mechanical Systems (MEMS): microfabrication technology, structural mechanics on micro-scale, electrostatics, circuit interface, control, computer-aided design, and system integration.

Same as MAE 247.

Restriction: Graduate students only.

**EECS 279. Micro-Sensors and Actuators. 4 Units.**

Introduction to the technology of Micro-Electro-Mechanical Systems (MEMS). Fundamental principles and applications of important microsensors, actuation principles on microscale. Introduction to the elements of signal processing; processing of materials for micro sensor/actuator fabrication; smart sensors and microsensor/microactuator array devices.

Same as MAE 249.

Restriction: Graduate students only.

**EECS 280A. Advanced Engineering Electromagnetics I. 4 Units.**

Stationary electromagnetic fields, Maxwell's equations, circuits and transmission lines, plane waves, guided waves, and radiation.

Restriction: Graduate students only.

**EECS 280AP. Advanced Engineering Electromagnetics I. 4 Units.**

Stationary electromagnetic fields, Maxwell's equations, circuits and transmission lines, plane waves, guided waves, and radiation.

Prerequisite: Recommended: Knowledge of engineering electromagnetics (e.g. EECS 180A)

Restriction: Master of Engineering students only. Graduate students only.

**EECS 280B. Advanced Engineering Electromagnetics II. 4 Units.**

Two- and three-dimensional boundary value problems, dielectric waveguides and other special waveguides, microwave networks and antenna arrays, electromagnetic properties of materials, and electromagnetic optics.

Prerequisite: EECS 280A

Restriction: Graduate students only.

**EECS 282. Monolithic Microwave Integrated Circuit (MMIC) Analysis and Design II. 4 Units.**

Design of microwave amplifiers using computer-aided design tools. Covers low-noise amplifiers, multiple stage amplifiers, broadband amplifiers, and power amplifiers. Hybrid circuit design techniques including filters and baluns. Theory and design rules for microwave oscillator design.

Restriction: Graduate students only.

**EECS 284P. RF Antenna Design . 4 Units.**

Advanced transmission line design, radiation of electromagnetic waves, dipole antennas, antenna arrays, advanced antenna designs, and practical design considerations in communications systems. Course is supplemented by RF design tools and modeling.

Prerequisite: EECS 280AP

Restriction: Master of Engineering students only. Graduate students only.

**EECS 285A. Optical Communications. 4 Units.**

Introduction to fiber optic communication systems, optical and electro-optic materials, and high-speed optical modulation and switching devices.

Restriction: Graduate students only.

**EECS 285AP. Optical Communications. 4 Units.**

Introduction to fiber optic communication systems, optical and electro-optic materials, and high-speed optical modulation and switching devices.

Prerequisite: Undergraduate-level Engineering Electromagnetics I (e.g. EECS E80A).

Restriction: Master of Engineering students only. Graduate students only.

**EECS 285B. Lasers and Photonics. 4 Units.**

Covers the fundamentals of lasers and applications, including Gaussian beam propagation, interaction of optical radiation with matters, and concepts of optical gain and feedback. Applications are drawn from diverse fields of optical communication, signal processing, and material diagnosis.

Prerequisite: Undergraduate course work in electromagnetic theory and atomic physics.

**EECS 285C. Nano Imaging. 4 Units.**

Theory and practice of modern nanoscale imaging techniques and applications. Traces the development of microscopy from ancient times to modern day techniques used for visualizing the nano-world from atoms to molecules including hands-on experience in the laboratory.

Restriction: Graduate students only.

**EECS 290. Curricular Practical Training. 1 Unit.**

Curricular practical training. Students will go through practical training under an industry mentor in a technical field corresponding to their concentration area.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EECS 292. Preparation for M.S. Comprehensive Examination. 1-8 Units.**

Individual reading and preparation for the M.S. comprehensive examination.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EECS 293. Preparation for Ph.D. Preliminary Examination. 1-8 Units.**

Individual reading and preparation for the Ph.D. preliminary examination.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EECS 294. Electrical Engineering and Computer Science Colloquium. 1 Unit.**

Invited speakers discuss their latest research results in electrical engineering and computer science.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EECS 295. Seminars in Engineering. 1-4 Units.**

Scheduled each year by individual faculty in major field of interest.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EECS 295P. Special Topics in Electrical Engineering and Computer Science. 4 Units.**

Studies in selected areas of Electrical Engineering. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Master of Engineering students only. Graduate students only.

**EECS 296. Master of Science Thesis Research. 1-16 Units.**

Individual research or investigation conducted in the pursuit of preparing and completing the thesis required for the M.S. degree in Engineering.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EECS 297. Doctor of Philosophy Dissertation Research. 1-16 Units.**

Individual research or investigation conducted in preparing and completing the dissertation required for the Ph.D. degree in Engineering.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EECS 298. Topics in Electrical Engineering and Computer Science. 4 Units.**

Study of Electrical and Computer Engineering concepts.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EECS 299. Individual Research. 1-16 Units.**

Individual research or investigation under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Engineering Courses

**ENGR 1A. General Chemistry for Engineers. 4 Units.**

Emphasis on solid-state chemistry. Quantum theory, atomic structure, periodic trends, chemical bonding, molecular orbitals, electronic band structure, gases, liquids, intermolecular forces, unit cells, crystal lattices, phase transformations, and electrochemistry.

(Design units: 0)

Prerequisite: AP Chemistry or SAT Subject Chemistry or SAT Mathematics or ACT Mathematics. AP Chemistry with a minimum score of 3. SAT Subject Chemistry with a minimum score of 600. SAT Mathematics with a minimum score of 600. ACT Mathematics with a minimum score of 27. A score of 85 or higher on the Engineering Chemistry Placement Exam (fee required) is also accepted.

Overlaps with CHEM 1A.

Restriction: Electrical Engineering Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Materials Science Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**(II)**

**ENGR 7A. Introduction to Engineering I. 2 Units.**

Introduction to engineering disciplines and the design process. Students enrolled in the online lecture also attend a three-hour lab on campus. Materials fee.

(Design units: 1)

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Lower-division students only. School of Engineering students have first consideration for enrollment.

**ENGR 7B. Introduction to Engineering II. 2 Units.**

Introduction to engineering disciplines and the design process. Students enrolled in the online lecture also attend a three-hour lab on campus. Materials fee.

(Design units: 2)

Prerequisite: ENGR 7A

Restriction: Lower-division students only. School of Engineering students have first consideration for enrollment.



**ENGR 30. Statics. 4 Units.**

Addition and resolution of forces, distributed forces, equivalent system of forces centroids, first moments, moments and products on inertia, equilibrium of rigid bodies, trusses, beams, cables. Course may be offered online.

(Design units: 0)

Corequisite: MATH 2D

Prerequisite: MATH 2D and PHYS 7C

Same as CEE 30, MAE 30.

Restriction: School of Engineering students have first consideration for enrollment.

**ENGR 54. Principles of Materials Science and Engineering. 4 Units.**

Superconductors to biodegradable polymers. Structure and properties of materials, including metal, ceramics, polymers, semiconductors, composites, traditional materials. Atomic structure, bonding, defects, phase equilibria, mechanical properties, electrical, optical and magnetic properties. Introduction to materials processing and synthesis. Materials fee.

(Design units: 0)

Prerequisite: (ENGR 1A or CHEM 1A or CHEM H2A) and PHYS 7C

Restriction: School of Engineering students have first consideration for enrollment.

**ENGR 80. Dynamics. 4 Units.**

Introduction to the kinematics and dynamics of particles and rigid bodies. The Newton-Euler, Work/Energy, and Impulse/Momentum methods are explored for ascertaining the dynamics of particles and rigid bodies. An engineering design problem using these fundamental principles is also undertaken.

(Design units: 0.5)

Prerequisite: MATH 2D and PHYS 7C

Same as CEE 80, MAE 80.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGR 92. Engineering and Computer Educational Laboratory. 1-4 Workload Units.**

Comprehensive academic support designed primarily for underrepresented or underprepared students in Engineering, ICS, or selected areas of the physical sciences. Typical program activities: tutoring, study skills, career planning, self-esteem enhancement, library research techniques.

(Design units: 0)

Grading Option: Workload Credit P/NP Only.

Repeatability: May be taken for credit for 12 units.

**ENGR 93. Public and Professional Service in Engineering. 1-2 Workload Units.**

Student participation in public and professional service activities related to engineering.

(Design units: 0)

Grading Option: Workload Credit P/NP Only.

Repeatability: May be repeated for credit unlimited times.

**ENGR 98. Group Study . 1-4 Units.**

Group study of selected topics in engineering.

(Design units: 1-4)

Repeatability: Unlimited as topics vary.

**ENGR 100. Special Topics in Fabrication Safety. 1 Workload Unit.**

Hands on training in the safe use of item fabrication: metalworking, woodworking, electronics fabrication, composites, welding, adhesives, water disposal, and others. Safety certification will be granted from this course and is required for access to Engineering School fabrication facilities.

(Design units: 0)

Grading Option: Workload Credit Letter Grade with P/NP.

Repeatability: Unlimited as topics vary.

Restriction: School of Engineering students have first consideration for enrollment.

**ENGR 150. Mechanics of Structures. 4 Units.**

Stresses and strains. Torsion. Bending. Beam deflection. Shear force and moment distributions in beams. Yielding and buckling of columns. Combined loading. Transformation of stresses and strain. Yielding criteria. Finite elements analysis of frames. Dynamic of two-bar truss.

(Design units: 2)

Prerequisite: (CEE 30 or ENGR 30 or MAE 30) and MATH 3A

Same as MAE 150.

Overlaps with CEE 150.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGR 165. Advanced Manufacturing. 4 Units.**

Principles in manufacturing processes. All machining requires energy: mechanical (cutting and shaping), heat energy (laser cutting), photochemical (photolithography), chemical energy (electro chemical machining and chemical vapor deposition). These methods and their fundamentals are examined. Materials fee.

(Design units: 2)

Restriction: Seniors only. School of Engineering students only.

Concurrent with ENGR 265.

**ENGR 180. Entrepreneurship for Scientists and Engineers. 4 Units.**

Learn the theory and practice of entrepreneurship and intrapreneurship. Covers positioning an idea, establishing the value propositions and benefits case, going to market strategy, creating an execution plan, and raising funds. Concepts are applied to a real-world venture project.

(Design units: 0)

Restriction: Upper-division students only. School of Engineering students have first consideration for enrollment.

Concurrent with ENGR 280.

**ENGR 189. Senior Project - Topics Vary. 1-4 Units.**

Multidisciplinary group senior project of theoretical or applied nature involving design.

(Design units: 1-4)

Repeatability: May be taken for credit for 12 units as topics vary.

Restriction: Seniors only.

**ENGR 190W. Communications in the Professional World. 4 Units.**

Upper-division technical writing course including the development of presentation skills. Effective communication with a range of audiences. Recognition of ethical and professional responsibilities for engineers.

(Design units: 0)

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: School of Engineering students only. Graduating seniors with an application on file have first consideration.

**(Ib)**

**ENGR 191. Curricular Practical Training. 1 Unit.**

Practical training under an industry mentor in a technical field corresponding to students' area of interest.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**ENGR 195. Special Topics in Engineering. 1-4 Units.**

Studies in selected areas of Engineering. Topics addressed vary each quarter.

(Design units: 1-4)

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ENGR 196W. Engineering Thesis. 4 Units.**

Preparation of final presentation and paper describing individual research in Engineering completed in one or more quarters of individual study (i.e., ENGR 199).

(Design units: 0)

Prerequisite: Completion of at least 4 units of Individual Research in Engineering. Satisfactory completion of the Lower-Division Writing requirement.

**(Ib)**

**ENGR H196W. Honors Thesis. 4 Units.**

Preparation of final presentation and paper describing individual research in Engineering. For participants in the Campuswide Honors Program.

(Design units: 1-4)

Prerequisite: ENGR H199. Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Campuswide Honors Collegium students only.

**(Ib)**

**ENGR 199. Individual Study. 1-4 Units.**

Supervised independent reading, research, or design for undergraduate Engineering majors. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Repeatability: May be taken for credit for 8 units.

Restriction: School of Engineering students only.

**ENGR 199P. Individual Study. 1-4 Units.**

Supervised independent reading, research, or design for undergraduate Engineering majors. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**ENGR H199. Individual Study for Honors Students. 1-5 Units.**

Supervised research in Engineering for participants in the Campuswide Honors Program. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-5)

Repeatability: May be repeated for credit unlimited times.

Restriction: Campuswide Honors Collegium students only.

**ENGR 200AP. Entrepreneurship Science and Engineering: Innovation. 4 Units.**

Teaches concepts on how to develop innovate/disruptive ideas through actual delivery and adoption. Focuses on the critical thinking skills, the process of developing an idea into a product/service, and teaching a framework to foster adoption of the idea and product.

Restriction: Master of Engineering students only. Graduate students only.

**ENGR 200BP. Entrepreneurship Science and Engineering: Build. 4 Units.**

Learn how to build an executable plan to transform an idea into a product. Learn how to construct a go-to market plan, raise funds for building the product, and leverage ecosystem resources to fill in resource gaps.

Restriction: Master of Engineering students only. Graduate students only.

**ENGR 200CP. Entrepreneurship Science and Engineering: Launch. 4 Units.**

Understand how to build an actual product. Learn about prototyping and basic project management skills. Learn a framework on when to pivot for course corrections. Identify how to define outcome metrics and measure progress as the product is launched.

Restriction: Master of Engineering students only. Graduate students only.

**ENGR 210P. Capstone Project . 4 Units.**

Students are required to complete a project that deals with a specific emphasis of their Master of Engineering concentration/specialization.

Repeatability: May be taken for credit 4 times.

Restriction: Master of Engineering students only. Graduate students only.

**ENGR 265. Advanced Manufacturing. 4 Units.**

Principles in manufacturing processes. All machining requires energy: mechanical (cutting and shaping), heat energy (laser cutting), photochemical (photolithography), chemical energy (electro chemical machining and chemical vapor deposition). These methods and their fundamentals are examined. Materials fee.

Restriction: Graduate students only. School of Engineering students only.

Concurrent with ENGR 165.

**ENGR 280. Entrepreneurship for Scientists and Engineers. 4 Units.**

Learn the theory and practice of entrepreneurship and intrapreneurship. Covers positioning an idea, establishing the value propositions and benefits case, going to market strategy, creating an execution plan, and raising funds. Concepts are applied to a real-world venture project.

Restriction: School of Engineering students have first consideration for enrollment. Graduate students only.

Concurrent with ENGR 180.

**ENGR 290. Developing Teaching Excellence. 4 Units.**

Introduces the Scholarship of Teaching and Learning (SoTL) as it applies to Engineering Education. Focuses on how teaching practice can be guided by the research literature on teaching and learning.

Restriction: Graduate students only.

**ENGR 291. Internship. 1 Unit.**

Practical training under an industry mentor in a technical field corresponding to the student's area of interest.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ENGR 295. Special Topics in Engineering. 1-4 Units.**

Studies in selected areas of Engineering. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ENGR 296. Master of Science Thesis Research. 1-16 Units.**

Individual research or investigation conducted in the pursuit of preparing and completing the thesis required for the M.S. in Engineering.

Repeatability: May be repeated for credit unlimited times.

**ENGR 297. Doctor of Philosophy Dissertation Research. 1-16 Units.**

Individual research or or investigation conducted in the pursuit of preparing and completing the dissertation required for the Ph.D. in Engineering.

Repeatability: May be repeated for credit unlimited times.

**ENGR 299. Individual Research. 1-16 Units.**

Individual research or investigation under the direction of an individual faculty.

Repeatability: May be repeated for credit unlimited times.

**ENGR 399. University Teaching. 4 Units.**

University teaching with Engineering faculty.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Teaching assistants only.

## Materials Science and Engineering Courses

**MSE 60. Laboratory in Synthesis and Characterization of Materials. 4 Units.**

Synthesis and characterization of ceramic, polymer, and semiconductor materials. Connect the process, structure, properties, and performance to materials science knowledge in a hands-on laboratory setting. Materials fee.

Prerequisite: ENGR 54 and CHEM 1C

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 69. Electronic and Optical Properties in Materials. 4 Units.**

Covers the electronic, optical, and dielectric properties of crystalline and amorphous materials to provide a foundation of the underlying physical principles governing the properties of existing and emerging electronic and photonic materials.

Prerequisite: PHYS 7D and PHYS 7E and (MATH 3A or ICS 6N) and MATH 3D and ENGR 54

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 141. Nano-Scale Materials and Applications. 4 Units.**

Overview of the chemistry, physics, and applications of nanometer-scale materials. Explore the effects of composition, bonding, and confinement on physical properties of nanomaterials, their chemical syntheses, and their device physics in electronic, optoelectronic, and energy technologies.

Prerequisite: (ENGR 1A or CHEM 1A or CHEM H2A) and ENGR 54 and MSE 69

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

Concurrent with MSE 241.

**MSE 151. Polymeric Materials. 4 Units.**

An introduction to physical aspects of polymers, including polymer molecular size and configuration, solution and bulk phase structural properties, mechanical properties including viscoelasticity and rheology, polymer synthesis methods, characterization techniques, processing methods, and examples from existing and emerging polymeric materials.

Prerequisite: ENGR 54 and (MSE 165A or CBE 40C or MAE 91)

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 155. Mechanical Behavior and Design Principles. 4 Units.**

Principles governing structure and mechanical behavior of materials, relationship relating microstructure and mechanical response with application to elasticity, plasticity, yielding, necking, creep, and fracture of materials. Introduction to experimental techniques to characterize the properties of materials. Design parameters.

Prerequisite: ENGR 54

Same as MAE 156.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Aerospace Engineering majors have second consideration for enrollment.

**MSE 155L. Mechanical Behavior Laboratory. 1 Unit.**

Introduction to experimental techniques to characterize mechanical properties of materials. Emphasis on correlations between property and microstructure. Experiments include: plastic stability in tension, effect of grain size on flow stress, microstructural engineering. Materials fee.

Corequisite: MSE 155

Prerequisite: ENGR 54

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 158. Ceramic Materials for Sustainable Energy. 4 Units.**

A technical elective for students interested in materials. Topics covered include structure and properties of ceramic materials, and design for sustainable energy applications.

Prerequisite: ENGR 54

Restriction: Materials Science and Engr Majors have first consideration for enrollment. Chemical Engineering majors have second consideration for enrollment.

**MSE 163. Computer Techniques in Experimental Research. 4 Units.**

Principles and practical guidelines of automated materials testing. Computer fundamentals, programming languages, data acquisition and control hardware, interfacing techniques, programming strategies, data analysis, data storage, safeguard procedures.

Restriction: Materials Science and Engr Majors have first consideration for enrollment. Chemical Engineering majors have second consideration for enrollment.

**MSE 164. X-ray Diffraction, Electron Microscopy, and Microanalysis. 4 Units.**

Material characterization using X-ray diffraction and scanning electron microscopy (SEM). Topics include X-ray diffraction and analysis; SEM imaging and microanalysis. Materials fee.

Prerequisite: ENGR 54 and PHYS 7D

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 164L. X-ray Diffraction, Electron Microscopy, and Microanalysis Lab. 1 Unit.**

Material characterization using X-ray diffraction and scanning electron microscopy (SEM). Topics include X-ray diffraction and analysis; SEM imaging and microanalysis.

Prerequisite: ENGR 54 and PHYS 7D

Restriction: Materials Science and Engr Majors only.

**MSE 165A. Thermodynamics of Materials. 4 Units.**

Treatment of the laws of thermodynamics and their application in understanding properties and equilibrium states of engineering materials. Develops relationships pertaining to multiphase equilibrium and presents graphical constructions for interpretation of phase diagrams. Statistical thermodynamics in relation to materials phenomena.

Prerequisite: CHEM 1C and PHYS 7C

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 165B. Diffusion and Heat Transport in Materials. 4 Units.**

Examines how kinetics affect materials development, behavior, and processing. Highlights the ways in which kinetics and diffusion are key to designing materials processing and heat treating strategies, with examples in various applied topics.

Prerequisite: MSE 165A or CBE 40C or MAE 91. MSE 165A with a grade of C- or better

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 165C. Materials Kinetics and Phase Transformations. 4 Units.**

Treatment of the kinetics of solid-state reactions and reactions at interfaces. Thermodynamics and kinetics of phase transformations, including solidification processes, diffusional and diffusionless phase transformations.

Prerequisite: ENGR 54 and (MSE 165B or (CBE 120B and CBE 120C) or MAE 120). MSE 165B with a grade of C- or better

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 165CL. Laboratory in Materials Kinetics and Phase Transformations. 1 Unit.**

Covers topics of practical application of the kinetics of solid state reactions, reactions at interfaces, and the thermodynamics and kinetics of phase transformations to common materials systems.

Prerequisite: ENGR 54 and (MSE 165B or (CBE 120B and CBE 120C) or MAE 120). MSE 165B with a grade of C- or better

Restriction: Materials Science and Engr Majors only.

**MSE 171. Green Engineering: Theory and Practice. 4 Units.**

Methods and impacts of selecting alternative technologies, processes, materials, chemicals, to reduce pollution, waste, and use of toxic substances, thereby creating "green," environmentally responsible, sustainable solutions. Topics include environmental regulations, recycling, life-cycle assessment, economic analysis, design, green chemistry, and toxicology.

Restriction: Seniors only. Materials Science and Engr Majors have first consideration for enrollment.

**MSE 173. Fundamentals of Materials Processing: How are Materials Processed to Make Things?. 4 Units.**

An in-depth knowledge of manufacturing processes with focus on the fundamentals of materials processing (heat flow, mass flow, fluid flow, etc.). Processing fundamentals that apply to the three main classes of engineering materials: metals, ceramics, and polymers.

Prerequisite: ENGR 54

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 174. Composite Materials Design. 3 Units.**

Introduction to fiber-reinforced composites for mechanical applications. Properties of reinforcing fibers. Manufacture of fibers and composites. Micromechanics of fiber composites. Strength criteria and failure modes. Macromechanics in design of laminated composite structures.

Prerequisite: ENGR 54 and ENGR 150

**MSE 175. Design Failure Investigation. 4 Units.**

Survey of mechanisms by which devices fail, including overload, fatigue, corrosion, and wear. Use of fractography and other evidence to interpret failure modes and specify design/manufacturing changes. Students redesign failed parts or structures based on actual parts and/or case histories.

Prerequisite: ENGR 54

Restriction: Materials Science and Engr Majors have first consideration for enrollment. Chemical Engineering majors have second consideration for enrollment.

**MSE 176. Surface and Adhesion Science. 4 Units.**

Structure, thermodynamics of, kinetics, and reactions on surfaces. Surface electronic and mechanical properties and characterization of all classes of materials including metals, semiconductors, ceramics, polymers, and soft materials. Adhesion between different materials is also addressed.

Prerequisite: (CBE 110 or MSE 165C) and (MSE 141 or MSE 69)

Same as CBE 183.

Restriction: Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

Concurrent with MSE 276 and CBE 283.



**MSE 189A. Senior Design Project I. 3 Units.**

Group supervised senior design projects that deal with materials selection in engineering design and that involve case studies in ethics, safety, design, failure modes, new products, and patents. Activities conclude with a presentation of the projects. Materials fee.

Prerequisite: ENGR 54 and MSE 155 and MSE 60 and MSE 165C

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Seniors only. Materials Science and Engr Majors only. MSE 189A, MSE 189B, and MSE 189C must be taken in the same academic year.

**MSE 189B. Senior Design Project II. 3 Units.**

Group supervised senior design projects that deal with materials selection in engineering design and that involve case studies in ethics, safety, design, failure modes, new products, and patents. Activities conclude with a presentation of the projects. Materials fee.

Prerequisite: MSE 189A

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Seniors only. Materials Science and Engr Majors only. MSE 189A, MSE 189B, and MSE 189C must be taken in the same academic year.

**MSE 189C. Senior Design Project III. 3 Units.**

Group supervised senior design projects that deal with materials selection in engineering design and that involve case studies in ethics, safety, design, failure modes, new products, and patents. Activities conclude with a presentation of the projects. Materials fee.

Prerequisite: MSE 189B

Restriction: Seniors only. Materials Science and Engr Majors only. MSE 189A, MSE 189B, and MSE 189C must be taken in the same academic year.

**MSE 190. Materials Selection and Design. 4 Units.**

Meaning and phases of design; design considerations; properties of engineering materials; materials property charts; materials selection; process selection; multi-constraint and multi-objective design. Selection of shape in mechanical components. Designing with hybrid materials: challenges and opportunities. Environmental considerations; case studies.

Prerequisite: ENGR 54 and ENGR 150

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 191. Materials Outreach. 3 Units.**

Demonstrates major concepts in Materials Science and Engineering. Concepts of materials engineering covered include deformation in crystalline solids, effects of heat treatment on mechanical properties, thermal barrier materials, composites design, mechanical behavior of polymers, superconductivity in ceramics.

Prerequisite: ENGR 54

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 195. Special Topics in Materials Science and Engineering. 1-4 Units.**

Studies in selected areas of Materials Science and Engineering. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**MSE 198. Group Study. 1-4 Units.**

Group study of selected topics in engineering.

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**MSE 199. Individual Study. 1-4 Units.**

Supervised independent reading, research, or design for undergraduate Engineering majors. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

Repeatability: May be taken for credit for 8 units.

Restriction: Materials Science and Engr Majors only.

**MSE 199P. Individual Study. 1-4 Units.**

Supervised independent reading, research, or design for undergraduate Engineering majors. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**MSE 200. Crystalline Solids: Structure, Imperfections, and Properties. 4 Units.**

Principles and concepts underlying the study of advanced materials including alloys, composites, ceramics, semiconductors, polymers, ferroelectrics, and magnetics. Crystal structure and defects, surface and interface properties, thermodynamics and kinetics of phase transformations, and material processing, related to fundamental material properties.

Restriction: Graduate students only.

**MSE 201A. Critical Analysis and Technical Communication I. 2 Units.**

Develop an understanding of the process to conduct research. Topics include performing analytical analysis of the scientific literature, formation of a hypothesis, defining investigations to validate hypothesis, communicating analysis in written form, writing a research proposal.

Restriction: Graduate students only.

**MSE 201B. Critical Analysis and Technical Communication II. 2 Units.**

Develop oral presentation skills and skills to understand significance of published research. Topics include performing critical and analytical analysis of the scientific literature, connecting core course content with experimental/theoretical methods in the scientific literature, and communicating analysis in oral form.

Prerequisite: MSE 201A

Restriction: Graduate students only.

**MSE 205. Materials Physics. 4 Units.**

Covers the electronic, optical, and dielectric properties of crystalline materials to provide a foundation of the underlying physical principles of governing the properties of existing and emerging electronic and photonic materials.

Prerequisite: MSE 200

Restriction: Graduate students only.

**MSE 241. Nano-Scale Materials and Applications. 4 Units.**

Overview of the chemistry, physics, and applications of nanometer-scale materials. Explore the effects of composition, bonding, and confinement on physical properties of nanomaterials, their chemical syntheses, and their device physics in electronic, optoelectronic, and energy technologies.

Prerequisite: MSE 200 and MSE 205

Restriction: Graduate students only.

Concurrent with MSE 141.

**MSE 249. Special Topics in Materials Science and Engineering. 1-4 Units.**

Studies in selected areas of Materials Science and Engineering. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**MSE 254. Polymer Science and Engineering. 4 Units.**

An introduction to physical aspects of polymers, including configuration and conformation of polymer chains and characterization techniques; crystallinity viscoelasticity, rheology, and processing.

Restriction: Graduate students only.

**MSE 255A. Design with Ceramic Materials. 4 Units.**

Dependence of ceramic properties on bonding, crystal structure, defects, and microstructure. Ceramic manufacturing technology. Survey of physical properties. Strength, deformation, and fracture of ceramics. Mechanical design with brittle, environment-sensitive materials exhibiting time-dependent strengths.

Prerequisite: ENGR 54

Restriction: Graduate students only.

**MSE 256A. Mechanical Behavior of Engineering Materials. 4 Units.**

Principles governing structure and mechanical behavior of materials, relationship relating microstructure and mechanical response with application to elasticity, plasticity, creep, and fatigue, study of rate-controlling mechanisms and failure modes, fracture of materials.

Restriction: Graduate students only.

**MSE 256B. Fracture of Engineering Materials. 4 Units.**

Fracture mechanics and its application to engineering materials. Elastic properties of cracks, the stress intensity factor, the crack tip plastic zone, the J integral approach, fracture toughness testing, the crack tip opening displacement, fracture at high temperatures, fatigue crack growth.

Restriction: Graduate students only.

**MSE 259. Transmission Electron Microscopy. 4 Units.**

The theory and operation of the transmission electron microscope (TEM), including the basic construction, electron optics, electron diffraction and reciprocal space, formation of image and electron diffraction information, microanalysis, and specimen preparation.

Prerequisite: MSE 200

Restriction: Graduate students only.

**MSE 262. Grain Boundaries and Interfaces in Nanocrystalline Materials. 4 Units.**

Structure and character of grain boundaries and interfaces in solids including nanocrystalline materials. Role of grain boundaries in chemical segregation, fracture, deformation, creep, conductivity, diffusion, and grain growth. Experimental techniques and computational methods used to characterize and model grain boundaries.

Prerequisite: MSE 200

**MSE 264. Scanning Electron Microscopy. 4 Units.**

The theory and operation of the scanning electron microscope (SEM) and X-ray microanalysis. Topics covered include the basic design and electron optics, electron beam - specimen interactions, image formation and interpretation, X-ray spectrometry, and other related topics and techniques.

Prerequisite: MSE 200

Restriction: Graduate students only.

**MSE 265. Phase Transformations. 4 Units.**

Advanced thermodynamics and kinetics of phase transformations and phase transitions.

Prerequisite: MSE 200

Restriction: Graduate students only.

**MSE 267. Seminar in Systems Microbiology Research. 1 Unit.**

A research and journal club seminar that covers topics on bacteria and phage using approaches and principles from biology, engineering, and physics.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Same as MBB 268, PHYS 268.

Restriction: Upper-division students only. Graduate students only.

**MSE 271. Green Engineering: Theory and Practice. 4 Units.**

Methods and impacts of selecting alternative technologies, processes, materials, chemicals, to reduce pollution, waste, and use of toxic substances, thereby creating "green," environmentally responsible, sustainable solutions. Topics include environmental regulations, recycling, life-cycle assessment, economic analysis, design, green chemistry, and toxicology.

Restriction: Graduate students only.

**MSE 273. Electroceramics & Solid State Electrochemical Systems. 4 Units.**

Theory, underlying principles, experimental techniques, and applications of electroceramics and solid-state electrochemical systems. Links solid state physics, atomic structure, thermodynamics, defect chemistry, and transport processes to electrical properties of ceramics - spanning from insulators to fast-ion conductors and HT superconductors.

Prerequisite: MSE 200

**MSE 276. Surface and Adhesion Science. 4 Units.**

Structure, thermodynamics of, kinetics, and reactions on surfaces. Surface electronic and mechanical properties and characterization of all classes of materials including metals, semiconductors, ceramics, polymers, and soft materials. Adhesion between different materials is also addressed.

Same as CBE 283.

Restriction: Graduate students only.

Concurrent with MSE 176 and CBE 183.

**MSE 295. Seminar in Engineering. 1-4 Units.**

Seminars by individual faculty in major fields of interest.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**MSE 296. Master of Science Thesis Research. 1-16 Units.**

Individual research or investigation conducted in preparation for the thesis required for the M.S. degree in Engineering.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**MSE 297. Doctor of Philosophy Dissertation Research. 1-16 Units.**

Individual research or investigation conducted in preparation for the dissertation required for the Ph.D. degree in Engineering.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**MSE 298. Seminars in Materials Science and Engineering. 2 Units.**

Presentation of advanced topics and reports of current research efforts in Materials Science and Engineering.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**MSE 299. Individual Research. 1-16 Units.**

Individual research or investigation under the direction of an individual faculty member.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Mechanical and Aerospace Engr Courses

### **ENGRMAE 10. Introduction to Engineering Computations. 4 Units.**

Introduction to the solution of engineering problems through the use of the computer. Elementary programming, numerical analysis, and data visualization with a high-level programming language such as MATLAB.

(Design units: 1)

Corequisite: MATH 2A

Prerequisite: MATH 2A or MATH 5A

Overlaps with EECS 10, EECS 12, BME 60B.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

### **ENGRMAE 30. Statics. 4 Units.**

Addition and resolution of forces, distributed forces, equivalent system of forces centroids, first moments, moments and products on inertia, equilibrium of rigid bodies, trusses, beams, cables. Course may be offered online.

(Design units: 0)

Corequisite: MATH 2D

Prerequisite: MATH 2D and PHYSICS 7C

Same as ENGRCEE 30, ENGR 30.

Restriction: School of Engineering students have first consideration for enrollment.

### **ENGRMAE 52. Computer-Aided Design. 4 Units.**

Develops skills for interpretation and presentation of mechanical design drawings and the use of CAD in engineering design. An integrated approach to drafting based on sketching, manual drawing, and three-dimensional CAD techniques is presented.

(Design units: 0.5)

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

### **ENGRMAE 57. Manufacturing Processes in Engineering. 2 Units.**

With laboratory. Machines and processes of mechanical manufacturing. Safety and professional procedures emphasized. Use of measuring instruments, hand tools, lathe, mill, drill press, bandsaw, grinder, welding equipment.

(Design units: 0)

Grading Option: Pass/no pass only.

Restriction: School of Engineering students have first consideration for enrollment.

### **ENGRMAE 60. Electric Circuits. 4 Units.**

Design and analysis of analog circuits based on lumped circuit elements with emphasis on the use of operational amplifiers. Sinusoidal and transient response. Constructional and laboratory testing of analog circuits, and introduction to data acquisition. Materials fee.

(Design units: 2)

Corequisite: MATH 3D

Prerequisite: PHYSICS 7D and PHYSICS 7LD

Overlaps with EECS 70A.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Materials Science Engineering Majors have first consideration for enrollment.

**ENGRMAE 80. Dynamics. 4 Units.**

Introduction to the kinematics and dynamics of particles and rigid bodies. The Newton-Euler, Work/Energy, and Impulse/Momentum methods are explored for ascertaining the dynamics of particles and rigid bodies. An engineering design problem using these fundamental principles is also undertaken.

(Design units: 0.5)

Prerequisite: MATH 2D and PHYSICS 7C

Same as ENGRCEE 80, ENGR 80.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRMAE 91. Introduction to Thermodynamics. 4 Units.**

Thermodynamic principles; open and closed systems representative of engineering problems. First and second law of thermodynamics with applications to engineering systems and design.

(Design units: 0.5)

Prerequisite: PHYSICS 7C and MATH 2D

Overlaps with CBE 40B.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRMAE 93. Topics in Design Project . 1-4 Units.**

Early-stage design/hands-on experience for students, and allows them to participate alongside seniors in the design project.

(Design units: 1)

Repeatability: Unlimited as topics vary.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

**ENGRMAE 106. Mechanical Systems Laboratory. 4 Units.**

Experiments in linear systems, including op-amp circuits, vibrations, and control systems. Emphasis on demonstrating that mathematical models can be useful tools for the analysis and design of electro-mechanical systems. Materials fee.

(Design units: 2)

Prerequisite: ENGRMAE 60 or EECS 70A

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRMAE 107. Fluid Thermal Science Laboratory. 4 Units.**

Fluid and thermal engineering laboratory. Experimental analysis of fluid flow, heat transfer, and thermodynamic systems. Probability, statistics, and uncertainty analysis. Report writing is emphasized and a design project is required. Materials fee.

(Design units: 1)

Corequisite: ENGRMAE 120

Restriction: Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 108. Aerospace Laboratory. 4 Units.**

Analytical and experimental investigation in aerodynamics, fluid dynamics, and heat transfer. Emphasis on study of flow over objects and lift and drag on airfoils. Introduction to basic diagnostic techniques. Report writing is emphasized. Design project is required.

(Design units: 2)

Prerequisite: ENGRMAE 130B

Restriction: Aerospace Engineering Majors have first consideration for enrollment. Mechanical Engineering majors have second consideration for enrollment.

**ENGRMAE 110. Combustion and Fuel Cell Systems. 4 Units.**

Fundamentals of gaseous, liquid, and coal-fired combustion and fuel cell systems. Fuels, fuel-air mixing, aerodynamics, and combustion and fuel cell thermodynamics. Operating and design aspects of practical systems including engines, power generators, boilers, furnaces, and incinerators.

(Design units: 2)

Prerequisite: ENGRMAE 115

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRMAE 112. Propulsion. 4 Units.**

Application of thermodynamics and fluid mechanics to basic flow processes and cycle performance in propulsion systems: gas turbines, ramjets, scramjets, and rockets.

(Design units: 1)

Prerequisite: ENGRMAE 135

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

**ENGRMAE 113. Electric Propulsion. 4 Units.**

Space propulsion requirements and maneuvers, stressing those best suited to electric propulsion. An introduction to plasma physics. Electrothermal, electromagnetic, and electrostatic accelerators, with emphasis in technologies (ion engines, Hall thrusters, and colloidal thrusters) belonging to the latter family.

(Design units: 1)

Prerequisite: ENGRMAE 112

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

Concurrent with ENGRMAE 213.

**ENGRMAE 114. Fuel Cell Fundamentals and Technology. 4 Units.**

Introduction to electrochemistry and electrocatalysis; nature of fuel-cell electrodes and electrolytes; charge transfer reactions at interfaces; charge transport and mass transport processes; fuel processing reactions; determination of fuel cell efficiency, fuel flexibility, emissions, and other characteristics.

(Design units: 0)

Prerequisite: ENGRMAE 115

Restriction: Seniors only. Mechanical Engineering Majors have first consideration for enrollment. Chemical Engineering majors have second consideration for enrollment.

Concurrent with ENGRMAE 214A.



**ENGRMAE 115. Applied Engineering Thermodynamics. 4 Units.**

Application of thermodynamic principles to compressible and incompressible processes representative of practical engineering problems; power cycles, refrigeration cycles, multicomponent mixtures, air conditioning systems, combustion, and compressible flow. Design of a thermodynamic process.

(Design units: 2)

Prerequisite: ENGRMAE 91 or CBE 40B or ENGRMSE 65A

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRMAE 117. Solar and Renewable Energy Systems. 4 Units.**

Basic principles, design, and operation of solar and other renewable energy systems including solar photo-voltaic, solar thermal, wind, and PEM fuel cell. Includes power generation and storage, and renewable fuels for transportation and stationary power generation.

(Design units: 1)

Prerequisite: (ENGRMAE 91 or CBE 40B)

Restriction: Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 118. Sustainable Energy Systems. 4 Units.**

Basic principles, design, and operation of sustainable energy systems including wind, solar photo-voltaic and thermal, hydroelectric, geothermal, oceanic, biomass combustion, advanced coal, and next generation nuclear. Includes power generation, storage, and transmission for stationary power generation.

(Design units: 1)

Prerequisite: ENGRMAE 115

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

Concurrent with ENGRMAE 218.

**ENGRMAE 119. Climate Solutions. 4 Units.**

Focuses on carbon neutrality and climate stability, addressing.

Same as EARTHSS 179, UPPP 111.

Restriction: Upper-division students only.

**ENGRMAE 120. Heat and Mass Transfer. 4 Units.**

Fundamentals of heat and mass transfer. Conduction, heat and mass transfer by convection in laminar and turbulent flows, radiation heat transfer, and combined modes of heat and mass transfer. Practical engineering applications.

(Design units: 0)

Prerequisite: ENGRMAE 130B

Overlaps with CBE 120B.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 130A. Introduction to Fluid Mechanics. 4 Units.**

Fundamental concepts; fluid statics; fluid dynamics; Bernoulli's equation; control-volume analysis; basic flow equations of conservation of mass, momentum, and energy; differential analysis; potential flow; viscous incompressible flow.

(Design units: 0)

Corequisite: ENGRMAE 91

Prerequisite: PHYSICS 7C and MATH 2D and MATH 2E and MATH 3D and (ENGRMAE 30 or ENGRCEE 30 or ENGR 30) and (ENGRMAE 80 or ENGRCEE 80 or ENGR 80). PHYSICS 7C with a grade of C- or better. MATH 2D with a grade of C- or better. MATH 2E with a grade of C- or better. MATH 3D with a grade of C- or better. ENGRMAE 30 with a grade of C- or better. ENGRCEE 30 with a grade of C- or better. ENGR 30 with a grade of C- or better. ENGRMAE 80 with a grade of C- or better. ENGRCEE 80 with a grade of C- or better. ENGR 80 with a grade of C- or better

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

**ENGRMAE 130B. Introduction to Viscous and Compressible Flows. 4 Units.**

Introduction to the analysis of viscous flows including fully developed laminar and turbulent flow in a pipe, viscous flow over immersed bodies, evaluation of boundary layer characteristics, lift and drag, compressible flow in a duct and normal shock waves.

(Design units: 1)

Prerequisite: ENGRMAE 130A

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

**ENGRMAE 132. Computational Fluid Dynamics. 4 Units.**

Introduction to computational fluid dynamics in simple engineering devices. The numerical simulations will be performed via the widely-used software ANSYS-Fluent. While Fluent is the choice of software, all major CFD packages are based on a similar numerical method.

(Design units: 0)

Prerequisite: ENGRMAE 130B. ENGRMAE 130B with a grade of C- or better

Restriction: Aerospace Engineering Majors only. Mechanical Engineering Majors only.

**ENGRMAE 135. Compressible Flow. 4 Units.**

Compressibility effects in fluid mechanics. One-dimensional flow with area variation, friction, heat transfer, and shocks. Design of gas supply systems. Two-dimensional flow with oblique shocks and isentropic waves. Supersonic airfoil theory and design, wind tunnel design. Basic diagnostics.

(Design units: 1)

Prerequisite: ENGRMAE 130A

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

**ENGRMAE 136. Aerodynamics. 4 Units.**

Analysis of flow over aircraft wings and airfoils, prediction of lift, moment, and drag. Topics: fluid dynamics equations; flow similitude; viscous effects; vorticity, circulation, Kelvin's theorem, potential flow; superposition principle, Kutta-Joukowski theorem; thin airfoil theory; finite wing theory; compressibility.

(Design units: 1)

Prerequisite: ENGRMAE 130B

Restriction: Aerospace Engineering Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 145. Theory of Machines and Mechanisms. 4 Units.**

Presents the basic mathematical theory of machines. Focuses on the principles of cam design, gearing and gear train analysis, and the kinematic and dynamic analysis of linkages, together with an introduction to robotics.

(Design units: 2)

Prerequisite: ENGRMAE 52 and (ENGRMAE 80 or ENGRCEE 80 or ENGR 80) and (MATH 3A or I&C SCI 6N)

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Materials Science and Engineering majors have second consideration for enrollment.

**ENGRMAE 146. Astronautics. 4 Units.**

Motion in gravitational force fields, orbit transfers, rocketry, interplanetary trajectories, attitude dynamics and stabilization, navigation, reentry, the space environment.

(Design units: 1)

Prerequisite: ENGRMAE 80 or ENGRCEE 80 or ENGR 80

Restriction: Aerospace Engineering Majors have first consideration for enrollment.

**ENGRMAE 147. Vibrations. 4 Units.**

Analysis of structural vibrations of mechanical systems. Modeling for lumped and distributed parameter systems. Topics include single and multi-degree of freedom systems, free and forced vibrations, Fourier series, convolution integral, mass/stiffness matrices, and normal modes with design project.

(Design units: 1)

Prerequisite: (ENGR 80 or ENGRCEE 80 or ENGRMAE 80) and MATH 2E and MATH 3D

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 150. Mechanics of Structures. 4 Units.**

Stresses and strains. Torsion. Bending. Beam deflection. Shear force and moment distributions in beams. Yielding and buckling of columns. Combined loading. Transformation of stresses and strain. Yielding criteria. Finite elements analysis of frames. Dynamic of two-bar truss.

(Design units: 2)

Prerequisite: (ENGRCEE 30 or ENGR 30 or ENGRMAE 30) and MATH 3A

Same as ENGR 150.

Overlaps with ENGRCEE 150.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 150L. Mechanics of Structures Laboratory. 1 Unit.**

Experimental techniques for the measurement of mechanical properties of materials and structures. Methods for load, displacement, and strain measurements. Tension, bending, compression tests. Determination of strength, stiffness, toughness for metals, polymers, ceramics, and composites. Deformation of structures. Materials fee.

(Design units: 0)

Corequisite: ENGRMAE 150

Prerequisite: ENGRMAE 30 or ENGR 30 or ENGRCEE 30

Overlaps with ENGRCEE 150L.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 151. Mechanical Engineering Design. 4 Units.**

A comprehensive group design project experience that involves identifying customer needs, idea generation, reverse engineering, preliminary design, standards, prototype development, testing, analysis, and redesign of a product involving fluid, thermal, and mechanical components. Introduces design for manufacturing and the environment. Materials fee.

(Design units: 3)

Corequisite: ENGRMAE 170

Prerequisite: ENGRMAE 120 and ENGRMAE 145

Restriction: Seniors only. Mechanical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 152. Introduction to Computer-Aided Engineering. 4 Units.**

Elements and principles of computer-aided engineering with modern hardware and software are presented with a design focus. Case studies are used to assist in finite-element method techniques. Not offered every year.

(Design units: 2)

Prerequisite: (ENGRMAE 150 or ENGR 150) and ENGRMAE 120

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 153. Advanced BIOMEMS Manufacturing Techniques. 4 Units.**

Introduction to BIOMEMS. Advanced biotechnology/biomedicine equipment based on MEMS and NEMS. Fundamentals of MEMS/NEMS sensing techniques and the biological and physics principles involved and the preferred MEMS and NEMS manufacturing techniques.

(Design units: 0)

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Biomedical Engineering Majors have first consideration for enrollment.

Concurrent with ENGRMAE 253.

**ENGRMAE 155. Composite Materials and Structures. 4 Units.**

Motivation for composite materials. Different classifications according to the nature of the matrix (PMC, MMC, CMC) and the reinforcement topology (fibers, whiskers, particulates). Mechanical properties. Failure mechanisms. Designing with composite materials. Advantages and limitations of homogenization techniques for numerical modeling.

(Design units: 0)

Prerequisite: ENGR 54 and (ENGRMAE 150 or ENGRCEE 150 or ENGR 150)

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering majors have second consideration for enrollment. Chemical Engineering majors have second consideration for enrollment. Civil Engineering majors have second consideration for enrollment. Materials Science and Engineering majors have second consideration for enrollment.

Concurrent with ENGRMAE 255.

**ENGRMAE 156. Mechanical Behavior and Design Principles. 4 Units.**

Principles governing structure and mechanical behavior of materials, relationship relating microstructure and mechanical response with application to elasticity, plasticity, yielding, necking, creep, and fracture of materials. Introduction to experimental techniques to characterize the properties of materials. Design parameters.

(Design units: 2)

Prerequisite: ENGR 54

Same as ENGRMSE 155.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Aerospace Engineering majors have second consideration for enrollment.

**ENGRMAE 157. Lightweight Structures. 4 Units.**

Fundamentals of torsion and bending. Analysis and design of thin-wall and composite beams. Stress analysis of aircraft components. Stiffness, strength, and buckling. Introduction to the Finite Element method and its application to plates and shells.

(Design units: 2)

Prerequisite: ENGR 150 or ENGRCEE 150 or ENGRMAE 150

Restriction: Aerospace Engineering Majors have first consideration for enrollment. Mechanical Engineering majors have second consideration for enrollment. Civil Engineering majors have second consideration for enrollment. Materials Science and Engineering majors have second consideration for enrollment.

**ENGRMAE 158. Aircraft Performance. 4 Units.**

Flight theory applied to subsonic propeller and jet aircraft. Nature of aerodynamic forces, drag and lift of wing and fuselage, high-lift devices, level-flight performance, climb and glide performance, range, endurance, take-off and landing distances, static and dynamic stability and control.

(Design units: 2)

Prerequisite: ENGRMAE 130A

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

**ENGRMAE 159. Aircraft Design. 4 Units.**

Preliminary design of subsonic general aviation and transport aircraft with emphasis on layout, aerodynamic design, propulsion, and performance. Estimation of total weight and weight distribution, design of wings, fuselage, and tail, selection and location of engines, prediction of overall performance.

(Design units: 4)

Prerequisite: ENGRMAE 112 and ENGRMAE 136 and ENGRMAE 158

Restriction: Aerospace Engineering Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 164. Air Pollution and Control. 4 Units.**

Sources, dispersion, and effects of air pollutants. Topics include emission factors, emission inventory, air pollution, meteorology, air chemistry, air quality modeling, impact assessment, source and ambient monitoring, regional control strategies.

(Design units: 2)

Prerequisite: (ENGRMAE 91 or CBE 40B) and ENGRMAE 130A

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRMAE 170. Introduction to Control Systems. 4 Units.**

Feedback control systems. Modeling, stability, and systems specifications. Root locus, Nyquist, and Bode methods of analysis and design.

(Design units: 2)

Prerequisite: (ENGRMAE 80 or ENGRCEE 80 or ENGR 80) and ENGRMAE 106

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 171. Digital Control Systems. 4 Units.**

Methods for analysis and design of discrete-time control systems. Z-transforms, difference equations, discrete Fourier transforms. Sampling theorem and applications. Z-plane stability, frequency response. Digital controller design. Introduction to digital filters.

(Design units: 2)

Prerequisite: ENGRMAE 170

Restriction: Civil Engineering Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 172. Design of Computer-Controlled Robots. 4 Units.**

Students design a small robotic device and program it to exhibit sentient behaviors. The basic aspects of mechatronic design are covered, including motor and sensor selection, control strategies, and microcomputer programming for the implementation of control paradigms. Materials fee.

(Design units: 3)

Corequisite: ENGRMAE 60

Prerequisite: ENGRMAE 170

Restriction: Mechanical Engineering Majors have first consideration for enrollment.

Concurrent with ENGRMAE 280.

**ENGRMAE 175. Dynamics and Control of Aerospace Vehicles. 4 Units.**

Equations of motion, linearization, stability derivatives, and longitudinal and lateral modes of motion. Handling qualities, sensors and actuators, and effects of various feedbacks on stability and performance. Stability augmentation. Autopilot design.

(Design units: 3)

Prerequisite: ENGRMAE 106

Restriction: Aerospace Engineering Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 182. Introduction to Machine Learning. 4 Units.**

Fundamental principles necessary to understand statistical learning methods. Introduction to the R programming language. Mathematical foundation for various machine learning algorithms. Computer implementation.

**ENGRMAE 183. Computer-Aided Mechanism Design. 4 Units.**

Focuses on design of planar, spherical, and spatial mechanisms using computer algebra and graphics. Topics include exact and approximate analytical design techniques. Students are required to use existing software (or develop new algorithms) to design various mechanisms for new applications.

(Design units: 4)

Prerequisite: MATH 3A or I&C SCI 6N

Restriction: Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 184. Fundamentals of Experimental Design. 4 Units.**

Review of statistics as applied to experimental research. Fundamentals and principles of statistical experimental design and analysis with emphasis on understanding and use of designed experiments, response surfaces, linear regression modeling, and process optimization.

(Design units: 1)

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

Concurrent with ENGRMAE 284.

**ENGRMAE 185. Numerical Analysis in Mechanical Engineering. 4 Units.**

Solution of mechanical-engineering equations by means of numerical methods. Errors in numerical analysis. Nonlinear equation and sets of equations. Numerical differentiation and integration. Ordinary differential equations. Boundary-value problems. Partial differential equations.

(Design units: 2)

Prerequisite: (ENGRMAE 10 or EECS 10 or EECS 12 or BME 60B) and MATH 3D and MATH 2E

Overlaps with MATH 105A.

**ENGRMAE 188. Engineering Design in Industry. 4 Units.**

Principles of engineering design in the context of an industrial application. Local manufacturing firms define an engineering design project to be completed in 10 weeks. Projects include initial brainstorming to final design, with a formal presentation.

(Design units: 4)

Repeatability: May be taken for credit 3 times.

Restriction: Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 189. Senior Project - Special Topics. 1-4 Units.**

Group or individual senior project of theoretical or applied nature involving design. Materials fee.

(Design units: 1-4)

Repeatability: May be taken for credit for 12 units as topics vary.

Restriction: Seniors only. Mechanical Engineering Majors only.

**ENGRMAE 193. Topics in MAE Design. 1-4 Units.**

Provides early-stage design/hands-on experience for upper-division students, and allows them to participate in senior design projects course ENGRMAE 189.

(Design units: 1)

Repeatability: May be taken for credit for 12 units as topics vary.

Restriction: Aerospace Engineering Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 195. Seminars in Engineering. 1-4 Units.**

Seminars by individual faculty in major fields of interest. Materials fee.

(Design units: 1-4)

Repeatability: Unlimited as topics vary.

**ENGRMAE 198. Group Study. 1-4 Units.**

Group study of selected topics in Aerospace and Mechanical Engineering.

(Design units: 1-4)

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**ENGRMAE 199. Individual Study. 1-4 Units.**

For undergraduate Engineering majors in supervised but independent reading, research, or design. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Repeatability: May be taken for credit for 8 units.

**ENGRMAE 199P. Individual Study. 1-4 Units.**

For undergraduate Engineering majors in supervised but independent reading, research, or design. Students taking individual study for design are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**ENGRMAE 200A. Engineering Analysis I. 4 Units.**

Linear algebra, including vector spaces, matrices, linear systems of equations, least squares, and the eigenvalue problem. Ordinary differential equations, including analytical and numerical solution methods, stability, and phase portraits.

Restriction: Graduate students only.

**ENGRMAE 200B. Engineering Analysis II. 4 Units.**

Review of ordinary differential equations, including Bessel and Legendre functions. Partial differential equations, including the diffusion equation, Laplace's equation, and the wave equation. Fourier series, Fourier and Laplace transforms and their applications.

Restriction: Graduate students only.



**ENGRMAE 205. Perturbation Methods in Engineering. 4 Units.**

Asymptotic Expansions of integrals. Regular and singular perturbations. Perturbation methods for ordinary and partial differential equations. Matched asymptotic expansions. Multiple-scale asymptotic expansion schemes. Not offered every year.

Prerequisite: ENGRMAE 200A and ENGRMAE 200B. Knowledge of linear differential equations.

Restriction: Graduate students only.

**ENGRMAE 206. Nonlinear Optimization Methods. 4 Units.**

Numerical methods for constrained and unconstrained optimization. Necessary and sufficient conditions for optimality. Conjugate gradient, variable metric algorithms. Gradient projection, penalty functions, and Lagrange methods. Not offered every year.

Prerequisite: ENGRMAE 200A

Restriction: Graduate students only.

**ENGRMAE 207. Methods of Computer Modeling in Engineering and the Sciences. 4 Units.**

Unified introduction to finite volume, finite element, field-boundary element, meshless, primal, dual, and mixed methods. Nonlinear problems posed by ordinary as well as partial differential equations. Computer implementations and comparisons of accuracy and convergence.

Restriction: Graduate students only.

**ENGRMAE 209P. Energy Efficiency Technology. 4 Units.**

Principles, design, operation of energy efficient technology in the built environment, including solar energy, green building design, low waste/emissions construction materials, energy harvesting, built environment energy conversion and storage, high efficiency lighting, daylighting, heat pumps, cooling systems, renewable power systems.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 210. Advanced Fundamentals of Combustion. 4 Units.**

Premixed, nonpremixed, and heterogenous reactions, with emphasis on kinetics, thermal ignition, turbulent flame propagation, detonations, explosions, flammability limits, diffusion flame, quenching, flame stabilization, and particle and spray combustion. Not offered every year.

Prerequisite: ENGRMAE 224 or ENGRMAE 230B

Restriction: Graduate students only.

**ENGRMAE 211P. Energy Storage Systems and Technology. 4 Units.**

Basic principles, design, and operation of energy storage systems and technology including lithium ion battery systems for transportation and stationary applications, for flow batteries (e.g., vanadium redox, sodium sulfur), and for reversible fuel cell electrolyzer systems and hydrogen energy storage.

Prerequisite: Required: Undergraduate-level knowledge of applied engineering thermodynamics.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 212. Engineering Electrochemistry: Fundamentals and Applications. 4 Units.**

Introduction to engineering electrochemistry fundamentals and applications. Examine thermodynamics and transport principles in typical electrochemical systems. Electrochemical sensors, batteries, fuel cells, and supercapacitors. Manufacturing aspects will also be covered.

Restriction: Graduate students only.

**ENGRMAE 212P. Engineering Electrochemistry: Fundamentals and Applications. 4 Units.**

Introduction to engineering electrochemistry fundamentals and applications. Examine thermodynamics and transport principles in typical electrochemical systems. Electrochemical sensors, batteries, fuel cells, and supercapacitors. Manufacturing aspects are also covered.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 213. Electric Propulsion. 4 Units.**

Space propulsion requirements and maneuvers, stressing those best suited to electric propulsion. An introduction to plasma physics. Electrothermal, electromagnetic and electrostatic accelerators, with emphasis in technologies (ion engines, Hall thrusters and colloidal thrusters) belonging to the latter family.

Restriction: Graduate students only.

Concurrent with ENGRMAE 113.

**ENGRMAE 214A. Fuel Cell Fundamentals and Technology. 4 Units.**

Introduction to electrochemistry and electrocatalysis; nature of fuel-cell electrodes and electrolytes; charge transfer reactions at interfaces; charge transport and mass transport processes; fuel processing reactions; determination of fuel cell efficiency, fuel flexibility, emissions and other characteristics.

Restriction: Graduate students only.

Concurrent with ENGRMAE 114.

**ENGRMAE 214AP. Fuel Cell Fundamentals and Technology. 4 Units.**

Introduction to electrochemistry and electrocatalysis; nature of fuel-cell electrodes and electrolytes; charge transfer reactions at interfaces; charge transport and mass transport processes; fuel processing reactions; determination of fuel cell efficiency, fuel flexibility, emissions, and other characteristics.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 214B. Fuel Cell Systems and Degradation. 4 Units.**

Fuel cell systems design; impacts of operating conditions; experimental and theoretical analysis methods for fuel cells systems; introduction to degradation mechanisms and mitigation techniques; provides broad insight into fuel-cell science, technology, system design and operation. Offered every other year.

Prerequisite: ENGRMAE 214A

Restriction: Graduate students only.

**ENGRMAE 214C. PEM Fuel Cells . 4 Units.**

An in-depth introduction to the fundamentals of PEM fuel cells, including thermodynamics, kinetics, and transport in electrochemical systems. Topics of specific interest to mechanical engineers will include water/heat management and dynamic responses.

Prerequisite: ENGRMAE 214A

Restriction: Graduate students only.

**ENGRMAE 215. Advanced Combustion Technology. 4 Units.**

Pollutant formation and experimental methods. Formation of gaseous pollutants and soot; transformation and emission of fuel contaminants in gas, liquid, and solid fuel combustion; methods employed to measure velocity, turbulence intensity, temperature, composition, particle size; methods to visualize reacting flows.

Prerequisite: ENGRMAE 200A and (ENGRMAE 230A or ENGRMAE 270A)

Restriction: Graduate students only.

**ENGRMAE 216. Statistical Thermodynamics. 4 Units.**

Statistics of independent particles, development of quantum mechanical description of atoms and molecules, application of quantum mechanics, evaluation of thermodynamics properties for solids, liquids, and gases, statistical mechanics of dependent particles (ensembles).

Restriction: Graduate students only.

**ENGRMAE 217. Generalized Thermodynamics. 4 Units.**

Generalized thermodynamics develops the laws of continuum thermodynamics from a set of plausible and intuitive postulates. The postulates are motivated qualitatively by a statistical description of matter and are justified by a posterior success for the resulting theory.

Restriction: Graduate students only.

**ENGRMAE 217P. Generalized Thermodynamics. 4 Units.**

Generalized thermodynamics develops the laws of continuum thermodynamics from a set of plausible and intuitive postulates. The postulates are motivated qualitatively by a statistical description of matter and are justified by a posterior success for the resulting theory.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 218. Sustainable Energy Systems. 4 Units.**

Basic principles, design and operation of sustainable energy systems including wind, solar photo-voltaic and thermal, hydroelectric, geothermal, oceanic, biomass combustion, advanced coal and next generation nuclear. Includes power generation, storage, and transmission for stationary power generation.

Restriction: Graduate students only.

Concurrent with ENGRMAE 118.

**ENGRMAE 218P. Sustainable Energy Systems. 4 Units.**

Basic principles, design, and operation of sustainable energy systems including wind, solar photo-voltaic and thermal, hydroelectric, geothermal, oceanic, biomass combustion, advanced coal, and next generation nuclear. Includes power generation, storage, and transmission for stationary power generation.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 219P. Solar and Renewable Energy Systems. 4 Units.**

Basic principles, design, and operation of solar and other renewable energy systems including solar photo-voltaic, solar thermal, wind, and PEM fuel cell. Includes power generation and storage, and renewable fuels for transportation and stationary power generation.

Prerequisite: Required: Knowledge of applied engineering thermodynamics.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 220. Conduction Heat Transfer. 4 Units.**

Steady state and transient conduction heat transfer in one- and multi-dimensional geometries. Analytical methods, exact and approximate. Numerical techniques are also included.

Restriction: Graduate students only.

**ENGRMAE 221. Convective Heat and Mass Transfer. 4 Units.**

Laminar and turbulent convective heat and mass transfer in external and internal flows. Forced and free convection. Exact and approximate solutions. Similarity solutions. Variable properties. Concentration boundary layer theory. Mass transfer conductance.

Prerequisite: ENGRMAE 230B

Restriction: Graduate students only.

**ENGRMAE 222. Radiative Heat Transfer. 4 Units.**

Black body radiation. Radiative transport equations for surfaces separated by non-participating media. Radiant energy transfer through absorbing, emitting, and scattering media. Radiation-conduction interaction. Radiation-convection interaction. Introduction to finite-difference solutions.

Restriction: Graduate students only.

**ENGRMAE 223A. Numerical Methods in Heat, Mass, and Momentum Transport (Laminar Flows) I. 4 Units.**

Introduction to the discretization of various types of partial differential equations (parabolic, elliptic, hyperbolic). Finite-volume discretization for one- and two-dimensional flows. Use of a two-dimensional elliptic procedure to predict sample laminar flows.

Prerequisite or corequisite: ENGRMAE 230A

Restriction: Graduate students only.

**ENGRMAE 223B. Numerical Methods in Heat, Mass, and Momentum II. 4 Units.**

Introduction to turbulence. Reynolds-averaging of Navier-Stokes equations. Second-order closure of the average equations. Use of two-dimensional elliptic procedure to predict confined turbulent flows. Not offered every year.

Prerequisite: ENGRMAE 223A

Restriction: Graduate students only.

**ENGRMAE 224. Advanced Transport Phenomena. 4 Units.**

Fundamentals of transport phenomena in fluid (gas and liquid), solid, and nano systems. Conservation equations, fundamentals of diffusion, ion transport, dispersion in turbulent/laminar flows, absorption, differential/staged distillation, transport in membranes, and nano/microscale transport phenomena. Not offered every year.

Restriction: Graduate students only.

**ENGRMAE 226. Special Topics in Fluid and Thermal Sciences. 1-4 Units.**

Special topics of current interest in fluid mechanics, heat and mass transfer, multiphase flows, or combustion. Emphasis could be placed on theory, computational methods, or experimental techniques.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ENGRMAE 227. Thermal Resistance Analysis in Microdevices and Nanomaterials. 4 Units.**

Heat transfer and thermal resistance analysis relevant for microdevices and nanomaterials. Overview of recent progress in nanotechnology and materials science. Thermal modeling strategies for novel electronic devices and energy conversion systems.

Restriction: Graduate students only.

**ENGRMAE 228. Nanoscale Phase Change Transport Physics. 4 Units.**

Discusses a wide range of phase change processes (i.e., evaporation, boiling, condensation, and freezing) through the use of novel thermal metamaterials with the aim of enhancing phase change performances.

Prerequisite: Undergraduate-level heat transfer is recommended.

Restriction: Graduate students only.

**ENGRMAE 229P. Nanoscale Materials for Modern Electronics. 4 Units.**

Introduction to design and synthesis of nanomaterials. Topics include thermal and liquid transport in materials systems, phase change heat transfer physics, and mechanical properties in materials systems.

Prerequisite: Required: Undergraduate-level knowledge of heat transfer.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 230A. Inviscid Incompressible Fluid Mechanics I. 4 Units.**

Equations of motion. Vector notation. Flow kinematics. Potential flow and complex potential. Vorticity and circulation. Bernoulli's theorem. Crocco's theorem. Conformal, Joukowski, and Schwarz-Christoffel transformations.

Restriction: Graduate students only.

**ENGRMAE 230B. Viscous Incompressible Fluid Mechanics II. 4 Units.**

Review of mass, momentum, energy equations. Stress tensor, constitutive relations. Laminar flows. Stokes and Oseen flows. Self-similarity. Boundary layer theory: thin-layer approximation, Falkner-Skan, Blasius solutions, integral methods. Jet, wake, cavity flows. Introduction to turbulence: instability, Reynolds averaging, mixing length.

Restriction: Graduate students only.

**ENGRMAE 230C. Compressible Fluid Dynamics. 4 Units.**

One-dimensional unsteady flow; Riemann invariants, acoustics, shock tube. Two-dimensional flow: shock polars, linear theory, similarity rules, method of characteristics. Three dimensional flow: slender-body theory. Effects of viscosity and conductivity: laminar boundary layer, Crocco-Busemann relations.

Prerequisite: ENGRMAE 230A or ENGRMAE 230B

Restriction: Graduate students only.

**ENGRMAE 230D. Theoretical Foundations of Fluid Mechanics. 4 Units.**

Well-posed problems and boundary, initial, and interface conditions; strong and weak solutions. Similarity, perturbation theory and limit behavior, bifurcations. Dispersive and nondispersive wave propagation, acoustics, ship waves, internal gravity waves, water waves. Vortices: mutual interactions and stability. Jets, wakes, cavities.

Prerequisite: ENGRMAE 230A and ENGRMAE 230B

Restriction: Graduate students only.

**ENGRMAE 231. Fundamentals of Turbulence. 4 Units.**

Phenomenon of turbulence. Reynolds equations. Dynamics of turbulence. Free turbulent shear flows. Wall-bounded turbulent shear flows. Turbulent transport of scalar quantities. Spectral dynamics. Mathematical models of turbulence.

Prerequisite: ENGRMAE 230A and ENGRMAE 230B

Restriction: Graduate students only.

**ENGRMAE 233. Turbulent Free Shear Flows. 4 Units.**

Practical and theoretical aspects of turbulent free shear flows. Instability, global scaling laws, mixing, and noise generation in incompressible and compressible shear layers, jets, and wakes. Kelvin-Helmholtz instability, near- and far-field growth rates, effect of compressibility, aeroacoustics of jets.

Prerequisite: ENGRMAE 200B and ENGRMAE 230A and ENGRMAE 230B

Restriction: Graduate students only.

**ENGRMAE 236. Nonequilibrium Gas Dynamics. 4 Units.**

Molecular description of fluid flow. Boltzmann equation. Chapman-Enskog expansion for flows with translational nonequilibrium. Shock structure. Inviscid flows with chemical and vibrational nonequilibrium. Not offered every year.

Prerequisite: ENGRMAE 230C

Restriction: Graduate students only.

**ENGRMAE 237. Computational Fluid Dynamics. 4 Units.**

Mathematical, physical, and computational fundamentals of computational fluid dynamics, numerical methods for solving the Euler and Navier-Stokes equations. Topics include: finite-difference and finite-volume discretization, time marching methods, von Neumann analysis, upwinding, flux splitting, TVD, and other high-resolution shock-capturing schemes.

Prerequisite: ENGRMAE 230C

Restriction: Graduate students only.

**ENGRMAE 238. Experimental Fluid Dynamics. 4 Units.**

Concepts and techniques for measurement of fluid motion. Quantitative and qualitative flow visualization. Flow facilities, shadowgraph, schlieren, interferometer, thermal anemometer. Laser diagnostics, fluorescence, Rayleigh, Raman, Mie scattering. Laser-Doppler, particle-image, and image-correlation velocimetry. Three- and four-dimensional digital imaging.

Prerequisite: ENGRMAE 230A and ENGRMAE 230B

Restriction: Graduate students only.

**ENGRMAE 239. Dynamics of Unsteady Flows. 4 Units.**

Unsteady potential flow modeling (Kelvin's circulation theorem, unsteady Bernoulli's equation). Theodorsen's frequency response, Wagner's step response, and the Kussner sharp-edged gust. State Space approximations for Unsteady Loads. Vortex Lattice. Flutter.

Prerequisite: ENGRMAE 230A is recommended.

Restriction: Graduate students only.

**ENGRMAE 241. Dynamics. 4 Units.**

Kinematics and dynamics of three-dimensional motions. Lagrange's equations, Newton-Euler equations. Applications include robot systems and spinning satellites.

Restriction: Graduate students only.

**ENGRMAE 242. Robotics. 4 Units.**

Spatial rigid-body transformations. Forward and inverse kinematics. Jacobian of serial and parallel chains. Screw coordinates and transformations. Rate and static analyses using screw theory. Singularity analysis. Trajectory generation. Not offered every year.

Restriction: Graduate students only.

**ENGRMAE 244. Theoretical Kinematics. 4 Units.**

Spatial rigid body kinematics is presented with applications to robotics. Orthogonal Matrices, Rodrigues' formula, Quaternions, Plucker coordinates, screw theory, and dual numbers are studied using modern projective geometry and multi-linear algebra. Applications include trajectory planning, inverse kinematics, and workspace analysis.

Restriction: Graduate students only.

**ENGRMAE 245. Spatial Mechanism Design. 4 Units.**

Fundamental kinematic theory required for planar, spherical, and spatial mechanism design. The focus is on algebraic methods for the exact solution of constraint equations. Not offered every year.

Restriction: Graduate students only.

**ENGRMAE 247. Micro-System Design. 4 Units.**

Covers the fundamentals of the many disciplines needed for design of Micro-Electro-Mechanical Systems (MEMS): microfabrication technology, structural mechanics on micro-scale, electrostatics, circuit interface, control, computer-aided design, and system integration.

Same as EECS 278.

Restriction: Graduate students only.

**ENGRMAE 247P. Micro-System Design. 4 Units.**

Covers the fundamentals of the many disciplines needed for design of Micro-Electro-Mechanical Systems (MEMS): microfabrication technology, structural mechanics on micro-scale, electrostatics, circuit interface, control, computer-aided design, and system integration.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 249. Micro-Sensors and Actuators. 4 Units.**

Introduction to the technology of Micro-Electro-Mechanical Systems (MEMS). Fundamental principles and applications of important microsensors, actuation principles on microscale. Introduction to the elements of signal processing; processing of materials for micro sensor/actuator fabrication; smart sensors and microsensor/microactuator array devices.

Same as EECS 279.

Restriction: Graduate students only.

**ENGRMAE 250. Biorobotics. 4 Units.**

Sensors, actuators, and neural circuits for biological movement control from an engineering perspective. Current approaches to robotic and mechatronic devices that support and enhance human movement in health and following neurologic injuries like stroke and spinal cord injury.

Restriction: Graduate students only.

**ENGRMAE 252. Fundamentals of Microfabrication. 4 Units.**

Introduces Engineering and Science students to the science of miniaturization. Different options to make very small machines (micro and nano size) are reviewed, materials choices are discussed, scaling laws are analyzed, and many practical applications are listed.

Restriction: Graduate students only.

**ENGRMAE 252P. Fundamentals of Microfabrication. 4 Units.**

Introduces engineering and science students to the science of miniaturization. Different options to make very small machines (micro and nano size) are reviewed, materials choices are discussed, scaling laws are analyzed, and many practical applications are listed.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 253. Advanced BIOMEMS Manufacturing Techniques. 4 Units.**

Introduction to BIOMEMS. Advanced biotechnology/biomedicine equipment based on MEMS and NEMS. Fundamentals of MEMS/NEMS sensing techniques and the biological and physics principles involved and the preferred MEMS and NEMS manufacturing techniques.

Restriction: Graduate students only.

Concurrent with ENGRMAE 153.

**ENGRMAE 254. Mechanics of Solids and Structures. 4 Units.**

Finite deformation kinematics; stress and strain measures; invariance in solid mechanics; objective rates; constitutive theory of elastic and inelastic solids; rate formulations; computational approaches; theories of plates and shells; applications to aerospace vehicles.

Restriction: Graduate students only.

**ENGRMAE 254P. Mechanics of Solids and Structures. 4 Units.**

Finite deformation kinematics; stress and strain measures; invariance in solid mechanics; objective rates; constitutive theory of elastic and inelastic solids; rate formulations; computational approaches; theories of plates and shells; applications to aerospace vehicles.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 255. Composite Materials and Structures. 4 Units.**

Motivation for composite materials. Different classifications according to the nature of the matrix (PMC, MMC, CMC) and the reinforcement topology (fibers, whiskers, particulates). Mechanical properties. Failure mechanisms. Designing with composite materials. Advantages and limitations of homogenization techniques for numerical modeling.

Restriction: Graduate students only.

Concurrent with ENGRMAE 155.

**ENGRMAE 256. Nanomechanics. 4 Units.**

Nanoscale materials and the experimental and computational techniques used to measure their properties. Mechanical behavior is the main focus, but other material properties such as diffusion and electron transport are discussed.

Restriction: Graduate students only.

**ENGRMAE 257P. Fabrication and Characterization of Nanomaterials . 4 Units.**

Introduction to nanoscale materials and experimental and computational techniques. Topics materials synthesis techniques, thin film deposition, nanoparticle and nanowire growth, characterization with electrons and X-rays, forces and surface interactions at the nanoscale, structure-property scaling laws, and atomistic/multiscale computer modeling.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 258. Mechanical Behavior of Solids - Continuum Theories. 4 Units.**

Presents a continuum, macroscopic view of deformation and failure of solids. Covers elasticity, plasticity, visco-elasticity, visco-plasticity, fracture and fatigue. Topics include discussions of physical behavior, mathematical formalism and measurement techniques.

Prerequisite: ENGRMAE 254

Restriction: Graduate students only.

**ENGRMAE 259. Mechanical Behavior of Solids - Atomistic Theories. 4 Units.**

Presents atomistic mechanisms that control mechanical behavior of materials. Covers plasticity, dislocation theory, strengthening mechanisms, high-temperature diffusion and grain boundary sliding, shear localization, void formation, ductile rupture, brittle fracture and fatigue.

Restriction: Graduate students only.

**ENGRMAE 259P. Mechanical Behavior of Solids - Atomistic Theories. 4 Units.**

Presents atomistic mechanisms that control mechanical behavior of materials. Covers plasticity, dislocation theory, strengthening mechanisms, high-temperature diffusion and grain boundary sliding, shear localization, void formation, ductile rupture, brittle fracture, and fatigue.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 260. Current Issues Related to Air Quality, Climate, and Energy. 4 Units.**

Current issues related to the atmosphere, climate, and air quality in the context of energy conversion and sustainability. Topics include transportation systems; building design; impacts on humans and ecosystems; modeling and meteorology; economics; and application to public policies.

Prerequisite: ENGRMAE 261 or CHEM 245 or EARTHSS 240

Same as CHEM 241.

Restriction: Graduate students only.

**ENGRMAE 270A. Linear Systems I. 4 Units.**

Input-output and state-space representations of continuous-time linear systems. State transition matrices, Controllability and observability. Irreducible realizations. State feedback and observer design.

Restriction: Graduate students only.

**ENGRMAE 270B. Linear Systems II. 4 Units.**

Advanced topics in linear systems: bases, linear operator representations, and Jordan forms. Review of dynamical systems, and stability. Time-varying systems, discrete-time representations, and multi-input/multi-output systems. Introduction to continuous and discrete time linear regulator (LQR) problems. Not offered every year.

Prerequisite: ENGRMAE 270A

Restriction: Graduate students only.

**ENGRMAE 272. Robust Control Theory. 4 Units.**

Methods for control design of systems with uncertainty. Feedback stability and small gain theorem. Multivariable stability margins and multiplier theory. H-infinity-optimal control, linear matrix inequalities. Not offered every year.

Prerequisite: ENGRMAE 270A

Restriction: Graduate students only.



**ENGRMAE 274. Optimal Control. 4 Units.**

Principles and methods of optimal control. Topics include objectives and issues in controlling nonlinear systems; linear variational and adjoint equations; optimality conditions via variational calculus, maximum principle, and dynamic programming; solution methods; applications to control robots and aerospace vehicles.

Prerequisite: ENGRMAE 200A and ENGRMAE 270A

Restriction: Graduate students only.

**ENGRMAE 275. Nonlinear Feedback Systems. 4 Units.**

Advanced tools for feedback control system analysis and synthesis. Norms, operators,  $L_p$  spaces, contraction mapping theorem, Lyapunov techniques along with their extensions. Circle criterion positivity and passivity. Applications to nonlinear control methods, such as sliding mode or adaptive techniques.

Prerequisite: ENGRMAE 270B

Restriction: Graduate students only.

**ENGRMAE 276. Geometric Nonlinear Control. 4 Units.**

Using the mathematics of differential geometry, a number of the concepts and results of linear systems theory have been extended to nonlinear systems. Describes these extensions and illustrate their use in nonlinear system analysis and design. Not offered every year.

Prerequisite: ENGRMAE 200A and ENGRMAE 270A

Restriction: Graduate students only.

**ENGRMAE 277. Learning Control Systems. 4 Units.**

Supervised learning for classification and regression: perceptrons, support vector machines, feed-forward neural networks, Gaussian processes. Generalization and model selection: cross-validation, regularization, and Bayesian methods. Unsupervised learning: clustering and dimensionality reduction. Learning control systems. Introduction to reinforcement learning.

Restriction: Graduate students only.

**ENGRMAE 278. Parameter and State Estimation. 4 Units.**

Bayesian and frequentist approaches to parameter and state estimation. Properties of estimators. Linear Gaussian systems and the Kalman Filter. Nonlinear state estimation, extended and unscented Kalman Filters. Introduction to Monte Carlo methods and particle filtering. Application to tracking and navigation.

Prerequisite: ENGRMAE 200A and ENGRMAE 270A

Restriction: Graduate students only.

**ENGRMAE 279. Special Topics in Mechanical Systems. 4 Units.**

Selected topics of current interest in mechanical systems. Topics include robotics, kinematics, control, dynamics, and geometric modeling.

Prerequisite: ENGRMAE 270A and ENGRMAE 241

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ENGRMAE 280. Design of Computer-Controlled Robots. 4 Units.**

The basic aspects of mechatronic design are covered, including motor and sensor selection, control strategies, finite state machines, inertial measurement units, and implementation of advanced feedback control laws. Students work in groups to create their own mechatronic device. Materials fee.

Restriction: Graduate students only.

Concurrent with ENGRMAE 172.

**ENGRMAE 284. Fundamentals of Experimental Design. 4 Units.**

Fundamentals and principles of statistical experimental design and analysis. Emphasis addresses understanding and use of designed experiments, response surfaces, linear regression modeling, process optimization, and development of links between empirical and theoretical models.

Restriction: Graduate students only.

Concurrent with ENGRMAE 184.

**ENGRMAE 294. Master of Science Thesis Project. 4 Units.**

Tutorial in which masters-level students taking the comprehensive examination option undertake a masters-level research project.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ENGRMAE 295. Special Topics in Mechanical and Aerospace Engineering. 1-4 Units.**

Special topics by individual faculty in major fields of interest.

Repeatability: Unlimited as topics vary.

**ENGRMAE 295P. Special Topics in Mechanical and Aerospace Engineering. 4 Units.**

Studies in selected areas of Mechanical and Aerospace Engineering. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 296. Master of Science Thesis Research. 1-16 Units.**

Individual research or investigation conducted in the pursuit of preparing and completing the thesis required for the M.S. in Engineering.

Repeatability: May be repeated for credit unlimited times.

**ENGRMAE 297. Doctor of Philosophy Dissertation Research. 1-16 Units.**

Individual research or investigation conducted in the pursuit of preparing and completing the dissertation required for the Ph.D. in Engineering.

Repeatability: May be repeated for credit unlimited times.

**ENGRMAE 298. Seminars in Mechanical and Aerospace Engineering. 1 Unit.**

Presentation of advanced topics and reports of current research efforts in mechanical engineering. Required of all graduate students in mechanical engineering.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**ENGRMAE 299. Individual Research. 1-16 Units.**

Individual research or investigation under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

Restriction: Consent of instructor to enroll

## Department of Biomedical Engineering

**Zoran Nenadic, Department Chair**

3120 Natural Sciences II

949-824-9196

<http://www.eng.uci.edu/dept/bme> (<http://www.eng.uci.edu/dept/bme/>)

Biomedical engineering combines engineering expertise with medical needs for the enhancement of health care. It is a branch of engineering in which knowledge and skills are developed and applied to define and solve problems in biology and medicine. Students choose the biomedical engineering field to be of service to people, for the excitement of working with living systems, and to apply advanced technology to the complex problems of medical care. Biomedical engineers may be called upon to design instruments and devices, to bring together knowledge from many sources to develop new procedures, or to carry out research to acquire knowledge needed to solve new problems.

During the last 20 years, we have witnessed unprecedented advances in engineering, medical care, and the life sciences. The combination of exploding knowledge and technology in biology, medicine, the physical sciences, and engineering, coupled with the changes in the way health care will be delivered in the next century, provide a fertile ground for biomedical engineering. Biomedical engineering, at the confluence of these fields, has played a vital role in this progress. Traditionally, engineers have been concerned with inanimate materials, devices, and systems, while life scientists have investigated biological structure and function. Biomedical engineers integrate these disciplines in a unique way, combining the methodologies of the physical sciences and engineering with the study of biological and medical problems. The collaboration between engineers, physicians, biologists, and physical scientists is an integral part of this endeavor and has produced many important discoveries in the areas of artificial organs, artificial implants, and diagnostic equipment.

The Department offers a B.S. in Biomedical Engineering (BME), a four-year engineering curriculum accredited by the Engineering Accreditation Commission of ABET (<http://www.abet.org/>), <http://www.abet.org>. This program prepares students for a wide variety of careers in Biomedical Engineering in industry, hospitals, and research laboratories or for further education in graduate school.

The Department also offers a B.S. in Biomedical Engineering: Premedical (BMEP), a four-year engineering curriculum taken with required premedical courses. It is one of many majors that can serve as preparation for further training in medical, veterinary, or allied health professions. It is also suitable for students interested in pursuing graduate work in Biomedical Engineering and other biomedical areas such as physiology, neurosciences, and bioinformatics. The curriculum has less engineering content but more biological sciences and chemistry course work than the Biomedical Engineering major. The undergraduate major in Biomedical Engineering: Premedical is not designed to be accredited, therefore is not accredited by ABET.

Areas of graduate study and research include biophotonics, biomedical nanoscale systems, biomedical computational technologies, and tissue engineering.

- Biomedical Engineering, B.S.
- Biomedical Engineering, M.S.
- Biomedical Engineering, Minor
- Biomedical Engineering, Ph.D.
- Biomedical Engineering: Premedical, B.S.

## Faculty

Kyriacos Athanasiou, Ph.D. Columbia University, *Henry Samueli Chair in Engineering and Director of DELTAi (Directing Engineering and Life Science Translational Advances at Irvine) and Distinguished Professor of Biomedical Engineering* (understanding and enhancing the healing processes of musculoskeletal tissues as well as the body's cartilaginous tissues, effecting translation of engineering innovations to clinical use, especially in terms of instruments and devices)

Michael W. Berns, Ph.D. Cornell University, *Arnold and Mabel Beckman Chair in Laser Biomedicine and Professor of Surgery; Biomedical Engineering; Developmental and Cell Biology*

Elliot L. Botvinick, Ph.D. University of California, San Diego, *Professor of Surgery; Biomedical Engineering*

Gregory Brewer, Ph.D. University of California, San Diego, *Adjunct Professor of Biomedical Engineering* (neuronal networks, decoding brain learning and memory, brain-inspired computing, Alzheimer's disease, brain aging, neuron cell culture)

James P. Brody, Ph.D. Princeton University, *Associate Professor of Biomedical Engineering* (bioinformatics, micro-nanoscale systems)

Bernard H. Choi, Ph.D. University of Texas at Austin, *Professor of Surgery; Biomedical Engineering*

Michelle Digman, Ph.D. University of Illinois at Chicago, *Associate Professor of Biomedical Engineering; Developmental and Cell Biology* (biophotonics, fluorescence Spectroscopy and microscopy, nano-scale imaging, mechanotransduction, cancer cell migration, fluorescence lifetime and metabolic mapping)

Timothy L. Downing, Ph.D. University of California, Berkeley, *Assistant Professor of Biomedical Engineering; Microbiology and Molecular Genetics* (stem cells and tissue engineering, regenerative biology, cell programming, epigenomics, mechanobiology)

Anthony J. Durkin, Ph.D. University of Texas at Austin, *Associate Professor of Biomedical Engineering* (spatial frequency domain imaging, wide field functional imaging, quantitative near-infrared spectroscopy of superficial tissues, chemometrics, fluorescence spectroscopy, quantitative spectral imaging)

Enrico Gratton, Ph.D. University of Rome, *Distinguished Professor of Biomedical Engineering; Developmental and Cell Biology; Physics and Astronomy* (design of new fluorescence instruments, protein dynamics, single molecule, fluorescence microscopy, photon migration in tissues)

Anna Grosberg, Ph.D. California Institute of Technology, *Associate Professor of Biomedical Engineering; Chemical and Biomolecular Engineering* (computational modeling of biological systems, biomechanics, cardiac tissue engineering)

Jered Haun, Ph.D. University of Pennsylvania, *Associate Professor of Biomedical Engineering; Chemical and Biomolecular Engineering; Materials Science and Engineering* (nanotechnology, molecular engineering, computational simulations, targeted drug delivery, clinical cancer detection)

Elliot E. Hui, Ph.D. University of California, Berkeley, *Associate Professor of Biomedical Engineering* (microscale tissue engineering, bioMEMS, cell-cell interactions, global health diagnostics)

Tibor Juhasz, Ph.D. Attila József University, *Professor of Ophthalmology; Biomedical Engineering*

Arash Kheradvar, Ph.D. California Institute of Technology, *Professor of Biomedical Engineering; Mechanical and Aerospace Engineering* (cardiac mechanics, cardiovascular devices, cardiac imaging)

Michelle Khine, Ph.D. University of California, Berkeley, *Professor of Biomedical Engineering; Chemical and Biomolecular Engineering; Materials Science and Engineering* (development of novel nano- and micro-fabrication technologies and systems for single cell analysis, stem cell research, in-vitro diagnostics)

Christine King, Ph.D. University of California, Irvine, *Assistant Professor of Teaching of Biomedical Engineering* (engineering and STEM education, active learning, wireless health systems, rehabilitation, brain-computer interfaces, robotics)

Frithjof Kruggel, M.D. Ludwig Maximilian University of Munich, *Professor of Biomedical Engineering* (biomedical signal and image processing, anatomical and functional neuroimaging in humans, structure-function relationship in the human brain)

Abraham P. Lee, Ph.D. University of California, Berkeley, *Professor of Biomedical Engineering; Mechanical and Aerospace Engineering* (integrated point-of-care diagnostics, engineered 'theranostic' vesicles and particles, active cell sorting microdevices, microphysiological microsystems, and high throughput droplet bioassays)

Chang C. Liu, Ph.D. Scripps Research Institute, *Assistant Professor of Biomedical Engineering; Chemistry; Molecular Biology and Biochemistry* (genetic engineering, directed evolution, synthetic biology, chemical biology)

Wendy F. Liu, Ph.D. Johns Hopkins University, *Associate Professor of Biomedical Engineering; Chemical and Biomolecular Engineering* (biomaterials, microdevices in cardiovascular engineering, cell-cell and cell-micro-environment interactions, cell functions and controls)

Beth A. Lopour, Ph.D. University of California, Berkeley, *Assistant Professor of Biomedical Engineering; Mechanical and Aerospace Engineering* (computational neuroscience, signal processing, mathematical modeling, epilepsy, translational research)

Joshua Mauney, Ph.D. Tufts University, *Jerry D. Choate Presidential Chair in Urology Tissue and Engineering and Associate Professor of Urology; Biomedical Engineering*

Zoran Nenadic, Ph.D. Washington University, *William J. Link Chair in Biomedical Engineering and Department Chair and Professor of Biomedical Engineering; Electrical Engineering and Computer Science* (adaptive biomedical signal processing, control algorithms for biomedical devices, brain-machine interfaces, modeling and analysis of biological neural networks)

Ronke Olabisi, Ph.D. University of Wisconsin-Madison, *Assistant Professor of Biomedical Engineering* (orthopedic tissue engineering and regenerative medicine for injury, aging, disease, and space flight)

Daryl Preece, Ph.D. University of Glasgow, *Assistant Professor of Biomedical Engineering* (nano-optics, neuro-photonics, optical forces and mechanotransduction, singular optics, and biophotonics)

William C. Tang, Ph.D. University of California, Berkeley, *Professor of Biomedical Engineering; Chemical and Biomolecular Engineering; Electrical Engineering and Computer Science* (micro-electro-mechanical systems (MEMS) nanoscale engineering for biomedical applications, microsystems integration, microimplants, microbiomechanics, microfluidics)

## Affiliate Faculty

Alpesh N. Amin, M.D. M.B.A. Northwestern University, *Department Chair and Thomas and Mary Cesario Endowed Chair in Medicine and Professor of Medicine; Biomedical Engineering; Paul Merage School of Business; Program in Public Health; Radiological Sciences*

Pierre F. Baldi, Ph.D. California Institute of Technology, *Director of the Institute for Genomics and Bioinformatics and Distinguished Professor of Computer Science; Biological Chemistry; Biomedical Engineering; Developmental and Cell Biology; Mathematics* (artificial intelligence and machine learning, biomedical informatics, databases and data mining, environmental informatics, statistics and statistical theory)

Bruce Blumberg, Ph.D. University of California, Los Angeles, *Professor of Developmental and Cell Biology; Biomedical Engineering; Environmental Health Sciences; Pharmaceutical Sciences* (gene regulation by nuclear hormone receptors in vertebrate development physiology, endocrine disruption)

Andrew Browne, M.D., Ph.D. University of Cincinnati, *Health Sciences Assistant Clinical Professor of Ophthalmology; Biomedical Engineering*

Peter J. Burke, Ph.D. Yale University, *Professor of Electrical Engineering and Computer Science; Biomedical Engineering; Materials Science and Engineering* (nano-electronics, bio-nanotechnology)

Hung Cao, Ph.D. University of Texas at Arlington, *Assistant Professor of Electrical Engineering and Computer Science; Biomedical Engineering* (MEMS, sensors, implants, heart disease, neurological disease, wireless biomedical systems)

Dan M. Cooper, M.D. University of California, San Francisco, *Senior Associate Dean, Clinical Translational Science and Associate Vice Chancellor, Clinical Translational Research and Professor of Pediatrics; Biomedical Engineering; Pharmaceutical Sciences*

Robert Corn, Ph.D. University of California, Berkeley, *UCI Distinguished Professor of Chemistry; Biomedical Engineering* (analytical, chemical biology, physical chemistry and chemical physics, polymer, materials, nanoscience)

Nancy A. Da Silva, Ph.D. California Institute of Technology, *Professor of Chemical and Biomolecular Engineering; Biomedical Engineering* (molecular biotechnology, metabolic engineering and synthetic biology, eukaryotic expression systems, biorenewable chemicals)

Hamid Djalilian, M.D. University of Minnesota, *Professor of Otolaryngology; Biomedical Engineering*

James Earthman, Ph.D. Stanford University, *Professor of Materials Science and Engineering; Biomedical Engineering* (biomaterials, compositionally complex materials, nanocrystalline alloys, quantitative percussion diagnostics, deformation and damage processes)

Rahim Esfandiyarpour, Ph.D. Stanford University, *Assistant Professor of Electrical Engineering and Computer Science; Biomedical Engineering* (nanotechnology and nanoscience, flexible electronics, MEMS and NEMS fabrication and modeling, stretchable and wearable bio devices, translational micro/nanotechnologies, biological and chemical sensors, microfluidics, microelectronics circuits and systems, physiological monitoring, Internet of Things (IOT) bio devices, technology development for personalized/precision medicine, and Point of Care (POC) diagnostics)

Gregory R.D. Evans, M.D. University of Southern California, *Department Chair and Professor of Plastic Surgery; Biomedical Engineering; Surgery*

Lisa Flanagan-Monuki, Ph.D. University of California, San Diego, *Associate Professor of Neurology; Anatomy and Neurobiology; Biomedical Engineering*

Ron D. Frostig, Ph.D. University of California, Los Angeles, *Professor of Neurobiology and Behavior; Biomedical Engineering*

Zhibin Guan, Ph.D. University of North Carolina at Chapel Hill, *Professor of Chemistry; Biomedical Engineering; Chemical and Biomolecular Engineering; Materials Science and Engineering* (chemical biology, organic and synthetic, polymer, materials, nanoscience)

Gultekin Gulsen, Ph.D. Bogazici University, *Associate Professor of Radiological Sciences; Biomedical Engineering; Physics and Astronomy*

Ranjan Gupta, M.D. Albany Medical College, *Professor of Orthopaedic Surgery; Biomedical Engineering*

Frank P.K. Hsu, M.D. University of Maryland, College Park, *Department Chair and Department Chair of Physical Medicine and Rehabilitation and Professor of Neurological Surgery; Biomedical Engineering; Otolaryngology*

Lan Huang, Ph.D. University of Florida, *Professor of Physiology and Biophysics; Biological Chemistry; Biomedical Engineering; Pharmaceutical Sciences*

Christopher C. Hughes, Ph.D. University of London, *Director of Edwards Lifesciences Center for Advanced Cardiovascular Technology and Professor of Molecular Biology and Biochemistry; Biomedical Engineering* (tissue engineering, growth and patterning of blood vessels)

James V. Jester, Ph.D. University of Southern California, *Jack H. Skirball Chair in Ophthalmology Research and Professor of Ophthalmology; Biomedical Engineering*

Joyce H. Keyak, Ph.D. University of California, San Francisco, *Professor in Residence of Radiological Sciences; Biomedical Engineering; Mechanical and Aerospace Engineering*

Baruch D. Kuppermann, M.D., Ph.D. University of Miami, *California Institute of Technology, Director, Gavin Herbert Eye Institute; Roger F. Steinart, M.D., Endowed Chair in Ophthalmology and Department Chair and Professor of Ophthalmology; Biomedical Engineering*

Young Jik Kwon, Ph.D. University of Southern California, *Professor of Pharmaceutical Sciences; Biomedical Engineering; Chemical and Biomolecular Engineering; Molecular Biology and Biochemistry* (gene therapy, drug delivery, cancer-targeted therapeutics, artificially-induced cellular vesicles, multi-modal therapies)

Jonathan Lakey, Ph.D. University of Alberta, *Professor of Surgery; Biomedical Engineering*

Arthur D. Lander, Ph.D. University of California, San Francisco, *Donald Bren Professor and Professor of Developmental and Cell Biology; Biomedical Engineering; Logic and Philosophy of Science* (systems biology of development, pattern formation, growth control)

Guann-Pyng Li, Ph.D. University of California, Los Angeles, *Director of the UCI Division of the California Institute for Telecommunications and Information Technology (Calit2), Director of the Integrated Nanosystems Research Facility and Professor of Electrical Engineering and Computer Science; Biomedical Engineering* (micro/nano technology for sensors and actuators, internet of things (IoT), smart manufacturing, biomedical devices and millimeter wave wireless communication)

Jack J. Lin, M.D. Rush University, *Associate Professor of Neurology; Biomedical Engineering*

John S. Lowengrub, Ph.D. Courant Institute of Mathematical Sciences, *Chancellor's Professor of Mathematics; Biomedical Engineering* (applied and computational mathematics, mathematical and computational biology)

Ray Luo, Ph.D. University of Maryland, College Park, *Professor of Molecular Biology and Biochemistry; Biomedical Engineering; Chemical and Biomolecular Engineering; Materials Science and Engineering* (protein structure, noncovalent associations involving proteins)



Marc J. Madou, Ph.D. Ghent University, *UCI Chancellor's Professor of Mechanical and Aerospace Engineering; Biomedical Engineering; Chemical and Biomolecular Engineering* (miniaturization science (MEMS and NEMS) with emphasis on chemical and biological applications )

John Middlebrooks, Ph.D. University of California, San Francisco, *Professor of Otolaryngology; Biomedical Engineering; Cognitive Sciences; Neurobiology and Behavior*

Sabee Y. Molloy, Ph.D. University of Wisconsin-Madison, *Professor of Radiological Sciences; Biomedical Engineering*

Jogeshwar Mukherjee, Ph.D. Jodhpur National University, *Professor in Residence of Radiological Sciences; Biomedical Engineering*

J. Stuart Nelson, Ph.D. University of California, Irvine, *Professor of Surgery; Biomedical Engineering*

Qing Nie, Ph.D. Ohio State University, *Director of the NSF-Simons Center for Multiscale Cell Fate Research and Chancellor's Professor of Mathematics; Biomedical Engineering* (applied and computational mathematics, mathematical and computational biology)

Pranav Patel, M.D. Saint Louis University, *Chief, Division of Cardiology; Director of Cardiac Catheterization Laboratory and Cardiac Care Unit (CCU) and Health Sciences Associate Clinical Professor of Medicine; Biomedical Engineering*

David J. Reinkensmeyer, Ph.D. University of California, Berkeley, *Professor of Anatomy and Neurobiology; Biomedical Engineering; Mechanical and Aerospace Engineering; Physical Medicine and Rehabilitation*

Phillip C-Y Sheu, Ph.D. University of California, Berkeley, *Professor of Electrical Engineering and Computer Science; Biomedical Engineering; Computer Science* (semantic computing, robotic computing, artificial intelligence, biomedical computing, multimedia computing)

Andrei M. Shkel, Ph.D. University of Wisconsin-Madison, *Professor of Mechanical and Aerospace Engineering; Biomedical Engineering; Electrical Engineering and Computer Science* (design and advanced control of micro-electro-mechanical systems (MEMS); high precision micro-machined gyroscopes; MEMS-enhanced optical systems, tools and prosthetic appliances; electromechanical and machine-information systems integration)

Zuzanna S. Siwy, Ph.D. Silesian University of Technology, *Professor of Physics and Astronomy; Biomedical Engineering; Chemistry*

Ramesh Srinivasan, Ph.D. Tulane University, *Department Chair and Professor of Cognitive Sciences; Biomedical Engineering* (perception, attention, decision-making, cognitive and clinical neuroscience)

Peter Tseng, Ph.D. University of California, Los Angeles, *Assistant Professor of Electrical Engineering and Computer Science; Biomedical Engineering* ((bio) Micro-Electro-Mechanical systems, wearable technology, materials-by-design, bioelectromagnetism, nanotechnology)

Vasan Venugopalan, Sc.D. Massachusetts Institute of Technology, *Department Chair and Professor of Chemical and Biomolecular Engineering; Biomedical Engineering; Materials Science and Engineering; Mechanical and Aerospace Engineering; Surgery* (laser-generated thermal, mechanical and radiative transport processes for application in medical diagnostics, imaging, therapeutics, biotechnology)

Szu-Wen Wang, Ph.D. Stanford University, *Professor of Chemical and Biomolecular Engineering; Biomedical Engineering* (combining principles of self-assembly with nature-inspired macromolecular systems to engineer new materials and therapeutic strategies)

H. Kumar Wickramasinghe, Ph.D. University of London, *Henry Samueli Endowed Chair in Engineering and Professor of Electrical Engineering and Computer Science; Biomedical Engineering* (nanoscale measurements and characterization, scanning probe microscopy, storage technology, nano-bio measurement technology)

Brian Wong, M.D. Johns Hopkins University, *Professor of Otolaryngology; Biomedical Engineering*

Xiangmin Xu, Ph.D. Vanderbilt University, *Professor of Anatomy and Neurobiology; Biomedical Engineering; Computer Science*

Albert Fan Yee, Ph.D. University of California, Berkeley, *Professor of Chemical and Biomolecular Engineering; Biomedical Engineering* (physics of polymers and soft materials, and their applications in nanotechnology and biomedical devices. Mechanics and toughening of polymers and composites)

Fan-Gang Zeng, Ph.D. Syracuse University, *Director of Hearing Research and Professor of Otolaryngology; Anatomy and Neurobiology; Biomedical Engineering; Cognitive Sciences*

Weian Zhao, Ph.D. McMaster University, *Associate Professor of Pharmaceutical Sciences; Biological Chemistry; Biomedical Engineering; Materials Science and Engineering* (stem cell therapy, diagnostics, biosensors, immunotherapy, single-cell analysis)

## Courses

### **BME 1. Introduction to Biomedical Engineering. 3 Units.**

Introduction to the central topics of biomedical engineering. Offers a perspective on bioengineering as a discipline in a seminar format. Principles of problem solving, design, engineering inventiveness, entrepreneurship, information access, communication, ethics, teamwork, and social responsibility are emphasized.

(Design units: 1)

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.

### **BME 3. Engineering Innovations in Treating Diabetes. 4 Units.**

Innovations in diabetes treatment from the 1800s until the present: purification of insulin, measuring and control of blood glucose, recombinant DNA, clinical trials, and ethics. Solving optimization problems in engineering with Excel.

(II and VA ).

### **BME 50A. Cell and Molecular Engineering. 4 Units.**

Molecular, structural, genetic, biophysical, and cellular principles of life and bioengineering. Introduction to molecular bioengineering, genetic engineering, synthetic biology, and cell biology. Applications to genetic and biomolecular design.

(Design units: 1)

Corequisite: BME 1

Prerequisite: CHEM 1C or CHEM H2C

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

### **BME 50B. Cell and Molecular Engineering. 4 Units.**

Physiological function from a cellular, molecular, and biophysical perspective. Introduction to genetics, neuronal signaling, and cell cycle control.

(Design units: 1)

Prerequisite: BME 50A

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment.

### **BME 60A. Engineering Analysis/Design: Data Acquisition. 4 Units.**

Fundamentals of LabVIEW programming, basics of computer-based experimentation, establishing interface between computer and data acquisition instrumentation, signal conditioning basics. Materials fee.

(Design units: 2)

Prerequisite: PHYS 7D

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.

### **BME 60B. Engineering Analysis/Design: Data Analysis. 4 Units.**

Overview of MATLAB; numeric, cell, and structure arrays; file management; plotting and model building; solving linear algebraic equations; signal and image processing. Materials fee.

(Design units: 1)

Prerequisite: MATH 3A

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.



**BME 60C. Engineering Analysis/Design: Computer-Aided Design. 4 Units.**

Introduction to SolidWorks and Computer-Aided Design software; design; analysis; rapid prototyping; visualization and presentation; manufacturing planning. Materials fee.

(Design units: 2)

Prerequisite or corequisite: BME 1

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.

**BME 60D. Engineering Analysis/Design: Finite-Element Simulation. 4 Units.**

Introduction to finite-element simulation; fundamentals of Multiphysics simulation;.

(Design units: 2)

Prerequisite: BME 60B and BME 60C

**BME 110A. Biomechanics I. 4 Units.**

Introduction to statics and dynamics. Topics include rigid bodies, analysis of structures, forces in beams, moments of inertia, friction, kinetics, work, and energy.

(Design units: 1)

Prerequisite: PHYS 7C and MATH 3A and MATH 3D and BME 60B and BME 60C

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**BME 110B. Biomechanics II. 4 Units.**

Introduction to biomechanics from subcellular to tissue levels. Introduction to stress, strain, and constitutive laws of cells and tissues. Emphasis is placed on biosolids. Introduction to elastic and viscoelastic behaviors with emphasis on the standard linear model of viscoelasticity.

(Design units: 1)

Prerequisite: BME 110A

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**BME 110C. Biomechanics III. 4 Units.**

Introduction to human biomechanics with emphasis on cardiovascular biomechanics and biofluid mechanics.

(Design units: 0)

Prerequisite: BME 110B

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BME 111. Design of Biomaterials. 4 Units.**

Natural and synthetic polymeric materials. Metal and ceramics implant materials. Mechanical properties, degradation, surface characterization, and design of materials. Wound repair, blood clotting, foreign body response, biocompatibility of material. Artificial organs and medical devices. Government regulations.

(Design units: 3)

Corequisite: BME 50B or BIO SCI 99.

Prerequisite: CHEM 1C

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**BME 114. Genetic Engineering and Synthetic Biology. 4 Units.**

Exploring how biological function can be engineered and 'synthesized' from the DNA level up.

(Design units: 0)

Prerequisite: (CHEM 1C or CHEM H2C) and MATH 3D and BME 50A and BME 50B

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BME 120. Sensory Motor Systems. 4 Units.**

A quantitative and systems approach to understanding physiological systems. Systems covered include the nervous and musculoskeletal systems.

(Design units: 2)

Prerequisite: (BME 60B or EECS 10 or EECS 12 or CEE 20 or MAE 10) and MATH 3D and PHYS 7D

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

Concurrent with BME 220.

**BME 121. Quantitative Physiology: Organ Transport Systems. 4 Units.**

A quantitative and systems approach to understanding physiological systems. Systems covered include the cardiopulmonary, circulatory, and renal systems.

(Design units: 1)

Prerequisite: (BME 60B or EECS 10 or EECS 12 or CEE 20 or MAE 10) and MATH 3D

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment.

**BME 130. Biomedical Signals and Systems. 4 Units.**

Analysis of analog and digital biomedical signals; Fourier Series expansions; difference and differential equations; convolutions. System models: discrete-time and continuous-time linear time-invariant systems; Laplace and Fourier transforms. Analysis of signals and systems using computer programs.

(Design units: 1)

Corequisite: BME 60B

Prerequisite: (MATH 3A or ICS 6N) and MATH 3D. Recommended: STAT 8.

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.

**BME 132. Introduction to Computational Biology. 4 Units.**

The use of theories and methods based on computer science, mathematics, and physics in molecular biology and biochemistry. Basics in biomolecular modeling. Analysis of sequence and structural data of biomolecules. Analysis of biomolecular functions.

Prerequisite: MATH 2D or MATH 3A or STAT 7 or STAT 8

Same as BIOL M123, CS 183.

Concurrent with MBB 223 and BME 232.

**BME 135. Photomedicine. 4 Units.**

Studies the use of optical and engineering-based systems (laser-based) for diagnosis, treating diseases, manipulation of cells and cell function. Physical, optical, and electro-optical principles are explored regarding molecular, cellular, organ, and organism applications.

(Design units: 0)

Prerequisite: PHYS 3C or PHYS 7D

Same as BIOL D130.

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BME 136. Engineering Medical Optics. 4 Units.**

Principles of optics and photonics, integration of optical components into systems and devices, and analysis of physiological signals obtained from Biophotonics measurements.

(Design units: 3)

Prerequisite: BME 130 and (BME 135 or BIOL D130)

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

Concurrent with BME 251.

**BME 137. Introduction to Biomedical Imaging. 4 Units.**

Introduction to imaging modalities widely used in medicine and biology, including X-ray, computed tomography (CT), nuclear medicine (PET and SPET), ultrasonic imaging, magnetic resonance imaging (MRI), optical tomography, imaging contrast, imaging processing, and complementary nature of the imaging modalities.

(Design units: 1)

Prerequisite: BME 130 or EECS 50 or EECS 150

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BME 138. Spectroscopy and Imaging of Biological Systems. 4 Units.**

Principles of spectroscopy; absorption; molecular orbitals; multiphoton transitions; Jablonski diagram; fluorescence anisotropy; fluorescence decay; quenching; FRET; excited state reactions; solvent relaxations; instruments; microscopy: wide field, LSM, TPE; fluorescent probes, fluctuations spectroscopy; optical resolution and super-resolution; CARS and SHG microscopy.

(Design units: 1)

Prerequisite: (MATH 3A or ICS 6N) and MATH 3D. Recommended: STAT 8.

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.

Concurrent with BME 238.

**BME 140. Design of Biomedical Electronics. 4 Units.**

Analog and digital circuits in bioinstrumentation. AC and DC circuit analysis, design and construction of filter and amplifiers using operational amplifier, digitization of signals and data acquisition, bioelectrical signals, design and construction of ECG instrument, bioelectrical signal measurement and analysis. Materials fee.

(Design units: 3)

Prerequisite: BME 60A and BME 130

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BME 142. Microfabrication. 4 Units.**

Essentials of photolithography, soft-lithography, microfabrication, Microelectromechanical Systems (MEMS), BioMEMS; applications in biomedical engineering.

(Design units: 2)

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BME 147. Microfluidics and Lab-on-a-Chip. 4 Units.**

Introduction to principles of microfluidics and state-of-the-art micro Total Analysis Systems (uTAS). Lab-on-a-Chip for bimolecular assays with device design principles for microscale sample preparation, flow transport, bimolecular manipulation, separation and detection, and the technologies for integrating these devices into microsystems.

(Design units: 1)

Prerequisite: BME 110C

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

Concurrent with BME 260.

**BME 148. Microimplants. 4 Units.**

Essential concepts of biomedical implants at the micro scale. Design, fabrication, and applications of several microimplantable devices including cochlear, retinal, neural, and muscular implants.

(Design units: 1)

Prerequisite: BME 111

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

Concurrent with BME 262.

**BME 149. Biomedical Microdevices . 4 Units.**

In-depth review of microfabricated devices designed for biological and medical applications. Studies of the design, implementation, manufacturing, and marketing of commercial and research bio-medical devices.

(Design units: 0)

Concurrent with BME 261.

**BME 150. Biotransport Phenomena. 4 Units.**

Fundamentals of heat and mass transfer, similarities in the respective rate equations. Emphasis on practical application of fundamental principles.

(Design units: 0)

Prerequisite: (BME 60B or CEE 20) and (MATH 3A or ICS 6N) and MATH 3D

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.

**BME 160. Tissue Engineering. 4 Units.**

Quantitative analysis of cell and tissue functions. Emerging developments in stem cell technology, biodegradable scaffolds, growth factors, and others important in developing clinical products. Applications of bioengineering.

(Design units: 2)

Prerequisite: (BME 50B or BIOL 99) and BME 111 and BME 121 and BME 150

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment.

**BME 170. Biomedical Engineering Laboratory. 4 Units.**

Measurement and analysis of biological systems using engineering tools and techniques. Laboratory experiments involve living systems with the emphasis on measuring physiological parameters. Materials fee.

(Design units: 1)

Prerequisite: BME 50B and BME 120 and BME 130

Restriction: Biomedical Engineering Majors have first consideration for enrollment.

**BME 171. Cell and Tissue Engineering Laboratory. 4 Units.**

Techniques in molecular, cellular, and tissue engineering. Topics include bacterial and mammalian cell culture, DNA cloning and gene transfer, fabrication of biomaterial scaffolds, and immunassays and microscopy techniques for cell-based assays.

(Design units: 0)

Prerequisite: BME 160

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Biomedical Engr: Premedical Majors have first consideration for enrollment.

**BME 180A. Biomedical Engineering Design. 3 Units.**

Design strategies, techniques, tools, and protocols commonly encountered in biomedical engineering; industrial design experience in group projects; ethics, economic analysis, and FDA product approval. Materials fee.

(Design units: 3)

Prerequisite: (BME 60B or MAE 10 or EECS 10) and (BME 60C or MAE 52 or EECS 31L) and (BME 140 or MAE 106 or EECS 170B). BME 180A, BME 180B, and BME 180C must be taken in the same academic year.

Grading Option: In progress only.

Restriction: Seniors only. Biomedical Engineering Majors only.

**BME 180B. Biomedical Engineering Design. 3 Units.**

Design strategies, techniques, tools, and protocols commonly encountered in biomedical engineering; industrial design experience in group projects; ethics, economic analysis, and FDA product approval. Materials fee.

(Design units: 3)

Prerequisite: BME 180A. BME 180A, BME 180B, and BME 180C must be taken in the same academic year.

Grading Option: In progress only.

Restriction: Seniors only. Biomedical Engineering Majors only.

**BME 180C. Biomedical Engineering Design. 3 Units.**

Design strategies, techniques, tools, and protocols commonly encountered in biomedical engineering; industrial design experience in group projects; ethics, economic analysis, and FDA product approval. Materials fee.

(Design units: 3)

Prerequisite: BME 180B. BME 180A, BME 180B, and BME 180C must be taken in the same academic year.

Restriction: Seniors only. Biomedical Engineering Majors only.

**BME 195. Special Topics in Biomedical Engineering. 1-4 Units.**

Studies in selected areas of Biomedical Engineering. Topics addressed vary each quarter.

(Design units: 1-4)

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**BME 197. Seminars in Biomedical Engineering. 2 Units.**

Presentation of advanced topics and reports of current research efforts in Biomedical Engineering.

(Design units: 1-2)

Restriction: Seniors only. Biomedical Engineering Majors have first consideration for enrollment.

Concurrent with BME 298.

**BME 199. Individual Study. 1-4 Units.**

Independent research conducted in the lab of a biomedical engineering core faculty member. A formal written report of the research conducted is required at the conclusion of the quarter.

(Design units: 1-4)

Prerequisite: BIOL 194S

Repeatability: May be taken for credit for 8 units.

**BME 199P. Individual Study. 1-4 Units.**

Supervised independent reading, research, or design for undergraduate Engineering majors. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**BME 210. Molecular and Cellular Engineering. 4 Units.**

Engineering of physiological function at the genetic, cellular, and tissue scales. Topics include cloning and genetic engineering, extracellular matrix biomaterials, principles of regenerative medicine and tissue engineering, and experimental design.

Restriction: Graduate students only.

**BME 211. Microscale Tissue Engineering. 4 Units.**

Engineering of physiological function at the scale of individual cells. Topics include cell micropatterning, microfluidic tissue culture, engineering the cellular microenvironment, and microphysiological systems.

Restriction: Graduate students only.

**BME 212. Cardiovascular Mechanobiology. 4 Units.**

Advanced topics in cellular engineering and mechanobiology, with focus on the cardiovascular system. Tools and techniques used to manipulate and measure mechanical forces at the molecular, cellular, tissue, and organ levels, and their applications in cardiovascular devices and tissue engineering.

Restriction: Graduate students only.

**BME 213. Systems Cell and Developmental Biology. 4 Units.**

Introduces concepts needed to understand cell and developmental biology at the systems level, i.e., how the parts (molecules) work together to create a complex output. Emphasis on using mathematical/computational modeling to expand/modify insights provided by intuition.

Same as DEVB 232.

Restriction: Graduate students only.

**BME 215. Linking Modeling and Experiments in Bioengineering. 4 Units.**

Overview of modeling based on experimental techniques in bioengineering. Construct and evaluate models of varying complexity and to relate them to experimental data.

Prerequisite: BME 220 and BME 221

Restriction: Graduate students only.

**BME 220. Sensory Motor Systems. 4 Units.**

A quantitative and systems approach to understanding physiological systems. Systems covered include the nervous and musculoskeletal systems.

Restriction: Graduate students only.

Concurrent with BME 120.

**BME 221. Organ Transport Systems. 4 Units.**

A quantitative and systems approach to understanding physiological systems. Systems covered include the cardiopulmonary, circulatory, and renal systems.

Restriction: Graduate students only.

**BME 222. Biofluid Mechanics . 4 Units.**

Introduces principles of biofluid mechanics in a research oriented scheme and approaches a wide spectrum of biofluid related problems in human body and solutions that involves engineering concepts.

Restriction: Graduate students only.

**BME 224. Molecular and Cellular Biophotonics. 4 Units.**

Principles underlying the application of photonic technologies to biomolecular and cellular systems. Sample technologies Optical Tweezers, Linear and Nonlinear Optical Microscopy and Fluorescence Lifetime and Correlation Methods, and their use to investigate emergent problems in Molecular, Cellular, and Developmental Biology.

Same as CHEM 224.

Restriction: Graduate students only.

**BME 225. Tissue and Organ Biophotonics. 4 Units.**

Principles underlying the application of photonic technologies to tissues, organs, organisms. Sample technologies include Optical Coherence Tomography, Optical Speckle Imaging, Optoacoustic Imaging, Wide-Field Spectroscopic Imaging, Diffuse Optical Spectroscopy. Addressing the use of these technologies to detect/monitor disease and physiological processes.

**BME 230A. Applied Engineering Mathematics I. 4 Units.**

Analytical techniques applied to engineering problems in transport phenomena, process dynamics and control, and thermodynamics.

**BME 230B. Applied Engineering Mathematics II. 4 Units.**

Focuses on biomedical system identification. Includes fundamental techniques of model building and testing such as formulation, solution of governing equations, sensitivity theory, identifiability theory, and uncertainty analysis.

Restriction: Graduate students only.

**BME 232. Introduction to Computational Biology. 4 Units.**

The use of theories and methods based on computer science, mathematics, and physics in molecular biology and biochemistry. Basics in biomolecular modeling. Analysis of sequence and structural data of biomolecules. Analysis of biomolecular functions.

Same as MBB 223.

Restriction: Graduate students only.

Concurrent with BIOL M123 and CS 183 and BME 132.

**BME 233. Dynamic Systems in Biology and Medicine. 4 Units.**

Introduces principles of system theory to analyze biological, biochemical, physiological, and bioengineering systems. Analytical and computational tools are used to model and analyze dynamic systems such as population, neuronal and heart dynamics, biochemical and physiological systems, oxygen diffusion and similar.

Restriction: Graduate students only.

**BME 234. Neuroimaging Data Analysis. 4 Units.**

Knowledge and understanding of recent techniques for the analysis of healthy and pathological structure and function in neuroimaging data.

Restriction: Graduate students only.

**BME 234P. Neuroimaging Data Analysis. 4 Units.**

Knowledge and understanding of recent techniques for the analysis of healthy and pathological structure and function in neuroimaging data.

Restriction: Master of Engineering students only. Graduate students only.

**BME 238. Spectroscopy and Imaging of Biological Systems. 4 Units.**

Principles of spectroscopy; absorption; molecular orbitals; multiphoton transitions; Jablonski diagram; fluorescence anisotropy; fluorescence decay; quenching; FRET; excited state reactions; solvent relaxations; instruments; microscopy: wide field, LSM, TPE; fluorescent probes, fluctuations spectroscopy; optical resolution and super-resolution; CARS and SHG microscopy.

Restriction: Graduate students only.

Concurrent with BME 138.

**BME 240. Introduction to Clinical Medicine for Biomedical Engineering. 4 Units.**

An introduction to clinical medicine for graduate students in biomedical engineering. Lectures and rotations through nephrology, gastroenterology, pulmonary, and critical care cardiology.

Restriction: Graduate students only. Biomedical Engineering Majors only.



**BME 251. Engineering Medical Optics. 4 Units.**

Principles of optics and photonics, integration of optical components into systems and devices, and analysis of physiologic signals obtained from Biophotonics measurements.

Restriction: Graduate students only.

Concurrent with BME 136.

**BME 252. Critical Thinking in Biophotonics. 2 Units.**

Critical thematic review of current research papers in the field of Biophotonics.

Prerequisite: BME 224 or BME 225

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

**BME 260. Microfluidics and Lab-On-A-Chip. 4 Units.**

Introduction to microfluidics and state-of-the-art micro Total Analysis Systems (uTAS). Lab-on-a-Chip for biomolecular assays with device design principles for microscale sample preparation, flow transport, biomolecular manipulation, separation and detection, and the technologies for integrating these devices into microsystems.

Restriction: Graduate students only.

Concurrent with BME 147.

**BME 262. Microimplants. 4 Units.**

Essential concepts of biomedical implants at the micro scale. Design, fabrication, and applications of several microimplantable devices including cochlear, retinal, neural, and muscular implants.

Restriction: Graduate students only.

Concurrent with BME 148.

**BME 262P. Microimplants. 4 Units.**

Essential concepts of biomedical implants at the micro scale. Design, fabrication, and applications of several microimplantable devices including cochlear, retinal, neural, and muscular implants.

Restriction: Master of Engineering students only. Graduate students only.

**BME 264. Auditory Science and Technology. 2 Units.**

Advanced topics in auditory science and technology from cochlear mechanics to cochlear implants.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**BME 290. Critical Thinking and Writing. 4 Units.**

Critical thinking and writing are essential ingredients for success in scientific research. Examines examples from the scientific literature to extract principles of good scientific reasoning, experimental design, and writing.

Restriction: Graduate students only.

**BME 295. Special Topics in Biomedical Engineering. 1-4 Units.**

Studies in selected areas of Biomedical Engineering. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**BME 295P. Special Topics in Biomedical Engineering. 4 Units.**

Studies in selected areas of Biomedical Engineering. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Master of Engineering students only. Graduate students only.

**BME 296. Master of Science Thesis Research. 1-16 Units.**

Individual research or investigation conducted in the pursuit of preparing and completing the thesis required for the M.S. in Engineering.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**BME 297. Doctor of Philosophy Dissertation Research. 1-16 Units.**

Individual research or investigation conducted in the pursuit of preparing and completing the dissertation required for the Ph.D. in Engineering.

Repeatability: May be repeated for credit unlimited times.

**BME 298. Seminars in Biomedical Engineering. 2 Units.**

Presentation of advanced topics and reports of current research efforts in biomedical engineering. Designed for graduate students in the Biomedical Engineering program.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Concurrent with BME 197.

**BME 299. Individual Research. 1-16 Units.**

Individual research or investigation under the direction of an individual faculty.

Repeatability: May be repeated for credit unlimited times.

## Biomedical Engineering, B.S.

**Program Educational Objectives:** Graduates of the Biomedical Engineering program will (1) promote continuous improvement in the field of biomedical engineering; (2) communicate effectively the relevant biomedical engineering problem to be solved across the engineering, life science, and medical disciplines; (3) apply critical reasoning as well as quantitative and design skills to identify and solve problems in biomedical engineering; and (4) lead and manage biomedical engineering projects in industry, government, or academia that involve multidisciplinary team members. (Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

Biomedical Engineering students learn engineering and principles of biology, physiology, chemistry, and physics. They may go on to design devices to diagnose and treat disease, engineer tissues to repair wounds, develop cutting-edge genetic treatments, or create computer programs to understand how the human body works.

The curriculum emphasizes education in the fundamentals of engineering sciences that form the common basis of all engineering sub-specialties. Education with this focus is intended to provide students with a solid engineering foundation for a career in which engineering practice may change rapidly. In addition, elements of bioengineering design are incorporated at every level in the curriculum. This is accomplished by integration of laboratory experimentation, computer applications, and exposure to real bioengineering problems throughout the program. Students also work as teams in senior design project courses to solve multidisciplinary problems suggested by industrial and clinical experience.

NOTE: Students may complete only one of the following programs: the major in Biomedical Engineering, the major in Biomedical Engineering: Premedical, or the minor in Biomedical Engineering.

**High School Students:** See School admissions information.

**Transfer Students:** Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following **required** courses: two years of approved calculus, one year of calculus-based physics with laboratories (mechanics, electricity and magnetism), completion of lower-division writing, one year of general chemistry (with laboratory), and one course in introductory programming. For course equivalency specific to each college, visit <http://assist.org>.

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division coursework may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at 949-824-4334.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Major Requirements

#### Mathematics and Basic Science Courses:

Students must complete a minimum of 48 units of mathematics and basic sciences including:

**Core Courses:**

BIO SCI 194S	Safety and Ethics for Research
CHEM 1A- 1B- 1C	General Chemistry and General Chemistry and General Chemistry
CHEM 1LC	General Chemistry Laboratory
MATH 2A- 2B	Single-Variable Calculus and Single-Variable Calculus
MATH 2D	Multivariable Calculus
MATH 2E	Multivariable Calculus
MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations
PHYSICS 7C	Classical Physics
PHYSICS 7LC	Classical Physics Laboratory
PHYSICS 7D- 7E	Classical Physics and Classical Physics
PHYSICS 7LD	Classical Physics Laboratory
STATS 8	Introduction to Biological Statistics

**Engineering Topics Courses:**

Students must complete a minimum of 28 units of engineering design including:

**Core Courses:**

BME 1	Introduction to Biomedical Engineering
BME 50A- 50B	Cell and Molecular Engineering and Cell and Molecular Engineering
BME 60A- 60B- 60C	Engineering Analysis/Design: Data Acquisition and Engineering Analysis/Design: Data Analysis and Engineering Analysis/Design: Computer-Aided Design
BME 110A- 110B- 110C	Biomechanics I and Biomechanics II and Biomechanics III
BME 111	Design of Biomaterials
BME 120	Sensory Motor Systems
BME 121	Quantitative Physiology: Organ Transport Systems
BME 130	Biomedical Signals and Systems
BME 140	Design of Biomedical Electronics
BME 150	Biotransport Phenomena
BME 170	Biomedical Engineering Laboratory
BME 180A- 180B- 180C	Biomedical Engineering Design and Biomedical Engineering Design and Biomedical Engineering Design

**Engineering Electives:**

Students select, with the approval of a faculty advisor a minimum of 12 units of engineering topics needed to satisfy school and major requirements. (The nominal Biomedical Engineering program will require 182 units of courses to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary.)

**Engineering Professional Topics Course:**

ENGR 190W	Communications in the Professional World
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**Optional Specialization in Biophotonics****Select three of the following:**

BME 135	Photomedicine
BME 136	Engineering Medical Optics
BME 137	Introduction to Biomedical Imaging

BME 138	Spectroscopy and Imaging of Biological Systems
EECS 180A	Engineering Electromagnetics I

These courses will also satisfy the Engineering Electives requirement.

### Optional Specialization in Micro and Nano Biomedical Engineering

#### Select three of the following:

BME 142	Microfabrication
BME 147	Microfluidics and Lab-on-a-Chip
BME 148	Microimplants
MSE 141	Nano-Scale Materials and Applications
ENGRMAE 153	Advanced BIOMEMS Manufacturing Techniques

These courses will also satisfy the Engineering Electives requirement.

The sample program of study chart shown is typical for the major in Biomedical Engineering. Students should keep in mind that this program is based upon a sequence of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Students who are not adequately prepared, or who wish to make changes in the sequence for other reasons, must have their program approved by their faculty advisor. Biomedical Engineering majors are encouraged to consult with academic counselors as needed, and students who are academically at risk are mandated to see a counselor as frequently as deemed necessary by the advising staff.

Freshman		
Fall	Winter	Spring
MATH 2A	MATH 2B	MATH 2D
CHEM 1A	CHEM 1B	CHEM 1C
BME 1	PHYSICS 7C	CHEM 1LC
General Education	PHYSICS 7LC	PHYSICS 7D
	General Education	PHYSICS 7LD
Sophomore		
Fall	Winter	Spring
MATH 3A	MATH 3D	MATH 2E
PHYSICS 7E	BME 50A	BME 50B
BME 60A	BME 60B	BME 60C
	General Education	STATS 8
Junior		
Fall	Winter	Spring
BME 110A	BME 110B	BME 110C
BME 120	BME 150	BME 111
BME 130	BME 140	BME 121
ENGR 190W	General Education	BIO SCI 194S
Senior		
Fall	Winter	Spring
BME 180A	BME 180B	BME 180C
Engineering Elective	Engineering Elective	BME 170
General Education	General Education	Engineering Elective
General Education	General Education	General Education

## Biomedical Engineering, M.S.

The Biomedical Engineering faculty have special interest and expertise in four thrust areas: Biophotonics, Biomedical Micro/Nanoscale Systems, Bioimaging and Computation, and Molecular and Cellular Engineering. Biophotonics faculty are interested in photomedicine, laser microscopy, optical coherence tomography, medical imaging, and phototherapy. Biomedical Micro/Nanoscale Systems faculty are interested in molecular engineering, polymer chemistry, molecular motors, design and fabrication of microelectromechanical systems (MEMS), integrated microsystems to study intercellular signaling, and single molecule studies of protein dynamics. Biomedical Computation faculty are interested in computational biology, biomedical signal and image processing, medical imaging, computational methods in protein engineering, and data mining.

Because of its interdisciplinary nature, biomedical engineering attracts students with a variety of backgrounds. Thus, the requirements for admission are tailored to students who have a bachelor's degree in an engineering, physical science, or biological science discipline, with a grade point average of 3.20 or higher in their upper-division course work. The minimum course work requirements for admission are six quarters of calculus through linear algebra and ordinary differential equations, three quarters of calculus-based physics, three quarters of chemistry, and two quarters of biology. Students without a physics, chemistry, or engineering undergraduate degree may be required to take additional relevant undergraduate engineering courses during their

first year in the program; any such requirements will be specifically determined by the BME Graduate Committee on a case-by-case basis and will be made known to the applicant at the time of acceptance to the program.

The recommended minimum combined verbal and quantitative portion of the GRE is 310, or a minimum combined MCAT score in Verbal Reasoning, Physical Sciences, and Biological Sciences problems of 508. A minimum score of 94 on the Test of English as a Foreign Language (TOEFL iBT) is recommended of all international students whose native language is not English. In addition, all applicants must submit three letters of recommendation.

Exceptionally promising UCI undergraduates may apply for admission through The Henry Samueli School of Engineering's accelerated M.S. and M.S./Ph.D. program, however, these students must satisfy the course work and letters of recommendation requirements described above.

## Core Requirement

Both the M.S. and Ph.D. require the students to complete 42 course units. These units include six core courses, the BME 298 seminar series, two elective courses, and four units of independent research.

A. Complete the following core courses:

BME 210	Molecular and Cellular Engineering
BME 220	Sensory Motor Systems
BME 221	Organ Transport Systems
BME 230A	Applied Engineering Mathematics I
BME 230B	Applied Engineering Mathematics II
BME 240	Introduction to Clinical Medicine for Biomedical Engineering

B. Complete:

BME 298	Seminars in Biomedical Engineering (three quarters)
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C. Complete two electives

D. Complete four units of independent research

The core courses cover the basics of cells, tissues, and physiology at the microscopic and macroscopic scale, engineering mathematics, and clinical theory. Core requirements can be waived for students entering the Ph.D. program with an M.S. degree in Biomedical Engineering.

## Elective Requirement

The two elective courses required to fulfill the course requirements for the M.S. and Ph.D. are offered within The Henry Samueli School of Engineering and the Schools of Biological Sciences, Physical Sciences, and Medicine. The electives must provide breadth in biomedical engineering, but also provide specific skills necessary to the specific research the student may undertake as part of the degree requirements. The selection of these courses should be based upon approval of the student's faculty advisor. Upper-division undergraduate courses and courses outside of the HSSoE may be selected upon approval of the BME Graduate Advisor. Elective requirements can be waived for students entering the Ph.D. program with an M.S. in Biomedical Engineering.

Students must successfully complete a minimum of 42 units of course work, as listed under "Core Requirement" and "Elective Requirement" above. A maximum of eight M.S. research units (i.e., BME 296) may be applied toward the 42-unit requirement.

In addition, the M.S. requires conducting a focused research project. Students must select a thesis advisor and complete an original research investigation including a written thesis, and obtain approval of the thesis by a thesis committee. During their research project, students are expected to enroll in at least 12 units of independent research per quarter.

The degree will be granted upon the recommendation of the Chair of the Department of Biomedical Engineering and The Henry Samueli School of Engineering Associate Dean for Student Affairs. The maximum time permitted is three years.

NOTE: Students who entered prior to fall of 2012 should follow the course requirements outlined within the *Catalogue* of the year they entered. The changes in number of units per course is not intended to change the course requirements for the degree nor to have any impact in the number of courses students are taking.

Although a student is not required to formally choose a specific research focus area, four research thrust areas have been identified for the program: Biophotonics, Biomedical Micro/Nanoscale Systems, Bioimaging & Computation, and Molecular & Cellular Engineering. These areas capitalize on existing strengths within The Henry Samueli School of Engineering and UCI as a whole, interact in a synergistic fashion, and will train biomedical engineers who are in demand in both private industry and academia.

**Biophotonics.** This research area includes the use of light to probe individual cells and tissues and whole organs for diagnostic and therapeutic purposes. The research areas include both fundamental investigation on the basic mechanisms of light interaction with biological systems and the clinical application of light to treat and diagnose disease. Current and future foci of the faculty are (1) microscope-based optical techniques to manipulate and study cells and organelles; (2) development of optically based technologies for the non-invasive diagnosis of cells and tissues using techniques

that include fiber-optic-based sensors, delivery systems, and imaging systems; and (3) development of optically based devices for minimally invasive surgery.

**Biomedical Micro/Nanoscale Systems.** This class of research areas encompasses the understanding, use and design of biomedical devices and systems that are at the micron or submicron level. Current strengths within The Henry Samueli School of Engineering and the UCI faculty as a whole include biomaterials, micro-electromechanical systems (MEMS), and the design of new biomedical molecules. The focus of biomedical engineering research in this area is the integration of micro and nano-scale systems with the needs of clinical medicine. Projected areas of growth include (1) micro/nano-electromechanical systems (M/NEMS) for biomedical devices, biofluid assay and micro implantable prosthesis (2) programmable DNA/ molecular microchip for sequencing and diagnostics; (3) cellular, tissue, and organ constructs on-a-chip; and (4) biomaterials and self-assembled nanostructures for biosensors and drug delivery.

**Biomedical Imaging & Computation.** Biomedical computational technologies include both advanced computational techniques, as well as advanced biomedical database systems and knowledge-base systems. Computational technologies that will be developed in this research area include (1) methods for biomedical analysis and diagnosis such as physical modeling of light-tissue interactions, atomic-level interactions, image processing, pattern recognition, and machine-learning algorithms; (2) language instruction and platform standardization; and (3) machine-patient interfaces. Areas of research related to biomedical database systems include the development of new technologies which can capture the rich semantics of biomedical information for intelligent reasoning.

**Molecular & Cellular Engineering.** Rapid developments in genetics, molecular biology, and cellular biology have extended the reach of engineering into the subcellular, cellular, and tissue size scales. As a result, several new fields including genetic engineering, cell-based therapy, and tissue engineering have emerged and matured in the past decades with the broad goal of extracting and applying engineering design principles to the most fundamental levels of biological organization.

## Program in Law and Graduate Studies (J.D./M.S.-BME; J.D./Ph.D.-BME)

Highly-qualified students interested in combining the study of law with graduate qualifications in the BME program are invited to undertake concurrent degree study under the auspices of UC Irvine's Program in Law and Graduate Studies (PLGS). Students in this program pursue a coordinated curriculum leading to a J.D. from the School of Law in conjunction with a Master's or Ph.D. in the BME program. Additional information is available from the PLGS Program Director's Office, 949-824-4158, or by email to [plgs@law.uci.edu](mailto:plgs@law.uci.edu). A full description of the program, with links to all relevant application information, can be found at the School of Law Concurrent Degree Programs website (<http://www.law.uci.edu/academics/interdisciplinary-studies/concurrent-degrees.html>) and in the Law School section of the *Catalogue*.

## Biomedical Engineering, Minor

The minor in Biomedical Engineering requires a total of nine courses: two advanced mathematics courses, five core Biomedical Engineering courses, and two Biomedical Engineering electives. Some of these courses may include prerequisites that may or may not be part of a student's course requirements for their major. Private biomedical industry has indicated a keen interest in engineers that have a more traditional engineering degree (i.e., electrical engineering), but also possess some in-depth knowledge of biomedical systems. Hence, the minor in Biomedical Engineering is designed to provide a student with the introductory skills necessary to perform as an engineer in the biomedical arena.

NOTE: Students may not receive both a minor in Biomedical Engineering and a specialization in Biochemical Engineering within the Chemical Engineering major.

### Mathematics Courses:

MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations

### Engineering Topics Courses:

BME 1	Introduction to Biomedical Engineering
BME 50A- 50B	Cell and Molecular Engineering and Cell and Molecular Engineering
BME 120	Sensory Motor Systems
BME 121	Quantitative Physiology: Organ Transport Systems

### Technical Electives:

Students select, with the approval of a faculty advisor, two technical elective courses:

BME 110A	Biomechanics I
BME 110B	Biomechanics II
BME 130	Biomedical Signals and Systems
BME 135/BIO SCI D130	Photomedicine
BME 136	Engineering Medical Optics
BME 140	Design of Biomedical Electronics
BME 160	Tissue Engineering

BME 199	Individual Study
CBE 181	Polymer Science and Engineering
EECS 179	Microelectromechanical Systems (MEMS)
EECS 188	Optical Electronics

## Biomedical Engineering, Ph.D.

The Biomedical Engineering faculty have special interest and expertise in four thrust areas: Biophotonics, Biomedical Micro/Nanoscale Systems, Bioimaging and Computation, and Molecular and Cellular Engineering. Biophotonics faculty are interested in photomedicine, laser microscopy, optical coherence tomography, medical imaging, and phototherapy. Biomedical Micro/Nanoscale Systems faculty are interested in molecular engineering, polymer chemistry, molecular motors, design and fabrication of microelectromechanical systems (MEMS), integrated microsystems to study intercellular signaling, and single molecule studies of protein dynamics. Biomedical Computation faculty are interested in computational biology, biomedical signal and image processing, medical imaging, computational methods in protein engineering, and data mining.

Because of its interdisciplinary nature, biomedical engineering attracts students with a variety of backgrounds. Thus, the requirements for admission are tailored to students who have a bachelor's degree in an engineering, physical science, or biological science discipline, with a grade point average of 3.20 or higher in their upper-division course work. The minimum course work requirements for admission are six quarters of calculus through linear algebra and ordinary differential equations, three quarters of calculus-based physics, three quarters of chemistry, and two quarters of biology. Students without a physics, chemistry, or engineering undergraduate degree may be required to take additional relevant undergraduate engineering courses during their first year in the program; any such requirements will be specifically determined by the BME Graduate Committee on a case-by-case basis and will be made known to the applicant at the time of acceptance to the program.

The recommended minimum combined verbal and quantitative portion of the GRE is 310, or a minimum combined MCAT score in Verbal Reasoning, Physical Sciences, and Biological Sciences problems of 508. A minimum score of 94 on the Test of English as a Foreign Language (TOEFL iBT) is recommended of all international students whose native language is not English. In addition, all applicants must submit three letters of recommendation.

Exceptionally promising UCI undergraduates may apply for admission through The Henry Samueli School of Engineering's accelerated M.S. and M.S./Ph.D. program, however, these students must satisfy the course work and letters of recommendation requirements described above.

### Core Requirement

Both the M.S. and Ph.D. require the students to complete 42 course units. These units include six core courses, the BME 298 seminar series, two elective courses, and four units of independent research.

A. Complete the following core courses:

BME 210	Molecular and Cellular Engineering
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BME 221	Organ Transport Systems
BME 230A	Applied Engineering Mathematics I
BME 230B	Applied Engineering Mathematics II
BME 240	Introduction to Clinical Medicine for Biomedical Engineering

B. Complete:

BME 298	Seminars in Biomedical Engineering (three quarters)
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C. Complete two electives

D. Complete four units of independent research

The core courses cover the basics of cells, tissues, and physiology at the microscopic and macroscopic scale, engineering mathematics, and clinical theory. Core requirements can be waived for students entering the Ph.D. program with an M.S. degree in Biomedical Engineering.

### Elective Requirement

The two elective courses required to fulfill the course requirements for the M.S. and Ph.D. are offered within The Henry Samueli School of Engineering and the Schools of Biological Sciences, Physical Sciences, and Medicine. The electives must provide breadth in biomedical engineering, but also provide specific skills necessary to the specific research the student may undertake as part of the degree requirements. The selection of these courses should be based upon approval of the student's faculty advisor. Upper-division undergraduate courses and courses outside of the HSSoE may be selected upon approval of the BME Graduate Advisor. Elective requirements can be waived for students entering the Ph.D. program with an M.S. in Biomedical Engineering.

The Ph.D. requires the achievement of an original and significant body of research that advances the discipline. Students with a B.S. may enter the Ph.D. program directly, provided they meet the background requirements described above. The Graduate Committee will handle applicants on a case-by-case basis, and any specific additional courses required by the student will be made explicit at the time of admission.



Each student will match with a faculty advisor, and an individual program of study is designed by the student and their faculty advisor. Two depth courses are required beyond that of the M.S. degree in preparation for the qualifying examination. Six milestones are required: (1) successful completion of 42 units of course work beyond the bachelor's degree, as listed under "Core Requirement" and "Elective Requirement" above; (2) successful completion of a preliminary examination; (3) establishing an area of specialization by taking two depth courses and three quarters of BME 298 during the second year; (4) formal advancement to candidacy by successfully passing the qualifying examination; (5) students in their third or fourth year must present results of their current research in the BME seminar series; and (6) completion of a significant body of original research and the submission of an acceptable written dissertation and its successful oral defense. During their research project, students are expected to enroll in at least 12 units of independent research per quarter. Students entering the Ph.D. program with an M.S. in Biomedical Engineering cannot receive another M.S. in Biomedical Engineering from UCI. Therefore, the requirements for milestone (1) can be waived, and the award of the Ph.D. is based on achieving milestones (2)–(6).

The preliminary examination will normally be taken at the end of the first year (May). A student must take it within two years of matriculating in the program and must either have passed all of the core courses or have an M.S. in Biomedical Engineering prior to taking the examination. The Preliminary Examination Committee prepares the examination and sets the minimum competency level for continuing on in the Ph.D. program. Students who fail may retake the examination the following year. Students who fail the second attempt will not be allowed to continue in the program. However, they may be eligible to receive a Master's degree upon completion of an original research investigation including a written thesis (refer to Master of Science Degree requirements). In the event a Ph.D. student decides not to continue in the program, the thesis-only option for the M.S. will still be enforced. After passing the preliminary examination at the Ph.D. competency level, students will match with a BME faculty advisor and design an individual program of study with their advisor.

Advancement to candidacy must be completed by the end of the summer of the second year following the passing of the preliminary examination. (Special exceptions can be made, but a formal request with justification must be supplied in writing to the BME Graduate Advisor.) The qualifying examination follows campus and The Henry Samueli School of Engineering guidelines and consists of an oral and written presentation of original work completed thus far, and a coherent plan for completing a body of original research. The qualifying examination is presented to the student's graduate advisory committee, which is selected by the student and faculty advisor and must have a minimum of five faculty (including the faculty advisor). Of these five faculty, three must be BME faculty. In addition, one faculty member must have his/her primary appointment outside the Department of Biomedical Engineering. The fifth member must have his/her primary appointment outside of The Henry Samueli School of Engineering.

The Ph.D. is awarded upon submission of an acceptable written dissertation and its successful oral defense. The degree is granted upon the recommendation of the graduate advisory committee and the Dean of Graduate Division. The normative time for completion of the Ph.D. is five years (four years for students who entered with a master's degree). The maximum time permitted is seven years.

Requirements listed here pertain to students enrolled in academic year 2012–13 or later. Students enrolled before this date may refer to a previous version of this *Catalogue*.

Although a student is not required to formally choose a specific research focus area, four research thrust areas have been identified for the program: Biophotonics, Biomedical Micro/Nanoscale Systems, Bioimaging & Computation, and Molecular & Cellular Engineering. These areas capitalize on existing strengths within The Henry Samueli School of Engineering and UCI as a whole, interact in a synergistic fashion, and will train biomedical engineers who are in demand in both private industry and academia.

**Biophotonics.** This research area includes the use of light to probe individual cells and tissues and whole organs for diagnostic and therapeutic purposes. The research areas include both fundamental investigation on the basic mechanisms of light interaction with biological systems and the clinical application of light to treat and diagnose disease. Current and future foci of the faculty are (1) microscope-based optical techniques to manipulate and study cells and organelles; (2) development of optically based technologies for the non-invasive diagnosis of cells and tissues using techniques that include fiber-optic-based sensors, delivery systems, and imaging systems; and (3) development of optically based devices for minimally invasive surgery.

**Biomedical Micro/Nanoscale Systems.** This class of research areas encompasses the understanding, use and design of biomedical devices and systems that are at the micron or submicron level. Current strengths within The Henry Samueli School of Engineering and the UCI faculty as a whole include biomaterials, micro-electromechanical systems (MEMS), and the design of new biomedical molecules. The focus of biomedical engineering research in this area is the integration of micro and nano-scale systems with the needs of clinical medicine. Projected areas of growth include (1) micro/nano-electromechanical systems (M/NEMS) for biomedical devices, biofluid assay and micro implantable prosthesis (2) programmable DNA/ molecular microchip for sequencing and diagnostics; (3) cellular, tissue, and organ constructs on-a-chip; and (4) biomaterials and self-assembled nanostructures for biosensors and drug delivery.

**Biomedical Imaging & Computation.** Biomedical computational technologies include both advanced computational techniques, as well as advanced biomedical database systems and knowledge-base systems. Computational technologies that will be developed in this research area include (1) methods for biomedical analysis and diagnosis such as physical modeling of light-tissue interactions, atomic-level interactions, image processing, pattern recognition, and machine-learning algorithms; (2) language instruction and platform standardization; and (3) machine-patient interfaces. Areas of research related to biomedical database systems include the development of new technologies which can capture the rich semantics of biomedical information for intelligent reasoning.

**Molecular & Cellular Engineering.** Rapid developments in genetics, molecular biology, and cellular biology have extended the reach of engineering into the subcellular, cellular, and tissue size scales. As a result, several new fields including genetic engineering, cell-based therapy, and tissue engineering

have emerged and matured in the past decades with the broad goal of extracting and applying engineering design principles to the most fundamental levels of biological organization.

## Program in Law and Graduate Studies (J.D./M.S.-BME; J.D./Ph.D.-BME)

Highly-qualified students interested in combining the study of law with graduate qualifications in the BME program are invited to undertake concurrent degree study under the auspices of UC Irvine's Program in Law and Graduate Studies (PLGS). Students in this program pursue a coordinated curriculum leading to a J.D. from the School of Law in conjunction with a Master's or Ph.D. in the BME program. Additional information is available from the PLGS Program Director's Office, 949-824-4158, or by email to [plgs@law.uci.edu](mailto:plgs@law.uci.edu). A full description of the program, with links to all relevant application information, can be found at the School of Law Concurrent Degree Programs website (<http://www.law.uci.edu/academics/interdisciplinary-studies/concurrent-degrees.html>) and in the Law School section of the *Catalogue*.

## Biomedical Engineering: Premedical, B.S.

**Program Educational Objectives:** Graduates of the Biomedical Engineering: Premedical program will: (1) demonstrate a broad knowledge in the field of biomedical engineering; (2) demonstrate critical reasoning as well as quantitative skills to identify, formulate, analyze and solve biomedical problems; (3) qualify to pursue entry into a medical college, or medical research in biomedical engineering, or other professional health programs. (Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.) The major program objective is to prepare students for medical school. The curriculum is designed to meet the requirements for admission to medical schools, but is also suitable for those planning to enter graduate school in biomedical engineering, physiology, biology, neurosciences, or related fields. It has less engineering content and more biological sciences than the accompanying Biomedical Engineering major. It is one of many majors that can serve as preparation for further training in medical, veterinary, or allied health professions.

The Biomedical Engineering: Premedical curriculum provides future physicians with a quantitative background in biomechanics, physiology, and biotransport. Such a background is increasingly important because of the heavy utilization of biomedical technology in modern medical practice. The curriculum includes courses in the sciences that satisfy the requirements of most medical schools.

**High School Students:** See School admissions information.

**Transfer Students:** Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following **required** courses: two years of approved calculus, one year of calculus-based physics with laboratories (mechanics, electricity and magnetism), completion of lower-division writing, one year of general chemistry (with laboratory), one year of organic chemistry (with laboratory), and one course in introductory programming. For course equivalency specific to each college, see [assist.org](https://assist.org) (<https://assist.org>).

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division coursework may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at 949-824-4334.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

## Major Requirements

### Mathematics and Basic Science Courses:

Students must complete a minimum of 48 units of mathematics and basic sciences including:

CHEM 1A- 1B- 1C	General Chemistry and General Chemistry and General Chemistry
CHEM 1LC- 1LD	General Chemistry Laboratory and General Chemistry Laboratory
CHEM 51A- 51B- 51C	Organic Chemistry and Organic Chemistry and Organic Chemistry
CHEM 51LB- 51LC	Organic Chemistry Laboratory and Organic Chemistry Laboratory
MATH 2A- 2B	Single-Variable Calculus and Single-Variable Calculus
MATH 2D	Multivariable Calculus
MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations
PHYSICS 7C	Classical Physics
PHYSICS 7LC	Classical Physics Laboratory

## PHYSICS 7D- 7E

Classical Physics  
and Classical Physics

## PHYSICS 7LD

Classical Physics Laboratory

Students select, with the approval of a faculty advisor, any additional basic science course needed to satisfy school and major requirements.

**Engineering Topics Courses:**

Students must complete the following engineering topics including:

BIO SCI 97	Genetics
BIO SCI 98	Biochemistry
BIO SCI 99	Molecular Biology
BIO SCI 100	Scientific Writing
BIO SCI D103	Cell Biology
or BIO SCI D104	Developmental Biology
BIO SCI D111L	Developmental and Cell Biology Laboratory
BIO SCI E112L- M114L- M116L	Physiology Laboratory and Biochemistry Laboratory and Molecular Biology Laboratory (select two of these three courses)
BIO SCI 194S	Safety and Ethics for Research
BME 1	Introduction to Biomedical Engineering
BME 60A- 60B- 60C	Engineering Analysis/Design: Data Acquisition and Engineering Analysis/Design: Data Analysis and Engineering Analysis/Design: Computer-Aided Design
BME 110A- 110B	Biomechanics I and Biomechanics II
BME 111	Design of Biomaterials
BME 120	Sensory Motor Systems
BME 121	Quantitative Physiology: Organ Transport Systems
BME 130	Biomedical Signals and Systems
BME 150	Biotransport Phenomena

Students select, with the approval of a faculty advisor, at least three additional engineering topics courses needed to satisfy school and major requirements.

(The nominal Biomedical Engineering: Premedical program will require 189 units of courses to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary).

The sample program of study chart shown is typical for the major in Biomedical Engineering: Premedical. Students should keep in mind that this program is based upon a sequence of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Students who are not adequately prepared, or who wish to make changes in the sequence for other reasons, must have their program approved by their faculty advisor. Biomedical Engineering: Premedical majors are encouraged to consult with academic counselors as needed, and students who are academically at risk are mandated to see a counselor as frequently as deemed necessary by the advising staff.

Freshman		
Fall	Winter	Spring
MATH 2A	MATH 2B	MATH 2D
CHEM 1A	CHEM 1B	CHEM 1C
BME 1	PHYSICS 7C	CHEM 1LC
General Education	PHYSICS 7LC	PHYSICS 7D
	General Education	PHYSICS 7LD
Sophomore		
Fall	Winter	Spring
MATH 3A	MATH 3D	CHEM 51C
CHEM 1LD	CHEM 51B	CHEM 51LC
CHEM 51A	CHEM 51LB	BME 60C
PHYSICS 7E	BME 60B	General Education
BME 60A	General Education	General Education
Junior		
Fall	Winter	Spring
BIO SCI 97	BIO SCI 98	BIO SCI 99
BME 110A	BME 110B	BME 111

BME 120	BME 150	BME 121
BME 130	Engineering Elective	General Education
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
BIO SCI 100	BIO SCI D103 or D104	BIO SCI E112L <sup>1</sup>
BIO SCI 194S	BIO SCI D111L	BIO SCI M114L <sup>1</sup>
General Education	Engineering Elective	BIO SCI M116L <sup>1</sup>
General Education	General Education	Engineering Elective

<sup>1</sup> Select two of BIO SCI E112L, BIO SCI M114L, BIO SCI M116L.

## Department of Chemical and Biomolecular Engineering

### Vasan Venugopalan, Department Chair

916 Engineering Tower

949-824-6412

<http://www.eng.uci.edu/dept/cbe> (<http://www.eng.uci.edu/dept/cbe/>)

The Department of Chemical and Biomolecular Engineering offers the B.S. in Chemical Engineering, and the M.S. and Ph.D. in Chemical and Biomolecular Engineering.

Chemical Engineering uses knowledge of chemistry, mathematics, physics, biology, and humanities to solve societal problems in areas such as energy, health, the environment, food, clothing, materials, and sustainability and serves a variety of processing industries whose vast array of products include chemicals, petroleum products, plastics, pharmaceuticals, foods, textiles, fuels, consumer products, and electronic and cryogenic materials. Chemical Engineering also advances societal goals by developing environmentally conscious and sustainable technologies to meet global challenges.

The undergraduate curriculum in Chemical Engineering builds on basic courses in chemical engineering, other branches of engineering, and electives which provide a strong background in humanities and human behavior. Elective programs developed by the student with a faculty advisor may include such areas as applied chemistry, biomolecular engineering, chemical reaction engineering, chemical processing, environmental engineering, materials science, process control systems engineering, and biomedical engineering.

- Chemical and Biomolecular Engineering, M.S.
- Chemical and Biomolecular Engineering, Ph.D.
- Chemical Engineering, B.S.

## Faculty

Tayloria Adams, Ph.D. Michigan Technological University, *Assistant Professor of Chemical and Biomolecular Engineering* (dielectrophoresis, microfluidic devices, stem cells, biomarker development, cell membrane biophysics, cell sorting)

Plamen Atanassov, Ph.D. Bulgarian Academy of Sciences, *UCI Chancellor's Professor of Chemical and Biomolecular Engineering; Chemistry; Materials Science and Engineering* (electrocatalysis and electrocatalysts for energy conversion processes; bio-electrocatalysis and energy harvesting systems)

Nancy A. Da Silva, Ph.D. California Institute of Technology, *Professor of Chemical and Biomolecular Engineering; Biomedical Engineering* (molecular biotechnology, metabolic engineering and synthetic biology, eukaryotic expression systems, biorenewable chemicals)

Alon A. Gorodetsky, Ph.D. California Institute of Technology, *Associate Professor of Chemical and Biomolecular Engineering; Chemistry; Materials Science and Engineering* (cephalopods, adaptive materials, camouflage, bioelectronics)

Juan Hong, Ph.D. Purdue University, *Professor Emeritus of Chemical and Biomolecular Engineering*

Daniel Knight, Ph.D. Ohio State University, *Assistant Professor of Teaching of Chemical and Biomolecular Engineering* (engineering pedagogy)

Han Li, Ph.D. University of California, Los Angeles, *Assistant Professor of Chemical and Biomolecular Engineering* (molecular biotechnology)

Henry Lim, Ph.D. Northwestern University, *Professor Emeritus of Chemical and Biomolecular Engineering*

Ali Mohraz, Ph.D. University of Michigan, *Associate Professor of Chemical and Biomolecular Engineering; Materials Science and Engineering* (colloid science, soft matter engineering with applications in health care and energy materials)

Robert J. Nielsen, Ph.D. California Institute of Technology, *Assistant Professor of Chemical and Biomolecular Engineering* (electronic structure, electrocatalysis, mechanism, alkane activation, homogenous catalysis)

Mikael Nilsson, Ph.D. Chalmers University of Technology, *Adjunct Professor of Chemical and Biomolecular Engineering; Materials Science and Engineering* (actinide chemistry, solvent extraction fundamental chemistry and process development, extraction and detection equipment development, radiolysis and phase composition of organic solvent)

Elizabeth L. Read, Ph.D. University of California, Berkeley, *Assistant Professor of Chemical and Biomolecular Engineering; Molecular Biology and Biochemistry* (dynamics of complex biochemical systems, regulation of immune responses)

Erdem Sasmaz, Ph.D. Stanford University, *Assistant Professor of Chemical and Biomolecular Engineering* (heterogenous catalysis and nanoparticle synthesis for clean energy production and carbon dioxide utilization)

Frank G. Shi, Ph.D. California Institute of Technology, *Professor of Chemical and Biomolecular Engineering; Materials Science and Engineering* (optoelectronic devices and materials, optoelectronic device packaging materials, optoelectronic medical devices and packaging, white LED technologies, high power LED packaging)

Vasan Venugopalan, Sc.D. Massachusetts Institute of Technology, *Department Chair and Professor of Chemical and Biomolecular Engineering; Biomedical Engineering; Materials Science and Engineering; Mechanical and Aerospace Engineering; Surgery* (laser-generated thermal, mechanical and radiative transport processes for application in medical diagnostics, imaging, therapeutics, biotechnology)

Szu-Wen Wang, Ph.D. Stanford University, *Professor of Chemical and Biomolecular Engineering; Biomedical Engineering* (combining principles of self-assembly with nature-inspired macromolecular systems to engineer new materials and therapeutic strategies)

Albert Fan Yee, Ph.D. University of California, Berkeley, *Professor of Chemical and Biomolecular Engineering; Biomedical Engineering* (physics of polymers and soft materials, and their applications in nanotechnology and biomedical devices. Mechanics and toughening of polymers and composites)

Iryna Zenyuk, Ph.D. Carnegie Mellon University, *Associate Director of National Fuel Cell Research Center and Assistant Professor of Chemical and Biomolecular Engineering; Materials Science and Engineering; Mechanical and Aerospace Engineering* (renewable energy, fuel cells, electrolyzers, batteries, X-ray imaging techniques, multi-scale modeling, transport phenomena)

## Affiliate Faculty

Shane Ardo, Ph.D. Johns Hopkins University, *Associate Professor of Chemistry; Chemical and Biomolecular Engineering; Materials Science and Engineering* (inorganic and organometallic, physical chemistry and chemical physics, polymer, materials, nanoscience)

Anna Grosberg, Ph.D. California Institute of Technology, *Associate Professor of Biomedical Engineering; Chemical and Biomolecular Engineering* (computational modeling of biological systems, biomechanics, cardiac tissue engineering)

Zhibin Guan, Ph.D. University of North Carolina at Chapel Hill, *Professor of Chemistry; Biomedical Engineering; Chemical and Biomolecular Engineering; Materials Science and Engineering* (chemical biology, organic and synthetic, polymer, materials, nanoscience)

Jered Haun, Ph.D. University of Pennsylvania, *Associate Professor of Biomedical Engineering; Chemical and Biomolecular Engineering; Materials Science and Engineering* (nanotechnology, molecular engineering, computational simulations, targeted drug delivery, clinical cancer detection)

Allon Hochbaum, Ph.D. University of California, Berkeley, *Associate Professor of Materials Science and Engineering; Chemical and Biomolecular Engineering; Chemistry* (nanoscale materials and hybrid bio-inorganic devices for applications in clean energy)

Michelle Khine, Ph.D. University of California, Berkeley, *Professor of Biomedical Engineering; Chemical and Biomolecular Engineering; Materials Science and Engineering* (development of novel nano- and micro-fabrication technologies and systems for single cell analysis, stem cell research, in-vitro diagnostics)

Young Jik Kwon, Ph.D. University of Southern California, *Professor of Pharmaceutical Sciences; Biomedical Engineering; Chemical and Biomolecular Engineering; Molecular Biology and Biochemistry* (gene therapy, drug delivery, cancer-targeted therapeutics, artificially-induced cellular vesicles, multi-modal therapies)

Matthew Law, Ph.D. University of California, Berkeley, *Associate Professor of Chemistry; Chemical and Biomolecular Engineering; Materials Science and Engineering* (inorganic and organometallic, physical chemistry and chemical physics, polymer, materials, nanoscience)

Wendy F. Liu, Ph.D. Johns Hopkins University, *Associate Professor of Biomedical Engineering; Chemical and Biomolecular Engineering* (biomaterials, microdevices in cardiovascular engineering, cell-cell and cell-micro-environment interactions, cell functions and controls)

Ray Luo, Ph.D. University of Maryland, College Park, *Professor of Molecular Biology and Biochemistry; Biomedical Engineering; Chemical and Biomolecular Engineering; Materials Science and Engineering* (protein structure, noncovalent associations involving proteins)

Marc J. Madou, Ph.D. Ghent University, *UCI Chancellor's Professor of Mechanical and Aerospace Engineering; Biomedical Engineering; Chemical and Biomolecular Engineering* (miniaturization science (MEMS and NEMS) with emphasis on chemical and biological applications )



Martha L. Mecartney, Ph.D. Stanford University, *Professor Emeritus of Materials Science and Engineering; Chemical and Biomolecular Engineering* (ceramics for energy applications and for extreme environments, flash sintering, interfacial design of thermal conductivity, transmission electron microscopy)

Bihter Padak, Ph.D. Stanford University, *Assistant Professor of Mechanical and Aerospace Engineering; Chemical and Biomolecular Engineering*

Regina Ragan, Ph.D. California Institute of Technology, *Endowed Chair for the Center for Diversity in Engineering Education and Professor of Materials Science and Engineering; Chemical and Biomolecular Engineering* (exploration and development of novel material systems for nanoscale electronic and optoelectronic devices)

Timothy Rupert, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Materials Science and Engineering; Chemical and Biomolecular Engineering; Mechanical and Aerospace Engineering* (mechanical behavior, nanomaterials, structure property relationships, microstructural stability, grain boundaries and interfaces, materials characterization)

William C. Tang, Ph.D. University of California, Berkeley, *Professor of Biomedical Engineering; Chemical and Biomolecular Engineering; Electrical Engineering and Computer Science* (micro-electro-mechanical systems (MEMS) nanoscale engineering for biomedical applications, microsystems integration, microimplants, microbiomechanics, microfluidics)

Yoon Jin Won, Ph.D. Stanford University, *Assistant Professor of Mechanical and Aerospace Engineering; Chemical and Biomolecular Engineering* (multi-scale structures for thermal and energy applications, in particular fabrication, characterization, and integration of structured materials)

## Courses

### **CBE 40A. Chemical Processes and Material Balances. 4 Units.**

Introduction to chemical engineering and the industries where chemical engineers play vital roles. Problem-solving skills and techniques. Quantitative calculations and applications using mass and energy balances. Stoichiometric equations, multiple bypasses, and others in process industries.

Prerequisite: MATH 2B and PHYS 7C and (CHEM 1B or CHEM H2B)

Restriction: Chemical Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

### **CBE 40B. Process Thermodynamics. 3 Units.**

Principles of thermodynamics: definitions, basic concepts, and laws; property relationships; construction of thermodynamic charts and tables; energy balances; phase and chemical equilibria; combined mass and energy balances.

Prerequisite: CBE 40A and (MATH 3A or ICS 6N). CBE 40A with a grade of C- or better

Restriction: Chemical Engineering Majors have first consideration for enrollment.

### **CBE 40C. Chemical Engineering Thermodynamics. 4 Units.**

Elements of chemical engineering thermodynamics, including equilibrium and stability; equations of state; generalized correlations of properties of materials; properties of ideal and non-ideal mixtures; thermodynamics of real solutions; ideal and non-ideal phase equilibria; chemical equilibria for ideal and non-ideal solutions.

Prerequisite: (EECS 10 or EECS 12 or ICS 31 or MAE 10) and MATH 2D and CBE 40B. CBE 40B with a grade of C- or better

Restriction: Chemical Engineering Majors have first consideration for enrollment.

### **CBE 100. Introduction to Numerical Methods in Engineering. 3 Units.**

An introduction to the fundamentals of numerical analysis and the computer algorithms in MATLAB for the solution of engineering problems, with emphasis on problems arising in chemical engineering thermodynamics, transport phenomena, and reaction engineering.

Prerequisite: CBE 40C

Restriction: Chemical Engineering Majors have first consideration for enrollment.

### **CBE 105. Engineering Physical Chemistry. 4 Units.**

Provides an integrated view of both classical and molecular perspectives on thermodynamics, thermodynamic potentials, entropy, and the second law. Students learn how to use statistical mechanics to create a bridge between the quantum mechanical world and the familiar macroscopic one.

Prerequisite: CHEM 1C and CBE 40C and (PHYS 7D or PHYS 7E)

Overlaps with CHEM 132A, CHEM 132B, CHEM 132C.

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 110. Reaction Kinetics and Reactor Design. 4 Units.**

Introduction to quantitative analysis of chemical reactions and chemical reactor design. Reactor operations including batch, continuous stirred tank, and tubular reactor. Homogeneous and heterogeneous reactions.

Prerequisite: CHEM 1C and MATH 3D and CBE 40B and CBE 40C and CBE 100. CBE 40B with a grade of C- or better. CBE 40C with a grade of C- or better

Restriction: Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engineering majors have second consideration for enrollment.

**CBE 120A. Momentum Transfer. 4 Units.**

Fluid statics, surface tension, Newton's law of viscosity, non-Newtonian and complex flows, momentum equations, laminar and turbulent flow, velocity profiles, flow in pipes and around objects, piping systems design, pumps and mixing, and other applications to chemical and related industries.

Prerequisite: CBE 40C and MATH 3D. CBE 40C with a grade of C- or better

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 120B. Heat Transfer. 3 Units.**

Principles of conduction, radiation, and convection of heat; phenomenological rate laws, differential and macroscopic energy balances; heat transfer rates, steady state and unsteady state conduction, convection; applications to chemical and related industries.

Prerequisite: CBE 120A. CBE 120A with a grade of C- or better

Restriction: Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engineering majors have second consideration for enrollment.

**CBE 120C. Mass Transfer. 3 Units.**

Molecular and continuum approaches to diffusion and convection in multi-component mixtures; steady state, quasi-steady state and transient mass transfer; effect of reactions on mass transfer; convective mass transfer; simultaneous mass, heat and momentum transfer; applications to chemical and related industries.

Prerequisite: CBE 120B and CBE 100

Restriction: Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engineering majors have second consideration for enrollment.

**CBE 130. Separation Processes. 4 Units.**

Application of equilibria and mass and energy balances for design of separation processes. Use of equilibrium laws for design of distillation, absorption, stripping, and extraction equipment. Design of multicomponent separators.

Prerequisite: CBE 40B and CBE 40C. CBE 40B with a grade of C- or better. CBE 40C with a grade of C- or better

Restriction: Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engineering majors have second consideration for enrollment.

**CBE 140A. Chemical Engineering Laboratory I. 4 Units.**

Experimental study of thermodynamics, fluid mechanics, and heat and mass transfer. Operation and evaluation of process equipment, data analysis. Materials fee.

Prerequisite: CBE 110 and CBE 120C

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 140B. Chemical Engineering Laboratory II. 4 Units.**

Continuation of the CBE 140A covering mass transfer operations such as distillation, absorption, extraction, etc. Rate and equilibria studies in simple chemical systems with and without reaction. Study of chemical process. Materials fee.

Prerequisite: CBE 130 and CBE 145 and CBE 140A

Restriction: Chemical Engineering Majors have first consideration for enrollment.



**CBE 145. Chemical Process Control. 4 Units.**

Dynamic responses and control of chemical process equipment, dynamic modeling of chemical processes, linear system analysis, analyses and design of feedback loops and advanced control systems.

Prerequisite: CBE 110 and CBE 120B and CBE 120C

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 150A. Chemical Engineering Design I. 3 Units.**

Introduction to process design; flow sheets for chemical processes; synthesis of multicomponent separation sequences and reaction paths; synthesis of heat exchange networks; computer-aided design and simulation of processes and components.

Prerequisite: CBE 110 and CBE 120C and CBE 130

Restriction: Seniors only. Chemical Engineering Majors only.

**CBE 150B. Chemical Engineering Design II. 3 Units.**

Application of chemical engineering basics to practical design problems; process economics; process safety; environmental impacts; a major team design project with progress reports, oral presentation, and technical report with engineering drawings and economics.

Prerequisite: CBE 150A

Restriction: Seniors only. Chemical Engineering Majors only.

**CBE 160. Engineering Biology. 3 Units.**

First-principle introduction to the modern biochemistry, molecular biology, and cell biology with an engineering language. The goal is to demonstrate that the vastly diverse biological phenomena can be explained by a set of fundamental principles in chemistry, thermodynamics, and kinetics.

**CBE 161. Introduction to Biochemical Engineering. 3 Units.**

Application of engineering principles to biochemical processes. Topics include microbial pathways, energetics and control systems, enzyme and microbial kinetics, and the design and analysis of biological reactors.

Prerequisite: CEMS 110 and (CHEM 1C or CHEM H2C) and MATH 3D

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 163. Kinetics of Biochemical Networks. 4 Units.**

Principles from statistical mechanics, thermodynamics, and chemical kinetics applied to biochemical systems, from fundamental processes such as receptor-ligand binding and enzyme catalysis, to complex cellular functions including signal transduction and gene regulation.

Prerequisite: CBE 120A

Restriction: Chemical Engineering Majors have first consideration for enrollment.

Concurrent with CBE 263.

**CBE 176. Nuclear and Radiochemistry. 4 Units.**

Advanced treatment of nuclear structure, nuclear reactions, and radioactive-decay processes. Introduction to nuclear activation analysis, isotope effects, radiation chemistry, hot-atom chemistry, nuclear age-dating methods, nuclear reactors, and nuclear power.

Prerequisite: (CHEM M3C or CHEM 1C or CHEM H2C) and MATH 2D

Same as CHEM 133.

Overlaps with CHEM 170.

Restriction: Chemistry Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment.

Concurrent with CHEM 233 and CBE 276.

**CBE 181. Polymer Science and Engineering. 4 Units.**

An introduction to physical aspects of polymers, including configuration and conformation of polymer chains and characterization techniques; crystallinity, viscoelasticity, mechanical properties, polymer alloys, processing, and application.

Prerequisite: ENGR 54 and (CBE 110 or MSE 165)

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 183. Surface and Adhesion Science. 4 Units.**

Structure, thermodynamics of, kinetics, and reactions on surfaces. Surface electronic and mechanical properties and characterization of all classes of materials including metals, semiconductors, ceramics, polymers, and soft materials. Adhesion between different materials is also addressed.

Prerequisite: (CBE 110 or MSE 165C) and (MSE 141 or MSE 69)

Same as MSE 176.

Restriction: Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

Concurrent with MSE 276 and CBE 283.

**CBE 187. Semiconductor Device Packaging. 3 Units.**

Introduction to the semiconductor device packaging and assembly process. Electrical, thermal, optical, and mechanical aspects of package design and reliability. Special topics on optoelectronics packaging are covered.

Prerequisite: CBE 40B

Restriction: Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**CBE 195. Special Topics in Chemical Engineering. 1-4 Units.**

Studies in selected areas of Chemical Engineering. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**CBE 198. Group Study. 1-4 Units.**

Group study of selected topics in engineering.

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**CBE 199. Individual Study. 1-4 Units.**

For undergraduate engineering majors in supervised but independent readings, research, or design. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

Repeatability: May be taken for credit for 8 units.

Restriction: Chemical Engineering Majors have first consideration for enrollment.

**CBE 199P. Individual Study. 1-4 Units.**

For undergraduate Engineering majors in supervised but independent reading, research, or design. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in The School of Engineering.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**CBE 200. Applied Engineering Mathematics I. 4 Units.**

Analytical techniques applied to engineering problems in transport phenomena, process dynamics and control, and thermodynamics.

Restriction: Graduate students only.

**CBE 210. Reaction Engineering. 4 Units.**

Advanced topics in reaction engineering, reactor stability analysis, diffusional effect in heterogeneous catalysis, energy balance, optimization of reactor operation, dispersed in phase reactors.

Restriction: Graduate students only.

**CBE 220A. Transport Phenomena I. 4 Units.**

Continuum modeling and analysis of heat and mass transfer from an integrated viewpoint. Scaling concepts, relevance of characteristic time- and length-scales, steady- and unsteady-state processes, bounded and unbounded problems, and convective transport, with applications to chemical and biological processes.

Restriction: Graduate students only.

**CBE 220B. Transport Phenomena II. 4 Units.**

Introduces flow of isothermal fluids from a momentum transport viewpoint. Steady- and unsteady-state creeping and laminar flows; viscous and inviscid flows; Navier-Stokes equations; lubrication theory; boundary layer theory; with specific application to complex chemical and biological engineering processes.

Prerequisite: CBE 220A

Restriction: Graduate students only.

**CBE 240. Advanced Engineering Thermodynamics. 4 Units.**

Introduction to modern thermodynamics and applications, with a focus on aspects relevant to chemical and materials engineering. Mathematical tools; equilibrium and stability; microscope rigorous equations of state; molecular-level thermodynamics of real mixtures; and phase and chemical equilibrium.

Restriction: Graduate students only.

**CBE 249. Special Topics in Chemical Engineering. 1-4 Units.**

Studies in selected areas of Chemical Engineering. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**CBE 250. Research Methods and Technical Communication. 4 Units.**

Intended for Ph.D. students to develop critical research skills in creating archival papers, intellectual property and technical proposals, and in analysis of the scientific literature.

Restriction: Graduate students only.

**CBE 261. Molecular Biotechnology. 4 Units.**

Engineering and biological principles important in recombinant cell technology. Host/vector selection; plasmid propagation; optimization of cloned gene expression; metabolic engineering; protein secretion; experimental techniques; modeling of recombinant cell systems.

Restriction: Graduate students only.

**CBE 262. Metabolic Engineering and Synthetic Biology. 4 Units.**

Synthesis of chemicals from renewable carbon and energy sources using.

Restriction: Graduate students only.

**CBE 263. Kinetics of Biochemical Networks . 4 Units.**

Principles from statistical mechanics, thermodynamics, and chemical kinetics applied to biochemical systems, from fundamental processes such as receptor-ligand binding and enzyme catalysis, to complex cellular functions including signal transduction and gene regulation.

Restriction: Graduate students only.

Concurrent with CBE 163.

**CBE 264. Drug Delivery. 4 Units.**

Introduction to design of drug delivery systems. Includes physicochemical and pharmacokinetic considerations in drug formulations, types of therapeutics, routes of administration, biomaterials, and novel drug delivery systems.

**CBE 266. Bioseparation Processes. 4 Units.**

Introduction to design of bioseparation processes. The recovery and purification of biologically produced proteins, chemicals, and particulates are important. Focuses on the use of chemical engineering skills and principles in the analysis and design of biologically-based processes.

Restriction: Graduate students only.

**CBE 276. Nuclear and Radiochemistry. 4 Units.**

Advanced treatment of nuclear structure, nuclear reactions, and radioactive-decay processes. Introduction to nuclear activation analysis, isotope effects, radiation chemistry, hot-atom chemistry, nuclear age-dating methods, nuclear reactors, and nuclear power.

Same as CHEM 233.

Restriction: Graduate students only.

Concurrent with CHEM 133 and CBE 176.

**CBE 277. Detection and Measurement of Radiation. 4 Units.**

Basic principles of detection and measurement of ionizing radiation; both theory and practical aspects of measurement techniques for alpha, beta, gamma, and neutron radiation, properties of different detector materials, electronics and data treatments, and analysis.

Prerequisite: CHEM 233 or CBE 276

Same as CHEM 244.

Restriction: Graduate students only.

**CBE 280. Advanced Polymer Science and Engineering. 4 Units.**

The synthesis, characterization, microstructure, rheology, and properties of polymer materials. Polymers in solution and in the liquid, crystalline and glassy states. Engineering and processing properties, including viscoelasticity and rheology. Forming and processing methods. Environmental issues.

Restriction: Graduate students only.

**CBE 282. Colloid Science and Engineering. 4 Units.**

An introduction to the basic foundations of colloid science, interfacial phenomena, suspensions and complex fluids, and engineering and assembly of colloidal materials.

Restriction: Graduate students only.

**CBE 283. Surface and Adhesion Science. 4 Units.**

Structure, thermodynamics of, kinetics, and reactions on surfaces. Surface electronic and mechanical properties and characterization of all classes of materials including metals, semiconductors, ceramics, polymers, and soft materials. Adhesion between different materials is also addressed.

Same as MSE 276.

Restriction: Graduate students only.

Concurrent with MSE 176 and CBE 183.

**CBE 288. Optoelectronics Packaging. 4 Units.**

Basic and current issues in the packaging of integrated circuits (IC) and fiber-optic devices are discussed.

Restriction: Graduate students only.

**CBE 295. Seminars in Engineering. 1-4 Units.**

Seminars scheduled each year by individual faculty in major field of interest.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**CBE 296. Master of Science Thesis Research. 1-16 Units.**

Individual research or investigation conducted in preparation for the thesis required for the M.S. degree.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CBE 297. Doctor of Philosophy Dissertation Research. 1-16 Units.**

Individual research or investigation conducted in preparation for the dissertation required for the Ph.D. degree.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CBE 298. Seminars in Engineering. 2 Units.**

Presentation of advanced topics and reports of current research efforts in chemical engineering.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**CBE 299. Individual Research. 1-16 Units.**

Individual research or investigation under the direction of an individual faculty member.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Chemical and Biomolecular Engineering, M.S.

Chemical engineering uses the knowledge of chemistry, mathematics, physics, biology, and humanities to solve societal problems in areas such as energy, health, environment, food, clothing, materials, shelter, and sustainability and serves a variety of processing industries whose vast array of products include chemicals, petroleum products, plastics, pharmaceuticals, foods, textiles, fuels, consumer products, and electronic and cryogenic materials. Chemical Engineering also advances societal goals by developing environmentally conscious and sustainable technologies to meet global challenges. Chemical engineering is an engineering discipline that has its strongest ties with the molecular sciences. This is an important asset since sciences such as chemistry, molecular biology, biomedicine, and solid-state physics are providing the seeds for future technologies. Chemical engineering has a bright future as the discipline which will bridge science with engineering in multidisciplinary environments.

Biomolecular Engineering is concerned with the processing of biological materials and processes that use biological agents such as living cells, enzymes, or antibodies. Biomolecular Engineering, with integrated knowledge of the principles of biology and chemical engineering, plays a major engineering role in the rapidly developing area of biotechnology. Career opportunities in Biomolecular Engineering are available in a variety of industries such as biotechnology, chemical, environmental, food, petrochemical, and pharmaceutical industries.

The principal objectives of the graduate curriculum in Chemical and Biomolecular Engineering are to develop and expand students' abilities to solve new and more challenging engineering problems and to promote their skills in independent thinking and learning in preparation for careers in manufacturing, research, or teaching. These objectives are reached through a program of course work and research designed by each student with the assistance, advice, and approval of a primary faculty advisor and a faculty advisory committee. Programs of study leading to the M.S. and Ph.D. in Chemical and Biomolecular Engineering are offered.

Students applying with the objective of a Ph.D. are admitted to the M.S./Ph.D. program only if they are likely to successfully complete a Ph.D. program. These students do not formally re-apply to the Ph.D. program after completing the M.S. Students who apply to the M.S.-only program must petition for the Ph.D. program if they desire to continue on for the Ph.D. Financial support is usually reserved for those students who plan to complete the Ph.D. The normative time to complete M.S. and Ph.D. degrees is two and five years, respectively.

It is strongly recommended that students have background and training in core Chemical Engineering topics (transport phenomena, thermodynamics, and reaction kinetics) as well as a strong background in mathematics, chemistry, and physics. A student who enters the program without undergraduate preparation in chemical engineering is required to take three to five additional prerequisite courses (MATH 3A and MATH 3D, and CBE 40B -CBE 40C, CBE 110, CBE 161, and CBE 120A).

Students are required to take the following courses for the M.S. and as a basis for the Ph.D. preliminary examination.

CBE 210	Reaction Engineering
CBE 220A	Transport Phenomena I
CBE 200	Applied Engineering Mathematics I
CBE 240	Advanced Engineering Thermodynamics

## Electives

Graduate advisors should be consulted on the selection of elective courses. All graduate courses offered in CBE are potential electives. Graduate-level courses offered in other Engineering departments and relevant graduate courses from other schools may also be taken as electives.

Two plans are available for the M.S. degree: a thesis option and a comprehensive examination option. Opportunities are available for part-time study toward the M.S.

### Plan I: Thesis Option

For the M.S. thesis option, students are required to complete a research study of great depth and originality and obtain approval for a complete program of study. A minimum of 36 units is required for the M.S. The following are required: four required core courses, three quarters of CBE 298 (Department Seminar), five additional graduate elective courses numbered 200–289 (or 200–295 if offered by other departments), related to their field of graduate studies, and approved by the graduate advisor. Up to two of these elective courses can be substituted by up to eight units of CBE 296 (M.S. Thesis Research), and one of the elective courses may be substituted by an upper-division undergraduate elective course approved by the CBE graduate advisor.

Full-time graduate students must enroll in the departmental seminar each quarter during their first year unless exempt by petition.

### Plan II: Comprehensive Examination Option

For the comprehensive examination option, students are required to complete 36 units of study and a comprehensive examination. The following are required: four required core courses, three quarters of CBE 298 (Department Seminar), five additional graduate elective courses numbered 200–289 (or 200–295 if offered by other departments), related to their field of graduate studies, and approved by the graduate advisor. One of the elective courses may be substituted by an upper-division undergraduate elective course approved by the CBE graduate advisor. Research units (CBE 296/CBE 299) do not count towards the degree requirements of the Comprehensive Exam Option.

Full-time graduate students must enroll in the departmental seminar each quarter during their first year unless exempt by petition.

In addition to fulfilling the course requirements outlined above, it is a University requirement for the Master of Science degree that students fulfill a minimum of 36 units of study.

## Additional Information

Students are required to consult the graduate student handbook for more specific details regarding the course, exam, and unit requirements.

# Chemical and Biomolecular Engineering, Ph.D.

Chemical engineering uses the knowledge of chemistry, mathematics, physics, biology, and humanities to solve societal problems in areas such as energy, health, environment, food, clothing, materials, shelter, and sustainability and serves a variety of processing industries whose vast array of products include chemicals, petroleum products, plastics, pharmaceuticals, foods, textiles, fuels, consumer products, and electronic and cryogenic materials. Chemical Engineering also advances societal goals by developing environmentally conscious and sustainable technologies to meet global challenges. Chemical engineering is an engineering discipline that has its strongest ties with the molecular sciences. This is an important asset since sciences such as chemistry, molecular biology, biomedicine, and solid-state physics are providing the seeds for future technologies. Chemical engineering has a bright future as the discipline which will bridge science with engineering in multidisciplinary environments.

Biomolecular Engineering is concerned with the processing of biological materials and processes that use biological agents such as living cells, enzymes, or antibodies. Biomolecular Engineering, with integrated knowledge of the principles of biology and chemical engineering, plays a major engineering role in the rapidly developing area of biotechnology. Career opportunities in Biomolecular Engineering are available in a variety of industries such as biotechnology, chemical, environmental, food, petrochemical, and pharmaceutical industries.

The principal objectives of the graduate curriculum in Chemical and Biomolecular Engineering are to develop and expand students' abilities to solve new and more challenging engineering problems and to promote their skills in independent thinking and learning in preparation for careers in manufacturing, research, or teaching. These objectives are reached through a program of course work and research designed by each student with the assistance, advice, and approval of a primary faculty advisor and a faculty advisory committee. Programs of study leading to the M.S. and Ph.D. in Chemical and Biomolecular Engineering are offered.

Students applying with the objective of a Ph.D. are admitted to the M.S./Ph.D. program only if they are likely to successfully complete a Ph.D. program. These students do not formally re-apply to the Ph.D. program after completing the M.S. Students who apply to the M.S.-only program must petition for the Ph.D. program if they desire to continue on for the Ph.D. Financial support is usually reserved for those students who plan to complete the Ph.D. The normative time to complete M.S. and Ph.D. degrees is two and five years, respectively.

The Ph.D. in Chemical and Biomolecular Engineering requires a commitment on the part of the student to dedicated study and collaboration with the faculty. Ph.D. students are selected on the basis of outstanding demonstrated potential and scholarship. Applicants must hold the appropriate prerequisite degrees from recognized institutions of high standing. After substantial preparation, Ph.D. candidates work under the supervision of faculty

advisors. The process involves extended immersion in a research atmosphere and culminates in the production of original research results presented in a dissertation.

Milestones to be passed in the Ph.D. program in order to remain in good standing include the following: acceptance into a research group by the faculty advisor at the end of the student's first year of study; successful completion of the Ph.D. preliminary examination by the end of the second year; preparation for pursuing research and the development of a research proposal culminating in passing the Qualifying Examination by the end of the third year of the Ph.D. program. The Qualifying Examination includes faculty evaluation of a written research dossier and an oral presentation. Students must advance to candidacy in their third year (second year for students who entered with a master's degree).

The core course requirements for the Ph.D. are the same as for the M.S. Students must enroll in the departmental seminar each quarter during their first year unless exempt by petition. Ph.D. students must take two additional elective courses beyond the M.S. requirements. These courses are to be taken after the first year of graduate work, should be relevant to the Ph.D. dissertation topic, and must be selected in consultation with the research advisor and approved by the CBE graduate advisor. The preliminary examination is based on the four core courses and the ability of the student to comprehend and present a research paper. M.S. students who have completed a CBE M.S. degree elsewhere must have a written approval by the graduate advisor to waive required CBE core courses, if they have taken the equivalent courses elsewhere.

Final examination involves the oral presentation and defense of an acceptable dissertation in a seminar attended by students and faculty. The Ph.D. is granted upon the recommendation of the Doctoral Committee and the Dean of the Graduate Division. The normative time for completion of the Ph.D. is five years (four years for students who entered with a master's degree). The maximum time permitted is seven years.

## Chemical Engineering, B.S.

**Program Educational Objectives:** Graduates of the Chemical Engineering program will (1) demonstrate achievement by applying a broad knowledge of chemical engineering; (2) apply critical reasoning and quantitative skills to identify and solve problems in chemical engineering; (3) implement skills for effective communication and teamwork; (4) demonstrate the potential to effectively lead chemical engineering projects in industry, government, or academia; and (5) exhibit a commitment to lifelong learning.

(Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

**High School Students:** See School Admissions information.

**Transfer Students:** Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following **required** courses: two years of approved calculus, one year of calculus-based physics with laboratories (mechanics, electricity and magnetism), completion of lower-division writing, one year of general chemistry (with laboratory), one year of organic chemistry (with laboratory), and one course in introductory programming. For course equivalency specific to each college, visit <http://assist.org>.

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division coursework may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at 949-824-4334.

**All students are required to meet the University Requirements.**

**All students are required to meet the School Requirements.**

### Major Requirements

#### Mathematics and Basic Science Courses:

CHEM 1A or ENGR 1A	General Chemistry General Chemistry for Engineers
CHEM 1B- 1C- 1LC- 1LD	General Chemistry and General Chemistry and General Chemistry Laboratory and General Chemistry Laboratory
CHEM 51A- 51B- 51C- 51LB- 51LC	Organic Chemistry and Organic Chemistry and Organic Chemistry and Organic Chemistry Laboratory and Organic Chemistry Laboratory
CBE 105	Engineering Physical Chemistry
MATH 2A- 2B	Single-Variable Calculus and Single-Variable Calculus
MATH 2D	Multivariable Calculus
MATH 2E	Multivariable Calculus



MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations
PHYSICS 7C- 7LC	Classical Physics and Classical Physics Laboratory
PHYSICS 7D- 7LD	Classical Physics and Classical Physics Laboratory

**Engineering Topics Courses:**

Students must complete a minimum of 18 units of engineering design.

CBE 40A- 40B- 40C	Chemical Processes and Material Balances and Process Thermodynamics and Chemical Engineering Thermodynamics
CBE 100	Introduction to Numerical Methods in Engineering
CBE 110	Reaction Kinetics and Reactor Design
CBE 120A- 120B- 120C	Momentum Transfer and Heat Transfer and Mass Transfer
CBE 130	Separation Processes
CBE 140A- 140B	Chemical Engineering Laboratory I and Chemical Engineering Laboratory II
CBE 145	Chemical Process Control
CBE 150A- 150B	Chemical Engineering Design I and Chemical Engineering Design II
ENGR 54	Principles of Materials Science and Engineering
ENGRMAE 10	Introduction to Engineering Computations

Students select, with the approval of a faculty advisor, any additional engineering topics courses needed to satisfy school and department requirements.

**Technical Elective Courses:**

Students select, with the approval of a faculty advisor, a minimum of 19 units of technical electives. Students may select an area of specialization and complete the associated requirements, as shown below.

(The nominal Chemical Engineering program will require 192 units of courses to satisfy all university and major requirements. Students typically need at least 14 units of engineering topics from technical electives to meet school requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary.)

**Engineering Professional Topics Course:**

ENGR 190W	Communications in the Professional World
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**Specialization in Biomolecular Engineering:**

Requires:

CBE 161	Introduction to Biochemical Engineering
and a minimum of 8 units from the following:	
BIO SCI 98	Biochemistry
BIO SCI 99	Molecular Biology
BME 50A	Cell and Molecular Engineering
BME 50B	Cell and Molecular Engineering
BME 121	Quantitative Physiology: Organ Transport Systems
BME 160	Tissue Engineering
CBE 163	Kinetics of Biochemical Networks
CBE 199	Individual Study

**Specialization in Energy and the Environment:**

Requires a minimum of 11 units including at least one course from the following:

CBE 176	Nuclear and Radiochemistry
CBE 199	Individual Study
MSE 141	Nano-Scale Materials and Applications

and select the remaining units from the following:

ENGRCEE 160	Environmental Processes
ENGRCEE 162	Introduction to Environmental Chemistry

ENGRCEE 163	Wastewater Treatment Process Design
ENGRCEE 171	Water Resources Engineering
ENGRCEE 172	Groundwater Hydrology
ENGRMAE 110	Combustion and Fuel Cell Systems
ENGRMAE 114	Fuel Cell Fundamentals and Technology
ENGRMAE 164	Air Pollution and Control

**Specialization in Materials Science:**

Requires a minimum of 12 units from:

CBE 181	Polymer Science and Engineering
CBE 187	Semiconductor Device Packaging
CBE 199	Individual Study (up to 4 units)
ENGR 150	Mechanics of Structures <sup>1</sup>
MSE 155	Mechanical Behavior and Design Principles
MSE 158	Ceramic Materials for Sustainable Energy
MSE 163	Computer Techniques in Experimental Research
MSE 175	Design Failure Investigation
ENGRMAE 155	Composite Materials and Structures

<sup>1</sup> Requires ENGR 30, not included in total.

The sample program of study chart shown is typical for the major in Chemical Engineering. Students should keep in mind that this program is based upon a sequence of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Students who are not adequately prepared, or who wish to make changes in the sequence for other reasons, must have their program approved by their faculty advisor. Chemical Engineering majors are encouraged to consult with academic counselors as needed, and students who are academically at risk are mandated to see a counselor as frequently as deemed necessary by the advising staff.

Freshman		
Fall	Winter	Spring
MATH 2A	MATH 2B	MATH 2D
ENGRMAE 10	PHYSICS 7C	PHYSICS 7D
CHEM 1A or ENGR 1A	PHYSICS 7LC	PHYSICS 7LD
General Education	CHEM 1B	CHEM 1C
	General Education	CHEM 1LC
Sophomore		
Fall	Winter	Spring
MATH 3A	MATH 3D	MATH 2E
CHEM 51A	CHEM 51B	CHEM 51C
CHEM 1LD	CHEM 51LB	CHEM 51LC
CBE 40A	CBE 40B	CBE 40C
General Education	ENGR 54	General Education
Junior		
Fall	Winter	Spring
CBE 120A	CBE 110	CBE 120C
CBE 100	CBE 120B	CBE 130
General Education	CBE 105	Technical Elective
General Education	General Education	General Education
Senior		
Fall	Winter	Spring
CBE 145	CBE 150A	CBE 150B
CBE 140A	CBE 140B	Technical Elective
ENGR 190W	Technical Elective	Technical Elective
Technical Elective	General Education	General Education

## Department of Civil and Environmental Engineering

**C. Sunny Jiang, Department Chair**

E4130 Engineering Gateway

949-824-5333

<http://www.eng.uci.edu/dept/cee> (<http://www.eng.uci.edu/dept/cee/>)

Civil Engineering is described as the art of sustainably harnessing the natural environment to meet human needs. The success of this endeavor is evident all around us. The arid plain which greeted the early settlers in Southern California has been transformed into a thriving regional community largely by the application of civil engineering.

The goal of the Civil Engineering curriculum is to prepare graduates for a career in practice, research, or teaching. At the undergraduate level a common core of fundamental subjects is provided, and students are required to specialize in their senior year. Specializations are offered in General Civil Engineering, Environmental Hydrology and Water Resource Engineering, Structural Engineering, and Transportation Systems Engineering. Graduate opportunities are in three major thrust areas: structural analysis, design, and reliability; transportation systems engineering; and water resources and environmental engineering.

The career opportunities in civil engineering are varied. Graduates may look forward to long-term careers in major corporations, public bodies, the military, private consulting firms, or to being self-employed in private practice. History has shown a civil engineering education to be a good ground for many administrative and managerial positions.

Environmental Engineering involves designing environmental protection or remediation strategies for multiple resources—water, air, and soil, often with combinations of physical, chemical, and biological treatment methods in the context of a complex regulatory framework.

The goal of the Environmental Engineering curriculum is to prepare graduates with a strong basic science background, particularly in chemistry and biology, and to provide students with a broad exposure to several environmental engineering science disciplines. Courses relating to transport processes, water quality control, air quality control, and process design are included in the core.

Career opportunities in environmental engineering are diverse. Graduates generally find careers related to pollution control and the remediation of air, water, and soil environments.

- Civil and Environmental Engineering, M.S.
- Civil and Environmental Engineering, Ph.D.
- Civil Engineering, B.S.
- Environmental Engineering, B.S.

## Faculty

Mohammad Javad Abdolhosseini Qomi, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Civil and Environmental Engineering* (mechanics and physics of multi-scale porous materials, nano- and meso-chemo-mechanics, engineering advanced materials for sustainable infrastructures)

Adeyemi Adeleye, Ph.D. University of California, Santa Barbara, *Assistant Professor of Civil and Environmental Engineering* (water/environmental chemistry, environmental nanotechnology, pollution remediation, fate and effects of emerging contaminants)

Amir Aghakouchak, Ph.D. University of Stuttgart, *Professor of Civil and Environmental Engineering* (hydrology, climatology, remote sensing of environment, climate extremes, compound and cascading hazards, climate change, stochastic modeling, water resources management)

Alfredo H.-S. Ang, Ph.D. University of Illinois at Urbana-Champaign, *Professor Emeritus of Civil and Environmental Engineering* (structural and earthquake engineering, risk and reliability engineering)

Tirtha Banerjee, Ph.D. Duke University, *Assistant Professor of Civil and Environmental Engineering* (atmospheric boundary layer dynamics, turbulent fluid dynamics, land/water/vegetation - atmosphere interaction, wildfires, vegetation dynamics, carbon and water cycles, hydrology, wetlands and terrestrial aquatic interfaces)

William J. Cooper, Ph.D. University of Miami, *Professor Emeritus of Civil and Environmental Engineering; Urban Planning and Public Policy* (environmental chemistry, advanced oxidation processes for water treatment, aquatic photochemistry of carbon cycling)

Kristen A. Davis, Ph.D. Stanford University, *Associate Professor of Civil and Environmental Engineering; Earth System Science* (coastal oceanography, fluid mechanics, turbulent flows)

Russell L. Detwiler, Ph.D. University of Colorado Boulder, *Associate Professor of Civil and Environmental Engineering* (groundwater hydrology, contaminant fate and transport, subsurface process modeling, groundwater/surface-water interaction)

Efi Foufoula-Georgiou, Ph.D. University of Florida, *Distinguished Professor of Civil and Environmental Engineering* (hydrology and geomorphology with emphasis on modeling the interactions between the atmosphere, land, and the terrestrial environment at plot to large-watershed scale)

Stanley B. Grant, Ph.D. California Institute of Technology, *Professor Emeritus of Civil and Environmental Engineering* (environmental engineering, inland and coastal water quality, coagulation and filtration of colloidal contaminants, environmental microbiology)

Gary L. Guymon, Ph.D. University of California, Davis, *Professor Emeritus of Civil and Environmental Engineering* (water resources, groundwater, modeling uncertainty)

Kuo-Lin Hsu, Ph.D. University of Arizona, *Professor of Civil and Environmental Engineering* (remote sensing of precipitation, hydrologic systems modeling, stochastic hydrology, water resources systems planning)

Michael Hyland, Ph.D. Northwestern University, *Assistant Professor of Civil and Environmental Engineering* (modeling, design, control, and analysis of smart city transportation systems with emphases on shared-use autonomous mobility services and urban transit networks)

R. (Jay) Jayakrishnan, Ph.D. University of Texas at Austin, *Professor of Civil and Environmental Engineering* (transportation systems analysis)

C. Sunny Jiang, Ph.D. University of South Florida, *Department Chair and Professor of Civil and Environmental Engineering; Ecology and Evolutionary Biology; Environmental Health Sciences* (water pollution microbiology, environmental biotechnology, aquatic microbial ecology)

Wenlong Jin, Ph.D. University of California, Davis, *Associate Professor of Civil and Environmental Engineering* (intelligent transportation systems, traffic flow theory, transportation network analysis)

Joel Lanning, Ph.D. University of California, San Diego, *Assistant Professor of Teaching of Civil and Environmental Engineering* (seismic design of civil structures, large-scale testing, alternative building materials, teaching methods in engineering education)

Anne Lemnitzer, Ph.D. University of California, Los Angeles, *Associate Professor of Civil and Environmental Engineering* (geotechnical and earthquake engineering, soil structure interaction, RC design, seismic monitoring)

Mo Li, Ph.D. University of Michigan, *Assistant Professor of Civil and Environmental Engineering; Materials Science and Engineering* (unconventional infrastructure materials, and their interfaces with structural engineering, advanced manufacturing, spatial damage sensing, and the environment)

Michael G. McNally, Ph.D. University of California, Irvine, *Professor of Civil and Environmental Engineering; Urban Planning and Public Policy* (travel behavior, transportation systems analysis)

Ayman S. Mosallam, Ph.D. Catholic University of America, *Professor of Civil and Environmental Engineering* (advanced composites and hybrid systems, seismic repair and rehabilitation of structures, diagnostic/prognostic structural health monitoring techniques, 3D printing in Construction and sustainable and green building technology)

Farzad Naeim, Ph.D. University of Southern California, *Adjunct Professor of Civil and Environmental Engineering* (performance-based earthquake engineering; structural health monitoring; seismic instrumentation; structural design of tall buildings; nonlinear response of structures; seismic isolation; energy dissipation systems and devices; design characteristics of earthquake ground motions; seismic analysis and design of complex structures)

Phu Dinh Nguyen, Ph.D. University of California, Irvine, *Assistant Adjunct Professor of Civil and Environmental Engineering* (hydrology, GIS, satellite precipitation estimation algorithms, databases and visualization tools for remotely-sensed data and information, crowdsourcing, water resources systems)

Betty H. Olson, Ph.D. University of California, Berkeley, *Professor Emeritus of Civil and Environmental Engineering* (molecular applications for optimizing biological processes in wastewater treatment, environmental health, drinking water microbiology)

Gerard C. Pardo, Ph.D. Stanford University, *Professor Emeritus of Civil and Environmental Engineering* (structural analysis, experimental structural dynamics)

Wilfred W. Recker, Ph.D. Carnegie Mellon University, *Distinguished Professor of Civil and Environmental Engineering* (transportation systems modeling, traffic control, and urban systems analysis)

Stephen G. Ritchie, Ph.D. Cornell University, *Director of the Institute of Transportation Studies and Professor of Civil and Environmental Engineering* (transportation engineering, advanced traffic management and control systems, development and application of emerging technologies in transportation)

Diego Rosso, Ph.D. University of California, Los Angeles, *Director of the UCI Water-Energy Nexus Center (WEX) and Professor of Civil and Environmental Engineering* (environmental process engineering, mass transfer, wastewater treatment, carbon- and energy-footprint analysis)

Brett F. Sanders, Ph.D. University of Michigan, *Professor of Civil and Environmental Engineering; Urban Planning and Public Policy* (urban flooding, coastal flooding, dam-break flooding, flood hazard modeling, flood risk management, sediment management, shallow-water hydrodynamics and morphodynamics, computational methods, remote-sensing with drones, translational research for flood modeling targeting community resilience, population health and poverty alleviation)

Jean-Daniel M. Saphores, Ph.D. Cornell University, *Professor of Civil and Environmental Engineering; Economics; Urban Planning and Public Policy* (transportation and environmental systems (with a focus on air pollution and energy use), travel behavior analysis, alternative fuel vehicles, automated vehicles, transit use, sustainable infrastructure management, and decision making under uncertainty using real options)

Jan W. Scherfig, Ph.D. University of California, Berkeley, *Professor Emeritus of Civil and Environmental Engineering* (water reclamation, waste treatment processes, environmental engineering)

Soroosh Sorooshian, Ph.D. University of California, Los Angeles, *Director of the Center for Hydrometeorology and Remote Sensing (CHRS) and UCI Distinguished Professor of Civil and Environmental Engineering; Earth System Science* (hydrology, hydrometeorology and hydroclimate modeling, remote sensing, water resources management)

Lizhi Sun, Ph.D. University of California, Los Angeles, *Professor of Civil and Environmental Engineering* (micro- and nano-mechanics, composites and nanocomposites, smart materials and structures, multiscale modeling, elastography)

Roberto Villaverde, Ph.D. University of Illinois at Urbana-Champaign, *Professor Emeritus of Civil and Environmental Engineering* (structural dynamics and earthquake engineering)

Jasper A. Vrugt, Ph.D. University of Amsterdam, *Associate Professor of Civil and Environmental Engineering; Earth System Science* (examining how (eco)systems work, why theories deviate from data, how scientists diagnose change, as applied to biogeosciences, ecology, geomorphology, geophysics, hydrology, soils)

Jann N. Yang, DSc Columbia University, *Professor Emeritus of Civil and Environmental Engineering* (system identification and damage detection, structural health monitoring, structural control, earthquake engineering, structural dynamics)

Farzin Zareian, Ph.D. Stanford University, *Associate Professor of Civil and Environmental Engineering* (structural engineering, performance-based earthquake engineering, structural reliability, structural control)

## Affiliate Faculty

Jacob Brouwer, Ph.D. Massachusetts Institute of Technology, *Professor of Mechanical and Aerospace Engineering; Civil and Environmental Engineering* (fuel cells, energy systems dynamics, electrochemical systems design and analysis, chemical kinetics, reacting flows)

Donald Dabdub, Ph.D. California Institute of Technology, *Associate Dean, Undergraduate Education and Professor of Mechanical and Aerospace Engineering; Civil and Environmental Engineering* (mathematical modeling of urban and global air pollution, dynamics of atmospheric aerosols, secondary organic aerosols, impact of energy generation on air quality, chemical reactions at gas-liquid interfaces)

Steven J. Davis, Ph.D. Stanford University, *Associate Professor of Earth System Science; Civil and Environmental Engineering*

Derek Dunn-Rankin, Ph.D. University of California, Berkeley, *Professor Emeritus of Mechanical and Aerospace Engineering; Civil and Environmental Engineering; Environmental Health Sciences* (combustion, optical particle sizing, particle aerodynamics, laser diagnostics and spectroscopy)

James T. Randerson, Ph.D. Stanford University, *UCI Chancellor's Professor of Earth System Science; Civil and Environmental Engineering; Ecology and Evolutionary Biology*

Eric Rignot, Ph.D. University of Southern California, *Department Chair and Donald Bren Professor of Earth System Science; Civil and Environmental Engineering*

G. Scott Samuelsen, Ph.D. University of California, Berkeley, *Director of Advanced Power and Energy Program, Research Professor and Professor Emeritus of Mechanical and Aerospace Engineering; Civil and Environmental Engineering* (combustion, sprays, laser diagnostics, air quality, turbulent transport, alternative fuels, modeling reacting flows, practical systems, energy and environmental conflict)

## Courses

### **ENGRCEE 11. Methods II: Probability and Statistics. 4 Units.**

Modeling and analysis of engineering problems under uncertainty. Engineering applications of probability and statistical concepts and methods.

(Design units: 0)

Prerequisite: (ENGRCEE 20 or EECS 10 or EECS 12 or ENGRMAE 10 or I&C SCI 31) and MATH 3A

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 20. Introduction to Computational Problem Solving. 4 Units.**

Introduction to computer programming within a numerical computing environment (MATLAB or similar) including types of data representation, graphical display of data, and development of modular programs with application to engineering analysis and problem solving.

(Design units: 1)

Corequisite: MATH 3A

Overlaps with BME 60B.

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 21. Computational Problem Solving. 4 Units.**

Engineering analysis and problem solving using MATLAB (or similar), including matrix algebra, solving systems of linear and nonlinear equations, numerical integration of ordinary differential equations (ODEs) and coupled ODEs, and analysis of numerical errors.

(Design units: 1)

Corequisite: MATH 3D

Prerequisite: (ENGRCEE 20 or BME 60B) and (MATH 3A or I&C SCI 6N)

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 30. Statics. 4 Units.**

Addition and resolution of forces, distributed forces, equivalent system of forces centroids, first moments, moments and products on inertia, equilibrium of rigid bodies, trusses, beams, cables. Course may be offered online.

(Design units: 0)

Corequisite: MATH 2D

Prerequisite: MATH 2D and PHYSICS 7C

Same as ENGR 30, ENGRMAE 30.

Restriction: School of Engineering students have first consideration for enrollment.

**ENGRCEE 60. Contemporary and Emerging Environmental Challenges. 4 Units.**

Introduces contemporary and emerging environmental challenges, illustrates links between human behavior, environmental policy, and engineering practices, examines policy options in the context of current institutions, and introduces tools and frameworks to reach sound economic, social, and environmental solutions.

(Design units: 0)

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**(III)****ENGRCEE 80. Dynamics. 4 Units.**

Introduction to the kinematics and dynamics of particles and rigid bodies. The Newton-Euler, Work/Energy, and Impulse/Momentum methods are explored for ascertaining the dynamics of particles and rigid bodies. An engineering design problem using these fundamental principles is also undertaken.

(Design units: 0.5)

Prerequisite: MATH 2D and PHYSICS 7C

Same as ENGR 80, ENGRMAE 80.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 81A. Civil Engineering Practicum I. 3 Units.**

Introduction to civil engineering through presentations on structural, environmental, water, and transportation systems. Introduction to graphics. Graphical visualization and communication using hand and computer sketching. Fundamentals of Computer Aided Design (CAD) using AutoCad. Laboratory sessions. Materials fee.

(Design units: 2)

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 81B. Civil Engineering Practicum II. 3 Units.**

Principles of surveying; fundamentals of Geographic Information Systems (GIS); introduction to the state-of-the-art and future areas of the profession, including applications of advanced technology and computers; Introduction to visualization and communication of design concepts; laboratory sessions. Materials fee.

(Design units: 1)

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 110. Methods III: Modeling, Economics, and Management. 4 Units.**

Analysis, modeling, and management of civil engineering systems. Statistics and system performance studies, probabilistic models and simulation, basic economics and capital investments, project elements and organization, managerial concepts and network technique, project scheduling. Emphasis on real-world examples. Laboratory sessions.

(Design units: 1)

Prerequisite: ENGRCEE 11

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 111. Methods IV: Systems Analysis and Decision-Making. 4 Units.**

Analysis and optimization for decision-making in civil and infrastructural systems. Topics include linear programming formulations and solution algorithms, network models, and logistical models. Emphasis is on project-level and managerial decision-making and selection from alternative designs.

(Design units: 1)

Prerequisite: (MATH 3A or I&C SCI 6N) and MATH 3D

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 114. GIS for Civil and Environmental Engineering. 4 Units.**

GIS for CEE provides an introduction to Geographic Information Systems (GIS) and their various applications in civil and environmental engineering. Topics include GIS data formats, data queries, spatial and attribute data, spatial data analysis, coordinate systems, and raster data analysis.

Concurrent with ENGRCEE 214.

**ENGRCEE 121. Transportation Systems I: Analysis and Design. 4 Units.**

Introduction to analysis and design of fundamental transportation system components, basic elements of geometric and pavement design, vehicle flow and elementary traffic, basic foundations of transportation planning and forecasting. Laboratory sessions.

(Design units: 2)

Prerequisite: ENGRCEE 11 and ENGRCEE 81A

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 122. Transportation Systems II: Operations and Control. 4 Units.**

Introduction to fundamentals of urban traffic engineering, including data collection, analysis, and design. Traffic engineering studies, traffic flow theory, traffic control devices, traffic signals, capacity and level of service analysis of freeways and urban streets. Laboratory sessions.

(Design units: 2)

Prerequisite: ENGRCEE 11 and ENGRCEE 121

Restriction: Civil Engineering Majors have first consideration for enrollment.

Concurrent with ENGRCEE 229A.



**ENGRCEE 123. Transportation Systems III: Planning and Forecasting. 4 Units.**

Theoretical foundations of transportation planning, design, and analysis methods. Theory and application of aggregate and disaggregate models for land use development, trip generation, destination, mode, and route choice. Transportation network analysis. Planning, design, and evaluation of system alternatives.

(Design units: 2)

Corequisite: ENGRCEE 110

Prerequisite: ENGRCEE 121

Restriction: Civil Engineering Majors have first consideration for enrollment.

Concurrent with ENGRCEE 223.

**ENGRCEE 124. Transportation Systems IV: Freeway Operations and Control. 4 Units.**

Fundamentals of traffic on urban freeways, including data collection analysis, and design. Traffic engineering studies, traffic flow theory, freeway traffic control devices, capacity, and level of service analysis of freeways and highways. Laboratory sessions.

(Design units: 2)

Prerequisite: ENGRCEE 121

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 125. Transportation and the Environment. 4 Units.**

Analysis of the impacts of motor vehicle transportation on the environment. Introduction to life cycle analysis applied to transportation. Basic economic tools for transportation externalities. Transportation planning, urban form, health, and the environment. Transportation sustainability.

(Design units: 0)

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 130. Soil Mechanics. 4 Units.**

Mechanics of soils, composition and classification of soils, compaction, compressibility and consolidation, shear strength, seepage, bearing capacity, lateral earth pressure, retaining walls, piles.

(Design units: 0)

Corequisite: ENGRCEE 130L

Prerequisite: ENGRCEE 150 and ENGRCEE 170

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 130L. Soil Mechanics Laboratory. 1 Unit.**

Laboratory procedures of soil testing for engineering problems. Materials fee.

(Design units: 0)

Corequisite: ENGRCEE 130

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 149. Introduction to Earthquake Engineering. 4 Units.**

Plate tectonics. Structural dynamics. Earthquake magnitude, intensity, and frequency. Seismic damage to structures. Earthquake load prediction including response spectra, normal mode, and direct integration techniques. The basis of building code earthquake load requirements for buildings.

(Design units: 2)

Prerequisite: ENGRCEE 11 and ENGRCEE 20 and ENGRCEE 151A

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 150. Mechanics of Materials. 4 Units.**

Stresses and strains, strain-stress diagrams, axial deformations, torsion, bending and shear stresses in beams, shear force and bending moment diagrams, combined stresses, principal stresses, Mohr's circle, deflection of beams, columns.

(Design units: 1)

Prerequisite: ENGRCEE 30 or ENGRMAE 30 or ENGR 30. ENGRCEE 30 with a grade of C- or better

Overlaps with ENGR 150, ENGRMAE 150.

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 150L. Mechanics of Materials Laboratory. 1 Unit.**

Experimental methods and fundamentals for mechanics of materials analysis. Materials fee.

(Design units: 0)

Prerequisite or corequisite: (ENGRCEE 30 or ENGRMAE 30 or ENGR 30) and ENGRCEE 150. ENGRCEE 30 with a grade of C- or better

Overlaps with ENGRMAE 150L.

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 151A. Structural Analysis. 4 Units.**

Fundamentals of structural analysis and loading. Deformation of statically determinate and indeterminate structures. Influence lines. Structural systems.

(Design units: 0)

Prerequisite: ENGRCEE 150 or ENGRMAE 150. ENGRCEE 150 with a grade of C- or better

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 151B. Structural Timber Design. 4 Units.**

Design of timber structures. Beams, columns, beam-columns, roof, and connections.

(Design units: 3)

Prerequisite: ENGRCEE 151A

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 151C. Reinforced Concrete Design. 4 Units.**

Ultimate strength design. Design of reinforced concrete beam sections. Design for shear and deflection. Design of columns. Design of isolated and combined footings. Laboratory sessions. Materials fee.

(Design units: 3)

Prerequisite: ENGRCEE 151A

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 152. Computer Methods in Structural Analysis and Design. 4 Units.**

Matrix techniques for indeterminate framed structures. Computer implementation using the stiffness method. Software packages for design of reinforced concrete, steel, and/or timber structures.

(Design units: 2)

Prerequisite: ENGRCEE 151C

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 155. Structural Steel Design. 4 Units.**

Design in steel of tension members, beams, columns, welded and bolted connections; eccentrically loaded and moment resistant joints; plate girders. Plastic design; load and resistance factor design. Composite construction; introduction to computer-aided design.

(Design units: 4)

Prerequisite: ENGRCEE 151A

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 156. Foundation Design. 4 Units.**

Applications of soil mechanics principles to the analysis and design of shallow foundations, retaining walls, pile foundations, and braced cuts. Design criteria: bearing capacity, working loads and tolerable settlements, structural integrity of the foundation element. Damage from construction operations.

(Design units: 3)

Prerequisite: ENGRCEE 130 and ENGRCEE 151C

Restriction: Civil Engineering Majors have first consideration for enrollment.

**ENGRCEE 160. Environmental Processes. 4 Units.**

Introduction to environmental processes in air and water, mass balances, and transport phenomena. Fundamentals of water-quality engineering including water and wastewater treatment.

(Design units: 1)

Prerequisite: (CHEM 1B or CHEM H2B) and ENGRCEE 170

Restriction: Civil Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 162. Introduction to Environmental Chemistry. 4 Units.**

Basic concepts from general, physical, and analytical chemistry as they relate to environmental engineering. Particular emphasis on the fundamentals of equilibrium and kinetics as they apply to acid-base chemistry, gas solubility, and redox reactions. Laboratory sessions. Materials fee.

(Design units: 0)

Prerequisite: (ENGR 1A or CHEM 1A or CHEM H2A) and (CHEM 1B or CHEM H2B) and (CHEM 1LC or CHEM 1LE or CHEM H2LB or CHEM M2LB) and (CHEM 51A or CHEM H52A)

Restriction: Chemical Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 163. Wastewater Treatment Process Design. 4 Units.**

Design of biological treatment processes. Topics include attached and suspended growth, aeration, anaerobic systems, process control, and economics. Design projects included. Materials fee.

(Design units: 4)

Prerequisite: ENGRCEE 160

Restriction: Civil Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 164. Carbon and Energy Footprint Analysis. 4 Units.**

Process design for wastewater treatment. Mass- and energy-balance analysis applied to water and wastewater treatment systems. Case studies include analysis of water supply, treatment, reclamation, and reuse.

(Design units: 2)

Prerequisite: ENGRCEE 160

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

Concurrent with ENGRCEE 264.

**ENGRCEE 165. Physical-Chemical Treatment Processes. 4 Units.**

Theory and dynamics of physical and chemical separation processes in water and wastewater treatment. Topics include coagulation, sedimentation, filtration, gas-transfer, membrane separations, and adsorption.

(Design units: 2)

Prerequisite: ENGRCEE 160 and (ENGRMAE 91 or CBE 40C)

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

Concurrent with ENGRCEE 265.

**ENGRCEE 169. Environmental Microbiology for Engineers. 4 Units.**

Fundamental and applied principles of microbiology. Structures and functions of microorganisms, the microbiology of water, wastewater and soil used in environmental engineering, and the impact of microorganisms on human and environmental health.

(Design units: 0)

Prerequisite: ENGRCEE 160

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 170. Introduction to Fluid Mechanics. 4 Units.**

Thermodynamic and mechanical fluid properties; fluid statics; control volume and differential approaches for mass, momentum, and energy; dimensional analysis and similarity.

(Design units: 1)

Corequisite: MATH 2E and ENGRCEE 20

Prerequisite: PHYSICS 7C

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 171. Water Resources Engineering. 4 Units.**

Principles governing the analysis and design of water resource systems including pressurized pipelines, pipe networks, channels, and ground water. Coverage of fluid mass, momentum and energy conservation, flow resistance, and related laboratory measurements in different systems. Materials fee.

(Design units: 2)

Prerequisite: ENGRCEE 170

Restriction: Chemical Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 172. Groundwater Hydrology. 4 Units.**

Topics include conservation of fluid mass, storage properties of porous media, matrix compressibility, boundary conditions, flow nets, well hydraulics, groundwater chemistry, and solute transport. Design projects and computer applications included.

(Design units: 2)

Prerequisite: ENGRCEE 170 or ENGRMAE 130A or CBE 120A

Restriction: Civil Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

Concurrent with ENGRCEE 272.

**ENGRCEE 173. Watershed Modeling. 4 Units.**

Basic principles of hydrologic modeling are practiced. Concepts of watershed delineation, land use change impact, design studies, and GIS tools are discussed. Focus on the USACE (HEC) software tools (HEC-HMS, and HEC-RAS) along with their associated GIS interfaces.

(Design units: 1)

Prerequisite: ENGRCEE 170 and ENGRCEE 176

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

Concurrent with ENGRCEE 273.

**ENGRCEE 176. Hydrology. 4 Units.**

Elements of the hydrologic cycle including precipitation, infiltration, evapotranspiration, ground water, and runoff. Unit Hydrograph theory and routing methods. Introduction to precipitation/runoff relationship and watershed modeling. Statistical methods and flood frequency analysis.

(Design units: 2)

Prerequisite: ENGRCEE 170 or ENGRMAE 130A

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

Concurrent with ENGRCEE 276.

**ENGRCEE 178. Fluid Mechanics of Open Channels. 4 Units.**

Fundamentals of fluid motion in open channels. Navier-Stokes equations and one-dimensional momentum and energy principles. Topics include rapidly varied flow, flow resistance and turbulence, gradually varied flow, unsteady flow, and computational methods for channel flow modeling.

(Design units: 1)

Prerequisite: (ENGRCEE 20 or BME 60B or ENGRMAE 10) and (ENGRCEE 170 or ENGRMAE 130A or CBEMS 125A)

Restriction: Civil Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRCEE 181A. Senior Design Practicum I. 2 Units.**

Team designs land development project including infrastructural, environmental, circulation aspects. Focus on traffic impact studies, design of roads, geometry, signals, geotechnical and hydrological analysis, design of structural elements, economic analysis. Oral/Written interim and final design reports. Laboratory sessions.

(Design units: 1)

Prerequisite: ENGRCEE 81A and ENGRCEE 81B and ENGRCEE 110 and (ENGRCEE 121 or ENGRCEE 151C or ENGRCEE 162 or ENGRCEE 171). ENGRCEE 181A and ENGRCEE 181B and ENGRCEE 181C must be taken in the same academic year.

Restriction: Seniors only. Civil Engineering Majors only. Environmental Engineering Majors only.

**ENGRCEE 181B. Senior Design Practicum II. 2 Units.**

Team designs land development project including infrastructural, environmental, circulation aspects. Focus on traffic impact studies, design of roads, geometry, signals, geotechnical and hydrological analysis, design of structural elements, economic analysis. Oral/Written interim and final design reports. Laboratory sessions.

(Design units: 2)

Corequisite: ENGRCEE 130

Prerequisite: ENGRENGRCEE 181A. CEE 181A and ENGRCEE 181B and ENGRCEE 181C must be taken in the same academic year.

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Seniors only. Civil Engineering Majors only. Environmental Engineering Majors only.

**ENGRCEE 181C. Senior Design Practicum III. 2 Units.**

Team designs land development project including infrastructural, environmental, circulation aspects. Focus on traffic impact studies, design of roads, geometry, signals, geotechnical and hydrological analysis, design of structural elements, economic analysis. Oral/Written interim and final design reports. Laboratory sessions.

(Design units: 2)

Prerequisite: ENGRENGRCEE 181B. ENGRCEE 181A and CEE 181B and ENGRCEE 181C must be taken in the same academic year.

Restriction: Seniors only. Civil Engineering Majors only. Environmental Engineering Majors only.

**ENGRCEE 195. Special Topics in Civil and Environmental Engineering. 1-4 Units.**

Studies in selected areas of Civil and Environmental Engineering. Topics addressed vary each quarter.

(Design units: 1-4)

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**ENGRCEE 198. Group Study. 1-4 Units.**

Group study of selected topics in Civil and Environmental Engineering.

(Design units: 1-4)

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**ENGRCEE 199. Individual Study. 1-4 Units.**

For undergraduate Engineering majors in supervised but independent reading, research, or design. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Repeatability: May be taken for credit for 8 units.

**ENGRCEE 199P. Individual Study. 1-4 Units.**

Supervised independent reading, research, or design for undergraduate Engineering majors. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**ENGRCEE 214. GIS for Civil and Environmental Engineering. 4 Units.**

GIS for CEE provides an introduction to Geographic Information Systems (GIS) and their various applications in civil and environmental engineering. Topics include GIS data formats, data queries, spatial and attribute data, spatial data analysis, coordinate systems, raster data analysis.

Concurrent with ENGRCEE 114.

**ENGRCEE 220A. Travel Demand Analysis I. 4 Units.**

Fundamentals of transportation systems analysis. Theoretical aspects of travel demand. Travel behavior. Modeling of performance characteristics and costs of transportation modes. In-depth presentation of travel demand modeling techniques. Development of travel choice models including mode, route, and destination choice. Equilibrium.

Restriction: Graduate students only.

**ENGRCEE 220B. Travel Demand Analysis II. 4 Units.**

Methods of discrete choice analysis and their applications in the modeling of transportation systems. Emphasis on the development of a sound understanding of theoretical aspects of discrete choice modeling that are useful in many applications in travel demand analysis.

Prerequisite: ENGRCEE 220A

Restriction: Graduate students only.

**ENGRCEE 220C. Travel Demand Analysis III: Activity-based Approaches. 4 Units.**

The methodological underpinnings of activity-based travel demand modeling. Presents methodologies within the context of a generalization of discrete choice modeling approaches, emphasizing the distinctions that separate these two approaches and presenting appropriate mathematical and statistical tools to address these distinctions.

Prerequisite: ENGRCEE 220A

Restriction: Graduate students only.

**ENGRCEE 221A. Transportation Systems Analysis I. 4 Units.**

Introduction to mathematical methods and models to address logistics and urban transportation problems. Techniques include stochastic models, queueing theory, linear programming, and introductory non-linear optimization.

Restriction: Graduate students only.

**ENGRCEE 221B. Transportation Systems Analysis II. 4 Units.**

Advanced mathematical methods and models to address logistics and urban transportation problems. Topics include network flows, advanced optimization techniques, network models, and heuristic algorithms.

Prerequisite: ENGRCEE 221A

Restriction: Graduate students only.

**ENGRCEE 222. Transit Systems Planning. 4 Units.**

Planning methods for public transportation in urban areas. Technological and operating characteristics of vehicles, facilities, and systems. Short-range planning techniques: data collection and analysis, demand analysis, mode choice, operational strategies, financial analysis. Design of systems to improve performance.

Restriction: Graduate students only.

**ENGRCEE 223. Transportation Systems III: Planning and Forecasting. 4 Units.**

Theoretical foundations of transportation planning, design, and analysis methods. Theory and application of aggregate and disaggregate models for land use development, trip generation, destination, mode, and route choice. Transportation network analysis. Planning, design, and evaluation of system alternatives.

Restriction: Graduate students only.

Concurrent with ENGRCEE 123.

**ENGRCEE 224A. Transportation Data Analysis I. 4 Units.**

Statistical analysis of transportation data sources. Analysis of categorical and ordinal data. Regression and advanced multivariate analysis methods such as discriminant analysis, canonical correlation, and factor analysis. Sampling techniques, sample error and bias, survey instrument design.

Restriction: Graduate students only.

**ENGRCEE 225B. Transportation Planning Models II. 4 Units.**

Design and application of comprehensive transportation models. Network development, demand modeling, and equilibrium assignment. Model calibration, validation, prediction, and evaluation. Regional modeling, site impact analysis, and circulation studies. Design of transportation alternatives.

Prerequisite: ENGRCEE 223

Restriction: Graduate students only.

**ENGRCEE 226A. Traffic Flow Theory I. 4 Units.**

Traffic measurement and fundamental speed-density-flow relationships. Kinematic models. Shock waves. Statistical-kinetic theory of traffic. Introductory car-following principles and stability. Gap acceptance. Platoon dispersion. Two-fluid model. Queueing process. Multi-regime and catastrophe models. Higher-order continuum models. Microscopic and macroscopic simulation.

Restriction: Graduate students only.

**ENGRCEE 226B. Traffic Flow Theory II. 4 Units.**

Advanced mathematical analysis of vehicular flow. Detailed treatise on car-following models. Fourier and Laplace analysis of stability problems. Perturbation analysis. Derivation of macroscopic traffic flow relationships from microscopic considerations. Advanced hydrodynamic theory.

Prerequisite: ENGRCEE 226A

Restriction: Graduate students only.

**ENGRCEE 228A. Urban Transportation Networks I. 4 Units.**

Analytical approaches and algorithms to the formulation and solution of the equilibrium assignment problem for transportation networks. Emphasis on user equilibrium (UE) comparison with system optimal, mathematical programming formulation, supply functions, estimation. Estimating origin-destination matrices, network design problems.

Prerequisite: ENGRCEE 220A

Restriction: Graduate students only.



**ENGRCEE 228B. Urban Transportation Networks II. 4 Units.**

Advanced analysis, optimization, and modeling of transportation networks. Topics include advanced static and dynamic traffic assignment algorithms, linear and nonlinear multi-commodity network flow optimization, network simplex, and network control problems.

Prerequisite: ENGRCEE 221A and ENGRCEE 228A

Restriction: Graduate students only.

**ENGRCEE 229A. Traffic Systems Operations and Control I. 4 Units.**

Introduction to operation, control, and analysis of arterial and freeway traffic systems. Control concepts, traffic stream principles, detectors, local controllers, system masters, traffic signal and ramp metering timing principles, traffic measurement technologies, traffic delay principles.

Restriction: Graduate students only.

Concurrent with ENGRCEE 122.

**ENGRCEE 229B. Traffic Systems Operations and Control II. 4 Units.**

Advanced topics related to operation, control, and analysis of arterial and freeway traffic systems. Control concepts, traffic stream principles, detectors, local controllers, system masters, traffic signal and ramp metering timing principles.

Prerequisite: ENGRCEE 229A

Restriction: Graduate students only.

**ENGRCEE 231. Foundation Engineering. 4 Units.**

Essentials for design and analysis of structural members that transmit superstructure loads to the ground. Topics include subsurface investigations, excavation, dewatering, bracing, footing, mat foundations, piles and pile foundations, caissons and cofferdams, other special foundations.

Restriction: Graduate students only.

**ENGRCEE 232. Geotech Earthquake Engineering. 4 Units.**

In-situ and laboratory determination of dynamic soil properties, liquefaction of soil, cyclic softening of clays, seismic compression and settlement analyses, ground improvement methods, seismic slope stability, introduction to soil structure interaction.

Restriction: Graduate students only.

**ENGRCEE 240. High Performance Materials. 4 Units.**

Part I: Linear and nonlinear fracture mechanics, methodology, real-world case studies; Part II: Composite material toughening, underlying micromechanics, materials engineering towards microstructure tailoring and new material design approaches; Part III: Emerging high-performance engineering materials for safety, energy and the environment.

Restriction: Graduate students only.

**ENGRCEE 242. Advanced Strength of Materials. 4 Units.**

Beams on elastic foundations. Combined axial and lateral loads. Curved beams. Unsymmetric bending. Shear center. Stresses and strains. Basic equations for theory of elasticity. Energy principles. Theory of torsion. Combined bending and torsion.

Restriction: Graduate students only.

**ENGRCEE 243. Mechanics of Composite Materials. 4 Units.**

Stress-strain relationship for orthotropic materials; invariant properties of an orthotropic lamina; biaxial strength theory for an orthotropic lamina; mechanics of materials approach to stiffness; elasticity approach to stiffness; classical lamination theory; strength of laminates; statistical theory of fatigue damage.

Restriction: Graduate students only.

**ENGRCEE 247. Structural Dynamics. 4 Units.**

Vibration of discrete and continuous mass elastic systems. Isolation and transmissibility. Dynamic recording instruments. Introduction to nonlinear theory of vibration. Response of structures to earthquake, traffic, and wind loads. Response spectra concepts. Normal mode analysis. Numerical integration techniques.

Restriction: Graduate students only.

**ENGRCEE 249. Earthquake Engineering. 4 Units.**

Earthquake magnitude, intensity, and frequency. Seismic damage to structures. Earthquake load prediction including response spectra, normal mode, and direct integration techniques. The basis of building code earthquake load requirements for buildings. Seismic response of special structures. Lifeline engineering.

Restriction: Graduate students only.

**ENGRCEE 250. Finite Element Method in Structural Engineering. 4 Units.**

Finite element concepts in structural engineering including variational formulations, shape functions, elements assembly, convergence and computer programming. Stiffness of truss, beam, and frame members, two- and three-dimensional solids, plate and shell elements. Static, vibration, stability, and inelastic analysis.

Restriction: Graduate students only.

**ENGRCEE 252. Multiscale Modeling of Materials and Structures. 4 Units.**

Introduction to modeling materials and structures across length.

Restriction: Graduate students only.

**ENGRCEE 254. Advanced Reinforced Concrete Behavior and Design. 4 Units.**

Flexural strength of reinforced concrete elements. Flexural ductility of unconfined and confined members with axial loads. Shear and torsional behaviors. Strength of reinforced concrete ductile frames and shear walls. Reinforced concrete detailing.

Restriction: Graduate students only.

**ENGRCEE 255. Advanced Behavior and Design of Steel Structures. 4 Units.**

Advanced principles of structural steel design. Analysis and design of beam-column members, braced and unbraced frames for buildings, and plate girders. Review of seismic design provisions. Design of connections.

Restriction: Graduate students only.

**ENGRCEE 258. Earthquake Resistant Structural Design. 4 Units.**

Objectives of seismic design. Cyclic load-distortion characteristics of typical structural elements. Desirable structural form. Ductility and methods of achieving it. Use of energy dissipators. Project involving design of multistory, multibay rigid-jointed plane frame.

Restriction: Graduate students only.

**ENGRCEE 260. Desalination. 4 Units.**

Introduction of state of technology, costs and benefits, environmental issues, and implementation issues related to desalination. Emphasis on membrane processes and biofouling prevention.

Restriction: Graduate students only.

**ENGRCEE 261. Applied Environmental Microbiology. 4 Units.**

Microbes in the environment and their impact on human interactions. Microbiological application in solving environmental engineering problems.

Restriction: Graduate students only.

**ENGRCEE 262. Environmental Chemistry II. 4 Units.**

Advanced concepts from physical and organic chemistry as they relate to environmental engineering. Emphasis on equilibrium and kinetics as they apply to redox reactions, coordination, absorption, gas phase reactions, and ion exchange.

Restriction: Graduate students only.

**ENGRCEE 263. Advanced Biological Treatment Processes. 4 Units.**

Analysis of biological processes in natural and engineered systems. Biological treatment processes, both aerobic and anaerobic, with emphasis on suspended growth systems including design consideration. Containment degradation or control covered. Includes laboratory on molecular tools used in wastewater treatment.

Restriction: Graduate students only.

**ENGRCEE 264. Carbon and Energy Footprint Analysis. 4 Units.**

Process design for wastewater treatment. Mass- and energy- balance analysis applied to water and wastewater treatment systems. Case studies include analysis of water supply, treatment, reclamation, and reuse.

Restriction: Graduate students only.

Concurrent with ENGRCEE 164.

**ENGRCEE 265. Physical-Chemical Treatment Processes. 4 Units.**

Theory and dynamics of physical and chemical separation processes in water and wastewater treatment. Topics include coagulation, sedimentation, filtration, gas transfer, membrane separations, and absorption.

Restriction: Graduate students only.

Concurrent with ENGRCEE 165.

**ENGRCEE 266. Drinking Water and Wastewater Biotechnology. 4 Units.**

Water and wastewater microbiology. Engineering principles, molecular aspects, and overview of microorganisms of importance to public health. Topics include aerobic and anaerobic wastewater treatment and disinfection of pathogens in water, wastewaters, and biosolids.

Restriction: Graduate students only.

**ENGRCEE 267. Energy, Climate Change, and Urban Air Quality. 4 Units.**

An introduction to the connection between energy, climate change, and urban air quality. It will focus on air quality and climate implications of energy choices, bringing light to the most important and time-relevant issues.

Restriction: Graduate students only.

**ENGRCEE 269. Beach Dynamics. 4 Units.**

Coastal erosion in California, human and natural influences on southern California beaches, and present-day challenges. Littoral cells and sediment budgets. Water wave theory. Littoral sediment transport and shoreline change modeling. Shoreline stabilization using green and gray infrastructure.

Restriction: Graduate students only.

**ENGRCEE 270. Flood Risk and Modeling. 4 Units.**

Global and national trends in flooding and related impacts including disasters; flood risk management; theory and numerical methods for flood inundation modeling; flood risk communication strategies including flood hazard visualizations.

**ENGRCEE 271. Flow in Unsaturated Porous Media. 4 Units.**

Fluid flow in the unsaturated zone (zone of aeration) of the subsurface. Soil-water physics, flow in regional groundwater systems, miscible displacement, mathematical modeling techniques.

Restriction: Graduate students only.

**ENGRCEE 272. Groundwater Hydrology. 4 Units.**

Topics include conservation of fluid mass, storage properties of porous media, matrix compressibility, boundary conditions, flow nets, well hydraulics, groundwater chemistry, and solute transport. Includes introduction to advanced topics in porous media. Design projects and computer applications included.

Restriction: Graduate students only.

Concurrent with ENGRCEE 172.

**ENGRCEE 273. Watershed Modeling. 4 Units.**

Basic principles of hydrologic modeling are practiced. Concepts of watershed delineation, land use change impact, design studies, and GIS tools are discussed. Focus on the USACE (HEC) software tools (HEC-HMS and HEC-RAS) along with their associated GIS interfaces.

Restriction: Graduate students only.

Concurrent with ENGRCEE 173.

**ENGRCEE 274. Climate Data Analysis. 4 Units.**

Trend analysis; statistical indices for diagnosing and detecting changes in extremes; nonstationary processes; extreme value analysis; multivariate extreme value methods; tail dependence estimation; uncertainties in observed and projected changes in climate extremes.

**ENGRCEE 275. Topics in Coastal Engineering. 4 Units.**

Linear wave theory. Wave properties: particle kinematics, energy propagation, shoaling, refraction, reflection, diffraction, and breaking. Wave statistics and spectra. Selected topics from: design of coastal structures; harbor engineering; littoral transport and shoreline morphology; and hydrodynamics of estuaries.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ENGRCEE 276. Hydrology. 4 Units.**

Elements of the hydrologic cycle including precipitation, infiltration, evapotranspiration, ground water, and runoff. Unit Hydrograph theory and routing methods. Introduction to precipitation/runoff relationship and watershed modeling. Statistical methods and flood frequency analysis. Discussion section covers advanced topics.

Restriction: Graduate students only.

Concurrent with ENGRCEE 176.

**ENGRCEE 277. Hydrologic Transport Fundamentals. 4 Units.**

Process description, mathematical and numerical modeling of transport processes in surface and ground water. Topics include advection, molecular diffusion, Taylor dispersion, mechanical dispersion in porous media, shear flow dispersion in channels, and turbulent jets and plumes.

Restriction: Graduate students only.

**ENGRCEE 279. Environmental Transport Modeling. 4 Units.**

Computational modeling of multi-dimensional flow and scalar transport problems in surface and ground water. Topics include mathematical model formulation, numerical method selection, serial and parallel implementation, model verification and validation.

Restriction: Graduate students only.

**ENGRCEE 281. Structural Reliability. 4 Units.**

Applications of probability theory to reliability analysis of engineering structures. Theory of structural reliability. Estimation of static random loads. Reliability analysis of structural components and system. Monte Carlo simulation.

Restriction: Graduate students only.

**ENGRCEE 283. Mathematical Methods in Engineering Analysis. 4 Units.**

Matrices; vector calculus; eigenvalue problems; Fourier analysis; partial differential equations; special functions; numerical analysis; finite difference method.

**ENGRCEE 289. Analysis of Hydrologic Systems. 4 Units.**

Application of systems theory in hydrologic, land surface, biogeochemical modeling. Design, identification, and calibration of conceptual models. Principles of dynamic systems, modeling approaches, theory of linear systems, mathematical concepts of differential calculus, theoretical concepts of parameter estimation and optimization theory.

**ENGRCEE 290. Merging Models and Data. 4 Units.**

Introduction to optimization and data assimilation methods for model calibration and uncertainty quantification. Local, global and multi-method search. Bayesian analysis using Monte Carlo simulation with Random Walk Metropolis, and adaptive samplers. Filtering methods for recursive inference. Illustration using environmental models.

Restriction: Graduate students only.

**ENGRCEE 291. Hydrologic Remote Sensing. 4 Units.**

Introduction to principles of remote sensing and application in hydrology. Review of sensor systems, thermal and multispectral image processing, and image classification. Examples from remote sensing of hydrologic processes such as precipitation, soil moisture, and vegetation are covered.

Prerequisite: ENGRCEE 276

Restriction: Graduate students only.

**ENGRCEE 292. Wavelets in Hydrology, Engineering, and Geoscience. 4 Units.**

Multiscale analysis of hydrologic, engineering, and earth system processes; energy decomposition in the time-frequency domain via wavelets; applications to fluid flows, climate and mechanical signals for feature extraction, trend analysis, coherent structures, and upscaling/downscaling.

Restriction: Graduate students only.

**ENGRCEE 295. Seminars in Engineering. 1-4 Units.**

Seminars scheduled each year by individual faculty in major field of interest.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ENGRCEE 296. Master of Science Thesis Research. 1-16 Units.**

Individual research or investigation conducted in preparation of the thesis required for the M.S. degree in Engineering.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ENGRCEE 297. Doctor of Philosophy Dissertation Research. 1-16 Units.**

Individual research or investigation conducted in preparation for the dissertation required for the Ph.D. degree in Engineering.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ENGRCEE 298. Special Topics in Civil Engineering. 1-4 Units.**

Presentation of advanced topics and special research areas in civil engineering.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ENGRCEE 299. Individual Research. 1-16 Units.**

Individual research or investigation under the direction of an individual faculty member.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Civil and Environmental Engineering, M.S.

Civil and Environmental Engineering provides innovative solutions at the interface of the natural and the built environment for the benefit of society. As such, education and research addresses the efficient design, maintenance, and sustainability of infrastructure while preserving and sustaining natural, social, and economic resources. The Department of Civil and Environmental Engineering focuses its graduate study and research program on four areas: **Structures, Geotechnics, and Materials**, including civil infrastructure materials, engineering mechanics, advanced composites, structural dynamics, performance-based earthquake engineering, geotechnical engineering, and reliability and risk assessment; **Transportation Systems**, including traffic operations and management, advanced information technology applications, travel behavior, and transportation systems analysis; **Hydrology and Water Resources Systems**, including dynamics of the hydrologic cycle and climate induced variability, flood and drought prediction and mitigation, and remote sensing of hydrologic systems; and **Environmental and Energy Systems**, including environmental pollution mitigation, water and air quality, water treatment technologies, water and energy nexus, and renewable energy.

The M.S. reflects achievement of an advanced level of competence for the professional practice of civil and environmental engineering. Two plans are available to those working toward the M.S.: Thesis option and Course Work option. Opportunities are available for part-time study toward the M.S. The Plan of Study for both options must be developed in consultation with a Faculty Advisor and approved by the Program Graduate Advisor.

### Plan I: Thesis Option

The thesis option requires completion of 48 units of study of which a maximum of ten units can be taken for study in conjunction with the thesis research topic. Upon approval of the Program Graduate Advisor, the maximum of 10 units of thesis research can be extended to 16 units. Thesis research includes the completion of an original research project; the writing of the thesis describing it; and review by a thesis committee. Of the 48 units, a minimum of 28 units must be in non-research, graduate-level approved engineering or related courses (numbered 200–292). The remaining units may be earned as graduate-level course work, individual research, or upper-division undergraduate units (maximum ten units).

## Plan II: Course Work Option

Course Work option requires the completion of 48 units of study, at least 40 of which must be in non-research graduate-level approved engineering or related courses (numbered 200–292). The remaining eight units may be earned as graduate-level course work, individual research, or upper-division undergraduate units.

At the point of application a student is required to choose one of four focus areas: Structures, Geotechnics and Materials; Transportation Systems; Hydrology and Water Resources Systems; or Environmental and Energy Systems. Once admitted, each student will be assigned to an advisor from among active faculty in their focus area. Financial support through research or teaching assistantships and a variety of fellowships and scholarships is available to qualified students and highly competitive. Interdisciplinary study in one or more areas outside of the student's primary focus area is strongly encouraged.

### Structures, Geotechnics, and Materials

This area emphasizes the application of analytical, numerical, experimental, and practical approaches to the investigation of built infrastructure systems that withstand natural and man-made loads and hazards. Specific interests include sensors and structural health monitoring, composites for infrastructure applications, reliability and risk assessment of civil engineering systems, structural control, system identification and damage detection, performance-based earthquake engineering, soil-structure interaction, smart materials and structures, multi-scale modeling, and sustainable green materials and infrastructural systems.

### Transportation Systems

Among leading centers for transportation research, the department offers a graduate research area that is distinguished by its interdisciplinary approach to the study of current and emerging urban transportation issues and through its partnership with the UC Irvine Institute of Transportation Studies. This area focuses on the planning, design, operation, and management of complex transportation systems. Emphasis is on the development of fundamental knowledge in engineering, systems analysis, modeling, and planning, combined with advanced computational techniques and information technologies, to address transportation problems affecting urban travel and goods movement.

### Hydrology and Water Resources Systems

Developing sustainable water supplies while preserving natural resources and the environment is a grand challenge in the 21st century requiring interdisciplinary thinking and engineering solutions. This area focuses on fundamentals and the use of mathematical, computational, and experimental approaches to understanding the dynamics of the hydrologic cycle, transport within aquatic systems, and the impact of human activity, particularly in urban areas. Specific areas include water resources planning, remote sensing of the environment, water-related hazards such as floods and droughts, and transport in land, oceans, and the atmosphere.

### Environmental and Energy Systems

Treatment, distribution, and collection of water and wastewater are energy intensive operations, and energy generation and distribution have direct and indirect impacts on environmental systems. This area addresses these interrelated challenges by focusing on the treatment and supply of water for municipal, agricultural, energy, and environmental uses, sustainable practices for managing urban stormwater, and chemical and microbiological processes for water treatment. Additionally, novel approaches for energy generation and distribution are covered in this area. Understanding and minimizing emissions of greenhouse gasses associated with water and wastewater treatment and energy generation and distribution are common themes in this area.

## Civil and Environmental Engineering, Ph.D.

The Ph.D. indicates attainment of an original and significant research contribution to the state-of-the-art in the candidate's field, and an ability to communicate advanced engineering concepts. The doctoral program is tailored to the individual needs and background of the student. The detailed program of study for each Ph.D. student is formulated in consultation with a faculty advisor who takes into consideration the objectives and preparation of the candidate. The program of study must be approved by the faculty advisor and the Graduate Advisor of the Department.

The Ph.D. dissertation is written documentation of original research that has impact on the chosen field of study. For the UCI Samueli School of Engineering, impact in the field is measured by accepted or published peer-reviewed journal articles, peer-reviewed conference proceedings, patents, or analogous evidence of original, significant, and independent contribution to the state of the art in the field as assessed by the approved dissertation committee.

There are no specific course requirements. Within this flexible framework, the School maintains specific guidelines that outline the milestones of a typical doctoral program. All doctoral students should consult the Civil and Environmental Engineering program's guidelines for details, but there are several milestones to be passed: admission to the Ph.D. program by the faculty; early assessment of the student's research potential (this includes a preliminary examination); research preparation; formal advancement to candidacy by passing the qualifying examination in the third year (second year for students who entered with a master's degree); completion of a significant research investigation; and the submission and oral defense of an acceptable dissertation. There is no foreign language requirement. Ph.D. students have to meet departmental research requirements as a research assistant or equivalent, with or without salary. The degree is granted upon the recommendation of the Doctoral Committee and the Dean of Graduate Studies. The normative time for completion of the Ph.D. is five years (four years for students who entered with a master's degree). The maximum time permitted is seven years.

At the point of application a student is required to choose one of four focus areas: Structures, Geotechnics and Materials; Transportation Systems; Hydrology and Water Resources Systems; or Environmental and Energy Systems. Once admitted, each student will be assigned to an advisor from among active faculty in their focus area. Financial support through research or teaching assistantships and a variety of fellowships and scholarships is available to qualified students and highly competitive. Interdisciplinary study in one or more areas outside of the student's primary focus area is strongly encouraged.

### **Structures, Geotechnics, and Materials**

This area emphasizes the application of analytical, numerical, experimental, and practical approaches to the investigation of built infrastructure systems that withstand natural and man-made loads and hazards. Specific interests include sensors and structural health monitoring, composites for infrastructure applications, reliability and risk assessment of civil engineering systems, structural control, system identification and damage detection, performance-based earthquake engineering, soil-structure interaction, smart materials and structures, multi-scale modeling, and sustainable green materials and infrastructural systems.

### **Transportation Systems**

Among leading centers for transportation research, the department offers a graduate research area that is distinguished by its interdisciplinary approach to the study of current and emerging urban transportation issues and through its partnership with the UC Irvine Institute of Transportation Studies. This area focuses on the planning, design, operation, and management of complex transportation systems. Emphasis is on the development of fundamental knowledge in engineering, systems analysis, modeling, and planning, combined with advanced computational techniques and information technologies, to address transportation problems affecting urban travel and goods movement.

### **Hydrology and Water Resources Systems**

Developing sustainable water supplies while preserving natural resources and the environment is a grand challenge in the 21st century requiring interdisciplinary thinking and engineering solutions. This area focuses on fundamentals and the use of mathematical, computational, and experimental approaches to understanding the dynamics of the hydrologic cycle, transport within aquatic systems, and the impact of human activity, particularly in urban areas. Specific areas include water resources planning, remote sensing of the environment, water-related hazards such as floods and droughts, and transport in land, oceans, and the atmosphere.

### **Environmental and Energy Systems**

Treatment, distribution, and collection of water and wastewater are energy intensive operations, and energy generation and distribution have direct and indirect impacts on environmental systems. This area addresses these interrelated challenges by focusing on the treatment and supply of water for municipal, agricultural, energy, and environmental uses, sustainable practices for managing urban stormwater, and chemical and microbiological processes for water treatment. Additionally, novel approaches for energy generation and distribution are covered in this area. Understanding and minimizing emissions of greenhouse gasses associated with water and wastewater treatment and energy generation and distribution are common themes in this area.

## **Civil Engineering, B.S.**

**Program Educational Objectives:** Graduates of the Civil Engineering program will (1) establish a Civil Engineering career in industry, government, or academia and achieve professional licensure as appropriate; (2) demonstrate excellence and innovation in engineering problem solving and design in a global and societal context; (3) commit to lifelong learning and professional development to stay current in technology and contemporary issues; and (4) take on increasing levels of responsibility and leadership in technical and/or managerial roles. (Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

The curriculum provides the opportunity to obtain a firm foundation in engineering science and to develop the techniques of analysis and design, which are basic for the successful practitioner. Emphasis is placed on developing problem-solving skills.

**High School Students:** See School Admissions information.

**Transfer Students:** Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following **required** courses: two years of approved calculus, one year of calculus-based physics with laboratories (mechanics, electricity and magnetism), completion of lower-division writing, one year of general chemistry (with laboratory), and one course in introductory programming. For course equivalency specific to each college, see <https://assist.org>.

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division coursework may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at 949-824-4334.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### **Major Requirements**

#### **Mathematics and Basic Science Courses:**

CHEM 1A

General Chemistry



or

ENGR 1A	General Chemistry for Engineers
CHEM 1B	General Chemistry
ENGRCEE 11	Methods II: Probability and Statistics
MATH 2A- 2B	Single-Variable Calculus and Single-Variable Calculus
MATH 2D	Multivariable Calculus
MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations
MATH 2E	Multivariable Calculus
PHYSICS 7C	Classical Physics
PHYSICS 7LC	Classical Physics Laboratory
PHYSICS 7D	Classical Physics
PHYSICS 7LD	Classical Physics Laboratory

One basic science elective selected from any Biological Science or Earth Systems Science course with approved GE II designation.

**Lower-Division Technical Elective:**

Select one course from two of the sections:

## Section A:

ENGR 7A- 7B	Introduction to Engineering I and Introduction to Engineering II *
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## Section B:

CHEM 1LE	Accelerated General Chemistry Lab
CHEM 1C- 1LC	General Chemistry and General Chemistry Laboratory

## Section C:

EECS 70A	Network Analysis I
ENGR 54	Principles of Materials Science and Engineering
ENGRMAE 80	Dynamics
ENGRMAE 91	Introduction to Thermodynamics

**Engineering Topics Courses:**

ENGRCEE 20	Introduction to Computational Problem Solving
ENGRCEE 21	Computational Problem Solving
ENGRCEE 30	Statics
ENGRCEE 81A	Civil Engineering Practicum I
ENGRCEE 81B	Civil Engineering Practicum II
ENGRCEE 110	Methods III: Modeling, Economics, and Management
ENGRCEE 111	Methods IV: Systems Analysis and Decision-Making
ENGRCEE 121	Transportation Systems I: Analysis and Design
ENGRCEE 130	Soil Mechanics
ENGRCEE 130L	Soil Mechanics Laboratory
ENGRCEE 150	Mechanics of Materials
ENGRCEE 150L	Mechanics of Materials Laboratory
ENGRCEE 151A	Structural Analysis
ENGRCEE 151C	Reinforced Concrete Design
ENGRCEE 160	Environmental Processes
ENGRCEE 170	Introduction to Fluid Mechanics
ENGRCEE 171	Water Resources Engineering
ENGRCEE 181A- 181B- 181C	Senior Design Practicum I and Senior Design Practicum II and Senior Design Practicum III

**Engineering Professional Topics Courses:**

ECON 20A- 20B	Basic Economics I and Basic Economics II
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ENGR 190W	Communications in the Professional World
ENGRCEE 60	Contemporary and Emerging Environmental Challenges
or UPPP 8	Introduction to Environmental Analysis and Design

**Specialization Electives:**

Students must select one of the areas of specialization and complete the associated requirements, as shown below. Students select, with the approval of a faculty advisor, any additional engineering topics courses needed to satisfy school and departmental requirements.

**Specialization in General Civil Engineering:**

Requires four courses, at least one course each from three of the following four options:

(1) Select one:	
ENGRCEE 122	Transportation Systems II: Operations and Control
ENGRCEE 123	Transportation Systems III: Planning and Forecasting
(2) Select one:	
ENGRCEE 149	Introduction to Earthquake Engineering
ENGRCEE 151B	Structural Timber Design
ENGRCEE 152	Computer Methods in Structural Analysis and Design
ENGRCEE 155	Structural Steel Design
ENGRCEE 156	Foundation Design
(3) Select one:	
ENGRCEE 163	Wastewater Treatment Process Design
ENGRCEE 164	Carbon and Energy Footprint Analysis
ENGRCEE 165	Physical-Chemical Treatment Processes
ENGRCEE 169	Environmental Microbiology for Engineers
(4) Select one:	
ENGRCEE 172	Groundwater Hydrology
ENGRCEE 173	Watershed Modeling
ENGRCEE 176	Hydrology
ENGRCEE 178	Fluid Mechanics of Open Channels

**Specialization in Environmental Hydrology and Water Resources:**

Select four of the following:

ENGRCEE 163	Wastewater Treatment Process Design
ENGRCEE 164	Carbon and Energy Footprint Analysis
ENGRCEE 165	Physical-Chemical Treatment Processes
ENGRCEE 169	Environmental Microbiology for Engineers
ENGRCEE 172	Groundwater Hydrology
ENGRCEE 173	Watershed Modeling
ENGRCEE 176	Hydrology
ENGRCEE 178	Fluid Mechanics of Open Channels

**Specialization in Structural Engineering:**

ENGRCEE 155	Structural Steel Design
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Select three of the following:

ENGRCEE 149	Introduction to Earthquake Engineering
ENGRCEE 151B	Structural Timber Design
ENGRCEE 152	Computer Methods in Structural Analysis and Design
ENGRCEE 156	Foundation Design
ENGRMAE 155	Composite Materials and Structures
ENGRMAE 157	Lightweight Structures

**Specialization in Transportation Systems Engineering:**

ENGRCEE 122	Transportation Systems II: Operations and Control
ENGRCEE 123	Transportation Systems III: Planning and Forecasting

Select two of the following:

EECS 70A	Network Analysis I (EECS 70A may not be used in this Specialization if used for a Lower-Division Technical Elective.)
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ENGRCEE 124	Transportation Systems IV: Freeway Operations and Control
ENGRCEE 125	Transportation and the Environment
ENGRMAE 170	Introduction to Control Systems
ENGRMAE 171	Digital Control Systems

- \* ENGR 7A-ENGR 7B is available only to lower-division students in Fall and Winter quarters. Both ENGR 7A-ENGR 7B must be taken to be counted as one Lower-Division Technical Elective.

In addition, students must aggregate a minimum of 22 design units. Design unit values are indicated at the end of each course description. The faculty advisors and the Student Affairs Office can provide necessary guidance for satisfying the design requirements.

(The nominal Civil Engineering program will require 185 units of courses depending on specialization to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary.)

At most an aggregate total of 6 units of 199 or H199 courses may be used to satisfy degree requirements.

The sample program of study chart shown is typical for the accredited major in Civil Engineering. Students should keep in mind that this program is based upon a rigid set of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Therefore, the course sequence should not be changed except for the most compelling reasons. Students must have their programs approved by their faculty advisor. Civil Engineering majors are encouraged to consult with academic counselors as needed, and students who are academically at risk are mandated to see a counselor as frequently as deemed necessary by the advising staff.

### Sample Program of Study — Civil Engineering

Freshman		
Fall	Winter	Spring
MATH 2A	MATH 2B	MATH 2D
CHEM 1A or ENGR 1A	PHYSICS 7C	PHYSICS 7D
Lower-Division Technical Elective	PHYSICS 7LC	PHYSICS 7LD
General Education	CHEM 1B	ENGRCEE 81A
	General Education	Basic Science Elective
Sophomore		
Fall	Winter	Spring
MATH 3A	MATH 3D	MATH 2E
ENGRCEE 20	ENGRCEE 11	ENGRCEE 21
ENGRCEE 30	ENGRCEE 81B	Lower-Division Technical Elective
General Education	General Education	General Education
Junior		
Fall	Winter	Spring
ENGRCEE 121	ENGRCEE 130	ENGRCEE 110
ENGRCEE 150	ENGRCEE 130L	ENGRCEE 151C
ENGRCEE 150L	ENGRCEE 151A	ENGRCEE 160
ENGRCEE 170	ENGRCEE 171	General Education
ENGR 190W		

- \* Note: ENGR 7A-ENGR 7B is available only to lower-division students in Fall and Winter quarters. Both ENGR 7A-ENGR 7B must be taken to be counted as one Lower-Division Technical Elective.

The following sample plans of study are provided for the senior year only; the first three years are common to all specializations.

### Senior-Year Sample Programs of Study — Civil Engineering

#### Senior: General Civil Engineering Specialization

Senior		
Fall	Winter	Spring
ENGRCEE 181A	ENGRCEE 181B	ENGRCEE 181C
Spec. Elective	ENGRCEE 111	Spec. Elective
General Education	Spec. Elective	Spec. Elective
General Education	General Education	General Education

Senior: Environmental Hydrology and Water Resources Specialization

Senior		
Fall	Winter	Spring
ENGRCEE 181A	ENGRCEE 181B	ENGRCEE 181C
Spec. Elective	ENGRCEE 111	Spec. Elective
General Education	Spec. Elective	Spec. Elective
General Education	General Education	General Education

Senior: Structural Engineering Specialization

Senior		
Fall	Winter	Spring
ENGRCEE 181A	ENGRCEE 181B	ENGRCEE 181C
ENGRCEE 155	ENGRCEE 111	Spec. Elective
Spec. Elective	Spec. Elective	General Education
General Education	General Education	General Education

Senior: Transportation Systems Engineering

Senior		
Fall	Winter	Spring
ENGRCEE 181A	ENGRCEE 181B	ENGRCEE 181C
Spec. Elective	ENGRCEE 111	ENGRCEE 123
General Education	ENGRCEE 122	Spec. Elective
General Education	General Education	General Education

## Environmental Engineering, B.S.

**Program Educational Objectives:** Graduates of the Environmental Engineering program will (1) establish an Environmental Engineering career in industry, government, or academia and achieve professional licensure as appropriate; (2) demonstrate excellence and innovation in engineering problem solving and design in a global and societal context; (3) commit to lifelong learning and professional development to stay current in technology and contemporary issues; and (4) take on increasing levels of responsibility and leadership in technical and/or managerial roles. (Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

The curriculum includes a core of mathematics, physics, chemistry, and biology, as well as engineering mechanics and methods courses. Students may select from a variety of environmental engineering courses to fulfill the remaining portion of the program and to focus their environmental engineering training in one or more of the following areas: water supply and resources, waste water management, or atmospheric systems and air pollution control. Design experiences are integrated into environmental engineering courses, and seniors enroll in a capstone design course.

**High School Students:** See School Admissions information.

**Transfer Students:** Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following **required** courses: two years of approved calculus, one year of calculus-based physics with laboratories (mechanics, electricity and magnetism), completion of lower-division writing, one year of general chemistry (with laboratory), and one course in introductory programming. For course equivalency specific to each college, visit [assist.org](https://assist.org) (<https://assist.org>).

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division coursework may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at 949-824-4334.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Major Requirements

#### Mathematics and Basic Science Courses:

CHEM 1A or ENGR 1A	General Chemistry General Chemistry for Engineers
CHEM 1B- 1C	General Chemistry and General Chemistry
CHEM 1LC- 1LD	General Chemistry Laboratory and General Chemistry Laboratory
CHEM 51A	Organic Chemistry
ENGRCEE 11	Methods II: Probability and Statistics

MATH 2A- 2B	Single-Variable Calculus and Single-Variable Calculus
MATH 2D	Multivariable Calculus
MATH 2E	Multivariable Calculus
MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations
PHYSICS 7C	Classical Physics
PHYSICS 7LC	Classical Physics Laboratory
PHYSICS 7D	Classical Physics
PHYSICS 7LD	Classical Physics Laboratory

Two additional basic science electives, one Earth System Science course approved for General Education II and one Biological Sciences course approved for General Education II.

#### Lower-Division Engineering Elective:

Students must take one course from the following:

CBE 40A	Chemical Processes and Material Balances
EECS 70A	Network Analysis I
ENGR 7A- 7B	Introduction to Engineering I and Introduction to Engineering II *
ENGR 54	Principles of Materials Science and Engineering
ENGRCEE 80 or ENGRMAE 80	Dynamics Dynamics

#### Engineering Topics Courses:

Students must complete a minimum of 19 units of engineering design.

##### Core Courses:

ENGRCEE 20	Introduction to Computational Problem Solving
ENGRCEE 21	Computational Problem Solving
ENGRCEE 30	Statics
ENGRCEE 81A	Civil Engineering Practicum I
ENGRCEE 81B	Civil Engineering Practicum II
ENGRMAE 91	Introduction to Thermodynamics
ENGRCEE 110	Methods III: Modeling, Economics, and Management
ENGRCEE 130- 130L	Soil Mechanics and Soil Mechanics Laboratory
ENGRCEE 150- 150L	Mechanics of Materials and Mechanics of Materials Laboratory
ENGRCEE 160	Environmental Processes
ENGRCEE 162	Introduction to Environmental Chemistry
ENGRCEE 170	Introduction to Fluid Mechanics
ENGRCEE 181A- 181B- 181C	Senior Design Practicum I and Senior Design Practicum II and Senior Design Practicum III

##### Engineering Elective Courses:

Students must take two courses each from two of the following three groups and one course from the remaining group. At least one of the Engineering electives must be one of the following courses: ENGRCEE 165, ENGRCEE 172, or ENGRCEE 178.

##### Water Supply and Resources:

ENGRCEE 171	Water Resources Engineering
ENGRCEE 172	Groundwater Hydrology
ENGRCEE 173	Watershed Modeling
ENGRCEE 176	Hydrology
ENGRCEE 178	Fluid Mechanics of Open Channels

##### Environmental Processes:

ENGRCEE 163	Wastewater Treatment Process Design
ENGRCEE 164	Carbon and Energy Footprint Analysis

ENGRCEE 165	Physical-Chemical Treatment Processes
ENGRCEE 169	Environmental Microbiology for Engineers
<b>Atmospheric Systems and Air Pollution Control:</b>	
EARTHSS 112	Global Climate Change and Impacts
ENGRMAE 110	Combustion and Fuel Cell Systems
ENGRMAE 115	Applied Engineering Thermodynamics
ENGRMAE 164	Air Pollution and Control

All additional engineering topics courses needed to satisfy school and major requirements must be approved by the faculty advisor. Environmental Engineering is an inherently interdisciplinary program. Students interested in pursuing a second degree along with Environmental Engineering may be able to substitute appropriate course work for required courses stated above. Please consult with an Engineering academic or faculty advisor.

#### Engineering Professional Topics Courses:

ECON 20A- 20B	Basic Economics I and Basic Economics II
ENGR 190W	Communications in the Professional World
ENGRCEE 60 or UPPP 8	Contemporary and Emerging Environmental Challenges Introduction to Environmental Analysis and Design

(The nominal Environmental Engineering program requires 191 units of courses to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary.)

At most an aggregate total of 6 units of 199 or H199 courses may be used to satisfy degree requirements.

- \* ENGR 7A-ENGR 7B is available only to lower-division students in Fall and Winter quarters. Both ENGR 7A-ENGR 7B must be taken to be counted as one Lower-Division Engineering Elective course.

The sample program of study chart shown is typical for the major in Environmental Engineering. Students should keep in mind that this program is based upon a sequence of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Students who are not adequately prepared, or who wish to make changes in the sequence for other reasons, must have their programs approved by their faculty advisor. Environmental Engineering majors are encouraged to consult with academic counselors as needed, and students who are academically at risk are mandated to see a counselor as frequently as deemed necessary by the advising staff.

## Sample Program of Study — Environmental Engineering

Freshman		
Fall	Winter	Spring
MATH 2A	MATH 2B	MATH 2D
CHEM 1A or ENGR 1A	CHEM 1B	CHEM 1C
Lower-Division Engineering Elective	PHYSICS 7C	CHEM 1LC
General Education	PHYSICS 7LC	PHYSICS 7D
		PHYSICS 7LD
		ENGRCEE 81A
Sophomore		
Fall	Winter	Spring
MATH 3A	MATH 3D	MATH 2E
CHEM 51A	ENGRCEE 11	ENGRCEE 21
CHEM 1LD	ENGRCEE 81B	ENGRMAE 91
ENGRCEE 20	General Education	General Education
ENGRCEE 30		
Junior		
Fall	Winter	Spring
ENGRCEE 150	ENGRCEE 130	ENGRCEE 110
ENGRCEE 150L	ENGRCEE 130L	ENGRCEE 160
ENGRCEE 170	ENGRCEE 162	Basic Science Elective
ENGR 190W	Engineering Elective	General Education
Basic Science Elective	General Education	
Senior		
Fall	Winter	Spring
ENGRCEE 181A	ENGRCEE 181B	ENGRCEE 181C
Engineering Elective	Engineering Elective	Engineering Elective
General Education	Engineering Elective	General Education
General Education	General Education	General Education

# Department of Electrical Engineering and Computer Science

## Athina Markopoulou, Department Chair

2213 Engineering Hall

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Electrical Engineering and Computer Science is a broad field of study reaching from physical electronic devices all the way up to complex computer software. It encompasses diverse subject areas such as photonics, electromagnetics, physics of semiconductor devices, analog, digital, and power electronics and circuits, communication and signal processing, as well as digital hardware and software systems, computer systems and networks, and distributed computing. Knowledge of the mathematical and natural sciences is applied to the theory, design, and implementation of electronic devices and systems for the benefit of society.

The Department offers three undergraduate degrees: Electrical Engineering, Computer Engineering, as well as Computer Science and Engineering. Computer Science and Engineering is offered in conjunction with the Donald Bren School of Information and Computer Sciences; information is available in the Interdisciplinary Studies section of the Catalogue.

Some electrical engineers focus on the study of electronic devices and circuits that are the basic building blocks of complex electronic systems. Others study power electronics and the generation, transmission, and utilization of electrical energy. A large group of electrical engineers studies the application of these complex systems to other areas, including medicine, biology, geology, and ecology. Still another group studies complex electronic systems such as automatic controls, telecommunications, wireless communications, and signal processing.

Computer engineers are trained in various fields of computer science and engineering. They engage in the design and analysis of digital computers and networks, including software and hardware systems. Computer design includes topics such as computer architecture, embedded systems, design automation, system software, data structures and algorithms, computer networks, and cloud computing. Computer Engineering courses include programming in high-level languages such as Python, C/C++ and Java; design of application and system software; design of hardware/software interfaces and embedded systems; and application of computers in solving engineering problems. Laboratories in both hardware and software experiences are integrated within the Computer Engineering curriculum.

The undergraduate curriculum in Electrical Engineering and Computer Engineering provides a solid foundation for future career growth, enabling graduates' careers to grow technically, administratively, or both. Many electrical and computer engineers will begin work in a large organizational environment as members of an engineering team, obtaining career satisfaction from solving meaningful problems that contribute to the success of the organization's overall goal. As their careers mature, technical growth most naturally results from the acquisition of an advanced degree and further development of the basic thought processes instilled in the undergraduate years. Administrative growth can result from the development of management skills on the job and/or through advanced degree programs in management.

Graduates of Electrical Engineering, Computer Engineering, and Computer Science and Engineering will find a variety of career opportunities in areas including wireless communication, voice and video coding, biomedical electronics, circuit design, optical devices and communication, semiconductor devices and fabrication, power systems, power electronics, computer hardware and software design, computer networks, design of embedded computer systems, application software, data storage and retrieval, pattern recognition, computer modeling, and parallel and cloud computing.

- Computer Engineering, B.S.
- Computer Science and Engineering, B.S.
- Electrical and Computer Engineering, M.S.
- Electrical and Computer Engineering, Ph.D.
- Electrical Engineering, B.S.

## Faculty

Hamidreza Aghasi, Ph.D. Cornell University, *Assistant Professor of Electrical Engineering and Computer Science* (analog circuit design, mm-wave and terahertz integrated circuits, high resolution integrated sensing and imaging, neuromorphic computation, emerging device technologies)

Mohammad A. Al Faruque, Ph.D. University of Kaiserslautern, *Chair of Emulex Career Development and Associate Professor of Electrical Engineering and Computer Science; Computer Science; Mechanical and Aerospace Engineering* (cyber-physical systems, internet of things, embedded systems, CPS security)

Nicolaos G. Alexopoulos, Ph.D. University of Michigan, *Professor Emeritus of Electrical Engineering and Computer Science* (high-frequency integrated circuit antennas, wireless communication, materials)

Ender Ayanoglu, Ph.D. Stanford University, *Professor of Electrical Engineering and Computer Science* (communication systems, communication theory, communication networks)



Nader Bagherzadeh, Ph.D. University of Texas at Austin, *Professor of Electrical Engineering and Computer Science; Computer Science* (parallel processing, computer architecture, computer graphics, memory systems, 3-D ICs, heterogeneous computing, low-power processing)

Neil J. Bershad, Ph.D. Rensselaer Polytechnic Institute, *Professor Emeritus of Electrical Engineering and Computer Science* (communication and information theory, signal processing)

Ozdal Boyraz, Ph.D. University of Michigan, *Professor of Electrical Engineering and Computer Science* (integrated optics, silicon photonics, optical communications systems, and microwave photonics)

Peter J. Burke, Ph.D. Yale University, *Professor of Electrical Engineering and Computer Science; Biomedical Engineering; Materials Science and Engineering* (nano-electronics, bio-nanotechnology)

Hung Cao, Ph.D. University of Texas at Arlington, *Assistant Professor of Electrical Engineering and Computer Science; Biomedical Engineering* (MEMS, sensors, implants, heart disease, neurological disease, wireless biomedical systems)

Filippo Capolino, Ph.D. University of Florence, *Professor of Electrical Engineering and Computer Science* (optics/electromagnetics in nanostructures and sensors, antennas/microwaves, RF and wireless systems)

Aparna Chandramowlishwaran, Ph.D. Georgia Institute of Technology, *Assistant Professor of Electrical Engineering and Computer Science; Computer Science; Mechanical and Aerospace Engineering* (high-performance computing, domain-specific compilers, algorithm-architecture co-design, data analysis, and scientific computing)

Pai H. Chou, Ph.D. University of Washington, *Professor Emeritus of Electrical Engineering and Computer Science* (embedded systems, low-power design, wireless sensing systems, energy harvesting, wearable medical devices, real-time systems, hardware/software co-design)

Jose B. Cruz, Ph.D. University of Illinois at Urbana-Champaign, *Professor Emeritus of Electrical Engineering and Computer Science*

Quoc-Viet Dang, Ph.D. University of California, Irvine, *Assistant Professor of Teaching of Electrical Engineering and Computer Science* (e-learning, data analysis, autonomous vehicle racing, cyber-physical systems, making the world a better place)

Franco De Flaviis, Ph.D. University of California, Los Angeles, *Professor of Electrical Engineering and Computer Science* (microwave systems, wireless communications, electromagnetic circuit simulations)

Rainer B. Doemer, Ph.D. Dortmund University, *Professor of Electrical Engineering and Computer Science; Computer Science* (system-level design, embedded computer systems, design methodologies, specification and modeling languages, advanced parallel simulation, integration of hardware and software systems)

Salma Elmalaki, Ph.D. University of California, Los Angeles, *Assistant Professor of Teaching of Electrical Engineering and Computer Science* (mobile computing, pervasive autonomous system, personalized computing, and internet-of-things (IoT))

Ahmed Eltawil, Ph.D. University of California, Los Angeles, *Professor of Electrical Engineering and Computer Science* (design of system and architectures for computing and communication devices, low power implementations and architectures for digital signal processing)

Rahim Esfandiyarpour, Ph.D. Stanford University, *Assistant Professor of Electrical Engineering and Computer Science; Biomedical Engineering* (nanotechnology and nanoscience, flexible electronics, MEMS and NEMS fabrication and modeling, stretchable and wearable bio devices, translational micro/nanotechnologies, biological and chemical sensors, microfluidics, microelectronics circuits and systems, physiological monitoring, Internet of Things (IoT) bio devices, technology development for personalized/precision medicine, and Point of Care (POC) diagnostics)

Leonard A. Ferrari, Ph.D. University of California, Irvine, *Professor Emeritus of Electrical Engineering and Computer Science* (machine vision, signal processing, computer graphics)

Daniel D. Gajski, Ph.D. University of Pennsylvania, *Professor Emeritus of Electrical Engineering and Computer Science* (embedded systems, software/hardware design, design methodologies and tools, science of design)

Jean-Luc Gaudiot, Ph.D. University of California, Los Angeles, *Professor of Electrical Engineering and Computer Science; Computer Science* (parallel processing, computer architecture, processor architecture)

Ramon Gomez, Ph.D. University of California, Los Angeles, *Assistant Adjunct Professor of Electrical Engineering and Computer Science* (analog and RF circuit design)

Michael M. Green, Ph.D. University of California, Los Angeles, *Stacy Nicholas Dean of The Henry Samueli School of Engineering and Associate Dean for Undergraduate Student Affairs of The Henry Samueli School of Engineering and Professor of Electrical Engineering and Computer Science* (analog/mixed-signal IC design, broadband circuit design, theory of nonlinear circuits)

Glenn E. Healey, Ph.D. Stanford University, *Professor of Electrical Engineering and Computer Science* (machine learning, data science, sabermetrics, physical modeling, computer vision, image processing)

Payam Heydari, Ph.D. University of Southern California, *Professor of Electrical Engineering and Computer Science* (design and analysis of analog, radio-frequency, millimeter-wave and terahertz integrated circuits)

Syed A. Jafar, Ph.D. Stanford University, *Professor of Electrical Engineering and Computer Science* (wireless communication and information theory)

Hamid Jafarkhani, Ph.D. University of Maryland, College Park, *Conexant-Broadcom Chair in the Center for Pervasive Communications and UCI Chancellor's Professor of Electrical Engineering and Computer Science* (communication theory, signal processing coding, wireless networks, medical image segmentation)

Pramod Khargonekar, Ph.D. University of Florida, *UCI Distinguished Professor of Electrical Engineering and Computer Science* (systems and control theory; learning and intelligent systems; applications to renewable energy and smart grid, neural engineering, and economics; leadership and creativity; technology and society)

Stuart A. Kleinfelder, Ph.D. Stanford University, *Professor of Electrical Engineering and Computer Science* (circuits and systems for visual imaging, X-rays, electron microscopy, particle physics, and other applications)

Fadi J. Kurdahi, Ph.D. University of Southern California, *Director, Center for Embedded Computer Systems and Associate Dean for Graduate and Professional Studies and Professor of Electrical Engineering and Computer Science; Computer Science* (embedded and cyber-physical systems, VLSI system design, design automation of digital systems)

Chin C. Lee, Ph.D. Carnegie Mellon University, *Director of Materials and Manufacturing Technology and Professor of Electrical Engineering and Computer Science* (electronic packaging, bonding technology, metallurgy, thermal design, semiconductor devices, electromagnetic theory, acoustics and optoelectronics)

Henry P. Lee, Ph.D. University of California, Berkeley, *Professor of Electrical Engineering and Computer Science* (photonics, fiber-optics and compound semiconductors)

Guann-Pyng Li, Ph.D. University of California, Los Angeles, *Director of the UCI Division of the California Institute for Telecommunications and Information Technology (Calit2), Director of the Integrated Nanosystems Research Facility and Professor of Electrical Engineering and Computer Science; Biomedical Engineering* (micro/nano technology for sensors and actuators, internet of things (IoT), smart manufacturing, biomedical devices and millimeter wave wireless communication)

Zhou Li, Ph.D. Indiana University Bloomington, *Assistant Professor of Electrical Engineering and Computer Science* (data-driven security analytics, internet measurement, side-channel analysis, IoT security)

Kwei-Jay Lin, Ph.D. University of Maryland, College Park, *Professor of Electrical Engineering and Computer Science; Computer Science* (real-time systems, distributed systems, service-oriented computing)

Athina Markopoulou, Ph.D. Stanford University, *Nicolaos G. and Sue Curtis Alexopoulos Presidential Chair in Electrical Engineering and Computer Science and Department Chair and Professor of Electrical Engineering and Computer Science; Computer Science* (networking: including network protocols, network measurement and analysis, mobile systems and mobile data analysis, network security and privacy)

Henry Samueli, Ph.D. University of California, Los Angeles, *Adjunct Professor of Electrical Engineering and Computer Science* (digital signal processing, communications systems engineering, CMOS integrated circuit design for applications in high-speed data transmission systems)

Terry Sanger, M.D. Harvard Medical School, *Vice President and Chief Scientific Officer for Children's Hospital Orange County and Professor of Electrical Engineering and Computer Science*

Yanning Shen, Ph.D. University of Minnesota, *Assistant Professor of Electrical Engineering and Computer Science* (machine learning, data science, network science, and statistical-signal processing)

Phillip C-Y Sheu, Ph.D. University of California, Berkeley, *Professor of Electrical Engineering and Computer Science; Biomedical Engineering; Computer Science* (semantic computing, robotic computing, artificial intelligence, biomedical computing, multimedia computing)

Yasser Shoukry, Ph.D. University of California, Los Angeles, *Assistant Professor of Electrical Engineering and Computer Science* (resilience, safety, security and privacy of artificial intelligence (AI), controlled cyber-physical systems (CPS), internet-of-things (IoT), and robotic systems)

Keyue M. Smedley, Ph.D. California Institute of Technology, *Professor of Electrical Engineering and Computer Science* (power electronics, renewables, energy storage and grid stabilization)

Allen R. Stubberud, Ph.D. University of California, Los Angeles, *Professor Emeritus of Electrical Engineering and Computer Science*

A. Lee Swindlehurst, Ph.D. Stanford University, *Professor of Electrical Engineering and Computer Science* (signal processing, estimation and detection theory, applications in wireless communications, geo-positioning, radar, sonar, biomedicine)

Harry H. Tan, Ph.D. University of California, Los Angeles, *Professor Emeritus of Electrical Engineering and Computer Science* (communication and information theory, stochastic processes)

Chen S. Tsai, Ph.D. Stanford University, *Distinguished Professor of Electrical Engineering and Computer Science* (integrated microwave magnetics, Ultrasonic Atomization for Nanoparticles Synthesis, silicon photonics)

Wei Kang (Kevin) Tsai, Ph.D. Massachusetts Institute of Technology, *Professor Emeritus of Electrical Engineering and Computer Science* (data communication networks, control systems)

Peter Tseng, Ph.D. University of California, Los Angeles, *Assistant Professor of Electrical Engineering and Computer Science; Biomedical Engineering* ((bio) Micro-Electro-Mechanical systems, wearable technology, materials-by-design, bioelectromagnetism, nanotechnology)

Zhiying Wang, Ph.D. California Institute of Technology, *Assistant Professor of Electrical Engineering and Computer Science* (information theory, coding theory for data storage, modeling, compression, and computation for genomic data)

H. Kumar Wickramasinghe, Ph.D. University of London, *Henry Samueli Endowed Chair in Engineering and Professor of Electrical Engineering and Computer Science; Biomedical Engineering* (nanoscale measurements and characterization, scanning probe microscopy, storage technology, nano-bio measurement technology)

Homayoun Yousefi-zadeh, Ph.D. University of Southern California, *Adjunct Professor of Electrical Engineering and Computer Science* (communications networks)

## Affiliate Faculty

Carter Butts, Ph.D. Carnegie Mellon University, *Professor of Sociology; Computer Science; Electrical Engineering and Computer Science; Statistics* (mathematical sociology, social networks, quantitative methodology, human judgment and decision making, economic sociology)

Nikil D. Dutt, Ph.D. University of Illinois at Urbana-Champaign, *UCI Chancellor's Professor of Computer Science; Cognitive Sciences; Electrical Engineering and Computer Science* (embedded systems, computer architecture, electronic design automation, software systems, brain-inspired architectures and computing)

Michael S. Franz, Ph.D. Swiss Federal Institute of Technology in Zurich, *UCI Chancellor's Professor of Computer Science; Electrical Engineering and Computer Science* (systems software, particularly compilers and virtual machines, trustworthy computing, software engineering)

Ian G. Harris, Ph.D. University of California, San Diego, *Professor of Computer Science; Electrical Engineering and Computer Science* (hardware/software covalidation, manufacturing test)

Scott A. Jordan, Ph.D. University of California, Berkeley, *Professor of Computer Science; Electrical Engineering and Computer Science* (pricing and differentiated services in the Internet, resource allocation in wireless networks, telecommunications policy)

Zak Kassas, Ph.D. University of Texas at Austin, *Assistant Professor of Mechanical and Aerospace Engineering; Electrical Engineering and Computer Science* (cyber-physical systems (CPS), autonomous vehicles (aerial, ground, indoor, underwater), satellite-based navigation, intelligent transportation systems (ITS), cognitive and software-defined radio (SDR), sensor fusion)

Marco Levorato, Ph.D. University of Padua, *Assistant Professor of Computer Science; Electrical Engineering and Computer Science* (artificial intelligence and machine learning, networks and distributed systems, statistics and statistical theory, stochastic modeling, signal processing)

Aditi Majumder, Ph.D. University of North Carolina at Chapel Hill, *Professor of Computer Science; Electrical Engineering and Computer Science* (novel displays and cameras for computer graphics and visualization, human-computer interaction, applied computer vision)

Zoran Nenadic, Ph.D. Washington University, *William J. Link Chair in Biomedical Engineering and Department Chair and Professor of Biomedical Engineering; Electrical Engineering and Computer Science* (adaptive biomedical signal processing, control algorithms for biomedical devices, brain-machine interfaces, modeling and analysis of biological neural networks)

Eric Potma, Ph.D. University of Groningen, *Professor of Chemistry; Electrical Engineering and Computer Science* (analytical, chemical biology, physical chemistry and chemical physics)

Isaac D. Scherson, Ph.D. Weizmann Institute of Science, *Professor of Computer Science; Electrical Engineering and Computer Science* (parallel computing architectures, massively parallel systems, parallel algorithms, interconnection networks, performance evaluation)

Andrei M. Shkel, Ph.D. University of Wisconsin-Madison, *Professor of Mechanical and Aerospace Engineering; Biomedical Engineering; Electrical Engineering and Computer Science* (design and advanced control of micro-electro-mechanical systems (MEMS); high precision micro-machined gyroscopes; MEMS-enhanced optical systems, tools and prosthetic appliances; electromechanical and machine-information systems integration)

Sameer Singh, Ph.D. University of Massachusetts Amherst, *Assistant Professor of Computer Science; Electrical Engineering and Computer Science; Language Science* (artificial intelligence and machine learning, databases and data mining, scientific and numerical computing)

William C. Tang, Ph.D. University of California, Berkeley, *Professor of Biomedical Engineering; Chemical and Biomolecular Engineering; Electrical Engineering and Computer Science* (micro-electro-mechanical systems (MEMS) nanoscale engineering for biomedical applications, microsystems integration, microimplants, microbiomechanics, microfluidics)

## Courses

### **EECS 1. Introduction to Electrical Engineering and Computer Engineering. 1 Unit.**

Introduction to the fields of Electrical Engineering and Computer Engineering, including possible careers in both traditional and new emerging areas. Background on both the Electrical Engineering and the Computer Engineering majors, curriculum requirements, specializations, and faculty research interests.

(Design units: 0)

Restriction: Electrical Engineering Majors have first consideration for enrollment.

### **EECS 10. Computational Methods in Electrical and Computer Engineering. 4 Units.**

An introduction to computers and structured programming. Binary Data Representation. Hands-on experience with a high-level structured programming language. Introduction to algorithm efficiency. Applications of structured programming in solving engineering problems. Programming laboratory.

(Design units: 0)

Corequisite: MATH 2A

Prerequisite: MATH 2A

Overlaps with EECS 12, ICS 31.

Restriction: Electrical Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment.

### **EECS 12. Introduction to Programming. 4 Units.**

An introduction to computers and programming. Python programming syntax/style, types. Numbers and sequences. Control flow. I/O and errors/exceptions. Function calling, parameter passing, formal arguments, return values. Variable scoping. Programming laboratory.

(Design units: 0)

Corequisite: MATH 2A

Overlaps with EECS 10, ICS 31.

Restriction: Computer Engineering Majors have first consideration for enrollment.

### **EECS 20. Computer Systems and C Programming. 4 Units.**

Introduction to computing systems. Data representation and operations. Simple logic design. Basic computer organization. Instruction set architecture and assembly language programming. Introduction to C. Functions and recursion, data structures, pointers. Programming laboratory.

(Design units: 1)

Prerequisite: EECS 12

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

### **EECS 22. Advanced C Programming. 3 Units.**

C language programming concepts. Control flow, function calls, recursion. Basic and composite data types, static and dynamic data structures. Program modules and compilation units. Preprocessor macros. C standard libraries.

(Design units: 1)

Prerequisite: EECS 10 or EECS 20

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 22L. Software Engineering Project in C Language. 3 Units.**

Hands-on experience with the ANSI-C programming language. Medium-sized programming projects, team work. Software specification, documentation, implementation, testing. Definition of data structures and application programming interface. Creation of program modules, linking with external libraries. Rule-based compilation, version control.

(Design units: 3)

Prerequisite: EECS 22

Restriction: Computer Engineering Majors have first consideration for enrollment.

**EECS 31. Introduction to Digital Systems. 4 Units.**

Digital representation of information. Specification, analysis, design and optimization of combinational and sequential logic, register-transfer components and register-transfer systems with datapaths and controllers. Introduction to high-level and algorithmic state-machines and custom processors.

(Design units: 2)

Prerequisite: ICS 31 or EECS 10 or EECS 12 or MAE 10

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 31L. Introduction to Digital Logic Laboratory. 3 Units.**

Introduction to common digital integrated circuits: gates, memory circuits, MSI components. Operating characteristics, specifications, applications. Design of simple combinational and sequential digital systems (arithmetic processors game-playing machines). Construction and debugging techniques using hardware description languages and CAD tools.

(Design units: 3)

Prerequisite: EECS 31 and (EECS 10 or EECS 12 or ICS 32)

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 40. Object-Oriented Systems and Programming. 4 Units.**

Primitive types and expressions. The class and method definition. Information hiding and encapsulation. Objects and reference. Overloading. Constructors. Inheritance basics. Programming with inheritance. Dynamic binding and polymorphism. Exception handling. An overview of streams and file input/output. Programming laboratory.

(Design units: 2)

Prerequisite: EECS 22L

Restriction: Computer Engineering Majors have first consideration for enrollment.

**EECS 50. Discrete-Time Signals and Systems. 4 Units.**

Analysis of discrete-time linear-time-invariant (DTLTI) systems in the time domain and using z-transforms. Introduction to techniques based on Discrete-Time, Discrete, and Fast Fourier Transforms. Examples of their application to digital signal processing and digital communications.

(Design units: 0)

Prerequisite: EECS 70A

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 55. Engineering Probability. 4 Units.**

Sets and set operations; nature of probability, sample spaces, fields of events, probability measures; conditional probability, independence, random variables, distribution functions, density functions, conditional distributions and densities; moments, characteristic functions, random sequences, independent and Markov sequences.

(Design units: 0)

Prerequisite: MATH 2D

Restriction: Computer Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment.

**EECS 70A. Network Analysis I. 4 Units.**

Modeling and analysis of electrical networks. Basic network theorems. Sinusoidal steady state and transient analysis of RLC networks and the impedance concept.

(Design units: 1)

Corequisite: MATH 3D

Prerequisite: PHYS 7D and (EECS 10 or EECS 12 or MAE 10 or ICS 31 or CEE 20)

Overlaps with MAE 60.

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**EECS 70B. Network Analysis II. 4 Units.**

Laplace transforms, complex frequency, and the s-plane. Network functions and frequency response, including resonance. Bode plots. Two-port network characterization.

(Design units: 1)

Corequisite: EECS 70LB

Prerequisite: (BME 60B or EECS 10 or EECS 12 or ICS 31 or CEE 20 or MAE 10) and EECS 70A

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**EECS 70LA. Network Analysis I Laboratory. 1 Unit.**

Laboratory to accompany EECS 70A.

(Design units: 0)

Corequisite: EECS 70A

Prerequisite: PHYS 7D and (EECS 10 or EECS 12 or BME 60B or CEE 20 or MAE 10)

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 70LB. Network Analysis II Laboratory. 1 Unit.**

Laboratory to accompany EECS 70B. Materials fee.

(Design units: 1)

Corequisite: EECS 70B

Prerequisite: (BME 60B or EECS 10 or EECS 12 or ICS 31 or CEE 20 or MAE 10) and EECS 70A

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 101. Introduction to Machine Vision. 3 Units.**

The use of digital computers for the analysis of visual scenes; image formation and sensing, color, segmentation, shape estimation, motion, stereo, pattern classification, computer architectures, applications. Computer experiments are used to illustrate fundamental principles.

(Design units: 2)

Prerequisite: EECS 150 or EECS 50

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.



**EECS 111. System Software. 4 Units.**

Multiprogramming, interrupt, processes, kernel, parallelism, critical sections, deadlocks, communication, multiprocessing, multilevel memory management, binding, name management, file systems, protection, resource allocation, scheduling. Experience with concurrent programming, synchronization mechanisms, interprocess communication.

(Design units: 2)

Prerequisite: EECS 112 and (ICS 46 or EECS 114)

Overlaps with CS 143A.

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 112. Organization of Digital Computers. 4 Units.**

Building blocks and organization of digital computers, the arithmetic, control, and memory units, and input/out devices and interfaces. Microprogramming and microprocessors.

(Design units: 4)

Prerequisite: EECS 31L

Overlaps with CS 152.

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 112L. Organization of Digital Computers Laboratory. 3 Units.**

Specification and implementation of a processor-based system using a hardware description language such as VHDL. Hands-on experience with design tools including simulation, synthesis, and evaluation using testbenches.

(Design units: 3)

Prerequisite: EECS 112

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 113. Processor Hardware/Software Interfaces. 4 Units.**

Hardware/software interfacing, including memory and bus interfaces, devices, I/O, and compiler code generation/instruction scheduling. Experience microcontroller programming and interfacing. Specific compiler code generation techniques including local variable and register allocations, instruction dependence and scheduling, and code optimization.

(Design units: 3)

Prerequisite: EECS 112

Restriction: Computer Engineering Majors have first consideration for enrollment. Computer Science and Engineering Majors have second consideration for enrollment.

**EECS 114. Engineering Data Structures and Algorithms. 4 Units.**

Introduces abstract behavior of classes data structures, alternative implementations, informal analysis of time and space efficiency. Also introduces classic algorithms and efficient algorithm design techniques (recursion, divide-and-conquer, branch-and-bound, dynamic programming).

(Design units: 2)

Prerequisite: EECS 40

Restriction: Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.



**EECS 116. Introduction to Data Management. 4 Units.**

Introduction to the design of databases and the use of database management systems (DBMS) for applications. Topics include entity-relationship modeling for design, relational data model, relational algebra, relational design theory, and Structured Query Language (SQL) programming.

(Design units: 1)

Prerequisite: ICS 33 or CSE 43 or EECS 114. ICS 33 with a grade of C or better. CSE 43 with a grade of C or better

Same as CS 122A.

Restriction: Computer Science Engineering Majors have first consideration for enrollment. School of Info & Computer Sci students have first consideration for enrollment.

**EECS 117. Parallel Computer Systems. 3 Units.**

General introduction to parallel computing focusing on parallel algorithms and architectures. Parallel models: Flynn's taxonomy, dataflow models. Parallel architectures: systolic arrays, hypercube architecture, shared memory machines, dataflow machines, reconfigurable architectures. Parallel algorithms appropriate to each machine type area also discussed.

(Design units: 1)

Prerequisite: EECS 20 and EECS 114 and EECS 112

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 118. Introduction to Knowledge and Software Engineering. 4 Units.**

Introduction of basic concepts in knowledge engineering and software engineering. Knowledge representation and reasoning, search planning, software life cycle, requirements engineering, software design languages, declarative programming, testing, database and web programming.

(Design units: 2)

Prerequisite: EECS 40

Restriction: Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 119. VLSI. 4 Units.**

Design techniques for Very Large Scale Integrated (VLSI) systems and chips. Review CMOS and related process technologies; primitives such as logic gates and larger design blocks; layout; floor planning; design hierarchy, component interfaces; use of associated CAD tools for design.

(Design units: 4)

Prerequisite: EECS 112 and EECS 170B

Overlaps with EECS 170D, CSE 112.

Restriction: Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 120. Fundamentals of Parallel Computing. 4 Units.**

Fundamentals of parallel computing, focusing on parallel algorithms and architectures. Topics include design of parallel and I/O efficient algorithms, basics of parallel machine architectures, and current/emerging programming models (shared memory, distributed memory, and accelerators).

Prerequisite: (EECS 12 or CS 152) and EECS 114

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 121. System Security. 3 Units.**

Fundamentals and practices of system security. Topics include cryptographic (encryption, decryption, and message authentication), software vulnerabilities (buffer overflow), network security (layer 2-7 attacks and defenses and PKI), web security (XSS and XSRF), and privacy.

Prerequisite: EECS 22 or ICS 45C

**EECS 141A. Communication Systems I. 3 Units.**

Introduction to analog communication systems including effects of noise. Modulation-demodulation for AM, DSB-SC, SSB, VSB, QAM, FM, PM, and PCM with application to radio, television, and telephony. Signal processing as applied to communication systems.

(Design units: 1)

Prerequisite: EECS 55 and EECS 150

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 141B. Communication Systems II. 3 Units.**

Signal space analysis. Optimum receivers for digital communication. Maximum a posteriori and maximum likelihood detection. Matched filter and correlation receiver. PAM, QAM, PSK, FSK, and MSK and their performance. Introduction to equalization, synchronization, information theory, and error control codes.

(Design units: 1)

Prerequisite: EECS 141A

Restriction: Computer Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**EECS 144. Antenna Design for Wireless Communication Links. 4 Units.**

Analysis and synthesis of antennas and antenna arrays. Adaptive arrays and digital beam forming for advanced wireless links. Friis transmission formula. Wireless communication equations for cell-site and mobile antennas, interference, slow and fast fading in mobile communication.

(Design units: 0)

Prerequisite: EECS 180A

**EECS 145. Electrical Engineering Analysis. 4 Units.**

Vector calculus, complex functions, and linear algebra with applications to electrical engineering problems.

(Design units: 0)

Prerequisite: MATH 3D

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering majors have second consideration for enrollment.

**EECS 148. Computer Networks. 4 Units.**

Computer network architectures, protocols, and applications. Internet congestion control, addressing, and routing. Local area networks. Multimedia networking.

(Design units: 2)

Prerequisite: EECS 55 or STAT 67

Same as CS 132.

Restriction: Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have first consideration for enrollment.

**EECS 150. Continuous-Time Signals and Systems. 4 Units.**

Characteristics and properties of continuous-time (analog) signals and systems. Analysis of linear time-invariant continuous-time systems using differential equation convolutional models. Analysis of these systems using Laplace transforms, Fourier series, and Fourier transforms. Examples from applications to telecommunications.

(Design units: 0)

Prerequisite: EECS 70A and EECS 145

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 152A. Digital Signal Processing. 3 Units.**

Nature of sampled data, sampling theorem, difference equations, data holds, z-transform, w-transform, digital filters, Butterworth and Chebychev filters, quantization effects.

(Design units: 2)

Prerequisite: EECS 50

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 152B. Digital Signal Processing Design and Laboratory. 3 Units.**

Design and implementation of algorithms on a DSP processor and using computer simulation. Applications in signal and image processing, communications, radar, etc.

(Design units: 3)

Prerequisite: EECS 152A

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 159A. Senior Design Project I. 3 Units.**

Teaches problem definition, detailed design, integration, and testability with teams of students specifying, designing, building, and testing complex systems. Lectures include engineering values, discussions, and ethical ramifications of engineering decisions.

(Design units: 3)

Prerequisite: EECS 113 or EECS 170C or CS 145

Restriction: Seniors only. Computer Science Engineering Majors only. Electrical Engineering Majors only. Computer Engineering Majors only.

**EECS 159B. Senior Design Project II. 3 Units.**

Teaches problem definition, detailed design, integration, and testability with teams of students specifying, designing, building, and testing complex systems. Lectures include engineering values, discussions, and ethical ramifications of engineering decisions. Materials fee.

(Design units: 3)

Prerequisite: EECS 159A

Restriction: Computer Science Engineering Majors only. Electrical Engineering Majors only. Computer Engineering Majors only.

**EECS 160A. Introduction to Control Systems. 4 Units.**

Modeling, stability, and specifications of feedback control systems. Root locus, Bode plots, Nyquist criteria, and state-space methods for dynamic analysis and design.

(Design units: 2)

Corequisite: EECS 160LA

Prerequisite: (EECS 10 or EECS 12 or MAE 10 or BME 60B or CEE 20) and EECS 150 and EECS 170B and EECS 170LB

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 160LA. Control Systems I Laboratory. 1 Unit.**

Laboratory accompanying EECS 160A. Materials fee.

(Design units: 1)

Corequisite: EECS 160A

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 163. Power Systems. 4 Units.**

Generation, transmission, and use of electrical energy. Fault calculation, protection, stability, and power flow.

(Design units: 1)

Corequisite: EECS 163L

Prerequisite: EECS 70B

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment.

**EECS 163L. Power Systems Laboratory. 1 Unit.**

Experiments and field trips relevant to studies in power systems. Materials fee.

(Design units: 0)

Corequisite: EECS 163

Restriction: Computer Science Engineering Majors only. Electrical Engineering Majors only. Computer Engineering Majors only.

**EECS 166A. Industrial and Power Electronics. 4 Units.**

Power switching devices, pulse width modulation (PWM) methods, switching converter topologies, control, and magnetics. Materials fee.

(Design units: 2)

Prerequisite: EECS 170C and EECS 160A

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have second consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

Concurrent with EECS 267A.

**EECS 170A. Electronics I. 4 Units.**

The properties of semiconductors, electronic conduction in solids, the physics and operation principles of semiconductor devices such as diodes and transistors, transistor equivalent circuits, and transistor amplifiers.

(Design units: 1)

Corequisite: PHYS 7E

Prerequisite: PHYS 7D and EECS 70B

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 170B. Electronics II. 4 Units.**

Design and analysis of single-stage amplifiers, biasing circuits, inverters, logic gates, and memory elements based on CMOS transistors.

(Design units: 2)

Corequisite: EECS 170LB

Prerequisite: EECS 70B and EECS 170A and EECS 170LA

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 170C. Electronics III. 4 Units.**

Principles of operation, design, and utilization of integrated circuit modules, including multi-stage amplifiers, operational amplifiers, and logic circuits.

(Design units: 2)

Corequisite: EECS 170LC

Prerequisite: EECS 170B and EECS 170LB

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have second consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 170D. Integrated Electronic Circuit Design. 4 Units.**

Design and fabrication of modern digital integrated circuits. Fabrication of CMOS process, transistor-level design simulation, functional characteristics of basic digital integrated circuits, and different logic families including the static and dynamic logic, layout, and extraction of digital circuits.

(Design units: 4)

Prerequisite: EECS 170C and EECS 170LC

Overlaps with EECS 119, CSE 112.

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have second consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 170E. Analog and Communications IC Design. 4 Units.**

Advanced topics in design of analog and communications integrated circuits. Topics include: implementation of passive components in integrated circuits; overview of frequency response of amplifiers, bandwidth estimation techniques, high-frequency amplifier design; design of radio-frequency oscillators.

(Design units: 3)

Prerequisite: EECS 170C

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have second consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 170LA. Electronics I Laboratory. 1 Unit.**

Laboratory accompanying EECS 170A to perform experiments on semiconductor material properties, semiconductor device physics and operation principles, and transistor amplifiers to improve experimental skills and to enhance the understanding of lecture materials.

(Design units: 1)

Corequisite: EECS 170A and PHYS 7E

Prerequisite: PHYS 7D and EECS 70B

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**EECS 170LB. Electronics II Laboratory. 1 Unit.**

Laboratory accompanying EECS 170B.

(Design units: 1)

Corequisite: EECS 170B

Prerequisite: EECS 170A and EECS 170LA

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 170LC. Electronics III Laboratory. 1 Unit.**

Laboratory accompanying EECS 170C to provide hands-on training in design of digital/analog circuits/subsystems. Materials fee.

(Design units: 1)

Corequisite: EECS 170C

Prerequisite: EECS 170B and EECS 170LB

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Engineering Majors have second consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 174. Semiconductor Devices. 4 Units.**

Metal-semiconductor junctions, diodes, bipolar junction transistors, MOS structures, MOSFETs, CMOS technology, LEDs, and laser diodes.

(Design units: 1)

Prerequisite: EECS 170A

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment. Materials Science Engineering Majors have second consideration for enrollment.

**EECS 176. Fundamentals of Solid-State Electronics and Materials. 4 Units.**

Physical properties of semiconductors and the roles materials play in device operation. Topics include: crystal structure, phonon vibrations, energy band, transport phenomenon, optical properties and quantum confinement effect essential to the understanding of electronic, optoelectronic and nanodevices.

(Design units: 1)

Prerequisite: EECS 170A

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**EECS 179. Microelectromechanical Systems (MEMS). 4 Units.**

Small-scale machines, small-scale phenomena, MEMS fabrication, MEMS CAD tools, MEMS devices and packaging, MEMS testing.

(Design units: 2)

Restriction: Upper-division students only. Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment.

**EECS 180A. Engineering Electromagnetics I. 4 Units.**

Electrostatics, magnetostatics, and electromagnetic fields: solutions to problems in engineering applications; transmission lines, Maxwell's equations and phasors, plane wave propagation, reflection, and transmission.

(Design units: 1)

Prerequisite: PHYS 7E and EECS 145

Restriction: Electrical Engineering Majors have first consideration for enrollment. Biomedical Engineering Majors have first consideration for enrollment. Materials Science Engineering Majors have first consideration for enrollment.

**EECS 180B. Engineering Electromagnetics II. 4 Units.**

Time-varying electromagnetic fields, plane waves, polarization, guidance of waves like rectangular waveguides and microstrips, optical fibers resonant cavities, skin effects and losses, spherical waves, radiation and reception of waves, antenna basics.

(Design units: 1)

Prerequisite: EECS 180A

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 180C. Engineering Electromagnetics III. 4 Units.**

Propagation in anisotropic media. Propagation in ferrites and non-reciprocal devices. Scattering and dispersion. Electromagnetic properties of materials. Scattering of small nanoparticles. Spherical waves. Cross section of large and small objects. Radar equation. Coherent and incoherent radiation.

(Design units: 0)

Prerequisite: EECS 180B

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment.

**EECS 182. Monolithic Microwave Integrated Circuit (MMIC) Analysis and Design. 4 Units.**

Design of microwave amplifiers including low-noise amplifiers, multiple stage amplifiers, power amplifiers, and introduction to broadband amplifiers. The goal is to provide the basic knowledge for the design of microwave amplifiers ranging from wireless system to radar system.

(Design units: 3)

Prerequisite: EECS 180A

Restriction: Computer Science Engineering Majors have first consideration for enrollment. Electrical Engineering Majors have first consideration for enrollment.

**EECS 188. Optical Electronics. 4 Units.**

Photodiodes and optical detection, photometry and radiometry, geometric optics, lens theory, imaging system, EM wave propagation, optical waveguides and fibers, heterojunction structures, laser theory, semiconductor lasers, and optical transmission system.

(Design units: 1)

Prerequisite: EECS 180A

Restriction: Electrical Engineering Majors have first consideration for enrollment. Computer Science Engineering Majors have second consideration for enrollment.

**EECS 195. Special Topics in Electrical and Computer Engineering. 1-4 Units.**

Studies special topics in selected areas of Electrical and Computer Engineering. Topics addressed vary each quarter.

(Design units: 1-4)

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**EECS 198. Group Study. 1-4 Units.**

Group study of selected topics in Electrical and Computer Engineering.

(Design units: 1-4)

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**EECS 199. Individual Study. 1-4 Units.**

For undergraduate Engineering majors in supervised but independent reading, research, or design. Students taking Individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Repeatability: May be taken for credit for 8 units.

**EECS 199P. Individual Study. 1-4 Units.**

For undergraduate Engineering majors in supervised but independent reading, research, or design. Students taking individual study for design credit are to submit a written paper to the instructor and to the Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**EECS 202A. Principles of Imaging. 4 Units.**

Linear systems, probability and random processes, image processing, projecting imaging, tomographic imaging.

Same as PHYS 233A.

Restriction: Graduate students only.

Concurrent with PHYS 147A.

**EECS 202B. Techniques in Medical Imaging I: X-ray, Nuclear, and NMR Imaging. 4 Units.**

Ionizing radiation, planar and tomographic radiographic and nuclear imaging, magnetism, NMR, MRI imaging.

Prerequisite: EECS 202A

Same as PHYS 233B.

Restriction: Graduate students only.

Concurrent with PHYS 147B.



**EECS 202BP. Techniques in Medical Imaging: X-ray, Nuclear, and NMR Imaging. 4 Units.**

Ionizing radiation, planar and tomographic radiographic and nuclear imaging, magnetism, NMR, MRI imaging.

Restriction: Master of Engineering students only. Graduate students only.

**EECS 202C. Techniques in Medical Imaging II: Ultrasound, Electrophysiological, Optical. 4 Units.**

Sound and ultrasound, ultrasonic imaging, physiological electromagnetism, EEG, MEG, ECG, MCG, optical properties of tissues, fluorescence and bioluminescence, MR impedance imaging, MR spectroscopy, electron spin resonance and ESR imaging.

Prerequisite: EECS 202B

Same as PHYS 233C.

Restriction: Graduate students only.

Concurrent with PHYS 147C.

**EECS 203A. Digital Image Processing. 4 Units.**

Pixel-level digital image representation and elementary operations; Fourier and other unitary transforms; compression, enhancement, filtering, and restoration; laboratory experience is provided.

Restriction: Graduate students only.

**EECS 211. Advanced System Software. 4 Units.**

Study of operating systems including interprocess communication, scheduling, resource management, concurrency, reliability, validation, protection and security, and distributed computing support. System software design languages and modeling analysis.

Restriction: Graduate students only.

**EECS 211P. Advanced System Software. 4 Units.**

Study of operating systems including interprocess communication, scheduling, resource management, concurrency, reliability, validation, protection and security, and distributed computing support. System software design languages and modeling analysis.

Prerequisite: Recommended: Undergraduate-level knowledge of system software (e.g. EECS 111) and organization of digital computers (e.g. UCI EECS 112).

Restriction: Master of Engineering students only. Graduate students only.

**EECS 213. Computer Architecture. 4 Units.**

Problems in hardware, firmware (microprogram), and software. Computer architecture for resource sharing, real-time applications, parallelism, microprogramming, and fault tolerance. Various architectures based on cost/performance and current technology.

Restriction: Graduate students only.

**EECS 213P. Computer Architecture. 4 Units.**

Problems in hardware, firmware (microprogram), and software. Computer architecture for resource sharing, real-time applications, parallelism, microprogramming, and fault tolerance. Various architectures based on cost/performance and current technology.

Prerequisite: Recommended: Undergraduate-level knowledge of organization of digital computers (e.g. EECS 112 and EECS 112L).

Restriction: Master of Engineering students only. Graduate students only.

**EECS 215. Design and Analysis of Algorithms. 4 Units.**

Computer algorithms from a practical standpoint. Algorithms for symbolic and numeric problems such as sorting, searching, graphs, and network flow. Analysis includes algorithm time and space complexity.

**EECS 215P. Design and Analysis of Algorithms. 4 Units.**

Computer algorithms from a practical standpoint. Algorithms for symbolic and numeric problems such as sorting, searching, graphs, and network flow. Analysis includes algorithm time and space complexity.

Restriction: Master of Engineering students only. Graduate students only.

**EECS 216. Advanced Application of Algorithms. 4 Units.**

Medium-sized group and individual programming project. Topics include specification requirements documentation, practical implementation of algorithms, and testing/verification of design.

Prerequisite: Recommended: Undergraduate course work in engineering data structures and algorithms.

**EECS 217. VLSI System Design. 4 Units.**

Overview of integrated fabrication, circuit simulation, basic device physics, device layout, timing; MOS logic design; layout generation, module generation, techniques for very large scale integrated circuit design.

Restriction: Graduate students only.

**EECS 220. Advanced Digital Signal Processing Architecture. 4 Units.**

Study the latest DSP architectures for applications in communication (wired and wireless) and multimedia processing. Emphasis given to understanding the current design techniques and to evaluate the performance, power, and application domain of the latest DSP processors.

Prerequisite: EECS 213

Restriction: Graduate students only.

**EECS 220P. Advanced Digital Signal Processing Architecture. 4 Units.**

Study the latest DSP architectures for applications in communication (wired and wireless) and multimedia processing. Emphasis given to understanding the current design techniques and to evaluate the performance, power, and application domain of the latest DSP processors.

Prerequisite: EECS 213P

Restriction: Master of Engineering students only. Graduate students only.

**EECS 221. Topics in Computer Engineering. 4 Units.**

New research results in computer engineering.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EECS 222. Embedded System Modeling. 4 Units.**

Computational models for embedded systems. System-level specification and description languages. Concepts, requirements, examples. Embedded system models at different levels of abstraction. Modeling of test benches, design under test, IP components. Discrete event simulation, semantics, and algorithms. Formerly EECS 222A.

Restriction: Graduate students only.

**EECS 223. Real-Time Computer Systems. 4 Units.**

Time bases, clock synchronization, real-time communication protocols, specification of requirements, task scheduling. Validation of timelines, real-time configuration management.

Prerequisite: EECS 211 and EECS 213

Restriction: Graduate students only.

**EECS 223P. Real-Time Computer Systems. 4 Units.**

Time bases, clock synchronization, real-time communication protocols, specification of requirements, task scheduling. Validation of timelines, real-time configuration management.

Prerequisite: EECS 211P and EECS 213P

Restriction: Master of Engineering students only. Graduate students only.

**EECS 224. High-Performance Computing. 4 Units.**

Fundamentals of high-performance computing, covering both theory and practice. Topics include performance analysis and tuning, design of parallel and I/O efficient algorithms, basics of parallel machine architectures, and current/emerging programming models (shared memory, distributed memory, and accelerators).

Prerequisite: EECS 215 or CS 260

Restriction: Graduate students only.

**EECS 225. Embedded Systems Design. 4 Units.**

Embedded systems design flow and methodology. Design space exploration. Co-design of hardware and software, embedded architecture and network exploration and synthesis. System software/hardware interface generation. Real-time constraints, specification-to-architecture mapping, design tools and methodologies. Formerly EECS 222B.

Restriction: Graduate students only.

**EECS 226. Embedded System Software. 4 Units.**

Embedded system software concepts, requirements, examples, for engineering applications such as multi-media and automotive. Software generation methodology. Algorithmic specification, design constraints. Embedded operating systems. Static, dynamic, real-time scheduling. Input/output, interrupt handling. Code generation, compilation, instruction set simulation. Formerly EECS 222C.

Restriction: Graduate students only.

**EECS 227. Cyber-Physical System Design. 4 Units.**

Model-based design of cyber-physical systems including, e.g., plant, sensing, control, actuation, embedded hardware/software, communication, real-time analysis, various levels of simulation (MILS, SILS, HILS), tools and methodologies for automatic synthesis, and application from various interdisciplinary domains.

Restriction: Graduate students only.

**EECS 229. Low Power SoC Design. 4 Units.**

From an inverter to server centers, low-power design theory and practice in modern systems-on-chip (SoC), energy efficient design time and runtime methods are surveyed at circuit, RTL, and architecture levels. Lab assignments will help students quantify tradeoffs and design practices.

Prerequisite: EECS 217

Restriction: Graduate students only.

**EECS 230. Energy Efficiency. 4 Units.**

Green energy sources for production, transmission, storage, and utilization of electricity, with a special focus on solar, wind, and nuclear energy production. Study of newly developed renewable sources of energy including capital cost, product cost, environmental issues, and technical feasibility.

**EECS 231. Advanced System Security. 4 Units.**

Advanced study about system security. Topics include software vulnerabilities (buffer overflow), vulnerability discovery (fuzzing), network security, side-channel analysis (power analysis and micro-architecture attacks), machine-learning security, IoT security, and privacy (differential privacy).

Restriction: Graduate students only.

**EECS 240. Random Processes. 4 Units.**

Extensions of probability theory to random variables varying with time. General properties of stochastic processes. Convergence. Estimation, including nonlinear and linear minimum mean square error and maximum likelihood. Spectral density and linear filters. Poisson processes and discrete-time Markov chains.

Restriction: Graduate students only.

**EECS 240P. Random Processes. 4 Units.**

Extensions of probability theory to random variables varying with time. General properties of stochastic processes. Convergence. Estimation, including nonlinear and linear minimum mean square error and maximum likelihood. Spectral density and linear filters. Poisson processes and discrete-time Markov chains.

Prerequisite: Recommended: Knowledge of engineering probability (e.g. EECS 55).

Restriction: Master of Engineering students only. Graduate students only.

**EECS 241A. Digital Communications I. 4 Units.**

Concepts and applications of digital communication systems. Baseband digital transmission of binary, multi-amplitude, and multidimensional signals. Introduction to and performance analysis of different modulation schemes.

**EECS 241AP. Digital Communications I. 4 Units.**

Concepts and applications of digital communication systems. Baseband digital transmission of binary, multi-amplitude, and multidimensional signals. Introduction to and performance analysis of different modulation schemes.

Restriction: Master of Engineering students only. Graduate students only.

**EECS 241B. Digital Communications II. 4 Units.**

Concepts and applications of equalization, multi-carrier modulation, spread spectrum and CDMA. Digital communications through fading memory channels.

Prerequisite: EECS 241A

Restriction: Graduate students only.

**EECS 241BP. Digital Communications II. 4 Units.**

Concepts and applications of equalization, multi-carrier modulation, spread spectrum, and CDMA. Digital communications through fading memory channels.

Prerequisite: EECS 241AP

Restriction: Master of Engineering students only. Graduate students only.

**EECS 242. Information Theory. 4 Units.**

Fundamental capabilities and limitations of information sources and information transmission systems. Analytical framework for modeling and evaluating communication systems: entropy, mutual information asymptotic equipartition property, entropy rates of a stochastic process, data compression, channel capacity, differential entropy, the Gaussian channel.

Prerequisite: EECS 240

**EECS 243. Error Correcting Codes. 4 Units.**

Different techniques for error correcting codes and analyzing their performance. Linear block codes; cyclic codes; convolutional codes. Minimum distance; optimal decoding; Viterbi decoding; bit error probability. Coding gain; trellis coded modulation.

Prerequisite: EECS 240

Restriction: Graduate students only.

**EECS 244. Wireless Communications. 4 Units.**

Introduction to wireless communications systems. Wireless channel modeling. Single carries, spread spectrum, and multi-carrier wireless modulation schemes. Diversity techniques. Multiple-access schemes. Transceiver design and system level tradeoffs. Brief overview of GSM, CDMA, (IS-95) and 2.5, 3G cellular schemes.

Prerequisite: EECS 241B

Restriction: Graduate students only.

**EECS 244P. Wireless Communications. 4 Units.**

Introduction to wireless communications systems. Wireless channel modeling. Single carries, spread spectrum, and multi-carrier wireless modulation schemes. Diversity techniques. Multiple-access schemes. Transceiver design and system level tradeoffs. Brief overview of GSM, CDMA, (IS-95) and 2.5, 3G cellular schemes.

Prerequisite: EECS 241BP

Restriction: Master of Engineering students only. Graduate students only.

**EECS 245. Space-Time Coding. 4 Units.**

A fundamental study of: Capacity of MIMO Channels, space-time code design criteria, space-time block codes, space-time trellis codes, differential detection for multiple antennas, spatial multiplexing, BLAST.

Prerequisite: EECS 242

Restriction: Graduate students only.

**EECS 247. Information Storage. 4 Units.**

Storage architecture, storage network and networking algorithms in data centers, principle of storage devices and non-volatile memory, data consistency, data availability and integrity, power management.

Restriction: Graduate students only.

**EECS 248A. Computer and Communication Networks. 4 Units.**

Network architecture of the Internet, telephone networks, cable networks, and cell phone networks. Network performance models. Network performance models. Advanced concepts and implementations of flow and congestion control, addressing, internetworking, forwarding, routing, multiple access, streaming, and quality-of-service.

Prerequisite: EECS 148 or CS 132

Same as CS 232, NSYS 201.

Restriction: Graduate students only.

**EECS 250. Digital Signal Processing I. 4 Units.**

Fundamental principles of digital signal processing, sampling, decimation and interpolation, discrete Fourier transforms and FFT algorithms, transversal and recursive filters, discrete random processes, and finite-word effects in digital filters.

Restriction: Graduate students only.

**EECS 250P. Digital Signal Processing I. 4 Units.**

Fundamental principles of digital signal processing, sampling, decimation and interpolation, discrete Fourier transforms and FFT algorithms, transversal and recursive filters, discrete random processes, and finite-word effects in digital filters.

Prerequisite: Recommended: Knowledge of digital signal processing (e.g. EECS 152A).

Restriction: Master of Engineering students only. Graduate students only.

**EECS 251A. Detection, Estimation, and Demodulation Theory. 4 Units.**

Fundamentals of hypothesis testing and Bayes and Maximum Likelihood Estimation. ARMA and state variable models for random time series analysis. Wiener and Kalman filtering and prediction. Adaptive algorithms for identification and tracking of parameters of time-varying models.

Prerequisite: EECS 240

**EECS 251B. Detection, Estimation, and Demodulation Theory. 4 Units.**

Fundamentals of hypothesis testing and Bayes and Maximum Likelihood Estimation. ARMA and state variable models for random time series analysis. Wiener and Kalman filtering and prediction. Adaptive algorithms for identification and tracking of parameters of time-varying models.

Prerequisite: EECS 240

**EECS 260A. Linear Systems I. 4 Units.**

State-space representation of continuous-time and discrete-time linear systems. Controllability, observability, stability. Realization of rational transfer functions.

Restriction: Graduate students only.

**EECS 261A. Linear Optimization Methods. 4 Units.**

Formulation, solution, and analysis of linear programming and linear network flow problems. Simplex methods, dual ascent methods, interior point algorithms, and auction algorithms. Duality theory and sensitivity analysis. Shortest path, max-flow, assignment, and minimum cost flow problems.

Restriction: Graduate students only.

**EECS 267A. Industrial and Power Electronics. 4 Units.**

Power switching devices, pulse width modulation (PWM) methods, switching converter topologies, control, and magnetics. Materials fee.

Restriction: Graduate students only.

Concurrent with EECS 166A.

**EECS 267B. Topics in Industrial and Power Electronics. 4 Units.**

Practical design of switching converters, electromagnetic compatibility, thermal management, and/or control methods.

Prerequisite: EECS 267A

Restriction: Graduate students only.

**EECS 270A. Advanced Analog Integrated Circuit Design I. 4 Units.**

Basic transistor configurations; differential pairs; active load/current sources; supply/temperature-independent biasing; op-amp gain and output stages; amplifier frequency response and stability compensation; nonidealities in op-amps; noise and dynamic range in analog circuits.

Restriction: Graduate students only.

**EECS 270AP. Advanced Analog Integrated Circuit Design I. 4 Units.**

Basic transistor configurations; differential pairs; active load/current sources; supply/temperature-independent biasing; op-amp gain and output stages; amplifier frequency response and stability compensation; nonidealities in op-amps; noise and dynamic range in analog circuits.

Prerequisite: Recommended: Introductory knowledge of control systems (e.g. EECS 160A) and electronics (e.g. EECS 170C).

Restriction: Master of Engineering students only. Graduate students only.

**EECS 270B. Advanced Analog Integrated Circuit Design II. 4 Units.**

Advanced transistor modeling issues; discrete-time and continuous-time analog Integrated Circuit (IC) filters; phase-locked loops; design of ICs operating at radio frequencies; low-voltage/low-power design techniques; A/D and D/A converters; AGC circuits.

Prerequisite: EECS 270A

Restriction: Graduate students only.

**EECS 270BP. Advanced Analog Integrated Circuit Design II. 4 Units.**

Advanced transistor modeling issues; discrete-time and continuous-time analog Integrated Circuit (IC) filters; phase-locked loops; design of ICs operating at radio frequencies; low-voltage/low-power design techniques; A/D and D/A converters; AGC circuits.

Prerequisite: EECS 270AP

Restriction: Master of Engineering students only. Graduate students only.

**EECS 270C. Design of Integrated Circuits for Broadband Applications. 4 Units.**

Topics include: broadband standards and protocols; high-frequency circuit design techniques; PLL theory and design; design of transceivers; electrical/optical interfaces.

Prerequisite: EECS 270A

Restriction: Graduate students only.

**EECS 270D. Radio-Frequency Integrated Circuit Design. 4 Units.**

Topics include: RF component modeling; matching network design; transmission line theory/modeling; Smith chart and S-parameters; noise modeling of active and passive components; high-frequency amplifier design; low-noise amplifier (LNA) design; mixer design; RF power amplifier.

Prerequisite: EECS 270A

Restriction: Graduate students only.

**EECS 270DP. Radio-Frequency Integrated Circuit Design. 4 Units.**

Topics include RF component modeling; matching network design; transmission line theory/modeling; Smith chart and S-parameters; noise modeling of active and passive components; high-frequency amplifier design; low-noise amplifier (LNA) design; mixer design; RF power amplifier.

Prerequisite: EECS 270AP

Restriction: Master of Engineering students only. Graduate students only.

**EECS 270E. High Frequency (Millimeter-Wave and Terahertz) Circuits. 4 Units.**

Discussion of the new methodologies, circuits, and systems developed at mm-wave and terahertz frequency ranges due to the growing interest in high speed communication and high frequency signal generation.

Restriction: Graduate students only.

**EECS 272. Topics in Electrical Engineering. 4 Units.**

New research results in electronic system design.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EECS 275A. Very Large Scale Integration (VLSI) Project. 4 Units.**

Students create VLSI design projects from conception through architecture, floor planning, detailed design, simulation, verification, and submission for project fabrication. Emphasis on practical experience in robust VLSI design techniques. (Successful students are expected to take EECS 275B.).

Restriction: Graduate students only.

**EECS 275B. Very Large Scale Integration (VLSI) Project Testing. 4 Units.**

Test and document student-created Complementary Metal Oxide Semiconductor (CMOS) Very Large Scale Integration (VLSI) projects designed in EECS 275A. Emphasis on practical laboratory experience in VLSI testing techniques. Materials fee.

Prerequisite: EECS 275A

Restriction: Graduate students only.

**EECS 277A. Advanced Semiconductor Devices I. 4 Units.**

Advanced complementary metal-oxide-semiconductor field-effect transistors (CMOSFET), device scaling, device modeling and fabrication, equivalent circuits, and their applications for digital, analog, RF.

Restriction: Graduate students only.

**EECS 277B. Advanced Semiconductor Devices II. 4 Units.**

Metal-semiconductor field-effect transistors (MESFET), heterojunction bipolar transistors (HBT), microwave semiconductor devices, equivalent circuits, device modeling and fabrication, microwave amplifiers, transmitters, and receivers.

Restriction: Graduate students only.

**EECS 277C. Nanotechnology. 4 Units.**

Fabrication and characterization techniques of electrical circuit elements at the nanometer scale. Quantized conductance, semiconductor quantum dots, single electron transistors, molecular wires, carbon nanotubes, self-assembly of nano-circuit elements, quantum methods of information processing.

Restriction: Graduate students only.

**EECS 278. Micro-System Design. 4 Units.**

Covers the fundamentals of the many disciplines needed for design of Micro-Electro-Mechanical Systems (MEMS): microfabrication technology, structural mechanics on micro-scale, electrostatics, circuit interface, control, computer-aided design, and system integration.

Same as MAE 247.

Restriction: Graduate students only.

**EECS 279. Micro-Sensors and Actuators. 4 Units.**

Introduction to the technology of Micro-Electro-Mechanical Systems (MEMS). Fundamental principles and applications of important microsensors, actuation principles on microscale. Introduction to the elements of signal processing; processing of materials for micro sensor/actuator fabrication; smart sensors and microsensor/microactuator array devices.

Same as MAE 249.

Restriction: Graduate students only.

**EECS 280A. Advanced Engineering Electromagnetics I. 4 Units.**

Stationary electromagnetic fields, Maxwell's equations, circuits and transmission lines, plane waves, guided waves, and radiation.

Restriction: Graduate students only.

**EECS 280AP. Advanced Engineering Electromagnetics I. 4 Units.**

Stationary electromagnetic fields, Maxwell's equations, circuits and transmission lines, plane waves, guided waves, and radiation.

Prerequisite: Recommended: Knowledge of engineering electromagnetics (e.g. EECS 180A)

Restriction: Master of Engineering students only. Graduate students only.

**EECS 280B. Advanced Engineering Electromagnetics II. 4 Units.**

Two- and three-dimensional boundary value problems, dielectric waveguides and other special waveguides, microwave networks and antenna arrays, electromagnetic properties of materials, and electromagnetic optics.

Prerequisite: EECS 280A

Restriction: Graduate students only.

**EECS 282. Monolithic Microwave Integrated Circuit (MMIC) Analysis and Design II. 4 Units.**

Design of microwave amplifiers using computer-aided design tools. Covers low-noise amplifiers, multiple stage amplifiers, broadband amplifiers, and power amplifiers. Hybrid circuit design techniques including filters and baluns. Theory and design rules for microwave oscillator design.

Restriction: Graduate students only.

**EECS 284P. RF Antenna Design . 4 Units.**

Advanced transmission line design, radiation of electromagnetic waves, dipole antennas, antenna arrays, advanced antenna designs, and practical design considerations in communications systems. Course is supplemented by RF design tools and modeling.

Prerequisite: EECS 280AP

Restriction: Master of Engineering students only. Graduate students only.



**EECS 285A. Optical Communications. 4 Units.**

Introduction to fiber optic communication systems, optical and electro-optic materials, and high-speed optical modulation and switching devices.

Restriction: Graduate students only.

**EECS 285AP. Optical Communications. 4 Units.**

Introduction to fiber optic communication systems, optical and electro-optic materials, and high-speed optical modulation and switching devices.

Prerequisite: Undergraduate-level Engineering Electromagnetics I (e.g. EECS E80A).

Restriction: Master of Engineering students only. Graduate students only.

**EECS 285B. Lasers and Photonics. 4 Units.**

Covers the fundamentals of lasers and applications, including Gaussian beam propagation, interaction of optical radiation with matters, and concepts of optical gain and feedback. Applications are drawn from diverse fields of optical communication, signal processing, and material diagnosis.

Prerequisite: Undergraduate course work in electromagnetic theory and atomic physics.

**EECS 285C. Nano Imaging. 4 Units.**

Theory and practice of modern nanoscale imaging techniques and applications. Traces the development of microscopy from ancient times to modern day techniques used for visualizing the nano-world from atoms to molecules including hands-on experience in the laboratory.

Restriction: Graduate students only.

**EECS 290. Curricular Practical Training. 1 Unit.**

Curricular practical training. Students will go through practical training under an industry mentor in a technical field corresponding to their concentration area.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EECS 292. Preparation for M.S. Comprehensive Examination. 1-8 Units.**

Individual reading and preparation for the M.S. comprehensive examination.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EECS 293. Preparation for Ph.D. Preliminary Examination. 1-8 Units.**

Individual reading and preparation for the Ph.D. preliminary examination.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EECS 294. Electrical Engineering and Computer Science Colloquium. 1 Unit.**

Invited speakers discuss their latest research results in electrical engineering and computer science.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EECS 295. Seminars in Engineering. 1-4 Units.**

Scheduled each year by individual faculty in major field of interest.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EECS 295P. Special Topics in Electrical Engineering and Computer Science. 4 Units.**

Studies in selected areas of Electrical Engineering. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Master of Engineering students only. Graduate students only.

**EECS 296. Master of Science Thesis Research. 1-16 Units.**

Individual research or investigation conducted in the pursuit of preparing and completing the thesis required for the M.S. degree in Engineering.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EECS 297. Doctor of Philosophy Dissertation Research. 1-16 Units.**

Individual research or investigation conducted in preparing and completing the dissertation required for the Ph.D. degree in Engineering.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**EECS 298. Topics in Electrical Engineering and Computer Science. 4 Units.**

Study of Electrical and Computer Engineering concepts.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**EECS 299. Individual Research. 1-16 Units.**

Individual research or investigation under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Computer Engineering, B.S.

**Program Educational Objectives:** Graduates of the Computer Engineering program will (1) be engaged in professional practice at or beyond the entry level or enrolled in high-quality graduate programs building on a solid foundation in engineering, mathematics, the sciences, humanities and social sciences, and experimental practice as well as modern engineering methods; (2) be innovative in the design, research and implementation of systems and products with strong problem solving, communication, teamwork, leadership, and entrepreneurial skills; (3) proactively function with creativity, integrity and relevance in the ever-changing global environment by applying their fundamental knowledge and experience to solve real-world problems with an understanding of societal, economic, environmental, and ethical issues. (Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

The undergraduate Computer Engineering curriculum includes a core of mathematics, physics, and chemistry. Engineering courses in fundamental areas fill in much of the remaining curriculum.

**High School Students:** See School Admissions information.

**Transfer Students:** Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following **required** courses: two years of approved calculus, one year of calculus-based physics with laboratories (mechanics, electricity and magnetism), completion of lower-division writing, and one course in computational methods (e.g., C, C++). For course equivalency specific to each college, visit <https://assist.org>.

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division coursework may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at 949-824-4334.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

**Major Requirements:**

**Mathematics and Basic Science Courses:**

EECS 55

Engineering Probability

EECS 70LA

Network Analysis I Laboratory

EECS 145	Electrical Engineering Analysis
I&C SCI 6D	Discrete Mathematics for Computer Science
MATH 2A- 2B	Single-Variable Calculus and Single-Variable Calculus
MATH 2D	Multivariable Calculus
MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations
PHYSICS 7C	Classical Physics
PHYSICS 7LC	Classical Physics Laboratory
PHYSICS 7D- 7E	Classical Physics and Classical Physics
PHYSICS 7LD	Classical Physics Laboratory
One additional math or basic science elective from the following:	
I&C SCI 6B	Boolean Logic and Discrete Structures
MATH 2E	Multivariable Calculus
PHYSICS 51A	Modern Physics
PHYSICS 52A	Fundamentals of Experimental Physics

or other courses as approved by faculty advisor.

### Engineering Topics Courses:

Students must complete a minimum of 26 units of engineering design.

#### Core Courses:

EECS 12	Introduction to Programming
EECS 20	Computer Systems and C Programming
EECS 22	Advanced C Programming
EECS 22L	Software Engineering Project in C Language
EECS 31	Introduction to Digital Systems
EECS 31L	Introduction to Digital Logic Laboratory
EECS 40	Object-Oriented Systems and Programming
EECS 50	Discrete-Time Signals and Systems
EECS 70A	Network Analysis I
EECS 70B	Network Analysis II
EECS 70LB	Network Analysis II Laboratory
EECS 111	System Software
EECS 112	Organization of Digital Computers
EECS 112L	Organization of Digital Computers Laboratory
EECS 113	Processor Hardware/Software Interfaces
EECS 114	Engineering Data Structures and Algorithms
EECS 118	Introduction to Knowledge and Software Engineering
EECS 119	VLSI
EECS 148	Computer Networks
EECS 159A- 159B	Senior Design Project I and Senior Design Project II
EECS 170A	Electronics I
EECS 170LA	Electronics I Laboratory
EECS 170B	Electronics II
EECS 170LB	Electronics II Laboratory

With the approval of a faculty advisor, students select any additional engineering topics courses needed to satisfy school and department requirements.

#### Engineering Elective Courses:

Select, with approval of a faculty advisor, a minimum of three courses of engineering topics.

COMPSCI 142A	Compilers and Interpreters
EECS 101	Introduction to Machine Vision
EECS 116	Introduction to Data Management

EECS 117	Parallel Computer Systems
EECS 120	Fundamentals of Parallel Computing
EECS 141A	Communication Systems I
EECS 141B	Communication Systems II
EECS 150	Continuous-Time Signals and Systems
EECS 152A	Digital Signal Processing
EECS 152B	Digital Signal Processing Design and Laboratory
EECS 199	Individual Study (up to 3 graded units)
ENGR 7A- 7B	Introduction to Engineering I and Introduction to Engineering II (*)

\* ENGR 7A and ENGR 7B can be counted as 4 units of Engineering Electives. ENGR 7A and ENGR 7B are available only to lower-division students. Both ENGR 7A and ENGR 7B must be taken to be counted as an Engineering Elective.

### Engineering Professional Topics Courses

ENGR 190W	Communications in the Professional World
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At most an aggregate total of 6 units of EECS 199 may be used to satisfy degree requirements; EECS 199 is open to students with a 3.0 GPA or higher.

(The nominal Computer Engineering program will require 187 units of courses to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary.)

The sample program of study chart shown is typical for the major in Computer Engineering. Students should keep in mind that this program is based upon a sequence of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Students who are not adequately prepared, or who wish to make changes in the sequence for other reasons, must have their program approved by their advisor. Computer Engineering majors are encouraged to consult with academic counselors as needed, and students who are academically at risk are mandated to see a counselor as frequently as deemed necessary by the advising staff.

Freshman		
Fall	Winter	Spring
MATH 2A	MATH 2B	MATH 2D
EECS 12	I&C SCI 6D	PHYSICS 7D
General Education	PHYSICS 7C- 7LC	PHYSICS 7LD
General Education	EECS 31	EECS 31L
		General Education
Sophomore		
Fall	Winter	Spring
MATH 3A	MATH 3D	EECS 22L
PHYSICS 7E	EECS 22	EECS 50
EECS 20	EECS 55	EECS 70B
Math./Science Elective	EECS 70A	EECS 70LB
	EECS 70LA	General Education
Junior		
Fall	Winter	Spring
EECS 112	EECS 112L	EECS 111
EECS 40	EECS 114	EECS 113
EECS 145	EECS 170B	EECS 148
EECS 170A	EECS 170LB	General Education
EECS 170LA	General Education	
Senior		
Fall	Winter	Spring
EECS 159A	EECS 159B	ENGR 190W
EECS 118	General Education	Engineering Elective
EECS 119	General Education	General Education
Engineering Elective	Engineering Elective	

Students must obtain approval for their program of study and must see their faculty advisor at least once each year.

# Electrical and Computer Engineering, M.S.

The Department offers M.S. and Ph.D. degrees in Electrical and Computer Engineering with a concentration in Electrical Engineering and in Computer Engineering. Because most graduate courses are not repeated every quarter, students should make every effort to begin their graduate program in the fall.

Detailed descriptions of the two concentrations are as follows.

## Electrical Engineering Concentration (EE)

The Electrical Engineering faculty study the following areas: optical and solid-state devices, including quantum electronics and optics, integrated electro-optics, design of semiconductor devices and materials, analog and mixed-signal IC design, microwave circuits antenna and devices, and nano imaging; systems engineering and signal processing, including communication theory, signal processing, power electronics, neural networks, communications networks, systems engineering, and control systems. Related communication networks topics are also addressed by the Networked Systems M.S. and Ph.D. degrees.

## Computer Engineering Concentration (CPE)

The concentration in Computer Engineering provides students with a solid base in the design, development, and evaluation of computer systems and software. Thrust areas include computer architecture, software design, and embedded systems, but the program is highly customizable to the specific interests of the student. The research activities of the faculty in this concentration include parallel and networked computer systems, distributed software architectures and databases, real-time and embedded computer systems, VLSI architectures, computer design automation, low-power design, computer communication protocols and networks, security, programming languages for parallel/distributed processing, knowledge management, service-oriented architectures, and software engineering.

Two plans are offered for the M.S.: a thesis option and a comprehensive examination option. For either option, students are required to develop a complete program of study with advice from their faculty advisor. The graduate advisor must approve the study plan. Part-time study toward the M.S. is available. The program of study must be completed within four calendar years from first enrollment.

### Plan I: Thesis Option

The thesis option requires completion of 12 courses of study; an original research investigation; the completion of an M.S. thesis; and approval of the thesis by a thesis committee. The thesis committee is composed of three full-time faculty members with the faculty advisor of the student serving as the chair. Required undergraduate core courses and graduate seminar courses, such as EECS 290, EECS 292, EECS 293, EECS 294, and EECS 295, may not be counted toward the 12 courses. No more than one course of EECS 299 and one undergraduate elective course may be counted toward the 12 courses. Up to four of the required 12 courses may be from EECS 296 (M.S. Thesis Research) with the approval of the student's thesis advisor. Additional concentration-specific requirements are as follows; a list of core and concentration courses is given at the end of this section.

#### Electrical Engineering Concentration:

At least seven concentration courses in the Electrical Engineering Concentration (EE) must be completed. All courses must be completed with a grade of B (3.0) or better.

#### Computer Engineering Concentration:

Three core courses in the Computer Engineering Concentration (CPE) must be completed: EECS 211, EECS 213, and EECS 215. At least four additional concentration or approved courses must also be completed. All courses must be completed with a grade of B (3.0) or better.

### Plan II: Comprehensive Examination Option

The comprehensive examination option requires the completion of 12 courses and a comprehensive examination. Only one EECS 299 course can be counted if the EECS 299 course is four or more units. Undergraduate core courses and graduate seminar courses, such as EECS 290, EECS 292, EECS 293, EECS 294, and EECS 295, may not be counted toward the 12 courses requirement. No more than two of undergraduate elective courses may be counted. In fulfillment of the comprehensive examination element of the M.S. program, students can choose one of the two alternatives:

1) EECS 290 Curricular Practical Training or 2) EECS 294 Electrical Engineering and Computer Science Colloquium. Either of the two alternatives may be taken for 1 unit and completed with a satisfactory grade to fulfill the comprehensive exam requirements. Additional concentration-specific requirements are as follows; a list of core and concentration courses is given at the end of this section.

#### Electrical Engineering Concentration:

Students enrolled in the Electrical Engineering (EE) concentration who choose the Comprehensive Examination option must select one of the following plans of study.

#### Circuits and Devices Plan of Study:

Select four of the following:

EECS 270A	Advanced Analog Integrated Circuit Design I
EECS 270B	Advanced Analog Integrated Circuit Design II
EECS 277A	Advanced Semiconductor Devices I
EECS 277B	Advanced Semiconductor Devices II

EECS 280A	Advanced Engineering Electromagnetics I
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EECS 285A	Optical Communications
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At least five additional courses from the list of EE concentration courses must be completed. All must be completed with a grade of B (3.0) or better.

#### Systems Plan of Study:

Select four of the following: <sup>1</sup>

EECS 240	Random Processes
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EECS 241A	Digital Communications I
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EECS 250	Digital Signal Processing I
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EECS 251A	Detection, Estimation, and Demodulation Theory
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EECS 260A	Linear Systems I
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EECS 267A	Industrial and Power Electronics
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At least five additional courses from the list of EE concentration courses must be completed. All must be completed with a grade of B (3.0) or better.

<sup>1</sup> If all six courses are not offered in an academic year, students who graduate in that year can petition to replace the courses that are not offered by EECS 242 and/or EECS 244.

### Electrical Engineering Concentration Courses

#### Electrical Engineering Concentration:

EECS 202A- 202B	Principles of Imaging and Techniques in Medical Imaging I: X-ray, Nuclear, and NMR Imaging
EECS 202C	Techniques in Medical Imaging II: Ultrasound, Electrophysiological, Optical
EECS 203A	Digital Image Processing
EECS 213	Computer Architecture
EECS 215	Design and Analysis of Algorithms
EECS 217	VLSI System Design
EECS 229	Low Power SoC Design
EECS 240	Random Processes
EECS 241A- 241B	Digital Communications I and Digital Communications II
EECS 242	Information Theory
EECS 243	Error Correcting Codes
EECS 244	Wireless Communications
EECS 245	Space-Time Coding
EECS 247	Information Storage
EECS 248A	Computer and Communication Networks
EECS 250	Digital Signal Processing I
EECS 251A- 251B	Detection, Estimation, and Demodulation Theory and Detection, Estimation, and Demodulation Theory
EECS 260A	Linear Systems I
EECS 261A	Linear Optimization Methods
EECS 267A- 267B	Industrial and Power Electronics and Topics in Industrial and Power Electronics
EECS 270A- 270B	Advanced Analog Integrated Circuit Design I and Advanced Analog Integrated Circuit Design II (and Advanced Analog Integrated Circuit Design II)
EECS 270C	Design of Integrated Circuits for Broadband Applications
EECS 270D	Radio-Frequency Integrated Circuit Design
EECS 272	Topics in Electrical Engineering
EECS 275A- 275B	Very Large Scale Integration (VLSI) Project and Very Large Scale Integration (VLSI) Project Testing
EECS 277A	Advanced Semiconductor Devices I
EECS 277B	Advanced Semiconductor Devices II
EECS 277C	Nanotechnology

EECS 278	Micro-System Design
EECS 279	Micro-Sensors and Actuators
EECS 280A	Advanced Engineering Electromagnetics I
EECS 280B	Advanced Engineering Electromagnetics II
EECS 282	Monolithic Microwave Integrated Circuit (MMIC) Analysis and Design II
EECS 285A	Optical Communications
EECS 285B	Lasers and Photonics
EECS 285C	Nano Imaging
EECS 298	Topics in Electrical Engineering and Computer Science

### Computer Engineering Concentration Courses

#### Computer Engineering Concentration:

Three core courses in the Computer Engineering Concentration (CPE) must be completed: EECS 211, EECS 213, and EECS 215. At least five additional concentration or approved courses must also be completed. All courses must be completed with a grade of B (3.0) or better.

#### Computer Engineering Concentration:

EECS 211	Advanced System Software <sup>1</sup>
EECS 213	Computer Architecture <sup>1</sup>
EECS 215	Design and Analysis of Algorithms <sup>1</sup>
EECS 217	VLSI System Design
EECS 220	Advanced Digital Signal Processing Architecture
EECS 221	Topics in Computer Engineering
EECS 222	Embedded System Modeling
EECS 223	Real-Time Computer Systems
EECS 224	High-Performance Computing
EECS 225	Embedded Systems Design
EECS 226	Embedded System Software
EECS 227	Cyber-Physical System Design
EECS 229	Low Power SoC Design
EECS 230	Energy Efficiency
EECS 248A	Computer and Communication Networks
EECS 298	Topics in Electrical Engineering and Computer Science
COMPSCI 233	Networking Laboratory
COMPSCI 234	Advanced Networks
COMPSCI 236	Wireless and Mobile Networking

<sup>1</sup> This course is also a core course.

In addition to fulfilling the course requirements outlined above, it is a University requirement for the Master of Science degree that students fulfill a minimum of 36 units of study.

### Program in Law and Graduate Studies (J.D./M.S.-ECE; J.D./Ph.D.-ECE)

Highly qualified students interested in combining the study of law with graduate qualifications in the ECE program are invited to undertake concurrent degree study under the auspices of UC Irvine's Program in Law and Graduate Studies (PLGS). Students in this program pursue a coordinated curriculum leading to a J.D. degree from the School of Law in conjunction with a Master's or Ph.D. degree in the ECE program. Additional information is available from the PLGS Program Director's Office, 949-824-4158, or by email to [plgs@uci.edu](mailto:plgs@uci.edu). A full description of the program, with links to all relevant application information can be found at the School of Law Concurrent Degree Programs website (<http://www.law.uci.edu/academics/interdisciplinary-studies/concurrent-degrees.html>) and in the Law School section (<http://catalogue.uci.edu/schooloflaw/#lawandgraduatestudies>) of the *Catalogue*.

## Electrical and Computer Engineering, Ph.D.

The Department offers M.S. and Ph.D. degrees in Electrical and Computer Engineering with a concentration in Electrical Engineering and in Computer Engineering. Because most graduate courses are not repeated every quarter, students should make every effort to begin their graduate program in the fall.



## Electrical Engineering Concentration (EE)

The Electrical Engineering faculty study the following areas: optical and solid-state devices, including quantum electronics and optics, integrated electro-optics, design of semiconductor devices and materials, analog and mixed-signal IC design, microwave circuits antenna and devices, and nano imaging; systems engineering and signal processing, including communication theory, signal processing, power electronics, neural networks, communications networks, systems engineering, and control systems. Related communication networks topics are also addressed by the Networked Systems M.S. and Ph.D. degrees (listed in the Interdisciplinary Studies section (<http://catalogue.uci.edu/interdisciplinarystudies/networkedsystems/>) of the *Catalogue*).

## Computer Engineering Concentration (CPE)

The concentration in Computer Engineering provides students with a solid base in the design, development, and evaluation of computer systems and software. Thrust areas include computer architecture, software design, and embedded systems, but the program is highly customizable to the specific interests of the student. The research activities of the faculty in this concentration include parallel and networked computer systems, distributed software architectures and databases, real-time and embedded computer systems, VLSI architectures, computer design automation, low-power design, computer communication protocols and networks, security, programming languages for parallel/distributed processing, knowledge management, service-oriented architectures, and software engineering.

The doctoral program in Electrical and Computer Engineering is tailored to the individual background and interest of the student. There are several milestones to pass: admission to the Ph.D. program by the Graduate Committee; Ph.D. preliminary examination on the background and potential for success in the doctoral program; departmental teaching requirement which can be satisfied through service as a teaching assistant or equivalent; original research work; development of a research report and dissertation proposal; advancement to Ph.D. candidacy in the third year (second year for students who entered with a master's degree) through the Ph.D. qualifying examination conducted on behalf of the Irvine Division of the Academic Senate; completion of a significant research investigation with original results; and completion and approval of a dissertation. The Ph.D. dissertation is written documentation of original research that has impact on the field of study for the Ph.D. A public Ph.D. dissertation defense is also required. During the Ph.D. study, four units of EECS 290 or EECS 294 must be completed.

The Ph.D. preliminary examination is conducted twice a year, in the fall and spring quarters. Detailed requirements for each concentration are specified in the departmental Ph.D. preliminary examination policies, available from the EECS Graduate Admissions Office. A student who already has an M.S. on enrollment must pass the Ph.D. preliminary examination within one complete academic year cycle after entering the Ph.D. program. A student who does not already have an M.S. on enrollment must pass the Ph.D. preliminary examination within two complete academic year cycles after entering the Ph.D. program. A student has only two chances to take and pass the Ph.D. preliminary examination. A student who fails the Ph.D. preliminary examination twice will be asked to withdraw from the program, or will be dismissed from the program, and may not be readmitted into the program.

The Ph.D. is granted upon the recommendation of the Doctoral Committee and the Dean of Graduate Studies. Part-time study toward the Ph.D. is not permitted. The normative time for completion of the Ph.D. is five years (four years for students who entered with a master's degree). The maximum time permitted is seven years.

## Program in Law and Graduate Studies (J.D./M.S.-ECE; J.D./Ph.D.-ECE)

Highly qualified students interested in combining the study of law with graduate qualifications in the ECE program are invited to undertake concurrent degree study under the auspices of UC Irvine's Program in Law and Graduate Studies (PLGS). Students in this program pursue a coordinated curriculum leading to a J.D. degree from the School of Law in conjunction with a Master's or Ph.D. degree in the ECE program. Additional information is available from the PLGS Program Director's Office, 949-824-4158, or by email to [plgs@uci.edu](mailto:plgs@uci.edu). A full description of the program, with links to all relevant application information can be found at the School of Law Concurrent Degree Programs website (<http://www.law.uci.edu/academics/interdisciplinary-studies/concurrent-degrees.html>) and in the Law School section (<http://catalogue.uci.edu/schooloflaw/#lawandgraduatestudies>) of the *Catalogue*.

## Electrical Engineering, B.S.

**Program Educational Objectives:** Graduates of the Electrical Engineering program will (1) engage in professional practice in academia, industry, or government; (2) promote innovation in the design, research and implementation of products and services in the field of electrical engineering through strong communication, leadership and entrepreneurial skills; (3) engage in life-long learning in the field of electrical engineering. (Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

The undergraduate Electrical Engineering curriculum is built around a basic core of humanities, mathematics, and natural and engineering science courses. It is arranged to provide the fundamentals of synthesis and design that will enable graduates to begin careers in industry or to go on to graduate study. UCI Electrical Engineering students take courses in network analysis, electronics, electronic system design, signal processing, electromagnetics, and computer engineering. They learn to design circuits and systems to meet specific needs and to use modern computers in problem analysis and solution.

Electrical Engineering majors have the opportunity to select a specialization in Electro-optics and Solid-State Devices; and Systems and Signal Processing. In addition to the courses offered by the Department, the major program includes selected courses from the Donald Bren School of Information and Computer Sciences.

**High School Students:** See School Admissions information.

**Transfer Students:** Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following **required** courses: two years of approved calculus, one year of calculus-based physics with laboratories (mechanics, electricity and magnetism), completion of lower-division writing, and one course in computational methods (e.g., C, C++). For course equivalency specific to each college, visit <https://assist.org>.

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division coursework may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at 949-824-4334.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

**Major Requirements:**

**Mathematics and Basic Science Courses:**

ENGR 1A or CHEM 1A	General Chemistry for Engineers General Chemistry
EECS 55	Engineering Probability
EECS 70LA	Network Analysis I Laboratory
EECS 145	Electrical Engineering Analysis
MATH 2A- 2B	Single-Variable Calculus and Single-Variable Calculus
MATH 2D	Multivariable Calculus
MATH 2E	Multivariable Calculus
MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations
PHYSICS 7C	Classical Physics
PHYSICS 7LC	Classical Physics Laboratory
PHYSICS 7D- 7E	Classical Physics and Classical Physics
PHYSICS 7LD	Classical Physics Laboratory
PHYSICS 51A	Modern Physics

**Engineering Topics Courses:**

Students must complete each of the following courses and accumulate a minimum of 28 units of engineering design:

EECS 1	Introduction to Electrical Engineering and Computer Engineering
EECS 10	Computational Methods in Electrical and Computer Engineering
EECS 31	Introduction to Digital Systems
EECS 31L	Introduction to Digital Logic Laboratory
EECS 50	Discrete-Time Signals and Systems
EECS 70A	Network Analysis I
EECS 70B	Network Analysis II
EECS 70LB	Network Analysis II Laboratory
EECS 150	Continuous-Time Signals and Systems
EECS 159A- 159B	Senior Design Project I and Senior Design Project II
EECS 160A	Introduction to Control Systems
EECS 160LA	Control Systems I Laboratory
EECS 170A	Electronics I
EECS 170LA	Electronics I Laboratory
EECS 170B	Electronics II
EECS 170LB	Electronics II Laboratory
EECS 170C	Electronics III
EECS 170LC	Electronics III Laboratory
EECS 180A	Engineering Electromagnetics I

**Electrical Engineering Specialization:**

Students must satisfy the requirements for one of the five specializations listed below.

### Technical Elective Courses:

In addition to a specialization, and with approval of a faculty advisor, students must select a minimum of three other technical elective courses, comprising of at least 10 units. At least one of these courses must be from outside the student's specialization. All EECS courses not required for the major are approved as technical electives. Four (4) units of 199 course work count as one technical elective. ENGR 7A and ENGR 7B can be counted as 4 units of Technical Electives. ENGR 7A and ENGR 7B are available only to lower-division students. Both ENGR 7A and ENGR 7B must be taken to be counted as a Technical Elective.

### Engineering Professional Topics Courses

ENGR 190W	Communications in the Professional World
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At most an aggregate total of 6 units of EECS 199 may be used to satisfy degree requirements; EECS 199 is open to students with a 3.0 GPA or higher.

(The nominal Electrical Engineering program will require 188-191 units of courses to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary.)

### Specialization in Electronic Circuit Design:

#### Requires:

EECS 170D	Integrated Electronic Circuit Design
EECS 170E	Analog and Communications IC Design
and select four of the following:	
EECS 166A	Industrial and Power Electronics
EECS 174	Semiconductor Devices
EECS 176	Fundamentals of Solid-State Electronics and Materials
EECS 179	Microelectromechanical Systems (MEMS)
EECS 182	Monolithic Microwave Integrated Circuit (MMIC) Analysis and Design
EECS 188	Optical Electronics

### Specialization in Semiconductors and Optoelectronics:

#### Requires:

EECS 174	Semiconductor Devices
EECS 188	Optical Electronics
PHYSICS 52A	Fundamentals of Experimental Physics
and select three of the following:	
EECS 170D	Integrated Electronic Circuit Design
EECS 176	Fundamentals of Solid-State Electronics and Materials
EECS 179	Microelectromechanical Systems (MEMS)
EECS 180B	Engineering Electromagnetics II
EECS 180C	Engineering Electromagnetics III
ENGR 54	Principles of Materials Science and Engineering

### Specialization in RF, Antennas and Microwaves:

#### Requires:

EECS 144	Antenna Design for Wireless Communication Links
EECS 180B	Engineering Electromagnetics II
EECS 182	Monolithic Microwave Integrated Circuit (MMIC) Analysis and Design
and select three of the following:	
EECS 170D	Integrated Electronic Circuit Design
EECS 170E	Analog and Communications IC Design
EECS 180C	Engineering Electromagnetics III
EECS 188	Optical Electronics
PHYSICS 52A	Fundamentals of Experimental Physics

### Specialization in Digital Signal Processing:

#### Requires:

EECS 22	Advanced C Programming
EECS 152A	Digital Signal Processing
EECS 152B	Digital Signal Processing Design and Laboratory

and select three of the following:

EECS 20	Computer Systems and C Programming
EECS 101	Introduction to Machine Vision
EECS 112	Organization of Digital Computers
EECS 141A	Communication Systems I
EECS 141B	Communication Systems II

#### Specialization in Communications:

##### Requires:

EECS 141A	Communication Systems I
EECS 141B	Communication Systems II

and select four of the following:

EECS 20	Computer Systems and C Programming
EECS 22	Advanced C Programming
EECS 144	Antenna Design for Wireless Communication Links
EECS 148	Computer Networks
EECS 152A	Digital Signal Processing
EECS 152B	Digital Signal Processing Design and Laboratory
EECS 170E	Analog and Communications IC Design
EECS 188	Optical Electronics

Listed below are sample programs for each of the five specializations within Electrical Engineering. These sample programs are typical for the accredited major in Electrical Engineering. Students should keep in mind that this program is based upon a rigid set of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Therefore, the course sequence should not be changed except for the most compelling reasons. Students who are not adequately prepared, or who wish to make changes in the sequence for other reasons, must have their programs approved by their advisor. Electrical Engineering majors are encouraged to consult with academic counselors as needed, and students who are academically at risk are mandated to see a counselor as frequently as deemed necessary by the advising staff.

### Sample Program of Study — Electrical Engineering (Electronic Circuit Design Specialization)

#### Freshman

Fall	Winter	Spring
MATH 2A	MATH 2B	MATH 2D
EECS 10	PHYSICS 7C	PHYSICS 7D
General Education	PHYSICS 7LC	PHYSICS 7LD
General Education	ENGR 1A or CHEM 1A	EECS 1
	General Education	EECS 31

#### Sophomore

Fall	Winter	Spring
MATH 3A	MATH 3D	MATH 2E
PHYSICS 7E	EECS 55	PHYSICS 51A
EECS 31L	EECS 70A	EECS 50
General Education	EECS 70LA	EECS 70B
	General Education	EECS 70LB

#### Junior

Fall	Winter	Spring
EECS 145	EECS 150	EECS 170C
EECS 170A	EECS 170B	EECS 170LC
EECS 170LA	EECS 170LB	ENGR 190W
Spec. Elective	EECS 180A	Spec. Elective
General Education	Spec. Elective	General Education

#### Senior

Fall	Winter	Spring
EECS 159A	EECS 159B	Technical Elective
EECS 160A	EECS 170E	General Education
EECS 160LA	Technical Elective	General Education
EECS 170D	Technical Elective	
Spec. Elective		

Students must obtain approval for their program of study and must see their faculty advisor at least once each year.

**Sample Program of Study — Electrical Engineering (Semiconductors and Optoelectronics)**

<b>Freshman</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 2A	MATH 2B	MATH 2D
EECS 10	PHYSICS 7C	PHYSICS 7D
General Education	PHYSICS 7LC	PHYSICS 7LD
General Education	ENGR 1A or CHEM 1A	EECS 1
	General Education	EECS 31
<b>Sophomore</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 3A	MATH 3D	MATH 2E
PHYSICS 7E	EECS 55	PHYSICS 51A
PHYSICS 52A	EECS 70A	EECS 50
EECS 31L	EECS 70LA	EECS 70B
	General Education	EECS 70LB
<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
EECS 145	EECS 150	EECS 170C
EECS 170A	EECS 170B	EECS 170LC
EECS 170LA	EECS 170LB	Spec. Elective
ENGR 190W	EECS 174	Technical Elective
General Education	EECS 180A	General Education
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
EECS 159A	EECS 159B	Technical Elective
EECS 160A	EECS 188	General Education
EECS 160LA	Spec. Elective	General Education
General Education	Technical Elective	
Spec. Elective		

Students must obtain approval for their program of study and must see their faculty advisor at least once each year.

**Sample Program of Study — Electrical Engineering (RF, Antennas and Microwaves)**

<b>Freshman</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 2A	MATH 2B	MATH 2D
EECS 10	PHYSICS 7C	PHYSICS 7D
General Education	PHYSICS 7LC	PHYSICS 7LD
General Education	ENGR 1A or CHEM 1A	EECS 1
	General Education	EECS 31
<b>Sophomore</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
MATH 3A	MATH 3D	MATH 2E
PHYSICS 7E	EECS 55	PHYSICS 51A
EECS 31L	EECS 70A	EECS 50
General Education	EECS 70LA	EECS 70B
	General Education	EECS 70LB
<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
EECS 145	EECS 150	EECS 170C
EECS 170A	EECS 170B	EECS 170LC
EECS 170LA	EECS 170LB	EECS 180B
ENGR 190W	EECS 180A	Spec. Elective
General Education	Spec. Elective	Spec. Elective
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
EECS 144	EECS 159B	General Education
EECS 159A	General Education	General Education
EECS 160A	Technical Elective	Technical Elective
EECS 160LA	Technical Elective	
EECS 182		

Students must obtain approval for their program of study and must see their faculty advisor at least once each year.

### Sample Program of Study — Electrical Engineering (Digital Signal Processing Specialization)

Freshman		
Fall	Winter	Spring
MATH 2A	MATH 2B	MATH 2D
EECS 10	PHYSICS 7C	PHYSICS 7D
General Education	PHYSICS 7LC	PHYSICS 7LD
General Education	CHEM 1A or ENGR 1A	EECS 1
	General Education	EECS 31
Sophomore		
Fall	Winter	Spring
MATH 3A	MATH 3D	MATH 2E
PHYSICS 7E	EECS 55	PHYSICS 51A
EECS 22	EECS 70A	EECS 50
EECS 31L	EECS 70LA	EECS 70B
	General Education	EECS 70LB
Junior		
Fall	Winter	Spring
EECS 145	EECS 150	EECS 170C
EECS 152A	EECS 152B	EECS 170LC
EECS 170A	EECS 170B	Spec. Elective
EECS 170LA	EECS 170LB	General Education
Spec. Elective	Spec. Elective	
Senior		
Fall	Winter	Spring
EECS 159A	EECS 159B	ENGR 190W
EECS 160A	EECS 180A	Technical Elective
EECS 160LA	Technical Elective	General Education
Technical Elective	General Education	General Education
General Education		

Students must obtain approval for their program of study and must see their faculty advisor at least once each year.

### Sample Program of Study — Electrical Engineering (Communication Specialization)

Freshman		
Fall	Winter	Spring
MATH 2A	MATH 2B	MATH 2D
EECS 10	PHYSICS 7C	PHYSICS 7D
General Education	PHYSICS 7LC	PHYSICS 7LD
General Education	ENGR 1A or CHEM 1A	EECS 1
	General Education	EECS 31
Sophomore		
Fall	Winter	Spring
MATH 3A	MATH 3D	MATH 2E
PHYSICS 7E	EECS 55	PHYSICS 51A
EECS 31L	EECS 70A	EECS 50
General Education	EECS 70LA	EECS 70B
	General Education	EECS 70LB
Junior		
Fall	Winter	Spring
EECS 145	EECS 150	EECS 170C
EECS 170A	EECS 170B	EECS 170LC
EECS 170LA	EECS 170LB	Spec. Elective
ENGR 190W	EECS 180A	Spec. Elective
Spec. Elective	Spec. Elective	General Education
Senior		
Fall	Winter	Spring
EECS 159A	EECS 159B	Technical Elective
EECS 141A	EECS 141B	General Education
EECS 160A	Technical Elective	General Education

Students must obtain approval for their program of study and must see their faculty advisor at least once each year.

## Department of Materials Science and Engineering

### Julie M. Schoenung, Department Chair

916 Engineering Tower

949-824-5802

<http://www.eng.uci.edu/dept/mse> (<http://www.eng.uci.edu/dept/mse/>)

The Department of Materials Science and Engineering offers the B.S. in Materials Science and Engineering, a minor in Materials Science and Engineering, and the M.S. and Ph.D. in Materials Science and Engineering.

- Materials Science and Engineering, B.S.
- Materials Science and Engineering, M.S.
- Materials Science and Engineering, Minor
- Materials Science and Engineering, Ph.D.

## Faculty

Diran Apelian, Sc.D. Massachusetts Institute of Technology, *Distinguished Professor of Materials Science and Engineering* (solidification processing; aluminum metallurgy; clean metal/melt refining; plasma processing/spray forming; powder metallurgy; nanostructured materials; semi-solid processing; thermal processing; resource recovery and recycling; innovation in engineering education)

William Bowman, Ph.D. Arizona State University, *Assistant Professor of Materials Science and Engineering* (materials for energy conversion and storage, advanced transmission electron microscopy and spectroscopy, correlating multiscale properties, electrical properties of ceramics, electrochemistry and defect chemistry, interfaces, grain boundaries and surfaces, electron energy-loss spectroscopy, ceramic processing and thin-film growth)

Stacy Copp, Ph.D. University of California, Santa Barbara, *Samueli Faculty Development Chair and Assistant Professor of Materials Science and Engineering* (soft matter-based photonic materials; metal nanoclusters; polymer nanostructures; self-assembly; biomimetics; machine learning for materials discovery)

James Earthman, Ph.D. Stanford University, *Professor of Materials Science and Engineering; Biomedical Engineering* (biomaterials, compositionally complex materials, nanocrystalline alloys, quantitative percussion diagnostics, deformation and damage processes)

Allon Hochbaum, Ph.D. University of California, Berkeley, *Associate Professor of Materials Science and Engineering; Chemical and Biomolecular Engineering; Chemistry* (nanoscale materials and hybrid bio-inorganic devices for applications in clean energy)

David Kisailus, Ph.D. University of California, Santa Barbara, *Professor of Materials Science and Engineering* (investigation of synthesis - structure and structure - property relationships in biological and biomimetic materials, development of multifunctional structural materials, synthesis and crystal growth of nanoscale materials for energy conversion, storage, and environmental remediation)

Enrique Lavernia, Ph.D. Massachusetts Institute of Technology, *Distinguished Professor of Materials Science and Engineering* (nanostructured materials, additive manufacturing, powder metallurgy, mechanical behavior)

Martha L. Mecartney, Ph.D. Stanford University, *Professor Emeritus of Materials Science and Engineering; Chemical and Biomolecular Engineering* (ceramics for energy applications and for extreme environments, flash sintering, interfacial design of thermal conductivity, transmission electron microscopy)

Farghalli A. Mohamed, Ph.D. University of California, Berkeley, *Professor Emeritus of Materials Science and Engineering* (mechanical behavior of engineering materials such as metals, composites and ceramics, the correlation between behavior and microstructure, creep and superplasticity, mechanisms responsible for strengthening and fracture)

Daniel Mumm, Ph.D. Northwestern University, *Associate Professor of Materials Science and Engineering* (development of materials for power generation systems, propulsion, integrated sensing, advanced vehicle concepts and platform protection)

Xiaoqing Pan, Ph.D. Saarlandes University, *Henry Samueli Endowed Chair and Director of Irvine Materials Research Institute (IMRI) and Professor of Materials Science and Engineering; Physics and Astronomy* (atomic-scale structure, properties and dynamic behaviors of advanced materials including thin films and nanostructures for memories, catalysts, and energy conversion and storage devices)



Regina Ragan, Ph.D. California Institute of Technology, *Endowed Chair for the Center for Diversity in Engineering Education and Professor of Materials Science and Engineering; Chemical and Biomolecular Engineering* (exploration and development of novel material systems for nanoscale electronic and optoelectronic devices)

Timothy Rupert, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Materials Science and Engineering; Chemical and Biomolecular Engineering; Mechanical and Aerospace Engineering* (mechanical behavior, nanomaterials, structure property relationships, microstructural stability, grain boundaries and interfaces, materials characterization)

Julie M. Schoenung, Ph.D. Massachusetts Institute of Technology, *Department Chair and Professor of Materials Science and Engineering* (materials selection, green engineering, materials processing and characterization, nanostructured materials, structure-property relationships)

Lorenzo Valdevit, Ph.D. Princeton University, *Director of Institute for Design and Manufacturing Innovation (IDMI) and Associate Professor of Materials Science and Engineering; Mechanical and Aerospace Engineering* (architected materials, mechanical metamaterials, additive manufacturing, optimal design)

## Affiliate Faculty

Shane Ardo, Ph.D. Johns Hopkins University, *Associate Professor of Chemistry; Chemical and Biomolecular Engineering; Materials Science and Engineering* (inorganic and organometallic, physical chemistry and chemical physics, polymer, materials, nanoscience)

Plamen Atanassov, Ph.D. Bulgarian Academy of Sciences, *UCI Chancellor's Professor of Chemical and Biomolecular Engineering; Chemistry; Materials Science and Engineering* (electrocatalysis and electrocatalysts for energy conversion processes; bio-electrocatalysis and energy harvesting systems)

Peter J. Burke, Ph.D. Yale University, *Professor of Electrical Engineering and Computer Science; Biomedical Engineering; Materials Science and Engineering* (nano-electronics, bio-nanotechnology)

Penghui Cao, Ph.D. Boston University, *Assistant Professor of Mechanical and Aerospace Engineering; Materials Science and Engineering* (fundamental understanding of the mechanisms by which materials plastically deform and fail, particularly in extreme environments)

Sarah Finkeldei, Ph.D. RWTH Aachen University, *Assistant Professor of Chemistry; Materials Science and Engineering* (nuclear chemistry)

Alon A. Gorodetsky, Ph.D. California Institute of Technology, *Associate Professor of Chemical and Biomolecular Engineering; Chemistry; Materials Science and Engineering* (cephalopods, adaptive materials, camouflage, bioelectronics)

Zhibin Guan, Ph.D. University of North Carolina at Chapel Hill, *Professor of Chemistry; Biomedical Engineering; Chemical and Biomolecular Engineering; Materials Science and Engineering* (chemical biology, organic and synthetic, polymer, materials, nanoscience)

Jered Haun, Ph.D. University of Pennsylvania, *Associate Professor of Biomedical Engineering; Chemical and Biomolecular Engineering; Materials Science and Engineering* (nanotechnology, molecular engineering, computational simulations, targeted drug delivery, clinical cancer detection)

Michelle Khine, Ph.D. University of California, Berkeley, *Professor of Biomedical Engineering; Chemical and Biomolecular Engineering; Materials Science and Engineering* (development of novel nano- and micro-fabrication technologies and systems for single cell analysis, stem cell research, in-vitro diagnostics)

Matthew Law, Ph.D. University of California, Berkeley, *Associate Professor of Chemistry; Chemical and Biomolecular Engineering; Materials Science and Engineering* (inorganic and organometallic, physical chemistry and chemical physics, polymer, materials, nanoscience)

Mo Li, Ph.D. University of Michigan, *Assistant Professor of Civil and Environmental Engineering; Materials Science and Engineering* (unconventional infrastructure materials, and their interfaces with structural engineering, advanced manufacturing, spatial damage sensing, and the environment)

Ray Luo, Ph.D. University of Maryland, College Park, *Professor of Molecular Biology and Biochemistry; Biomedical Engineering; Chemical and Biomolecular Engineering; Materials Science and Engineering* (protein structure, noncovalent associations involving proteins)

Ali Mohraz, Ph.D. University of Michigan, *Associate Professor of Chemical and Biomolecular Engineering; Materials Science and Engineering* (colloid science, soft matter engineering with applications in health care and energy materials)

Mikael Nilsson, Ph.D. Chalmers University of Technology, *Adjunct Professor of Chemical and Biomolecular Engineering; Materials Science and Engineering* (actinide chemistry, solvent extraction fundamental chemistry and process development, extraction and detection equipment development, radiolysis and phase composition of organic solvent)

Joseph Patterson, Ph.D. University of Warwick, *Assistant Professor of Chemistry; Materials Science and Engineering* (polymer, materials, nanoscience)

Frank G. Shi, Ph.D. California Institute of Technology, *Professor of Chemical and Biomolecular Engineering; Materials Science and Engineering* (optoelectronic devices and materials, optoelectronic device packaging materials, optoelectronic medical devices and packaging, white LED technologies, high power LED packaging)

Vasan Venugopalan, Sc.D. Massachusetts Institute of Technology, *Department Chair and Professor of Chemical and Biomolecular Engineering; Biomedical Engineering; Materials Science and Engineering; Mechanical and Aerospace Engineering; Surgery* (laser-generated thermal, mechanical and radiative transport processes for application in medical diagnostics, imaging, therapeutics, biotechnology)

Huolin Xin, Ph.D. Cornell University, *Assistant Professor of Physics and Astronomy; Materials Science and Engineering*

Iryna Zenyuk, Ph.D. Carnegie Mellon University, *Associate Director of National Fuel Cell Research Center and Assistant Professor of Chemical and Biomolecular Engineering; Materials Science and Engineering; Mechanical and Aerospace Engineering* (renewable energy, fuel cells, electrolyzers, batteries, X-ray imaging techniques, multi-scale modeling, transport phenomena)

Weian Zhao, Ph.D. McMaster University, *Associate Professor of Pharmaceutical Sciences; Biological Chemistry; Biomedical Engineering; Materials Science and Engineering* (stem cell therapy, diagnostics, biosensors, immunotherapy, single-cell analysis)

## Courses

### **MSE 60. Laboratory in Synthesis and Characterization of Materials. 4 Units.**

Synthesis and characterization of ceramic, polymer, and semiconductor materials. Connect the process, structure, properties, and performance to materials science knowledge in a hands-on laboratory setting. Materials fee.

Prerequisite: ENGR 54 and CHEM 1C

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

### **MSE 69. Electronic and Optical Properties in Materials. 4 Units.**

Covers the electronic, optical, and dielectric properties of crystalline and amorphous materials to provide a foundation of the underlying physical principles governing the properties of existing and emerging electronic and photonic materials.

Prerequisite: PHYS 7D and PHYS 7E and (MATH 3A or ICS 6N) and MATH 3D and ENGR 54

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

### **MSE 141. Nano-Scale Materials and Applications. 4 Units.**

Overview of the chemistry, physics, and applications of nanometer-scale materials. Explore the effects of composition, bonding, and confinement on physical properties of nanomaterials, their chemical syntheses, and their device physics in electronic, optoelectronic, and energy technologies.

Prerequisite: (ENGR 1A or CHEM 1A or CHEM H2A) and ENGR 54 and MSE 69

Restriction: Biomedical Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

Concurrent with MSE 241.

### **MSE 151. Polymeric Materials. 4 Units.**

An introduction to physical aspects of polymers, including polymer molecular size and configuration, solution and bulk phase structural properties, mechanical properties including viscoelasticity and rheology, polymer synthesis methods, characterization techniques, processing methods, and examples from existing and emerging polymeric materials.

Prerequisite: ENGR 54 and (MSE 165A or CBE 40C or MAE 91)

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

### **MSE 155. Mechanical Behavior and Design Principles. 4 Units.**

Principles governing structure and mechanical behavior of materials, relationship relating microstructure and mechanical response with application to elasticity, plasticity, yielding, necking, creep, and fracture of materials. Introduction to experimental techniques to characterize the properties of materials. Design parameters.

Prerequisite: ENGR 54

Same as MAE 156.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Aerospace Engineering majors have second consideration for enrollment.

**MSE 155L. Mechanical Behavior Laboratory. 1 Unit.**

Introduction to experimental techniques to characterize mechanical properties of materials. Emphasis on correlations between property and microstructure. Experiments include: plastic stability in tension, effect of grain size on flow stress, microstructural engineering. Materials fee.

Corequisite: MSE 155

Prerequisite: ENGR 54

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 158. Ceramic Materials for Sustainable Energy. 4 Units.**

A technical elective for students interested in materials. Topics covered include structure and properties of ceramic materials, and design for sustainable energy applications.

Prerequisite: ENGR 54

Restriction: Materials Science and Engr Majors have first consideration for enrollment. Chemical Engineering majors have second consideration for enrollment.

**MSE 163. Computer Techniques in Experimental Research. 4 Units.**

Principles and practical guidelines of automated materials testing. Computer fundamentals, programming languages, data acquisition and control hardware, interfacing techniques, programming strategies, data analysis, data storage, safeguard procedures.

Restriction: Materials Science and Engr Majors have first consideration for enrollment. Chemical Engineering majors have second consideration for enrollment.

**MSE 164. X-ray Diffraction, Electron Microscopy, and Microanalysis. 4 Units.**

Material characterization using X-ray diffraction and scanning electron microscopy (SEM). Topics include X-ray diffraction and analysis; SEM imaging and microanalysis. Materials fee.

Prerequisite: ENGR 54 and PHYS 7D

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 164L. X-ray Diffraction, Electron Microscopy, and Microanalysis Lab. 1 Unit.**

Material characterization using X-ray diffraction and scanning electron microscopy (SEM). Topics include X-ray diffraction and analysis; SEM imaging and microanalysis.

Prerequisite: ENGR 54 and PHYS 7D

Restriction: Materials Science and Engr Majors only.

**MSE 165A. Thermodynamics of Materials. 4 Units.**

Treatment of the laws of thermodynamics and their application in understanding properties and equilibrium states of engineering materials. Develops relationships pertaining to multiphase equilibrium and presents graphical constructions for interpretation of phase diagrams. Statistical thermodynamics in relation to materials phenomena.

Prerequisite: CHEM 1C and PHYS 7C

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 165B. Diffusion and Heat Transport in Materials. 4 Units.**

Examines how kinetics affect materials development, behavior, and processing. Highlights the ways in which kinetics and diffusion are key to designing materials processing and heat treating strategies, with examples in various applied topics.

Prerequisite: MSE 165A or CBE 40C or MAE 91. MSE 165A with a grade of C- or better

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 165C. Materials Kinetics and Phase Transformations. 4 Units.**

Treatment of the kinetics of solid-state reactions and reactions at interfaces. Thermodynamics and kinetics of phase transformations, including solidification processes, diffusional and diffusionless phase transformations.

Prerequisite: ENGR 54 and (MSE 165B or (CBE 120B and CBE 120C) or MAE 120). MSE 165B with a grade of C- or better

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 165CL. Laboratory in Materials Kinetics and Phase Transformations. 1 Unit.**

Covers topics of practical application of the kinetics of solid state reactions, reactions at interfaces, and the thermodynamics and kinetics of phase transformations to common materials systems.

Prerequisite: ENGR 54 and (MSE 165B or (CBE 120B and CBE 120C) or MAE 120). MSE 165B with a grade of C- or better

Restriction: Materials Science and Engr Majors only.

**MSE 171. Green Engineering: Theory and Practice. 4 Units.**

Methods and impacts of selecting alternative technologies, processes, materials, chemicals, to reduce pollution, waste, and use of toxic substances, thereby creating "green," environmentally responsible, sustainable solutions. Topics include environmental regulations, recycling, life-cycle assessment, economic analysis, design, green chemistry, and toxicology.

Restriction: Seniors only. Materials Science and Engr Majors have first consideration for enrollment.

**MSE 173. Fundamentals of Materials Processing: How are Materials Processed to Make Things?. 4 Units.**

An in-depth knowledge of manufacturing processes with focus on the fundamentals of materials processing (heat flow, mass flow, fluid flow, etc.). Processing fundamentals that apply to the three main classes of engineering materials: metals, ceramics, and polymers.

Prerequisite: ENGR 54

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 174. Composite Materials Design. 3 Units.**

Introduction to fiber-reinforced composites for mechanical applications. Properties of reinforcing fibers. Manufacture of fibers and composites. Micromechanics of fiber composites. Strength criteria and failure modes. Macromechanics in design of laminated composite structures.

Prerequisite: ENGR 54 and ENGR 150

**MSE 175. Design Failure Investigation. 4 Units.**

Survey of mechanisms by which devices fail, including overload, fatigue, corrosion, and wear. Use of fractography and other evidence to interpret failure modes and specify design/manufacturing changes. Students redesign failed parts or structures based on actual parts and/or case histories.

Prerequisite: ENGR 54

Restriction: Materials Science and Engr Majors have first consideration for enrollment. Chemical Engineering majors have second consideration for enrollment.

**MSE 176. Surface and Adhesion Science. 4 Units.**

Structure, thermodynamics of, kinetics, and reactions on surfaces. Surface electronic and mechanical properties and characterization of all classes of materials including metals, semiconductors, ceramics, polymers, and soft materials. Adhesion between different materials is also addressed.

Prerequisite: (CBE 110 or MSE 165C) and (MSE 141 or MSE 69)

Same as CBE 183.

Restriction: Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

Concurrent with MSE 276 and CBE 283.

**MSE 189A. Senior Design Project I. 3 Units.**

Group supervised senior design projects that deal with materials selection in engineering design and that involve case studies in ethics, safety, design, failure modes, new products, and patents. Activities conclude with a presentation of the projects. Materials fee.

Prerequisite: ENGR 54 and MSE 155 and MSE 60 and MSE 165C

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Seniors only. Materials Science and Engr Majors only. MSE 189A, MSE 189B, and MSE 189C must be taken in the same academic year.

**MSE 189B. Senior Design Project II. 3 Units.**

Group supervised senior design projects that deal with materials selection in engineering design and that involve case studies in ethics, safety, design, failure modes, new products, and patents. Activities conclude with a presentation of the projects. Materials fee.

Prerequisite: MSE 189A

Grading Option: In Progress (Letter Grade with P/NP).

Restriction: Seniors only. Materials Science and Engr Majors only. MSE 189A, MSE 189B, and MSE 189C must be taken in the same academic year.

**MSE 189C. Senior Design Project III. 3 Units.**

Group supervised senior design projects that deal with materials selection in engineering design and that involve case studies in ethics, safety, design, failure modes, new products, and patents. Activities conclude with a presentation of the projects. Materials fee.

Prerequisite: MSE 189B

Restriction: Seniors only. Materials Science and Engr Majors only. MSE 189A, MSE 189B, and MSE 189C must be taken in the same academic year.

**MSE 190. Materials Selection and Design. 4 Units.**

Meaning and phases of design; design considerations; properties of engineering materials; materials property charts; materials selection; process selection; multi-constraint and multi-objective design. Selection of shape in mechanical components. Designing with hybrid materials: challenges and opportunities. Environmental considerations; case studies.

Prerequisite: ENGR 54 and ENGR 150

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 191. Materials Outreach. 3 Units.**

Demonstrates major concepts in Materials Science and Engineering. Concepts of materials engineering covered include deformation in crystalline solids, effects of heat treatment on mechanical properties, thermal barrier materials, composites design, mechanical behavior of polymers, superconductivity in ceramics.

Prerequisite: ENGR 54

Restriction: Materials Science and Engr Majors have first consideration for enrollment.

**MSE 195. Special Topics in Materials Science and Engineering. 1-4 Units.**

Studies in selected areas of Materials Science and Engineering. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

**MSE 198. Group Study. 1-4 Units.**

Group study of selected topics in engineering.

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**MSE 199. Individual Study. 1-4 Units.**

Supervised independent reading, research, or design for undergraduate Engineering majors. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

Repeatability: May be taken for credit for 8 units.

Restriction: Materials Science and Engr Majors only.

**MSE 199P. Individual Study. 1-4 Units.**

Supervised independent reading, research, or design for undergraduate Engineering majors. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**MSE 200. Crystalline Solids: Structure, Imperfections, and Properties. 4 Units.**

Principles and concepts underlying the study of advanced materials including alloys, composites, ceramics, semiconductors, polymers, ferroelectrics, and magnetics. Crystal structure and defects, surface and interface properties, thermodynamics and kinetics of phase transformations, and material processing, related to fundamental material properties.

Restriction: Graduate students only.

**MSE 201A. Critical Analysis and Technical Communication I. 2 Units.**

Develop an understanding of the process to conduct research. Topics include performing analytical analysis of the scientific literature, formation of a hypothesis, defining investigations to validate hypothesis, communicating analysis in written form, writing a research proposal.

Restriction: Graduate students only.

**MSE 201B. Critical Analysis and Technical Communication II. 2 Units.**

Develop oral presentation skills and skills to understand significance of published research. Topics include performing critical and analytical analysis of the scientific literature, connecting core course content with experimental/theoretical methods in the scientific literature, and communicating analysis in oral form.

Prerequisite: MSE 201A

Restriction: Graduate students only.

**MSE 205. Materials Physics. 4 Units.**

Covers the electronic, optical, and dielectric properties of crystalline materials to provide a foundation of the underlying physical principles of governing the properties of existing and emerging electronic and photonic materials.

Prerequisite: MSE 200

Restriction: Graduate students only.

**MSE 241. Nano-Scale Materials and Applications. 4 Units.**

Overview of the chemistry, physics, and applications of nanometer-scale materials. Explore the effects of composition, bonding, and confinement on physical properties of nanomaterials, their chemical syntheses, and their device physics in electronic, optoelectronic, and energy technologies.

Prerequisite: MSE 200 and MSE 205

Restriction: Graduate students only.

Concurrent with MSE 141.

**MSE 249. Special Topics in Materials Science and Engineering. 1-4 Units.**

Studies in selected areas of Materials Science and Engineering. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**MSE 254. Polymer Science and Engineering. 4 Units.**

An introduction to physical aspects of polymers, including configuration and conformation of polymer chains and characterization techniques; crystallinity viscoelasticity, rheology, and processing.

Restriction: Graduate students only.

**MSE 255A. Design with Ceramic Materials. 4 Units.**

Dependence of ceramic properties on bonding, crystal structure, defects, and microstructure. Ceramic manufacturing technology. Survey of physical properties. Strength, deformation, and fracture of ceramics. Mechanical design with brittle, environment-sensitive materials exhibiting time-dependent strengths.

Prerequisite: ENGR 54

Restriction: Graduate students only.

**MSE 256A. Mechanical Behavior of Engineering Materials. 4 Units.**

Principles governing structure and mechanical behavior of materials, relationship relating microstructure and mechanical response with application to elasticity, plasticity, creep, and fatigue, study of rate-controlling mechanisms and failure modes, fracture of materials.

Restriction: Graduate students only.

**MSE 256B. Fracture of Engineering Materials. 4 Units.**

Fracture mechanics and its application to engineering materials. Elastic properties of cracks, the stress intensity factor, the crack tip plastic zone, the J integral approach, fracture toughness testing, the crack tip opening displacement, fracture at high temperatures, fatigue crack growth.

Restriction: Graduate students only.

**MSE 259. Transmission Electron Microscopy. 4 Units.**

The theory and operation of the transmission electron microscope (TEM), including the basic construction, electron optics, electron diffraction and reciprocal space, formation of image and electron diffraction information, microanalysis, and specimen preparation.

Prerequisite: MSE 200

Restriction: Graduate students only.

**MSE 262. Grain Boundaries and Interfaces in Nanocrystalline Materials. 4 Units.**

Structure and character of grain boundaries and interfaces in solids including nanocrystalline materials. Role of grain boundaries in chemical segregation, fracture, deformation, creep, conductivity, diffusion, and grain growth. Experimental techniques and computational methods used to characterize and model grain boundaries.

Prerequisite: MSE 200

**MSE 264. Scanning Electron Microscopy. 4 Units.**

The theory and operation of the scanning electron microscope (SEM) and X-ray microanalysis. Topics covered include the basic design and electron optics, electron beam - specimen interactions, image formation and interpretation, X-ray spectrometry, and other related topics and techniques.

Prerequisite: MSE 200

Restriction: Graduate students only.

**MSE 265. Phase Transformations. 4 Units.**

Advanced thermodynamics and kinetics of phase transformations and phase transitions.

Prerequisite: MSE 200

Restriction: Graduate students only.

**MSE 267. Seminar in Systems Microbiology Research. 1 Unit.**

A research and journal club seminar that covers topics on bacteria and phage using approaches and principles from biology, engineering, and physics.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Same as MBB 268, PHYS 268.

Restriction: Upper-division students only. Graduate students only.

**MSE 271. Green Engineering: Theory and Practice. 4 Units.**

Methods and impacts of selecting alternative technologies, processes, materials, chemicals, to reduce pollution, waste, and use of toxic substances, thereby creating "green," environmentally responsible, sustainable solutions. Topics include environmental regulations, recycling, life-cycle assessment, economic analysis, design, green chemistry, and toxicology.

Restriction: Graduate students only.

**MSE 273. Electroceramics & Solid State Electrochemical Systems. 4 Units.**

Theory, underlying principles, experimental techniques, and applications of electroceramics and solid-state electrochemical systems. Links solid state physics, atomic structure, thermodynamics, defect chemistry, and transport processes to electrical properties of ceramics - spanning from insulators to fast-ion conductors and HT superconductors.

Prerequisite: MSE 200



**MSE 276. Surface and Adhesion Science. 4 Units.**

Structure, thermodynamics of, kinetics, and reactions on surfaces. Surface electronic and mechanical properties and characterization of all classes of materials including metals, semiconductors, ceramics, polymers, and soft materials. Adhesion between different materials is also addressed.

Same as CBE 283.

Restriction: Graduate students only.

Concurrent with MSE 176 and CBE 183.

**MSE 295. Seminar in Engineering. 1-4 Units.**

Seminars by individual faculty in major fields of interest.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**MSE 296. Master of Science Thesis Research. 1-16 Units.**

Individual research or investigation conducted in preparation for the thesis required for the M.S. degree in Engineering.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**MSE 297. Doctor of Philosophy Dissertation Research. 1-16 Units.**

Individual research or investigation conducted in preparation for the dissertation required for the Ph.D. degree in Engineering.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**MSE 298. Seminars in Materials Science and Engineering. 2 Units.**

Presentation of advanced topics and reports of current research efforts in Materials Science and Engineering.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**MSE 299. Individual Research. 1-16 Units.**

Individual research or investigation under the direction of an individual faculty member.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Materials Science and Engineering, B.S.

**Program Educational Objectives:** Graduates of the Materials Science and Engineering program will (1) establish a productive Materials Science and Engineering career in industry, government or academia; (2) apply critical reasoning and the requisite analytical/quantitative skills in seeking solutions to materials science and engineering problems; (3) promote innovation in materials discovery, development and design through effective leadership, skilled communications, and multidisciplinary teamwork; (4) exhibit a commitment to engineering ethics, environmental stewardship, continued learning, and professional development.

(Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

Since the beginning of history, materials have played a crucial role in the growth, prosperity, security, and quality of human life. In fact, materials have been so intimately related to the emergence of human culture and civilization that anthropologists and historians have identified early cultures by the name of the significant materials dominating those cultures. These include the stone, bronze, and iron ages of the past. At the present time, the scope of materials science and engineering has become very diverse; it is no longer confined to topics related to metals and alloys but includes those relevant to ceramics, composites, polymers, biomaterials, nanostructures, intelligent materials, and electronic devices. In addition, present activities in materials science and engineering cover not only areas whose utility can be identified today, but also areas whose utility may be unforeseen. The

services of materials scientists and engineers are required in a variety of engineering operations dealing, for example, with emerging energy systems, design of semiconductors and optoelectronic and nano devices, development of new technologies based on composites and high-temperature superconductivity, biomedical products, performance (e.g., quality, reliability, safety, energy efficiency) in automobile and aircraft components, improvement in nondestructive testing techniques, corrosion behavior in refineries, radiation damage in nuclear power plants, and fabrication of advanced materials.

The undergraduate major in Materials Science and Engineering (MSE) provides students with a thorough knowledge of basic engineering and scientific principles. The undergraduate curriculum in MSE includes (a) a core of Chemistry, Physics, and Mathematics; (b) basic Engineering courses; (c) Materials and Engineering core; and (d) technical courses in Materials Science, Engineering, and Sciences.

Because of the interdisciplinary nature of MSE and its intimate relations with other Engineering disciplines (Aerospace, Biomedical, Chemical, Civil, Computer, Electrical, Environmental, and Mechanical Engineering), qualified students will be able to satisfy in a straightforward manner the degree requirements of their Engineering major and the MSE major.

**High School Students:** See School Admissions information.

**Transfer Students:** Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following **required** courses: two years of approved calculus, one year of calculus-based physics with laboratories (mechanics, electricity and magnetism), completion of lower-division writing, one year of general chemistry (with laboratory), and one course in introductory programming. For course equivalency specific to each college, visit <https://assist.org>.

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division coursework may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at 949-824-4334.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Major Requirements

#### Mathematics and Basic Science Courses:

##### Core Courses:

ENGR 1A or CHEM 1A	General Chemistry for Engineers General Chemistry
CHEM 1B- 1C	General Chemistry and General Chemistry
CHEM 1LC	General Chemistry Laboratory
MATH 2A- 2B	Single-Variable Calculus and Single-Variable Calculus
MATH 2D	Multivariable Calculus
MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations
MATH 2E	Multivariable Calculus
PHYSICS 7C- 7LC	Classical Physics and Classical Physics Laboratory
PHYSICS 7D- 7E	Classical Physics and Classical Physics
PHYSICS 7LD	Classical Physics Laboratory

#### Engineering Topics Courses:

##### Core Courses:

MSE 60	Laboratory in Synthesis and Characterization of Materials
MSE 69	Electronic and Optical Properties in Materials
MSE 151	Polymeric Materials
MSE 155	Mechanical Behavior and Design Principles
MSE 155L	Mechanical Behavior Laboratory
MSE 158	Ceramic Materials for Sustainable Energy
MSE 164	X-ray Diffraction, Electron Microscopy, and Microanalysis
MSE 164L	X-ray Diffraction, Electron Microscopy, and Microanalysis Lab
MSE 165A	Thermodynamics of Materials
MSE 165B	Diffusion and Heat Transport in Materials
MSE 165C	Materials Kinetics and Phase Transformations

MSE 165CL	Laboratory in Materials Kinetics and Phase Transformations
MSE 175	Design Failure Investigation
MSE 189A- 189B- 189C	Senior Design Project I and Senior Design Project II and Senior Design Project III
MSE 190	Materials Selection and Design
EECS 70A	Network Analysis I
or ENGRMAE 60	Electric Circuits
ENGR 54	Principles of Materials Science and Engineering
ENGR 150	Mechanics of Structures
or ENGRMAE 150	Mechanics of Structures
ENGRMAE 10	Introduction to Engineering Computations
ENGRMAE 30	Statics
or ENGR 30	Statics
or ENGRCEE 30	Statics
ENGRMAE 150L	Mechanics of Structures Laboratory

**Engineering Electives:**

Students must complete a minimum of four courses from the lists below (at most two of the courses can be Basic Science or Engineering Electives, and at least two courses must be Technical Electives):

**Basic Science or Engineering Electives**

BIO SCI 93	From DNA to Organisms
BME 50A	Cell and Molecular Engineering
BME 50B	Cell and Molecular Engineering
EECS 70B	Network Analysis II
ENGR 7A- 7B	Introduction to Engineering I and Introduction to Engineering II
ENGRMAE 52	Computer-Aided Design
ENGRMAE 80	Dynamics
or ENGRCEE 80	Dynamics
or ENGR 80	Dynamics
PHYSICS 52A	Fundamentals of Experimental Physics
STATS 7	Basic Statistics

**Technical Electives**

BME 110B	Biomechanics II
BME 111	Design of Biomaterials
BME 120	Sensory Motor Systems
CBE 187	Semiconductor Device Packaging
EECS 170A	Electronics I
EECS 174	Semiconductor Devices
EECS 176	Fundamentals of Solid-State Electronics and Materials
ENGR 165	Advanced Manufacturing
ENGRMAE 114	Fuel Cell Fundamentals and Technology
ENGRMAE 117	Solar and Renewable Energy Systems
ENGRMAE 118	Sustainable Energy Systems
ENGRMAE 145	Theory of Machines and Mechanisms
ENGRMAE 147	Vibrations
ENGRMAE 151	Mechanical Engineering Design
ENGRMAE 153	Advanced BIOMEMS Manufacturing Techniques
ENGRMAE 155	Composite Materials and Structures
ENGRMAE 157	Lightweight Structures
MSE 141	Nano-Scale Materials and Applications
MSE 171	Green Engineering: Theory and Practice

MSE 173	Fundamentals of Materials Processing: How are Materials Processed to Make Things?
MSE 174	Composite Materials Design
MSE 176	Surface and Adhesion Science
MSE 199	Individual Study

Students select, with the approval of a faculty advisor, any additional engineering topics courses needed to satisfy school and department requirements.

#### Engineering Professional Topics Course:

ENGR 190W	Communications in the Professional World
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(The nominal Materials Science and Engineering program will require 187 units of courses to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary. Dual engineering majors are reminded that they are required to satisfy all requirements of both majors individually. Students should not assume that courses for one, such as senior design, will satisfy the requirements of the other, without prior approval.)

- <sup>1</sup> ENGR 7A-ENGR 7B is available only to lower-division students. Both ENGR 7A-ENGR 7B must be taken to be counted as an Engineering Elective course.
- <sup>2</sup> May be used to satisfy a maximum of one elective course requirement.

Students majoring in MSE may elect, with approval of their faculty advisor, to use available engineering electives to complete one of the following specializations.

#### Specialization in Materials Processing

Requires a minimum of three courses from:

CBE 187	Semiconductor Device Packaging
ENGR 165	Advanced Manufacturing
ENGRMAE 153	Advanced BIOMEMS Manufacturing Techniques
MSE 171	Green Engineering: Theory and Practice
MSE 173	Fundamentals of Materials Processing: How are Materials Processed to Make Things?
MSE 174	Composite Materials Design

#### Specialization in Energy Materials and Sustainability

Requires a minimum of three courses from:

ENGRMAE 114	Fuel Cell Fundamentals and Technology
ENGRMAE 117	Solar and Renewable Energy Systems
ENGRMAE 118	Sustainable Energy Systems
MSE 141	Nano-Scale Materials and Applications
MSE 171	Green Engineering: Theory and Practice

#### Specialization in Biomaterials:

Requires a minimum of three courses from:

BME 110B	Biomechanics II
BME 111	Design of Biomaterials
BME 120	Sensory Motor Systems
ENGRMAE 153	Advanced BIOMEMS Manufacturing Techniques

#### Specialization in Electronic and Functional Materials:

Requires a minimum of three courses from:

CBE 187	Semiconductor Device Packaging
EECS 170A	Electronics I
EECS 174	Semiconductor Devices
EECS 176	Fundamentals of Solid-State Electronics and Materials
MSE 141	Nano-Scale Materials and Applications
MSE 176	Surface and Adhesion Science

#### Specialization in Structural and Mechanical Materials:

Requires a minimum of three courses from:

ENGR 165	Advanced Manufacturing
MSE 173	Fundamentals of Materials Processing: How are Materials Processed to Make Things?
MSE 174	Composite Materials Design
ENGRMAE 145	Theory of Machines and Mechanisms
ENGRMAE 147	Vibrations
ENGRMAE 155	Composite Materials and Structures
ENGRMAE 157	Lightweight Structures

A sample program of study chart for the major in Materials Science and Engineering is available in the Undergraduate Student Affairs Office. Students should keep in mind that this program is based upon a sequence of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Students who are not adequately prepared, or who wish to make changes in the sequence for other reasons, must have their program approved by their faculty advisor. Materials Science and Engineering majors are encouraged to consult with academic counselors as needed, and students who are academically at risk are mandated to see a counselor as frequently as deemed necessary by the advising staff.

## Sample Program of Study — Materials Science and Engineering

Freshman		
Fall	Winter	Spring
MATH 2A	MATH 2B	MATH 2D
ENGR 1A	CHEM 1B	CHEM 1C
ENGRMAE 10	PHYSICS 7C	CHEM 1LC
General Education	PHYSICS 7LC	PHYSICS 7D
	General Education	PHYSICS 7LD
Sophomore		
Fall	Winter	Spring
MATH 3A	MATH 3D	MATH 2E
PHYSICS 7E	MSE 60	EECS 70A
ENGR 30	Engineering Elective	MSE 69
ENGR 54	General Education	Engineering Elective
Junior		
Fall	Winter	Spring
MSE 165A	MSE 165B	MSE 165C
ENGR 150	MSE 155	MSE 165CL
ENGRMAE 150L	MSE 155L	MSE 190
MSE 164	ENGR 190W	General Education
MSE 164L	General Education	General Education
Senior		
Fall	Winter	Spring
MSE 151	MSE 175	MSE 189C
MSE 189A	MSE 189B	General Education
MSE 158	Engineering Elective	General Education
Engineering Elective	General Education	

## Materials Science and Engineering, M.S.

Materials Science and Engineering focuses on the discovery of new materials, the tailoring of materials systems for optimum performance in a given technological application, and the design of novel materials solutions for emerging technologies. MSE is an interdisciplinary field incorporating elements of chemistry, physics, biology and/or engineering to derive and control the connections between structure (at length scales ranging from sub-atomic to macroscale), the processing necessary to achieve that structure, the fundamental properties (electrical, optical, thermal, mechanical, etc.), and their performance. These correlations are investigated using advanced materials characterization techniques and theoretical/computational analysis. Many of the most pressing scientific and technological challenges faced by humanity are constrained by the limits of currently available materials. The discovery, design and development of enabling materials is at the core of solving current and future scientific and engineering grand challenges, and benefit industries involved in electronics, advanced sensors, communications, human health, transportation, manufacturing recreation, energy conversion and storage, and environmental sustainability.

Current research programs include nanomaterials, nanostructures, nanoelectronics, nanodevices, nanocharacterization, device/system packaging materials, materials for fuel cells and related alternative energy systems, biocompatible materials, soft materials such as biological materials and polymeric materials, electronic and photonic materials, hybrid materials, interfacial engineering of materials, and multifunctional materials. Faculty with relevant research are affiliated with the Integrated Nanofabrication Research Facility (INRF), the National Fuel Cell Research Center (NFCRC), the

California Institute for Telecommunications and Information Technology (Calit2), the Advanced Power and Energy Program (APEP), the Laboratory for Electron and X-ray Instrumentation (LEXI), and the Irvine Materials Research Institute (IMRI), among others.

The MSE graduate degree program is hosted by the Department of Materials Science and Engineering (MSE). Faculty who may serve as advisors are listed as affiliated with the MSE Department and include faculty with strong materials science and engineering research programs from other departments. The formal degree that is awarded upon successful completion of the program is either the M.S. or Ph.D. in Materials Science and Engineering.

## Specific Fields of Emphasis

The Materials faculty at UCI have special interest and expertise in all areas of modern materials and technologies, including biomaterials, energy materials, advanced ceramics, polymers and nanocomposite materials, structural and nanostructured metallic materials, micro/nano-device materials, device/system packaging materials, and multifunctional materials.

Given the nature of Materials Science and Engineering as a cross-disciplinary program, students having a background and suitable training, in Materials, Engineering (Mechanical, Electrical, Civil, Chemical, Aerospace), and the Physical Sciences (Physics, Chemistry, Geology) are encouraged to participate. A student with an insufficient background may be required to take remedial undergraduate courses. Recommended background courses include an introduction to materials, thermodynamics, mechanical behavior, and electrical/optical/magnetic behavior.

The M.S. reflects achievement of an advanced level of competence for professional practice of materials science and engineering. Two options are available: a thesis option and a comprehensive examination option.

## Required Courses

Students are required to take one course from each area for the M.S. and as a basis for the Ph.D. preliminary examination.

### Crystal Structure and Defects:

MSE 200	Crystalline Solids: Structure, Imperfections, and Properties
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### Electrical and Optical Behavior:

MSE 205	Materials Physics
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### Mechanical Behavior:

MSE 256A	Mechanical Behavior of Engineering Materials
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### Thermodynamics and Kinetics:

MSE 265	Phase Transformations
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## Electives

Faculty advisors should be consulted on the selection of elective courses. All graduate courses offered in MSE are potential electives. Graduate-level courses offered in other Engineering departments and relevant graduate courses from other schools may also be taken as electives.

### Plan I: Thesis Option

For the M.S. thesis option, students are required to complete a research study of great depth and originality and obtain approval for a complete program of study. A committee of three full-time faculty members is appointed to guide development of the thesis. A minimum of 36 units is required for the M.S.

For the thesis option, the following are required: four required core courses; three quarters of MSE 298 (Department Seminar); five additional graduate elective courses numbered 200–289 (or 200-295 if offered by other departments) for 3 or more units each, related to their field of graduate studies, and approved by the graduate advisor. Up to two of these elective courses can be substituted by up to eight units of MSE 296 (M.S. Thesis Research), and one of these elective courses may be substituted by an upper-division undergraduate elective course if the course is not a part of the required MSE undergraduate core curriculum and is approved by the MSE graduate advisor.

Full-time graduate students must enroll in the departmental seminar each quarter during their first year unless exempt by petition.

### Plan II: Comprehensive Examination Option

For the comprehensive examination option, students are required to complete 36 units of study and a comprehensive examination.

The following are required: four required core courses; three quarters of MSE 298 (Department Seminar); and a minimum of five additional graduate elective courses for 3 or more units numbered 200–289 (or 200-295 if offered by other departments), related to their field of graduate studies, and approved by the graduate advisor. One of these elective courses may be substituted by an upper-division undergraduate elective course if the course is not a part of the required MSE undergraduate core curriculum and is approved by the MSE graduate advisor.

Research units (MSE 296/MSE 299) do not count towards the degree requirements of the Comprehensive Exam Option. Full-time graduate students must enroll in the departmental seminar each quarter during their first year unless exempt by petition.

In addition to fulfilling the course requirements outlined above, it is a University requirement for the Master of Science degree that students fulfill a minimum of 36 units of study.

## Materials Science and Engineering, Minor

The interdisciplinary field of materials science and engineering has become critical to many emerging areas of advanced technology and their applications. As a result, there are needs and opportunities for engineers and scientists with education and training in materials science and engineering. The goal of the minor in Materials Science and Engineering (MSE) is to provide students at UCI with such education and training that will enable them, upon graduation, to not only participate in projects or programs of an interdisciplinary nature but also address challenging societal needs and complex technological advances.

Students are required to complete all prerequisites for required courses and selected electives. In particular, students need to complete the following courses before applying:

CHEM 1A	General Chemistry
CHEM 1LE	Accelerated General Chemistry Lab
MATH 2D	Multivariable Calculus
MATH 2E	Multivariable Calculus
MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations
PHYSICS 7C	Classical Physics
PHYSICS 7LC	Classical Physics Laboratory
PHYSICS 7D	Classical Physics
PHYSICS 7LD	Classical Physics Laboratory

The Materials Science and Engineering minor requires a total of seven courses—five required courses and two electives:

### Required courses:

ENGR 54	Principles of Materials Science and Engineering
MSE 165C	Materials Kinetics and Phase Transformations
Select three of the following:	
MSE 69	Electronic and Optical Properties in Materials
MSE 151	Polymeric Materials
MSE 155	Mechanical Behavior and Design Principles
MSE 158	Ceramic Materials for Sustainable Energy
MSE 164	X-ray Diffraction, Electron Microscopy, and Microanalysis
MSE 165A	Thermodynamics of Materials
MSE 165B	Diffusion and Heat Transport in Materials
MSE 175	Design Failure Investigation
MSE 190	Materials Selection and Design

### Electives:

Select two of the following:

BME 110B	Biomechanics II
BME 111	Design of Biomaterials
BME 120	Sensory Motor Systems
CBE 187	Semiconductor Device Packaging
EECS 170A	Electronics I
EECS 174	Semiconductor Devices
EECS 176	Fundamentals of Solid-State Electronics and Materials
ENGR 165	Advanced Manufacturing
ENGRMAE 114	Fuel Cell Fundamentals and Technology
ENGRMAE 117	Solar and Renewable Energy Systems
ENGRMAE 118	Sustainable Energy Systems
ENGRMAE 145	Theory of Machines and Mechanisms
ENGRMAE 147	Vibrations
ENGRMAE 151	Mechanical Engineering Design



ENGRMAE 153	Advanced BIOMEMS Manufacturing Techniques
ENGRMAE 155	Composite Materials and Structures
ENGRMAE 157	Lightweight Structures
MSE 141	Nano-Scale Materials and Applications
MSE 171	Green Engineering: Theory and Practice
MSE 173	Fundamentals of Materials Processing: How are Materials Processed to Make Things?
MSE 174	Composite Materials Design

## Materials Science and Engineering, Ph.D.

The Ph.D. in Materials Science and Engineering requires a commitment on the part of the student to dedicated study and collaboration with the faculty. Ph.D. students are selected on the basis of outstanding demonstrated potential and scholarship. Applicants must hold the appropriate prerequisite degrees from recognized institutions of high standing. After substantial preparation, Ph.D. candidates work under the supervision of faculty advisors. The process involves extended immersion in a research atmosphere and culminates in the production of original research results presented in a dissertation. Milestones to be passed in the Ph.D. program in order to remain in good standing include the following: acceptance into a research group by the faculty advisor at the end of the student's first year of study; successful completion of the Ph.D. preliminary examination by the end of the second year; preparation for pursuing research and the development of a research proposal culminating in passing the Qualifying Examination by the end of the third year of the Ph.D. program. The Qualifying Examination includes faculty evaluation of a written research dossier and an oral presentation. Students must advance to candidacy in their third year (second year for students who entered with a master's degree).

Students applying with the objective of a Ph.D. are admitted to the M.S./Ph.D. program only if they are likely to successfully complete a Ph.D. program. These students do not formally re-apply to the Ph.D. program after completing the M.S. Students who apply to the M.S.-only program must petition for the Ph.D. program if they desire to continue on for a Ph.D. Financial support is usually reserved for those students who plan to complete the Ph.D. The normative time to complete M.S. and Ph.D. degrees is two and five years, respectively.

The core course requirements for the Ph.D. are listed under 'Required Courses' above. Students must also enroll in MSE 298 (Department Seminar) each quarter during their first year unless exempt by petition. Ph.D. students must take two additional elective courses each for 3-4 units or a combination approved by the graduate advisor beyond the M.S. requirements. These courses are to be taken after the first year of graduate work, should be relevant to the Ph.D. dissertation topic, and must be selected in consultation with the research advisor and approved by the MSE graduate advisor. The preliminary examination is based on the four required core courses for the M.S. Students who have completed an MSE M.S. elsewhere must have a written approval by the graduate advisor to waive required MSE core courses, if they have taken the equivalent courses elsewhere.

Final examination involves the oral presentation and defense of an acceptable dissertation in a seminar attended by students and faculty. The Ph.D. is granted upon the recommendation of the Doctoral Committee and the Dean of the Graduate Division. The normative time for completion of the Ph.D. is five years (four years for students who entered with a master's degree). The maximum time permitted is seven years.

### Expectations for the Ph.D. Dissertation

The Ph.D. dissertation is written documentation of original research that has impact on the field of study for the Ph.D. Impact in the field is measured by accepted or published peer-reviewed journal articles, peer-reviewed conference proceedings, patents, or analogous original documented adoption of innovative technology. Faculty research advisors are to provide in writing their specific expectations consistent with the above criteria.

## Department of Mechanical and Aerospace Engineering

### Roger Rangel, Department Chair

4221 Engineering Gateway

949-824-8451

<http://mae.eng.uci.edu/>

The Department of Mechanical and Aerospace Engineering offers two undergraduate B.S. programs: one in Mechanical Engineering and the other in Aerospace Engineering. The Department also offers M.S. and Ph.D. programs in Mechanical and Aerospace Engineering.

Mechanical Engineers and Aerospace Engineers design, manufacture, and control machines ranging from robots to aircraft and spacecraft, design engines and power plants that drive these machines, analyze the environmental impact associated with power generation, and strive to promote environmental quality. These disciplines require the creative use of mathematics, physics, and chemistry together with engineering science and technology in areas such as fluid and solid mechanics, thermodynamics and heat transfer, dynamics, controls, and atmospheric science to achieve these goals. Mechanical Engineering and Aerospace Engineering students at UCI learn the problem-solving, design, modeling, and testing skills required to contribute to be leaders in advancing modern technology and to be on the forefront of scientific discoveries.

The Mechanical Engineering undergraduate program includes required courses that provide engineering fundamentals and technical electives that allow students to study particular areas of interest. Elective courses can be organized into specializations in Aerospace Engineering, Energy Systems

and Environmental Engineering, Flow Physics and Propulsion Systems, and Design of Mechanical Systems. Independent research opportunities allow students to pursue other avenues for focusing their studies.

Aerospace Engineering deals with all aspects of aircraft and spacecraft design and operation, thus requiring the creative use of many different disciplines. The undergraduate curriculum in Aerospace Engineering includes courses in subsonic and supersonic aerodynamics, propulsion, controls and performance, light-weight structures, spacecraft dynamics, and advanced materials. In the senior capstone course, students work in teams on the preliminary design of a commercial jet transport.

Career opportunities for Mechanical and Aerospace Engineering graduates are in a broad range of industries, including manufacturers of vehicles of all types, as well as aircraft and spacecraft, micro-mechanical systems, rehabilitation engineering, and research laboratories in universities and government.

- Aerospace Engineering, B.S.
- Mechanical and Aerospace Engineering, M.S.
- Mechanical and Aerospace Engineering, Ph.D.
- Mechanical Engineering, B.S.

## Faculty

Satya N. Atluri, ScD Massachusetts Institute of Technology, *Professor Emeritus of Mechanical and Aerospace Engineering*

James E. Bobrow, Ph.D. University of California, Los Angeles, *Professor Emeritus of Mechanical and Aerospace Engineering* (robotics, mechatronics, and design optimization)

Ramin Bostanabad, Ph.D. Northwestern University, *Assistant Professor of Mechanical and Aerospace Engineering* (design under uncertainty, probabilistic machine learning, materials informatics, computational microstructure characterization, topology optimization)

Jacob Brouwer, Ph.D. Massachusetts Institute of Technology, *Professor of Mechanical and Aerospace Engineering; Civil and Environmental Engineering* (fuel cells, energy systems dynamics, electrochemical systems design and analysis, chemical kinetics, reacting flows)

Natascha Buswell, Ph.D. Purdue University, *Assistant Professor of Teaching of Mechanical and Aerospace Engineering* (graduate engineering education, faculty development, engineering teaching, engineering education research methods)

Penghui Cao, Ph.D. Boston University, *Assistant Professor of Mechanical and Aerospace Engineering; Materials Science and Engineering* (fundamental understanding of the mechanisms by which materials plastically deform and fail, particularly in extreme environments)

David Copp, Ph.D. University of California, Santa Barbara, *Assistant Professor of Teaching of Mechanical and Aerospace Engineering* (optimal control and estimation, hybrid dynamical systems, energy storage, pedagogy)

Donald Dabdub, Ph.D. California Institute of Technology, *Associate Dean, Undergraduate Education and Professor of Mechanical and Aerospace Engineering; Civil and Environmental Engineering* (mathematical modeling of urban and global air pollution, dynamics of atmospheric aerosols, secondary organic aerosols, impact of energy generation on air quality, chemical reactions at gas-liquid interfaces)

Derek Dunn-Rankin, Ph.D. University of California, Berkeley, *Professor Emeritus of Mechanical and Aerospace Engineering; Civil and Environmental Engineering; Environmental Health Sciences* (combustion, optical particle sizing, particle aerodynamics, laser diagnostics and spectroscopy)

Said E. Elghobashi, Ph.D. University of London, *Distinguished Professor Emeritus of Mechanical and Aerospace Engineering* (direct numerical simulation of turbulent, chemically reacting and dispersed two-phase flows)

Manuel Gamero-Castaño, Ph.D. Yale University, *Associate Professor of Mechanical and Aerospace Engineering* (electric propulsion, with emphasis on colloid thruster technology for precision formation flying missions and Hall thrusters. Electrohydrodynamic atomization of liquids and related problems like electrospray ionization and technological applications of electrosprays, aerosol diagnostics)

Tryphon Georgiou, Ph.D. University of Florida, *Distinguished Professor of Mechanical and Aerospace Engineering* (dynamical systems and control, mathematical physics, applied mathematics. Current interests focus on stochastic control, geometry of optimal mass transport, inverse problems in physics and signal analysis, and topics related to the control of fluids, networks and thermodynamic systems)

Faryar Jabbari, Ph.D. University of California, Los Angeles, *Associate Dean for Academic Affairs and Professor of Mechanical and Aerospace Engineering* (optimal control theory, distributed parameter systems, parameter identification)

Zak Kassas, Ph.D. University of Texas at Austin, *Assistant Professor of Mechanical and Aerospace Engineering; Electrical Engineering and Computer Science* (cyber-physical systems (CPS), autonomous vehicles (aerial, ground, indoor, underwater), satellite-based navigation, intelligent transportation systems (ITS), cognitive and software-defined radio (SDR), sensor fusion)

Solmaz S. Kia, Ph.D. University of California, Irvine, *Assistant Professor of Mechanical and Aerospace Engineering; Computer Science* (systems and control, decentralized/distributed algorithm design for multi-agent systems, cooperative robotics)

John C. LaRue, Ph.D. University of California, San Diego, *Professor Emeritus of Mechanical and Aerospace Engineering* (fluid mechanics, heat transfer, turbulence)

Jaeho Lee, Ph.D. Stanford University, *Assistant Professor of Mechanical and Aerospace Engineering* (heat transfer, thermal management, thermoelectrics, phononics, nanomaterials)

Robert Liebeck, Ph.D. University of Illinois at Urbana-Champaign, *Adjunct Professor of Mechanical and Aerospace Engineering* (aerodynamics, hydrodynamics, aircraft design)

Feng Liu, Ph.D. Princeton University, *Professor of Mechanical and Aerospace Engineering* (computational fluid dynamics, turbomachinery, propulsion)

Marc J. Madou, Ph.D. Ghent University, *UCI Chancellor's Professor of Mechanical and Aerospace Engineering; Biomedical Engineering; Chemical and Biomolecular Engineering* (miniaturization science (MEMS and NEMS) with emphasis on chemical and biological applications )

J. Michael McCarthy, Ph.D. Stanford University, *Director of the Performance Engineering Program and Professor of Mechanical and Aerospace Engineering* (design of mechanical systems, computer aided design, kinematic theory of spatial motion)

Vincent G. McDonell, Ph.D. University of California, Irvine, *Adjunct Professor of Mechanical and Aerospace Engineering* (combustion, alternative fuels, gas turbines, sprays, diagnostics, combined heat and power, emissions, autoignition/flashback)

Kenneth D. Mease, Ph.D. University of Southern California, *Professor Emeritus of Mechanical and Aerospace Engineering* (nonlinear dynamics and control; flight guidance and control)

Lawrence Muzio, Ph.D. University of California, Berkeley, *Adjunct Professor of Mechanical and Aerospace Engineering* (thermodynamics, combustion and combustion in practical systems, air pollution formation and control, advanced diagnostics applied to practical combustion systems)

Bihter Padak, Ph.D. Stanford University, *Assistant Professor of Mechanical and Aerospace Engineering; Chemical and Biomolecular Engineering*

Dimitri Papamoschou, Ph.D. California Institute of Technology, *Professor of Mechanical and Aerospace Engineering* (compressible turbulence, jet and fan aeroacoustics, jet noise reduction, mixing enhancement, microphone phased array methods)

Edwin Peraza Hernandez, Ph.D. Texas A&M University, *Assistant Professor of Mechanical and Aerospace Engineering* (morphing structures, deployable structures, origami, tensegrity, active materials, structural optimization)

Roger H. Rangel, Ph.D. University of California, Berkeley, *Department Chair and Professor of Mechanical and Aerospace Engineering* (heat transfer, fluid mechanics, two-phase flows, fluid instability and atomization)

David J. Reinkensmeyer, Ph.D. University of California, Berkeley, *Professor of Anatomy and Neurobiology; Biomedical Engineering; Mechanical and Aerospace Engineering; Physical Medicine and Rehabilitation*

G. Scott Samuelsen, Ph.D. University of California, Berkeley, *Director of Advanced Power and Energy Program, Research Professor and Professor Emeritus of Mechanical and Aerospace Engineering; Civil and Environmental Engineering* (combustion, sprays, laser diagnostics, air quality, turbulent transport, alternative fuels, modeling reacting flows, practical systems, energy and environmental conflict)

Andrei M. Shkel, Ph.D. University of Wisconsin-Madison, *Professor of Mechanical and Aerospace Engineering; Biomedical Engineering; Electrical Engineering and Computer Science* (design and advanced control of micro-electro-mechanical systems (MEMS); high precision micro-machined gyroscopes; MEMS-enhanced optical systems, tools and prosthetic appliances; electromechanical and machine-information systems integration)

Athanasios Sideris, Ph.D. University of Southern California, *Professor of Mechanical and Aerospace Engineering* (control systems, neural networks)

William A. Sirignano, Ph.D. Princeton University, *Henry Samueli Endowed Chair in Engineering and Distinguished Professor of Mechanical and Aerospace Engineering* (combustion theory, multiphase flows, turbulent reacting flows, computational methods, rocket and jet propulsion, gas turbine and internal combustion engines)

Haithem Taha, Ph.D. Virginia Polytechnic Institute and State University, *Assistant Professor of Mechanical and Aerospace Engineering* (geometric nonlinear control theory; unsteady aerodynamics and aeroelasticity; optimization, calculus of variations and optimal control; flight dynamics and autopilot design; airplane performance and configuration aerodynamics)

Mark Walter, Ph.D. California Institute of Technology, *Professor of Teaching of Mechanical and Aerospace Engineering* (mechanics of multifunctional materials, building energy efficiency)

Yun Wang, Ph.D. Pennsylvania State University, *Professor of Mechanical and Aerospace Engineering* (fuel cells, computational modeling, thermo-fluidics, two-phase flows, electrochemistry, Computational Fluid Dynamics (CFD), turbulent combustion)

Gregory N. Washington, Ph.D. North Carolina State University at Raleigh, *Professor Emeritus of Mechanical and Aerospace Engineering* (dynamic systems with emphasis on modeling and control of smart material systems and devices)

Yoon Jin Won, Ph.D. Stanford University, *Assistant Professor of Mechanical and Aerospace Engineering; Chemical and Biomolecular Engineering* (multi-scale structures for thermal and energy applications, in particular fabrication, characterization, and integration of structured materials)

## Affiliate Faculty

Mohammad A. Al Faruque, Ph.D. University of Kaiserslautern, *Chair of Emulex Career Development and Associate Professor of Electrical Engineering and Computer Science; Computer Science; Mechanical and Aerospace Engineering* (cyber-physical systems, internet of things, embedded systems, CPS security)

Aparna Chandramowlishwaran, Ph.D. Georgia Institute of Technology, *Assistant Professor of Electrical Engineering and Computer Science; Computer Science; Mechanical and Aerospace Engineering* (high-performance computing, domain-specific compilers, algorithm-architecture co-design, data analysis, and scientific computing)

Joyce H. Keyak, Ph.D. University of California, San Francisco, *Professor in Residence of Radiological Sciences; Biomedical Engineering; Mechanical and Aerospace Engineering*

Arash Kheradvar, Ph.D. California Institute of Technology, *Professor of Biomedical Engineering; Mechanical and Aerospace Engineering* (cardiac mechanics, cardiovascular devices, cardiac imaging)

Abraham P. Lee, Ph.D. University of California, Berkeley, *Professor of Biomedical Engineering; Mechanical and Aerospace Engineering* (integrated point-of-care diagnostics, engineered 'theranostic' vesicles and particles, active cell sorting microdevices, microphysiological microsystems, and high throughput droplet bioassays)

Beth A. Lopour, Ph.D. University of California, Berkeley, *Assistant Professor of Biomedical Engineering; Mechanical and Aerospace Engineering* (computational neuroscience, signal processing, mathematical modeling, epilepsy, translational research)

Timothy Rupert, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Materials Science and Engineering; Chemical and Biomolecular Engineering; Mechanical and Aerospace Engineering* (mechanical behavior, nanomaterials, structure property relationships, microstructural stability, grain boundaries and interfaces, materials characterization)

Lorenzo Valdevit, Ph.D. Princeton University, *Director of Institute for Design and Manufacturing Innovation (IDMI) and Associate Professor of Materials Science and Engineering; Mechanical and Aerospace Engineering* (architected materials, mechanical metamaterials, additive manufacturing, optimal design)

Vasan Venugopalan, Sc.D. Massachusetts Institute of Technology, *Department Chair and Professor of Chemical and Biomolecular Engineering; Biomedical Engineering; Materials Science and Engineering; Mechanical and Aerospace Engineering; Surgery* (laser-generated thermal, mechanical and radiative transport processes for application in medical diagnostics, imaging, therapeutics, biotechnology)

Iryna Zenyuk, Ph.D. Carnegie Mellon University, *Associate Director of National Fuel Cell Research Center and Assistant Professor of Chemical and Biomolecular Engineering; Materials Science and Engineering; Mechanical and Aerospace Engineering* (renewable energy, fuel cells, electrolyzers, batteries, X-ray imaging techniques, multi-scale modeling, transport phenomena)

## Courses

### **ENGRMAE 10. Introduction to Engineering Computations. 4 Units.**

Introduction to the solution of engineering problems through the use of the computer. Elementary programming, numerical analysis, and data visualization with a high-level programming language such as MATLAB.

(Design units: 1)

Corequisite: MATH 2A

Prerequisite: MATH 2A or MATH 5A

Overlaps with EECS 10, EECS 12, BME 60B.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 30. Statics. 4 Units.**

Addition and resolution of forces, distributed forces, equivalent system of forces centroids, first moments, moments and products on inertia, equilibrium of rigid bodies, trusses, beams, cables. Course may be offered online.

(Design units: 0)

Corequisite: MATH 2D

Prerequisite: MATH 2D and PHYSICS 7C

Same as ENGRCEE 30, ENGR 30.

Restriction: School of Engineering students have first consideration for enrollment.

**ENGRMAE 52. Computer-Aided Design. 4 Units.**

Develops skills for interpretation and presentation of mechanical design drawings and the use of CAD in engineering design. An integrated approach to drafting based on sketching, manual drawing, and three-dimensional CAD techniques is presented.

(Design units: 0.5)

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 57. Manufacturing Processes in Engineering. 2 Units.**

With laboratory. Machines and processes of mechanical manufacturing. Safety and professional procedures emphasized. Use of measuring instruments, hand tools, lathe, mill, drill press, bandsaw, grinder, welding equipment.

(Design units: 0)

Grading Option: Pass/no pass only.

Restriction: School of Engineering students have first consideration for enrollment.

**ENGRMAE 60. Electric Circuits. 4 Units.**

Design and analysis of analog circuits based on lumped circuit elements with emphasis on the use of operational amplifiers. Sinusoidal and transient response. Constructional and laboratory testing of analog circuits, and introduction to data acquisition. Materials fee.

(Design units: 2)

Corequisite: MATH 3D

Prerequisite: PHYSICS 7D and PHYSICS 7LD

Overlaps with EECS 70A.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Materials Science Engineering Majors have first consideration for enrollment.

**ENGRMAE 80. Dynamics. 4 Units.**

Introduction to the kinematics and dynamics of particles and rigid bodies. The Newton-Euler, Work/Energy, and Impulse/Momentum methods are explored for ascertaining the dynamics of particles and rigid bodies. An engineering design problem using these fundamental principles is also undertaken.

(Design units: 0.5)

Prerequisite: MATH 2D and PHYSICS 7C

Same as ENGRCEE 80, ENGR 80.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRMAE 91. Introduction to Thermodynamics. 4 Units.**

Thermodynamic principles; open and closed systems representative of engineering problems. First and second law of thermodynamics with applications to engineering systems and design.

(Design units: 0.5)

Prerequisite: PHYSICS 7C and MATH 2D

Overlaps with CBE 40B.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRMAE 93. Topics in Design Project . 1-4 Units.**

Early-stage design/hands-on experience for students, and allows them to participate alongside seniors in the design project.

(Design units: 1)

Repeatability: Unlimited as topics vary.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

**ENGRMAE 106. Mechanical Systems Laboratory. 4 Units.**

Experiments in linear systems, including op-amp circuits, vibrations, and control systems. Emphasis on demonstrating that mathematical models can be useful tools for the analysis and design of electro-mechanical systems. Materials fee.

(Design units: 2)

Prerequisite: ENGRMAE 60 or EECS 70A

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRMAE 107. Fluid Thermal Science Laboratory. 4 Units.**

Fluid and thermal engineering laboratory. Experimental analysis of fluid flow, heat transfer, and thermodynamic systems. Probability, statistics, and uncertainty analysis. Report writing is emphasized and a design project is required. Materials fee.

(Design units: 1)

Corequisite: ENGRMAE 120

Restriction: Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 108. Aerospace Laboratory. 4 Units.**

Analytical and experimental investigation in aerodynamics, fluid dynamics, and heat transfer. Emphasis on study of flow over objects and lift and drag on airfoils. Introduction to basic diagnostic techniques. Report writing is emphasized. Design project is required.

(Design units: 2)

Prerequisite: ENGRMAE 130B

Restriction: Aerospace Engineering Majors have first consideration for enrollment. Mechanical Engineering majors have second consideration for enrollment.

**ENGRMAE 110. Combustion and Fuel Cell Systems. 4 Units.**

Fundamentals of gaseous, liquid, and coal-fired combustion and fuel cell systems. Fuels, fuel-air mixing, aerodynamics, and combustion and fuel cell thermodynamics. Operating and design aspects of practical systems including engines, power generators, boilers, furnaces, and incinerators.

(Design units: 2)

Prerequisite: ENGRMAE 115

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.



**ENGRMAE 112. Propulsion. 4 Units.**

Application of thermodynamics and fluid mechanics to basic flow processes and cycle performance in propulsion systems: gas turbines, ramjets, scramjets, and rockets.

(Design units: 1)

Prerequisite: ENGRMAE 135

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

**ENGRMAE 113. Electric Propulsion. 4 Units.**

Space propulsion requirements and maneuvers, stressing those best suited to electric propulsion. An introduction to plasma physics. Electrothermal, electromagnetic, and electrostatic accelerators, with emphasis in technologies (ion engines, Hall thrusters, and colloidal thrusters) belonging to the latter family.

(Design units: 1)

Prerequisite: ENGRMAE 112

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

Concurrent with ENGRMAE 213.

**ENGRMAE 114. Fuel Cell Fundamentals and Technology. 4 Units.**

Introduction to electrochemistry and electrocatalysis; nature of fuel-cell electrodes and electrolytes; charge transfer reactions at interfaces; charge transport and mass transport processes; fuel processing reactions; determination of fuel cell efficiency, fuel flexibility, emissions, and other characteristics.

(Design units: 0)

Prerequisite: ENGRMAE 115

Restriction: Seniors only. Mechanical Engineering Majors have first consideration for enrollment. Chemical Engineering majors have second consideration for enrollment.

Concurrent with ENGRMAE 214A.

**ENGRMAE 115. Applied Engineering Thermodynamics. 4 Units.**

Application of thermodynamic principles to compressible and incompressible processes representative of practical engineering problems; power cycles, refrigeration cycles, multicomponent mixtures, air conditioning systems, combustion, and compressible flow. Design of a thermodynamic process.

(Design units: 2)

Prerequisite: ENGRMAE 91 or CBE 40B or ENGRMSE 65A

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRMAE 117. Solar and Renewable Energy Systems. 4 Units.**

Basic principles, design, and operation of solar and other renewable energy systems including solar photo-voltaic, solar thermal, wind, and PEM fuel cell. Includes power generation and storage, and renewable fuels for transportation and stationary power generation.

(Design units: 1)

Prerequisite: (ENGRMAE 91 or CBE 40B)

Restriction: Mechanical Engineering Majors have first consideration for enrollment.



**ENGRMAE 118. Sustainable Energy Systems. 4 Units.**

Basic principles, design, and operation of sustainable energy systems including wind, solar photo-voltaic and thermal, hydroelectric, geothermal, oceanic, biomass combustion, advanced coal, and next generation nuclear. Includes power generation, storage, and transmission for stationary power generation.

(Design units: 1)

Prerequisite: ENGRMAE 115

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

Concurrent with ENGRMAE 218.

**ENGRMAE 119. Climate Solutions. 4 Units.**

Focuses on carbon neutrality and climate stability, addressing.

Same as EARTHSS 179, UPPP 111.

Restriction: Upper-division students only.

**ENGRMAE 120. Heat and Mass Transfer. 4 Units.**

Fundamentals of heat and mass transfer. Conduction, heat and mass transfer by convection in laminar and turbulent flows, radiation heat transfer, and combined modes of heat and mass transfer. Practical engineering applications.

(Design units: 0)

Prerequisite: ENGRMAE 130B

Overlaps with CBE 120B.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 130A. Introduction to Fluid Mechanics. 4 Units.**

Fundamental concepts; fluid statics; fluid dynamics; Bernoulli's equation; control-volume analysis; basic flow equations of conservation of mass, momentum, and energy; differential analysis; potential flow; viscous incompressible flow.

(Design units: 0)

Corequisite: ENGRMAE 91

Prerequisite: PHYSICS 7C and MATH 2D and MATH 2E and MATH 3D and (ENGRMAE 30 or ENGRCEE 30 or ENGR 30) and (ENGRMAE 80 or ENGRCEE 80 or ENGR 80). PHYSICS 7C with a grade of C- or better. MATH 2D with a grade of C- or better. MATH 2E with a grade of C- or better. MATH 3D with a grade of C- or better. ENGRMAE 30 with a grade of C- or better. ENGRCEE 30 with a grade of C- or better. ENGR 30 with a grade of C- or better. ENGRMAE 80 with a grade of C- or better. ENGRCEE 80 with a grade of C- or better. ENGR 80 with a grade of C- or better

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

**ENGRMAE 130B. Introduction to Viscous and Compressible Flows. 4 Units.**

Introduction to the analysis of viscous flows including fully developed laminar and turbulent flow in a pipe, viscous flow over immersed bodies, evaluation of boundary layer characteristics, lift and drag, compressible flow in a duct and normal shock waves.

(Design units: 1)

Prerequisite: ENGRMAE 130A

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

**ENGRMAE 132. Computational Fluid Dynamics. 4 Units.**

Introduction to computational fluid dynamics in simple engineering devices. The numerical simulations will be performed via the widely-used software ANSYS-Fluent. While Fluent is the choice of software, all major CFD packages are based on a similar numerical method.

(Design units: 0)

Prerequisite: ENGRMAE 130B. ENGRMAE 130B with a grade of C- or better

Restriction: Aerospace Engineering Majors only. Mechanical Engineering Majors only.

**ENGRMAE 135. Compressible Flow. 4 Units.**

Compressibility effects in fluid mechanics. One-dimensional flow with area variation, friction, heat transfer, and shocks. Design of gas supply systems. Two-dimensional flow with oblique shocks and isentropic waves. Supersonic airfoil theory and design, wind tunnel design. Basic diagnostics.

(Design units: 1)

Prerequisite: ENGRMAE 130A

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

**ENGRMAE 136. Aerodynamics. 4 Units.**

Analysis of flow over aircraft wings and airfoils, prediction of lift, moment, and drag. Topics: fluid dynamics equations; flow similitude; viscous effects; vorticity, circulation, Kelvin's theorem, potential flow; superposition principle, Kutta-Joukowski theorem; thin airfoil theory; finite wing theory; compressibility.

(Design units: 1)

Prerequisite: ENGRMAE 130B

Restriction: Aerospace Engineering Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 145. Theory of Machines and Mechanisms. 4 Units.**

Presents the basic mathematical theory of machines. Focuses on the principles of cam design, gearing and gear train analysis, and the kinematic and dynamic analysis of linkages, together with an introduction to robotics.

(Design units: 2)

Prerequisite: ENGRMAE 52 and (ENGRMAE 80 or ENGRCEE 80 or ENGR 80) and (MATH 3A or I&C SCI 6N)

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Materials Science and Engineering majors have second consideration for enrollment.

**ENGRMAE 146. Astronautics. 4 Units.**

Motion in gravitational force fields, orbit transfers, rocketry, interplanetary trajectories, attitude dynamics and stabilization, navigation, reentry, the space environment.

(Design units: 1)

Prerequisite: ENGRMAE 80 or ENGRCEE 80 or ENGR 80

Restriction: Aerospace Engineering Majors have first consideration for enrollment.

**ENGRMAE 147. Vibrations. 4 Units.**

Analysis of structural vibrations of mechanical systems. Modeling for lumped and distributed parameter systems. Topics include single and multi-degree of freedom systems, free and forced vibrations, Fourier series, convolution integral, mass/stiffness matrices, and normal modes with design project.

(Design units: 1)

Prerequisite: (ENGR 80 or ENGRCEE 80 or ENGRMAE 80) and MATH 2E and MATH 3D

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 150. Mechanics of Structures. 4 Units.**

Stresses and strains. Torsion. Bending. Beam deflection. Shear force and moment distributions in beams. Yielding and buckling of columns. Combined loading. Transformation of stresses and strain. Yielding criteria. Finite elements analysis of frames. Dynamic of two-bar truss.

(Design units: 2)

Prerequisite: (ENGRCEE 30 or ENGR 30 or ENGRMAE 30) and MATH 3A

Same as ENGR 150.

Overlaps with ENGRCEE 150.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 150L. Mechanics of Structures Laboratory. 1 Unit.**

Experimental techniques for the measurement of mechanical properties of materials and structures. Methods for load, displacement, and strain measurements. Tension, bending, compression tests. Determination of strength, stiffness, toughness for metals, polymers, ceramics, and composites. Deformation of structures. Materials fee.

(Design units: 0)

Corequisite: ENGRMAE 150

Prerequisite: ENGRMAE 30 or ENGR 30 or ENGRCEE 30

Overlaps with ENGRCEE 150L.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 151. Mechanical Engineering Design. 4 Units.**

A comprehensive group design project experience that involves identifying customer needs, idea generation, reverse engineering, preliminary design, standards, prototype development, testing, analysis, and redesign of a product involving fluid, thermal, and mechanical components. Introduces design for manufacturing and the environment. Materials fee.

(Design units: 3)

Corequisite: ENGRMAE 170

Prerequisite: ENGRMAE 120 and ENGRMAE 145

Restriction: Seniors only. Mechanical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 152. Introduction to Computer-Aided Engineering. 4 Units.**

Elements and principles of computer-aided engineering with modern hardware and software are presented with a design focus. Case studies are used to assist in finite-element method techniques. Not offered every year.

(Design units: 2)

Prerequisite: (ENGRMAE 150 or ENGR 150) and ENGRMAE 120

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 153. Advanced BIOMEMS Manufacturing Techniques. 4 Units.**

Introduction to BIOMEMS. Advanced biotechnology/biomedicine equipment based on MEMS and NEMS. Fundamentals of MEMS/NEMS sensing techniques and the biological and physics principles involved and the preferred MEMS and NEMS manufacturing techniques.

(Design units: 0)

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Biomedical Engineering Majors have first consideration for enrollment.

Concurrent with ENGRMAE 253.

**ENGRMAE 155. Composite Materials and Structures. 4 Units.**

Motivation for composite materials. Different classifications according to the nature of the matrix (PMC, MMC, CMC) and the reinforcement topology (fibers, whiskers, particulates). Mechanical properties. Failure mechanisms. Designing with composite materials. Advantages and limitations of homogenization techniques for numerical modeling.

(Design units: 0)

Prerequisite: ENGR 54 and (ENGRMAE 150 or ENGRCEE 150 or ENGR 150)

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering majors have second consideration for enrollment. Chemical Engineering majors have second consideration for enrollment. Civil Engineering majors have second consideration for enrollment. Materials Science and Engineering majors have second consideration for enrollment.

Concurrent with ENGRMAE 255.

**ENGRMAE 156. Mechanical Behavior and Design Principles. 4 Units.**

Principles governing structure and mechanical behavior of materials, relationship relating microstructure and mechanical response with application to elasticity, plasticity, yielding, necking, creep, and fracture of materials. Introduction to experimental techniques to characterize the properties of materials. Design parameters.

(Design units: 2)

Prerequisite: ENGR 54

Same as ENGRMSE 155.

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment. Aerospace Engineering majors have second consideration for enrollment.

**ENGRMAE 157. Lightweight Structures. 4 Units.**

Fundamentals of torsion and bending. Analysis and design of thin-wall and composite beams. Stress analysis of aircraft components. Stiffness, strength, and buckling. Introduction to the Finite Element method and its application to plates and shells.

(Design units: 2)

Prerequisite: ENGR 150 or ENGRCEE 150 or ENGRMAE 150

Restriction: Aerospace Engineering Majors have first consideration for enrollment. Mechanical Engineering majors have second consideration for enrollment. Civil Engineering majors have second consideration for enrollment. Materials Science and Engineering majors have second consideration for enrollment.

**ENGRMAE 158. Aircraft Performance. 4 Units.**

Flight theory applied to subsonic propeller and jet aircraft. Nature of aerodynamic forces, drag and lift of wing and fuselage, high-lift devices, level-flight performance, climb and glide performance, range, endurance, take-off and landing distances, static and dynamic stability and control.

(Design units: 2)

Prerequisite: ENGRMAE 130A

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

**ENGRMAE 159. Aircraft Design. 4 Units.**

Preliminary design of subsonic general aviation and transport aircraft with emphasis on layout, aerodynamic design, propulsion, and performance. Estimation of total weight and weight distribution, design of wings, fuselage, and tail, selection and location of engines, prediction of overall performance.

(Design units: 4)

Prerequisite: ENGRMAE 112 and ENGRMAE 136 and ENGRMAE 158

Restriction: Aerospace Engineering Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 164. Air Pollution and Control. 4 Units.**

Sources, dispersion, and effects of air pollutants. Topics include emission factors, emission inventory, air pollution, meteorology, air chemistry, air quality modeling, impact assessment, source and ambient monitoring, regional control strategies.

(Design units: 2)

Prerequisite: (ENGRMAE 91 or CBE 40B) and ENGRMAE 130A

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Chemical Engineering Majors have first consideration for enrollment. Environmental Engineering Majors have first consideration for enrollment.

**ENGRMAE 170. Introduction to Control Systems. 4 Units.**

Feedback control systems. Modeling, stability, and systems specifications. Root locus, Nyquist, and Bode methods of analysis and design.

(Design units: 2)

Prerequisite: (ENGRMAE 80 or ENGRCEE 80 or ENGR 80) and ENGRMAE 106

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment. Civil Engineering Majors have first consideration for enrollment. Materials Science and Engr Majors have first consideration for enrollment.

**ENGRMAE 171. Digital Control Systems. 4 Units.**

Methods for analysis and design of discrete-time control systems. Z-transforms, difference equations, discrete Fourier transforms. Sampling theorem and applications. Z-plane stability, frequency response. Digital controller design. Introduction to digital filters.

(Design units: 2)

Prerequisite: ENGRMAE 170

Restriction: Civil Engineering Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 172. Design of Computer-Controlled Robots. 4 Units.**

Students design a small robotic device and program it to exhibit sentient behaviors. The basic aspects of mechatronic design are covered, including motor and sensor selection, control strategies, and microcomputer programming for the implementation of control paradigms. Materials fee.

(Design units: 3)

Corequisite: ENGRMAE 60

Prerequisite: ENGRMAE 170

Restriction: Mechanical Engineering Majors have first consideration for enrollment.

Concurrent with ENGRMAE 280.

**ENGRMAE 175. Dynamics and Control of Aerospace Vehicles. 4 Units.**

Equations of motion, linearization, stability derivatives, and longitudinal and lateral modes of motion. Handling qualities, sensors and actuators, and effects of various feedbacks on stability and performance. Stability augmentation. Autopilot design.

(Design units: 3)

Prerequisite: ENGRMAE 106

Restriction: Aerospace Engineering Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 182. Introduction to Machine Learning. 4 Units.**

Fundamental principles necessary to understand statistical learning methods. Introduction to the R programming language. Mathematical foundation for various machine learning algorithms. Computer implementation.

**ENGRMAE 183. Computer-Aided Mechanism Design. 4 Units.**

Focuses on design of planar, spherical, and spatial mechanisms using computer algebra and graphics. Topics include exact and approximate analytical design techniques. Students are required to use existing software (or develop new algorithms) to design various mechanisms for new applications.

(Design units: 4)

Prerequisite: MATH 3A or I&C SCI 6N

Restriction: Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 184. Fundamentals of Experimental Design. 4 Units.**

Review of statistics as applied to experimental research. Fundamentals and principles of statistical experimental design and analysis with emphasis on understanding and use of designed experiments, response surfaces, linear regression modeling, and process optimization.

(Design units: 1)

Restriction: Mechanical Engineering Majors have first consideration for enrollment. Aerospace Engineering Majors have first consideration for enrollment.

Concurrent with ENGRMAE 284.

**ENGRMAE 185. Numerical Analysis in Mechanical Engineering. 4 Units.**

Solution of mechanical-engineering equations by means of numerical methods. Errors in numerical analysis. Nonlinear equation and sets of equations. Numerical differentiation and integration. Ordinary differential equations. Boundary-value problems. Partial differential equations.

(Design units: 2)

Prerequisite: (ENGRMAE 10 or EECS 10 or EECS 12 or BME 60B) and MATH 3D and MATH 2E

Overlaps with MATH 105A.

**ENGRMAE 188. Engineering Design in Industry. 4 Units.**

Principles of engineering design in the context of an industrial application. Local manufacturing firms define an engineering design project to be completed in 10 weeks. Projects include initial brainstorming to final design, with a formal presentation.

(Design units: 4)

Repeatability: May be taken for credit 3 times.

Restriction: Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 189. Senior Project - Special Topics. 1-4 Units.**

Group or individual senior project of theoretical or applied nature involving design. Materials fee.

(Design units: 1-4)

Repeatability: May be taken for credit for 12 units as topics vary.

Restriction: Seniors only. Mechanical Engineering Majors only.

**ENGRMAE 193. Topics in MAE Design. 1-4 Units.**

Provides early-stage design/hands-on experience for upper-division students, and allows them to participate in senior design projects course ENGRMAE 189.

(Design units: 1)

Repeatability: May be taken for credit for 12 units as topics vary.

Restriction: Aerospace Engineering Majors have first consideration for enrollment. Mechanical Engineering Majors have first consideration for enrollment.

**ENGRMAE 195. Seminars in Engineering. 1-4 Units.**

Seminars by individual faculty in major fields of interest. Materials fee.

(Design units: 1-4)

Repeatability: Unlimited as topics vary.

**ENGRMAE 198. Group Study. 1-4 Units.**

Group study of selected topics in Aerospace and Mechanical Engineering.

(Design units: 1-4)

Repeatability: May be repeated for credit unlimited times.

Restriction: Upper-division students only.

**ENGRMAE 199. Individual Study. 1-4 Units.**

For undergraduate Engineering majors in supervised but independent reading, research, or design. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Repeatability: May be taken for credit for 8 units.

**ENGRMAE 199P. Individual Study. 1-4 Units.**

For undergraduate Engineering majors in supervised but independent reading, research, or design. Students taking individual study for design are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering.

(Design units: 1-4)

Grading Option: Pass/no pass only.

Repeatability: May be repeated for credit unlimited times.

**ENGRMAE 200A. Engineering Analysis I. 4 Units.**

Linear algebra, including vector spaces, matrices, linear systems of equations, least squares, and the eigenvalue problem. Ordinary differential equations, including analytical and numerical solution methods, stability, and phase portraits.

Restriction: Graduate students only.

**ENGRMAE 200B. Engineering Analysis II. 4 Units.**

Review of ordinary differential equations, including Bessel and Legendre functions. Partial differential equations, including the diffusion equation, Laplace's equation, and the wave equation. Fourier series, Fourier and Laplace transforms and their applications.

Restriction: Graduate students only.

**ENGRMAE 205. Perturbation Methods in Engineering. 4 Units.**

Asymptotic Expansions of integrals. Regular and singular perturbations. Perturbation methods for ordinary and partial differential equations. Matched asymptotic expansions. Multiple-scale asymptotic expansion schemes. Not offered every year.

Prerequisite: ENGRMAE 200A and ENGRMAE 200B. Knowledge of linear differential equations.

Restriction: Graduate students only.

**ENGRMAE 206. Nonlinear Optimization Methods. 4 Units.**

Numerical methods for constrained and unconstrained optimization. Necessary and sufficient conditions for optimality. Conjugate gradient, variable metric algorithms. Gradient projection, penalty functions, and Lagrange methods. Not offered every year.

Prerequisite: ENGRMAE 200A

Restriction: Graduate students only.

**ENGRMAE 207. Methods of Computer Modeling in Engineering and the Sciences. 4 Units.**

Unified introduction to finite volume, finite element, field-boundary element, meshless, primal, dual, and mixed methods. Nonlinear problems posed by ordinary as well as partial differential equations. Computer implementations and comparisons of accuracy and convergence.

Restriction: Graduate students only.

**ENGRMAE 209P. Energy Efficiency Technology. 4 Units.**

Principles, design, operation of energy efficient technology in the built environment, including solar energy, green building design, low waste/emissions construction materials, energy harvesting, built environment energy conversion and storage, high efficiency lighting, daylighting, heat pumps, cooling systems, renewable power systems.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 210. Advanced Fundamentals of Combustion. 4 Units.**

Premixed, nonpremixed, and heterogenous reactions, with emphasis on kinetics, thermal ignition, turbulent flame propagation, detonations, explosions, flammability limits, diffusion flame, quenching, flame stabilization, and particle and spray combustion. Not offered every year.

Prerequisite: ENGRMAE 224 or ENGRMAE 230B

Restriction: Graduate students only.



**ENGRMAE 211P. Energy Storage Systems and Technology. 4 Units.**

Basic principles, design, and operation of energy storage systems and technology including lithium ion battery systems for transportation and stationary applications, for flow batteries (e.g., vanadium redox, sodium sulfur), and for reversible fuel cell electrolyzer systems and hydrogen energy storage.

Prerequisite: Required: Undergraduate-level knowledge of applied engineering thermodynamics.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 212. Engineering Electrochemistry: Fundamentals and Applications. 4 Units.**

Introduction to engineering electrochemistry fundamentals and applications. Examine thermodynamics and transport principles in typical electrochemical systems. Electrochemical sensors, batteries, fuel cells, and supercapacitors. Manufacturing aspects will also be covered.

Restriction: Graduate students only.

**ENGRMAE 212P. Engineering Electrochemistry: Fundamentals and Applications. 4 Units.**

Introduction to engineering electrochemistry fundamentals and applications. Examine thermodynamics and transport principles in typical electrochemical systems. Electrochemical sensors, batteries, fuel cells, and supercapacitors. Manufacturing aspects are also covered.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 213. Electric Propulsion. 4 Units.**

Space propulsion requirements and maneuvers, stressing those best suited to electric propulsion. An introduction to plasma physics. Electrothermal, electromagnetic and electrostatic accelerators, with emphasis in technologies (ion engines, Hall thrusters and colloidal thrusters) belonging to the latter family.

Restriction: Graduate students only.

Concurrent with ENGRMAE 113.

**ENGRMAE 214A. Fuel Cell Fundamentals and Technology. 4 Units.**

Introduction to electrochemistry and electrocatalysis; nature of fuel-cell electrodes and electrolytes; charge transfer reactions at interfaces; charge transport and mass transport processes; fuel processing reactions; determination of fuel cell efficiency, fuel flexibility, emissions and other characteristics.

Restriction: Graduate students only.

Concurrent with ENGRMAE 114.

**ENGRMAE 214AP. Fuel Cell Fundamentals and Technology. 4 Units.**

Introduction to electrochemistry and electrocatalysis; nature of fuel-cell electrodes and electrolytes; charge transfer reactions at interfaces; charge transport and mass transport processes; fuel processing reactions; determination of fuel cell efficiency, fuel flexibility, emissions, and other characteristics.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 214B. Fuel Cell Systems and Degradation. 4 Units.**

Fuel cell systems design; impacts of operating conditions; experimental and theoretical analysis methods for fuel cells systems; introduction to degradation mechanisms and mitigation techniques; provides broad insight into fuel-cell science, technology, system design and operation. Offered every other year.

Prerequisite: ENGRMAE 214A

Restriction: Graduate students only.

**ENGRMAE 214C. PEM Fuel Cells . 4 Units.**

An in-depth introduction to the fundamentals of PEM fuel cells, including thermodynamics, kinetics, and transport in electrochemical systems. Topics of specific interest to mechanical engineers will include water/heat management and dynamic responses.

Prerequisite: ENGRMAE 214A

Restriction: Graduate students only.

**ENGRMAE 215. Advanced Combustion Technology. 4 Units.**

Pollutant formation and experimental methods. Formation of gaseous pollutants and soot; transformation and emission of fuel contaminants in gas, liquid, and solid fuel combustion; methods employed to measure velocity, turbulence intensity, temperature, composition, particle size; methods to visualize reacting flows.

Prerequisite: ENGRMAE 200A and (ENGRMAE 230A or ENGRMAE 270A)

Restriction: Graduate students only.

**ENGRMAE 216. Statistical Thermodynamics. 4 Units.**

Statistics of independent particles, development of quantum mechanical description of atoms and molecules, application of quantum mechanics, evaluation of thermodynamics properties for solids, liquids, and gases, statistical mechanics of dependent particles (ensembles).

Restriction: Graduate students only.

**ENGRMAE 217. Generalized Thermodynamics. 4 Units.**

Generalized thermodynamics develops the laws of continuum thermodynamics from a set of plausible and intuitive postulates. The postulates are motivated qualitatively by a statistical description of matter and are justified by a posterior success for the resulting theory.

Restriction: Graduate students only.

**ENGRMAE 217P. Generalized Thermodynamics. 4 Units.**

Generalized thermodynamics develops the laws of continuum thermodynamics from a set of plausible and intuitive postulates. The postulates are motivated qualitatively by a statistical description of matter and are justified by a posterior success for the resulting theory.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 218. Sustainable Energy Systems. 4 Units.**

Basic principles, design and operation of sustainable energy systems including wind, solar photo-voltaic and thermal, hydroelectric, geothermal, oceanic, biomass combustion, advanced coal and next generation nuclear. Includes power generation, storage, and transmission for stationary power generation.

Restriction: Graduate students only.

Concurrent with ENGRMAE 118.

**ENGRMAE 218P. Sustainable Energy Systems. 4 Units.**

Basic principles, design, and operation of sustainable energy systems including wind, solar photo-voltaic and thermal, hydroelectric, geothermal, oceanic, biomass combustion, advanced coal, and next generation nuclear. Includes power generation, storage, and transmission for stationary power generation.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 219P. Solar and Renewable Energy Systems. 4 Units.**

Basic principles, design, and operation of solar and other renewable energy systems including solar photo-voltaic, solar thermal, wind, and PEM fuel cell. Includes power generation and storage, and renewable fuels for transportation and stationary power generation.

Prerequisite: Required: Knowledge of applied engineering thermodynamics.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 220. Conduction Heat Transfer. 4 Units.**

Steady state and transient conduction heat transfer in one- and multi-dimensional geometries. Analytical methods, exact and approximate. Numerical techniques are also included.

Restriction: Graduate students only.

**ENGRMAE 221. Convective Heat and Mass Transfer. 4 Units.**

Laminar and turbulent convective heat and mass transfer in external and internal flows. Forced and free convection. Exact and approximate solutions. Similarity solutions. Variable properties. Concentration boundary layer theory. Mass transfer conductance.

Prerequisite: ENGRMAE 230B

Restriction: Graduate students only.

**ENGRMAE 222. Radiative Heat Transfer. 4 Units.**

Black body radiation. Radiative transport equations for surfaces separated by non-participating media. Radiant energy transfer through absorbing, emitting, and scattering media. Radiation-conduction interaction. Radiation-convection interaction. Introduction to finite-difference solutions.

Restriction: Graduate students only.

**ENGRMAE 223A. Numerical Methods in Heat, Mass, and Momentum Transport (Laminar Flows) I. 4 Units.**

Introduction to the discretization of various types of partial differential equations (parabolic, elliptic, hyperbolic). Finite-volume discretization for one- and two-dimensional flows. Use of a two-dimensional elliptic procedure to predict sample laminar flows.

Prerequisite or corequisite: ENGRMAE 230A

Restriction: Graduate students only.

**ENGRMAE 223B. Numerical Methods in Heat, Mass, and Momentum II. 4 Units.**

Introduction to turbulence. Reynolds-averaging of Navier-Stokes equations. Second-order closure of the average equations. Use of two-dimensional elliptic procedure to predict confined turbulent flows. Not offered every year.

Prerequisite: ENGRMAE 223A

Restriction: Graduate students only.

**ENGRMAE 224. Advanced Transport Phenomena. 4 Units.**

Fundamentals of transport phenomena in fluid (gas and liquid), solid, and nano systems. Conservation equations, fundamentals of diffusion, ion transport, dispersion in turbulent/laminar flows, absorption, differential/staged distillation, transport in membranes, and nano/microscale transport phenomena. Not offered every year.

Restriction: Graduate students only.

**ENGRMAE 226. Special Topics in Fluid and Thermal Sciences. 1-4 Units.**

Special topics of current interest in fluid mechanics, heat and mass transfer, multiphase flows, or combustion. Emphasis could be placed on theory, computational methods, or experimental techniques.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ENGRMAE 227. Thermal Resistance Analysis in Microdevices and Nanomaterials. 4 Units.**

Heat transfer and thermal resistance analysis relevant for microdevices and nanomaterials. Overview of recent progress in nanotechnology and materials science. Thermal modeling strategies for novel electronic devices and energy conversion systems.

Restriction: Graduate students only.

**ENGRMAE 228. Nanoscale Phase Change Transport Physics. 4 Units.**

Discusses a wide range of phase change processes (i.e., evaporation, boiling, condensation, and freezing) through the use of novel thermal metamaterials with the aim of enhancing phase change performances.

Prerequisite: Undergraduate-level heat transfer is recommended.

Restriction: Graduate students only.

**ENGRMAE 229P. Nanoscale Materials for Modern Electronics. 4 Units.**

Introduction to design and synthesis of nanomaterials. Topics include thermal and liquid transport in materials systems, phase change heat transfer physics, and mechanical properties in materials systems.

Prerequisite: Required: Undergraduate-level knowledge of heat transfer.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 230A. Inviscid Incompressible Fluid Mechanics I. 4 Units.**

Equations of motion. Vector notation. Flow kinematics. Potential flow and complex potential. Vorticity and circulation. Bernoulli's theorem. Crocco's theorem. Conformal, Joukowski, and Schwarz-Christoffel transformations.

Restriction: Graduate students only.

**ENGRMAE 230B. Viscous Incompressible Fluid Mechanics II. 4 Units.**

Review of mass, momentum, energy equations. Stress tensor, constitutive relations. Laminar flows. Stokes and Oseen flows. Self-similarity. Boundary layer theory: thin-layer approximation, Falkner-Skan, Blasius solutions, integral methods. Jet, wake, cavity flows. Introduction to turbulence: instability, Reynolds averaging, mixing length.

Restriction: Graduate students only.

**ENGRMAE 230C. Compressible Fluid Dynamics. 4 Units.**

One-dimensional unsteady flow; Riemann invariants, acoustics, shock tube. Two-dimensional flow: shock polars, linear theory, similarity rules, method of characteristics. Three dimensional flow: slender-body theory. Effects of viscosity and conductivity: laminar boundary layer, Crocco-Busemann relations.

Prerequisite: ENGRMAE 230A or ENGRMAE 230B

Restriction: Graduate students only.

**ENGRMAE 230D. Theoretical Foundations of Fluid Mechanics. 4 Units.**

Well-posed problems and boundary, initial, and interface conditions; strong and weak solutions. Similarity, perturbation theory and limit behavior, bifurcations. Dispersive and nondispersive wave propagation, acoustics, ship waves, internal gravity waves, water waves. Vortices: mutual interactions and stability. Jets, wakes, cavities.

Prerequisite: ENGRMAE 230A and ENGRMAE 230B

Restriction: Graduate students only.

**ENGRMAE 231. Fundamentals of Turbulence. 4 Units.**

Phenomenon of turbulence. Reynolds equations. Dynamics of turbulence. Free turbulent shear flows. Wall-bounded turbulent shear flows. Turbulent transport of scalar quantities. Spectral dynamics. Mathematical models of turbulence.

Prerequisite: ENGRMAE 230A and ENGRMAE 230B

Restriction: Graduate students only.

**ENGRMAE 233. Turbulent Free Shear Flows. 4 Units.**

Practical and theoretical aspects of turbulent free shear flows. Instability, global scaling laws, mixing, and noise generation in incompressible and compressible shear layers, jets, and wakes. Kelvin-Helmholtz instability, near- and far-field growth rates, effect of compressibility, aeroacoustics of jets.

Prerequisite: ENGRMAE 200B and ENGRMAE 230A and ENGRMAE 230B

Restriction: Graduate students only.

**ENGRMAE 236. Nonequilibrium Gas Dynamics. 4 Units.**

Molecular description of fluid flow. Boltzmann equation. Chapman-Enskog expansion for flows with translational nonequilibrium. Shock structure. Inviscid flows with chemical and vibrational nonequilibrium. Not offered every year.

Prerequisite: ENGRMAE 230C

Restriction: Graduate students only.

**ENGRMAE 237. Computational Fluid Dynamics. 4 Units.**

Mathematical, physical, and computational fundamentals of computational fluid dynamics, numerical methods for solving the Euler and Navier-Stokes equations. Topics include: finite-difference and finite-volume discretization, time marching methods, von Neumann analysis, upwinding, flux splitting, TVD, and other high-resolution shock-capturing schemes.

Prerequisite: ENGRMAE 230C

Restriction: Graduate students only.

**ENGRMAE 238. Experimental Fluid Dynamics. 4 Units.**

Concepts and techniques for measurement of fluid motion. Quantitative and qualitative flow visualization. Flow facilities, shadowgraph, schlieren, interferometer, thermal anemometer. Laser diagnostics, fluorescence, Rayleigh, Raman, Mie scattering. Laser-Doppler, particle-image, and image-correlation velocimetry. Three- and four-dimensional digital imaging.

Prerequisite: ENGRMAE 230A and ENGRMAE 230B

Restriction: Graduate students only.

**ENGRMAE 239. Dynamics of Unsteady Flows. 4 Units.**

Unsteady potential flow modeling (Kelvin's circulation theorem, unsteady Bernoulli's equation). Theodorsen's frequency response, Wagner's step response, and the Kussner sharp-edged gust. State Space approximations for Unsteady Loads. Vortex Lattice. Flutter.

Prerequisite: ENGRMAE 230A is recommended.

Restriction: Graduate students only.

**ENGRMAE 241. Dynamics. 4 Units.**

Kinematics and dynamics of three-dimensional motions. Lagrange's equations, Newton-Euler equations. Applications include robot systems and spinning satellites.

Restriction: Graduate students only.

**ENGRMAE 242. Robotics. 4 Units.**

Spatial rigid-body transformations. Forward and inverse kinematics. Jacobian of serial and parallel chains. Screw coordinates and transformations. Rate and static analyses using screw theory. Singularity analysis. Trajectory generation. Not offered every year.

Restriction: Graduate students only.

**ENGRMAE 244. Theoretical Kinematics. 4 Units.**

Spatial rigid body kinematics is presented with applications to robotics. Orthogonal Matrices, Rodrigues' formula, Quaternions, Plucker coordinates, screw theory, and dual numbers are studied using modern projective geometry and multi-linear algebra. Applications include trajectory planning, inverse kinematics, and workspace analysis.

Restriction: Graduate students only.

**ENGRMAE 245. Spatial Mechanism Design. 4 Units.**

Fundamental kinematic theory required for planar, spherical, and spatial mechanism design. The focus is on algebraic methods for the exact solution of constraint equations. Not offered every year.

Restriction: Graduate students only.

**ENGRMAE 247. Micro-System Design. 4 Units.**

Covers the fundamentals of the many disciplines needed for design of Micro-Electro-Mechanical Systems (MEMS): microfabrication technology, structural mechanics on micro-scale, electrostatics, circuit interface, control, computer-aided design, and system integration.

Same as EECS 278.

Restriction: Graduate students only.

**ENGRMAE 247P. Micro-System Design. 4 Units.**

Covers the fundamentals of the many disciplines needed for design of Micro-Electro-Mechanical Systems (MEMS): microfabrication technology, structural mechanics on micro-scale, electrostatics, circuit interface, control, computer-aided design, and system integration.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 249. Micro-Sensors and Actuators. 4 Units.**

Introduction to the technology of Micro-Electro-Mechanical Systems (MEMS). Fundamental principles and applications of important microsensors, actuation principles on microscale. Introduction to the elements of signal processing; processing of materials for micro sensor/actuator fabrication; smart sensors and microsensor/microactuator array devices.

Same as EECS 279.

Restriction: Graduate students only.

**ENGRMAE 250. Biorobotics. 4 Units.**

Sensors, actuators, and neural circuits for biological movement control from an engineering perspective. Current approaches to robotic and mechatronic devices that support and enhance human movement in health and following neurologic injuries like stroke and spinal cord injury.

Restriction: Graduate students only.

**ENGRMAE 252. Fundamentals of Microfabrication. 4 Units.**

Introduces Engineering and Science students to the science of miniaturization. Different options to make very small machines (micro and nano size) are reviewed, materials choices are discussed, scaling laws are analyzed, and many practical applications are listed.

Restriction: Graduate students only.

**ENGRMAE 252P. Fundamentals of Microfabrication. 4 Units.**

Introduces engineering and science students to the science of miniaturization. Different options to make very small machines (micro and nano size) are reviewed, materials choices are discussed, scaling laws are analyzed, and many practical applications are listed.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 253. Advanced BIOMEMS Manufacturing Techniques. 4 Units.**

Introduction to BIOMEMS. Advanced biotechnology/biomedicine equipment based on MEMS and NEMS. Fundamentals of MEMS/NEMS sensing techniques and the biological and physics principles involved and the preferred MEMS and NEMS manufacturing techniques.

Restriction: Graduate students only.

Concurrent with ENGRMAE 153.

**ENGRMAE 254. Mechanics of Solids and Structures. 4 Units.**

Finite deformation kinematics; stress and strain measures; invariance in solid mechanics; objective rates; constitutive theory of elastic and inelastic solids; rate formulations; computational approaches; theories of plates and shells; applications to aerospace vehicles.

Restriction: Graduate students only.

**ENGRMAE 254P. Mechanics of Solids and Structures. 4 Units.**

Finite deformation kinematics; stress and strain measures; invariance in solid mechanics; objective rates; constitutive theory of elastic and inelastic solids; rate formulations; computational approaches; theories of plates and shells; applications to aerospace vehicles.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 255. Composite Materials and Structures. 4 Units.**

Motivation for composite materials. Different classifications according to the nature of the matrix (PMC, MMC, CMC) and the reinforcement topology (fibers, whiskers, particulates). Mechanical properties. Failure mechanisms. Designing with composite materials. Advantages and limitations of homogenization techniques for numerical modeling.

Restriction: Graduate students only.

Concurrent with ENGRMAE 155.

**ENGRMAE 256. Nanomechanics. 4 Units.**

Nanoscale materials and the experimental and computational techniques used to measure their properties. Mechanical behavior is the main focus, but other material properties such as diffusion and electron transport are discussed.

Restriction: Graduate students only.

**ENGRMAE 257P. Fabrication and Characterization of Nanomaterials . 4 Units.**

Introduction to nanoscale materials and experimental and computational techniques. Topics materials synthesis techniques, thin film deposition, nanoparticle and nanowire growth, characterization with electrons and X-rays, forces and surface interactions at the nanoscale, structure-property scaling laws, and atomistic/multiscale computer modeling.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 258. Mechanical Behavior of Solids - Continuum Theories. 4 Units.**

Presents a continuum, macroscopic view of deformation and failure of solids. Covers elasticity, plasticity, visco-elasticity, visco-plasticity, fracture and fatigue. Topics include discussions of physical behavior, mathematical formalism and measurement techniques.

Prerequisite: ENGRMAE 254

Restriction: Graduate students only.

**ENGRMAE 259. Mechanical Behavior of Solids - Atomistic Theories. 4 Units.**

Presents atomistic mechanisms that control mechanical behavior of materials. Covers plasticity, dislocation theory, strengthening mechanisms, high-temperature diffusion and grain boundary sliding, shear localization, void formation, ductile rupture, brittle fracture and fatigue.

Restriction: Graduate students only.

**ENGRMAE 259P. Mechanical Behavior of Solids - Atomistic Theories. 4 Units.**

Presents atomistic mechanisms that control mechanical behavior of materials. Covers plasticity, dislocation theory, strengthening mechanisms, high-temperature diffusion and grain boundary sliding, shear localization, void formation, ductile rupture, brittle fracture, and fatigue.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 260. Current Issues Related to Air Quality, Climate, and Energy. 4 Units.**

Current issues related to the atmosphere, climate, and air quality in the context of energy conversion and sustainability. Topics include transportation systems; building design; impacts on humans and ecosystems; modeling and meteorology; economics; and application to public policies.

Prerequisite: ENGRMAE 261 or CHEM 245 or EARTHSS 240

Same as CHEM 241.

Restriction: Graduate students only.

**ENGRMAE 270A. Linear Systems I. 4 Units.**

Input-output and state-space representations of continuous-time linear systems. State transition matrices, Controllability and observability. Irreducible realizations. State feedback and observer design.

Restriction: Graduate students only.

**ENGRMAE 270B. Linear Systems II. 4 Units.**

Advanced topics in linear systems: bases, linear operator representations, and Jordan forms. Review of dynamical systems, and stability. Time-varying systems, discrete-time representations, and multi-input/multi-output systems. Introduction to continuous and discrete time linear regulator (LQR) problems. Not offered every year.

Prerequisite: ENGRMAE 270A

Restriction: Graduate students only.

**ENGRMAE 272. Robust Control Theory. 4 Units.**

Methods for control design of systems with uncertainty. Feedback stability and small gain theorem. Multivariable stability margins and multiplier theory. H-infinity-optimal control, linear matrix inequalities. Not offered every year.

Prerequisite: ENGRMAE 270A

Restriction: Graduate students only.

**ENGRMAE 274. Optimal Control. 4 Units.**

Principles and methods of optimal control. Topics include objectives and issues in controlling nonlinear systems; linear variational and adjoint equations; optimality conditions via variational calculus, maximum principle, and dynamic programming; solution methods; applications to control robots and aerospace vehicles.

Prerequisite: ENGRMAE 200A and ENGRMAE 270A

Restriction: Graduate students only.

**ENGRMAE 275. Nonlinear Feedback Systems. 4 Units.**

Advanced tools for feedback control system analysis and synthesis. Norms, operators,  $L_p$  spaces, contraction mapping theorem, Lyapunov techniques along with their extensions. Circle criterion positivity and passivity. Applications to nonlinear control methods, such as sliding mode or adaptive techniques.

Prerequisite: ENGRMAE 270B

Restriction: Graduate students only.

**ENGRMAE 276. Geometric Nonlinear Control. 4 Units.**

Using the mathematics of differential geometry, a number of the concepts and results of linear systems theory have been extended to nonlinear systems. Describes these extensions and illustrate their use in nonlinear system analysis and design. Not offered every year.

Prerequisite: ENGRMAE 200A and ENGRMAE 270A

Restriction: Graduate students only.

**ENGRMAE 277. Learning Control Systems. 4 Units.**

Supervised learning for classification and regression: perceptrons, support vector machines, feed-forward neural networks, Gaussian processes. Generalization and model selection: cross-validation, regularization, and Bayesian methods. Unsupervised learning: clustering and dimensionality reduction. Learning control systems. Introduction to reinforcement learning.

Restriction: Graduate students only.



**ENGRMAE 278. Parameter and State Estimation. 4 Units.**

Bayesian and frequentist approaches to parameter and state estimation. Properties of estimators. Linear Gaussian systems and the Kalman Filter. Nonlinear state estimation, extended and unscented Kalman Filters. Introduction to Monte Carlo methods and particle filtering. Application to tracking and navigation.

Prerequisite: ENGRMAE 200A and ENGRMAE 270A

Restriction: Graduate students only.

**ENGRMAE 279. Special Topics in Mechanical Systems. 4 Units.**

Selected topics of current interest in mechanical systems. Topics include robotics, kinematics, control, dynamics, and geometric modeling.

Prerequisite: ENGRMAE 270A and ENGRMAE 241

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**ENGRMAE 280. Design of Computer-Controlled Robots. 4 Units.**

The basic aspects of mechatronic design are covered, including motor and sensor selection, control strategies, finite state machines, inertial measurement units, and implementation of advanced feedback control laws. Students work in groups to create their own mechatronic device. Materials fee.

Restriction: Graduate students only.

Concurrent with ENGRMAE 172.

**ENGRMAE 284. Fundamentals of Experimental Design. 4 Units.**

Fundamentals and principles of statistical experimental design and analysis. Emphasis addresses understanding and use of designed experiments, response surfaces, linear regression modeling, process optimization, and development of links between empirical and theoretical models.

Restriction: Graduate students only.

Concurrent with ENGRMAE 184.

**ENGRMAE 294. Master of Science Thesis Project. 4 Units.**

Tutorial in which masters-level students taking the comprehensive examination option undertake a masters-level research project.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

**ENGRMAE 295. Special Topics in Mechanical and Aerospace Engineering. 1-4 Units.**

Special topics by individual faculty in major fields of interest.

Repeatability: Unlimited as topics vary.

**ENGRMAE 295P. Special Topics in Mechanical and Aerospace Engineering. 4 Units.**

Studies in selected areas of Mechanical and Aerospace Engineering. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Master of Engineering students only. Graduate students only.

**ENGRMAE 296. Master of Science Thesis Research. 1-16 Units.**

Individual research or investigation conducted in the pursuit of preparing and completing the thesis required for the M.S. in Engineering.

Repeatability: May be repeated for credit unlimited times.

**ENGRMAE 297. Doctor of Philosophy Dissertation Research. 1-16 Units.**

Individual research or investigation conducted in the pursuit of preparing and completing the dissertation required for the Ph.D. in Engineering.

Repeatability: May be repeated for credit unlimited times.

**ENGRMAE 298. Seminars in Mechanical and Aerospace Engineering. 1 Unit.**

Presentation of advanced topics and reports of current research efforts in mechanical engineering. Required of all graduate students in mechanical engineering.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

**ENGRMAE 299. Individual Research. 1-16 Units.**

Individual research or investigation under the direction of an individual faculty member.

Repeatability: May be repeated for credit unlimited times.

Restriction: Consent of instructor to enroll

## Aerospace Engineering, B.S.

**Program Educational Objectives:** Graduates of the program will have the professional and scientific education that allows them to be successful as career engineers and in graduate programs. Specifically, they will be able to (1) function in professional environments in industry, government, and academia applying and building upon engineering science knowledge, problem-solving skills, and communication skills; (2) function as members of teams and in leadership roles applying ethical and inclusive standards including the AIAA code of ethics within and beyond traditional Aerospace Engineering disciplines; and (3) remain current with technology and contemporary scientific, environmental, and societal issues, and consequently improve skills and knowledge through a lifelong process of learning. (Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

The undergraduate Aerospace Engineering curriculum includes a core of mathematics, physics, and chemistry. Engineering courses in fundamental areas constitute much of the remaining curriculum. A few technical electives allow the undergraduate student to specialize somewhat or to pursue broader understanding. A senior capstone design experience culminates the curriculum.

**High School Students:** See School admissions information.

**Transfer Students:** Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following required courses: two years of approved calculus, one year of calculus-based physics with laboratories (mechanics, electricity and magnetism), completion of lower-division writing, one course in general chemistry (with laboratory), and one course in introductory programming. For course equivalency specific to each college, visit <http://assist.org>.

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division coursework may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at 949-824-4334.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Major Requirements

#### Mathematics and Basic Science Courses:

CHEM 1A	General Chemistry
or ENGR 1A	General Chemistry for Engineers
CHEM 1LE	Accelerated General Chemistry Lab
MATH 2A- 2B	Single-Variable Calculus and Single-Variable Calculus
MATH 2D	Multivariable Calculus
MATH 2E	Multivariable Calculus
MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations
PHYSICS 7C	Classical Physics
PHYSICS 7LC	Classical Physics Laboratory
PHYSICS 7D- 7E	Classical Physics and Classical Physics
PHYSICS 7LD	Classical Physics Laboratory
PHYSICS 52A	Fundamentals of Experimental Physics

One additional General Education Category II course offered by the Schools of Physical Sciences, Biological Sciences, or Information and Computer Sciences.

**Engineering Topics Courses:**

Students must complete a minimum of 24 units of engineering design.

**Core Courses:**

ENGR 54	Principles of Materials Science and Engineering
ENGRMAE 10	Introduction to Engineering Computations
ENGRMAE 30	Statics
ENGRMAE 60 or EECS 70A	Electric Circuits Network Analysis I
ENGRMAE 80	Dynamics
ENGRMAE 91	Introduction to Thermodynamics
ENGRMAE 106	Mechanical Systems Laboratory
ENGRMAE 108	Aerospace Laboratory
ENGRMAE 112	Propulsion
ENGRMAE 130A	Introduction to Fluid Mechanics
ENGRMAE 130B	Introduction to Viscous and Compressible Flows
ENGRMAE 135	Compressible Flow
ENGRMAE 136	Aerodynamics
ENGRMAE 146	Astronautics
ENGRMAE 150	Mechanics of Structures
ENGRMAE 150L	Mechanics of Structures Laboratory
ENGRMAE 157	Lightweight Structures
ENGRMAE 158	Aircraft Performance
ENGRMAE 159	Aircraft Design
ENGRMAE 170	Introduction to Control Systems
ENGRMAE 175	Dynamics and Control of Aerospace Vehicles

**Technical Elective Courses:**

Students select a minimum of 12 units of technical electives. For students majoring in both Aerospace Engineering and Mechanical Engineering, a core course in one major cannot be counted as a technical elective in the other major. Any upper-division course in the department not used for the degree may be used as a technical elective. At least 4 units of technical electives must come from ENGRMAE upper-division courses and no more than 4 units of the technical electives should come from ENGRMAE 188, ENGRMAE 189, and ENGRMAE 199. With approval of the Undergraduate Advisor, students may choose from other departments' upper-division courses that have primarily technical content. Preapproved courses are listed on the MAE website: <http://engineering.uci.edu/files/mae-technical-electives.pdf>

**Engineering Professional Topics Course:**

ECON 20A or ECON 23	Basic Economics I Basic Economics for Engineers
ENGR 190W	Communications in the Professional World

At most an aggregate total of 4 units of 199 or H199 courses may be used to satisfy degree requirements.

(The nominal Aerospace Engineering program will require 185 units of courses to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary.)

Design unit values are indicated at the end of each course description. The faculty advisors and the Undergraduate Student Affairs Office can provide necessary guidance for satisfying the design requirements. Selection of elective courses must be approved by the student's faculty advisor and the departmental undergraduate advisor.

Freshman		
Fall	Winter	Spring
MATH 2A	MATH 2B	MATH 2D
ENGRMAE 10	PHYSICS 7C	PHYSICS 7D
CHEM 1A or ENGR 1A	PHYSICS 7LC	PHYSICS 7LD
ENGR 7A*	CHEM 1LE	Basic Science
General Education	ENGR 7B*	
	General Education	
Sophomore		
Fall	Winter	Spring
MATH 3A	MATH 3D	MATH 2E

PHYSICS 7E	ENGR 54	ENGRMAE 91
PHYSICS 52A	ENGRMAE 60	ECON 23 or 20A
ENGRMAE 30	ENGRMAE 80	
General Education		

<b>Junior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
ENGRMAE 130A	ENGRMAE 130B	ENGRMAE 106
ENGRMAE 150	ENGRMAE 146	ENGRMAE 108
ENGRMAE 150L	ENGRMAE 157	ENGRMAE 135
ENGR 190W	General Education	General Education
<b>Senior</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
ENGRMAE 112	ENGRMAE 158	ENGRMAE 159
ENGRMAE 136	ENGRMAE 175	Technical Elective
ENGRMAE 170	Technical Elective *	Technical Elective
General Education	General Education	General Education

\*ENGR 7A-ENGR 7B is a technical elective, available only to lower-division students in Fall and Winter quarters. Both ENGR 7A and ENGR 7B must be taken to count as a technical elective. If ENGR 7A-ENGR 7B is taken, this will replace one technical elective course in the senior year.

The sample program of study chart shown is typical for the major in Aerospace Engineering. This program is based upon a set of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Students should consult with their academic counselor to structure their program of study. Aerospace Engineering majors are encouraged to consult with academic counselors as needed, and students who are academically at risk are mandated to see a counselor as frequently as deemed necessary by the advising staff.

## Mechanical and Aerospace Engineering, M.S.

The Mechanical and Aerospace Engineering faculty have special interest and expertise in five thrust areas: continuum mechanics; power, propulsion, and environment; micro/nanomechanics; and systems and design.

Continuum mechanics faculty study the physics of fluids, physics and chemistry of solids, and structural mechanics. Areas of emphasis in fluid mechanics include incompressible and compressible turbulent flows, multiphase flows, chemically reacting and other nonequilibrium flows, aeroacoustics, aerodynamics, and fluid-solid interaction. In the field of solid mechanics, research and course work emphasize theoretical and computational approaches which contribute to a basic understanding of and new insight into the properties and behavior of condensed matter. General areas of interest are large-strain and large-rotation inelastic solids, constitutive modeling, and fracture mechanics. Computational algorithms center on boundary element methods and the new class of meshless methods. Studies in structural mechanics involve the analysis and synthesis of low-mass structures, smart structures, and engineered materials, with emphasis on stiffness, stability, toughness, damage tolerance, longevity, optimal life-cycle costs and self-adaptivity.

Research in power, propulsion, and environment encompasses aerospace propulsion, combustion and thermophysics, fuel cell technologies, and atmospheric physics and impacts. In aerospace propulsion, particular emphasis is placed in the areas of turbomachinery, spray combustion, combustion instability, innovative engine cycles, and compressible turbulent mixing. The topic of combustion and thermophysics addresses the fundamental fluid-dynamical, heat-transfer, and chemical mechanisms governing combustion in diverse settings. Fuel-cell research encompasses the development of fuel-cell technology, hybrid engines, and thermionic devices. Activities cover the thermodynamics of energy systems, the controls associated with advanced energy systems, and systems analyses. The area of atmospheric physics and impacts deals with the modeling and controlling of chemical pollution, particle dispersion, and noise emission caused by energy-generation and propulsion devices. Research on atmospheric turbulence addresses the energy exchanges between the Earth's land and ocean surfaces and the overlying atmosphere. Micro/nanomechanics encompasses the thrusts of miniaturization engineering, mechatronics, and biotechnology. Miniaturization engineering is relevant to the development of small-scale mechanical, chemical and biological systems for applications in biotechnology, automotive, robotic, and alternative energy applications. It involves the establishment of scaling laws, manufacturing methods, materials options and modeling from the atom to the macrosystem. Mechatronic design is the integrated and optimal design of a mechanical system and its embedded control system. Main focus research is the design, modeling, and characterization of Micro-Electro-Mechanical Systems (MEMS). Particular emphasis is placed on analysis and design of algorithmic methods and physical systems that realize sensor-based motion planning. The thematic area of biotechnology involves the understanding, modeling, and application of fundamental phenomena in mechanical engineering, electrical engineering, and chemistry towards the development of bio-sensors and actuators.

Systems and design research is conducted in the areas of dynamic systems optimization and control, biomechanical engineering, robotics and machine learning, and design engineering. Advanced concepts in dynamics, optimization and control are applied to the areas of biorobotics, flight trajectory design, guidance and navigation, learning systems, micro sensors and actuators, flexible structures, combustion, fuel cells, and fluid-optical interactions.

Biomechanical engineering integrates physiology with engineering in order to develop innovative devices and algorithms for medical diagnosis and treatment. The focus of robotics and machine learning is the creation of machines with human-like intelligence capabilities for learning. Faculty in

design engineering develop methodologies to address issues ranging from defining the size and shape of components needed for force and motion specifications, to characterizing performance in terms of design parameters, cost and complexity.

Aerospace engineering research efforts combine specialties from each of the four thrust areas toward the design, modeling, and operation of complex aerospace systems.

Two plans are available to pursue study toward the M.S.: a thesis option and a comprehensive examination option. Opportunities are available for part-time study toward the M.S. The Plan of Study for both options must be developed in consultation with a Faculty Advisor and approved by the Department Graduate Advisor. Opportunities to pursue teaching experiences and to take a course to develop teaching excellence are also offered, and may be integrated into your plan of study.

### **Plan I: Thesis Option**

The thesis option requires completion of eight graduate, technical and science courses; the completion of an original research project with a Faculty Advisor, the writing of the thesis describing it; and approval of the thesis by a thesis committee. This plan is available for those who wish to gain research experience or as preparation for study toward the doctoral degree. Students must complete 12 units of ENGRMAE 296, 3 units of ENGRMAE 298, and four graduate courses from a restricted list in the selected major. Additionally, four of the eight required graduate courses must be from the MAE Department. With the approval of the graduate advisor, one non-core graduate course may be replaced by an upper-division undergraduate course in MAE; this course may not have been used to satisfy the undergraduate degree requirements.

### **Plan II: Comprehensive Examination Option**

The comprehensive examination option requires completion of eleven graduate, technical and science courses, plus a comprehensive exam. Students must complete 3 units of ENGRMAE 298 and four graduate courses from a restricted list. Additionally, six of the eleven required graduate courses must be from the MAE Department. Up to two of the required courses may be replaced by an equivalent number of units of ENGRMAE 294, which includes execution and documentation of a research or design project under a faculty advisor. With the approval of the graduate advisor, one graduate course may be replaced by an upper-division undergraduate course in MAE; this course may not be used to satisfy both undergraduate and graduate degree requirements. Consult the MAE Department (<http://mae.eng.uci.edu/>) website (<http://mae.eng.uci.edu/>) or Graduate Advisor, for detailed information on the comprehensive exam.

## **Mechanical and Aerospace Engineering, Ph.D.**

The Mechanical and Aerospace Engineering faculty have special interest and expertise in five thrust areas: continuum mechanics; power, propulsion, and environment; micro/nanomechanics; and systems and design.

Continuum mechanics faculty study the physics of fluids, physics and chemistry of solids, and structural mechanics. Areas of emphasis in fluid mechanics include incompressible and compressible turbulent flows, multiphase flows, chemically reacting and other nonequilibrium flows, aeroacoustics, aerodynamics, and fluid-solid interaction. In the field of solid mechanics, research and course work emphasize theoretical and computational approaches which contribute to a basic understanding of and new insight into the properties and behavior of condensed matter. General areas of interest are large-strain and large-rotation inelastic solids, constitutive modeling, and fracture mechanics. Computational algorithms center on boundary element methods and the new class of meshless methods. Studies in structural mechanics involve the analysis and synthesis of low-mass structures, smart structures, and engineered materials, with emphasis on stiffness, stability, toughness, damage tolerance, longevity, optimal life-cycle costs and self-adaptivity.

Research in power, propulsion, and environment encompasses aerospace propulsion, combustion and thermophysics, fuel cell technologies, and atmospheric physics and impacts. In aerospace propulsion, particular emphasis is placed in the areas of turbomachinery, spray combustion, combustion instability, innovative engine cycles, and compressible turbulent mixing. The topic of combustion and thermophysics addresses the fundamental fluid-dynamical, heat-transfer, and chemical mechanisms governing combustion in diverse settings. Fuel cell research encompasses the development of fuel-cell technology, hybrid engines, and thermionic devices. Activities cover the thermodynamics of energy systems, the controls associated with advanced energy systems, and systems analyses. The area of atmospheric physics and impacts deals with the modeling and controlling of chemical pollution, particle dispersion, and noise emission caused by energy-generation and propulsion devices. Research on atmospheric turbulence addresses the energy exchanges between the Earth's land and ocean surfaces and the overlying atmosphere. Micro/nanomechanics encompasses the thrusts of miniaturization engineering, mechatronics, and biotechnology. Miniaturization engineering is relevant to the development of small-scale mechanical, chemical and biological systems for applications in biotechnology, automotive, robotic, and alternative energy applications. It involves the establishment of scaling laws, manufacturing methods, materials options and modeling from the atom to the macrosystem. Mechatronic design is the integrated and optimal design of a mechanical system and its embedded control system. Main focus research is the design, modeling, and characterization of Micro Electro Mechanical Systems (MEMS). Particular emphasis is placed on analysis and design of algorithmic methods and physical systems that realize sensor-based motion planning. The thematic area of biotechnology involves the understanding, modeling, and application of fundamental phenomena in mechanical engineering, electrical engineering, and chemistry towards the development of bio-sensors and actuators.

Systems and design research is conducted in the areas of dynamic systems optimization and control, biomechanical engineering, robotics and machine learning, and design engineering. Advanced concepts in dynamics, optimization and control are applied to the areas of biorobotics, flight trajectory design, guidance and navigation, learning systems, micro sensors and actuators, flexible structures, combustion, fuel cells, and fluid-optical interactions.

Biomechanical engineering integrates physiology with engineering in order to develop innovative devices and algorithms for medical diagnosis and treatment. The focus of robotics and machine learning is the creation of machines with human-like intelligence capabilities for learning. Faculty in design engineering develop methodologies to address issues ranging from defining the size and shape of components needed for force and motion specifications, to characterizing performance in terms of design parameters, cost and complexity.

Aerospace engineering research efforts combine specialties from each of the five thrust areas toward the design, modeling, and operation of complex aerospace systems.

The doctoral program in Mechanical and Aerospace Engineering is tailored to the individual needs and background of the student. The detailed program of study for each Ph.D. student is formulated in consultation with a faculty advisor who takes into consideration the objectives and preparation of the candidate.

Within this flexible framework the Department maintains specific guidelines that outline the milestones of a typical doctoral program. All doctoral students should consult the Departmental Ph.D. guidelines for program details, but there are several milestones to be passed: admission to the Ph.D. program by the faculty; completion of three non-research graduate, technical courses beyond M.S. degree requirements; passage of a preliminary examination or similar assessment of the student's background and potential for success in the doctoral program; course work; meeting departmental teaching requirements, which can be satisfied through service as a teaching assistant or equivalent; research preparation; formal advancement to candidacy in the third year (second year for students who entered with a master's degree) through a qualifying examination conducted on behalf of the Irvine division of the Academic Senate, which includes the development of a research proposal; completion of a significant research investigation, and completion and defense of an acceptable dissertation. There is no foreign language requirement. The degree is granted upon the recommendation of the Doctoral Committee and the Dean of Graduate Studies. Students enrolled in the Ph.D. program must take a full-time load (minimum of 12 units). The normative time for completion of the Ph.D. is five years (four years for students who entered with a master's degree). The maximum time permitted is seven years. Before seeking admission, Ph.D. applicants are encouraged to communicate directly and in some detail with prospective faculty sponsors. The student's objectives and financial resources must coincide with a faculty sponsor's research interests and research support. Financial aid in the form of a teaching assistantship or fellowship may not cover the period of several years required to complete the program. During the balance of the period the student will be in close collaboration with the faculty research advisor.

## Mechanical Engineering, B.S.

**Program Educational Objectives:** Graduates of the program will have the professional and scientific education that allows them to be successful as career engineers and in graduate programs. Specifically, they will be able to (1) function in professional environments in industry, government, and academia applying and building upon engineering science knowledge, problem-solving skills, and communication skills; (2) function as members of teams and in leadership roles applying ethical and inclusive standards including the ASME code of ethics within and beyond traditional Mechanical Engineering disciplines; and (3) remain current with technology and contemporary scientific, environmental and societal issues, and consequently improve skills and knowledge through a lifelong process of learning. (Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

The undergraduate Mechanical Engineering curriculum includes a foundation of mathematics, physics, and chemistry. Engineering courses in fundamental areas constitute much of the remaining curriculum. A few technical electives allow undergraduate students to specialize in Aerospace Engineering, Energy Systems and Environmental Engineering, Flow Physics and Propulsion Systems, and Design of Mechanical Systems or to pursue broader understanding in these areas. A senior capstone design experience culminates the curriculum.

**High School Students:** See School Admissions information.

**Transfer Students:** Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following required courses: two years of approved calculus, one year of calculus-based physics with laboratories (mechanics, electricity and magnetism), completion of lower-division writing, one course in general chemistry (with laboratory), and one course in introductory programming.

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division coursework may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at 949-824-4334.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Major Requirements

#### Mathematics and Basic Science Courses:

CHEM 1A or ENGR 1A	General Chemistry General Chemistry for Engineers
CHEM 1LE	Accelerated General Chemistry Lab
MATH 2A- 2B	Single-Variable Calculus and Single-Variable Calculus
MATH 2D	Multivariable Calculus



MATH 2E	Multivariable Calculus
MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations
PHYSICS 7C	Classical Physics
PHYSICS 7LC	Classical Physics Laboratory
PHYSICS 7D- 7E	Classical Physics and Classical Physics
PHYSICS 7LD	Classical Physics Laboratory
PHYSICS 52A	Fundamentals of Experimental Physics
One additional General Education Category II course offered by the Schools of Physical Sciences, Biological Sciences, or Information and Computer Sciences.	

**Engineering Topics Courses:**

Students must complete a minimum of 24 units of engineering design.

**Core Courses:**

ENGR 54	Principles of Materials Science and Engineering
ENGRMAE 10	Introduction to Engineering Computations
ENGRMAE 30	Statics
ENGRMAE 52	Computer-Aided Design
ENGRMAE 60	Electric Circuits
or EECS 70A	Network Analysis I
ENGRMAE 80	Dynamics
ENGRMAE 91	Introduction to Thermodynamics
ENGRMAE 106	Mechanical Systems Laboratory
ENGRMAE 107	Fluid Thermal Science Laboratory
ENGRMAE 112	Propulsion
or ENGRMAE 115	Applied Engineering Thermodynamics
ENGRMAE 120	Heat and Mass Transfer
ENGRMAE 130A	Introduction to Fluid Mechanics
ENGRMAE 130B	Introduction to Viscous and Compressible Flows
ENGRMAE 145	Theory of Machines and Mechanisms
ENGRMAE 147	Vibrations
ENGRMAE 150	Mechanics of Structures
ENGRMAE 150L	Mechanics of Structures Laboratory
ENGRMAE 151	Mechanical Engineering Design
ENGRMAE 155	Composite Materials and Structures
or ENGRMAE 156	Mechanical Behavior and Design Principles
or ENGRMAE 157	Lightweight Structures
ENGRMAE 170	Introduction to Control Systems
ENGRMAE 189	Senior Project - Special Topics (minimum of 3 units)

**Technical Elective Courses:**

Students select a minimum of 16 units of technical electives. For students majoring in both Aerospace Engineering and Mechanical Engineering, a core course in one major cannot be counted as a technical elective in the other major. Any upper-division course in the department not used for the degree may be used as a technical elective. At least 8 units of the technical electives must come from ENGRMAE upper-division courses other than project-based courses ENGRMAE 188, ENGRMAE 189, and ENGRMAE 199. With approval of the Undergraduate Advisor, students may choose any remaining technical elective units from other departments' upper-division courses that have primarily technical content. Preapproved courses from other departments are listed on the MAE website: <http://engineering.uci.edu/files/mae-technical-electives.pdf>

**Engineering Professional Topics Course:**

ECON 20A	Basic Economics I
or ECON 23	Basic Economics for Engineers
ENGR 190W	Communications in the Professional World

At most an aggregate total of 4 units of 199 or H199 courses may be used to satisfy degree requirements.



(The nominal Mechanical Engineering program will require 188 units of courses to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary.)

### Specialization in Aerospace Engineering:

Completion of a Senior Design Project in this area, and

select two of the following:

ENGRMAE 112	Propulsion
ENGRMAE 135	Compressible Flow
ENGRMAE 136	Aerodynamics
ENGRMAE 158	Aircraft Performance
ENGRMAE 159	Aircraft Design
ENGRMAE 175	Dynamics and Control of Aerospace Vehicles

### Specialization in Energy Systems and Environmental Engineering:

Completion of a Senior Design Project in this area, and

select two of the following:

ENGRMAE 110	Combustion and Fuel Cell Systems
ENGRMAE 112	Propulsion
ENGRMAE 114	Fuel Cell Fundamentals and Technology
ENGRMAE 115	Applied Engineering Thermodynamics
ENGRMAE 117	Solar and Renewable Energy Systems
ENGRMAE 118	Sustainable Energy Systems
ENGRMAE 164	Air Pollution and Control

### Specialization in Flow Physics and Propulsion Systems:

Completion of a Senior Design Project in this area, and

select two of the following:

ENGRMAE 110	Combustion and Fuel Cell Systems
ENGRMAE 112	Propulsion
ENGRMAE 113	Electric Propulsion
ENGRMAE 132	Computational Fluid Dynamics
ENGRMAE 135	Compressible Flow

### Specialization in Design of Mechanical Systems:

Completion of a Senior Design Project in this area, and

select two of the following:

ENGR 165	Advanced Manufacturing
ENGRMAE 152	Introduction to Computer-Aided Engineering
ENGRMAE 171	Digital Control Systems
ENGRMAE 172	Design of Computer-Controlled Robots
ENGRMAE 183	Computer-Aided Mechanism Design
ENGRMAE 188	Engineering Design in Industry

Design unit values are indicated at the end of each course description. The faculty advisors and the Student Affairs Office can provide necessary guidance for satisfying the design requirements. Selection of elective courses must be approved by the student's faculty advisor and the departmental undergraduate advisor.

#### Freshman

Fall	Winter	Spring
MATH 2A	MATH 2B	MATH 2D
ENGRMAE 10	PHYSICS 7C	PHYSICS 7D
CHEM 1A or ENGR 1A	PHYSICS 7LC	PHYSICS 7LD
ENGR 7A*	CHEM 1LE	Basic Science
General Education	ENGR 7B*	
	General Education	

#### Sophomore

Fall	Winter	Spring
MATH 3A	MATH 3D	MATH 2E
PHYSICS 7E	ENGR 54	ENGRMAE 52

PHYSICS 52A	ENGRMAE 60	ENGRMAE 91
ENGRMAE 30	ENGRMAE 80	ECON 23 or 20A
General Education		

Junior		
Fall	Winter	Spring
ENGRMAE 115 or 112	ENGRMAE 130B	ENGRMAE 106
ENGRMAE 130A	ENGRMAE 147	ENGRMAE 120
ENGRMAE 150	General Education	ENGRMAE 145
ENGRMAE 150L	ENGRMAE 155, 156, or 157	General Education
ENGR 190W		
Senior		
Fall	Winter	Spring
ENGRMAE 107	ENGRMAE 151	ENGRMAE 189 (1 unit)
ENGRMAE 170	ENGRMAE 189 (1 unit)	Technical Elective
ENGRMAE 189 (1 unit)	Technical Elective *	Technical Elective
General Education	Technical Elective	General Education
	General Education	

\*ENGR 7A-ENGR 7B is a technical elective, available only to lower-division students in Fall and Winter quarters. Both ENGR 7A & ENGR 7B must be taken to count as a technical elective. If ENGR 7A-ENGR 7B is taken, this will replace one technical elective course in the senior year.

The sample program of study chart shown is typical for the accredited major in Mechanical Engineering. Students should keep in mind that this program is based upon a rigid set of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Students should consult with their academic counselor to structure their program of study. Mechanical Engineering majors are encouraged to consult with academic counselors as needed, and students who are academically at risk are mandated to see a counselor as frequently as deemed necessary by the advising staff.

Students can dual major in Mechanical Engineering and Aerospace Engineering by satisfying the degree requirements for both majors.

## Engineering Management, M.S.

John C. LaRue, **Professor of Mechanical and Aerospace Engineering, The Henry Samueli School of Engineering**

Joanna Ho, **Professor and Associate Dean of Masters Programs, The Paul Merage School of Business**

204 Rockwell Engineering Center; 949-824-8090

<http://www.eng.uci.edu/admissions/graduate/programs-and-concentrations/engineering-management> (<http://www.eng.uci.edu/admissions/graduate/programs-and-concentrations/engineering-management/>)

The Master of Science in Engineering Management is a graduate degree jointly offered by The Paul Merage School of Business and The Henry Samueli School of Engineering that will prepare engineers for leadership roles in technology, science, government, and engineering-based companies and organizations. The curriculum includes courses in engineering from The Henry Samueli School of Engineering and courses in business administration from The Paul Merage School of Business. Students will emerge as innovators by taking on the role of business and engineering project managers tasked with solving complex engineering product development challenges through consulting projects, business plans, and exposure to current issues within the engineering sector. Through this process, quantitative and qualitative skills along with business communication skills will be developed.

This competitive major teaches business from the engineering perspective and engineering from the business perspective, and students will learn to think about their work through the lens of innovation and to develop a crucial view to enhance their careers.

Applicants apply directly to The Samueli School for the M.S. in Engineering Management. Applicants must meet any applicable prerequisite requirements for the specific engineering specialization they wish to pursue. Admission to graduate standing in The Samueli School of Engineering is generally accorded to those possessing at least a B.S. in engineering or an allied field obtained with an acceptable level of scholarship from an institution of recognized standing. Those seeking admission without the prerequisite scholarship record may, in some cases, undertake remedial work; if completed at the stipulated academic level, they will be considered for admission. Those admitted from an allied field may be required to take supplementary upper-division courses in basic engineering subjects.

The Samueli and Merage Schools will evaluate applicants on their prior academic record and their potential for management and leadership as demonstrated in submitted application materials including work experience and in an interview. These materials will include university transcripts, GRE test scores, letters of recommendation, and a Statement of Purpose. Competitive applicants will be interviewed by the Merage School.

### Master of Science Degree: Plan II: Comprehensive Exam Option

The M.S. degree requires the completion of designated course work which corresponds to a minimum of 17 courses beyond the bachelor's degree. As part of the program, students must complete a two-week orientation and an intensive course in early to mid-September preceding the fall quarter which presents fundamental concepts of management to initiate students into the concrete challenges that managers in high-performing organizations typically confront.

## Core Requirements

Due to the interdisciplinary nature of this degree, it is important to establish a common foundation in Engineering Management for students from various backgrounds. This foundation is sufficiently covered in Engineering Management courses that are listed below and that deal with the following topics:

ENGR 280	Entrepreneurship for Scientists and Engineers
MGMTMBA 200	Thinking Strategically in the Digital Age
MGMTMBA 211	MBA Proseminar (3 quarters)
MGMTMBA 298	Merage Consulting Projects (or equivalent)

Plus, a departmental seminar based on specialization area, for example:

BME 298	Seminars in Biomedical Engineering
CBE 298	Seminars in Engineering
EECS 294	Electrical Engineering and Computer Science Colloquium
ENGRCEE 295	Seminars in Engineering
ENGRMAE 298	Seminars in Mechanical and Aerospace Engineering

## Electives

**Business.** In addition to the core courses listed above, at least five additional courses from The Merage School of Business are required. (Students will be recommended certain classes based on career tracks they plan to pursue.)

- Three Merage School M.B.A. core courses;
- Two additional courses from a selected group of either core or elective courses.

### M.B.A. Courses

#### Core:

MGMTMBA 201A	Business Analytics: Decision-Making
MGMTMBA 201B	Management Science
MGMTMBA 202	Organizational Leadership for Management
MGMTMBA 203A	Financial Reporting
MGMTMBA 203B	Driving Profitability Through Management Accounting
MGMTMBA 204A	Microeconomics for Management in the Digital Age
MGMTMBA 204B	Macroeconomics for Management
MGMTMBA 205	Marketing Principles
MGMTMBA 207	Competing with Digital: Technology, Analytics, and Platforms
MGMTMBA 208	Operational Excellence: Processes, Models, and Analytics
MGMTMBA 209A	Managerial Finance
MGMTMBA 210	Strategy: Foundations and Dynamics

#### Electives:

Refer to the Business School section of the Catalogue for a list of current M.B.A. electives.

**Engineering.** In addition to the core courses listed above, at least five courses from The Samueli School are required. (Students will be recommended certain classes based on career tracks they plan to pursue.)

- Three courses from a chosen primary specialization in Engineering: Biomedical Engineering, Chemical and Biomolecular Engineering, Civil Engineering, Electrical and Computer Engineering, Materials Science and Engineering, or Mechanical and Aerospace Engineering;
- Two additional elective courses chosen from the primary specialization, from another specialization, or from other courses within or outside The Samueli School as approved by the Director or Director-Elect.

## Approved Specialization Courses

### Biomedical Engineering:

BME 210	Molecular and Cellular Engineering
BME 213	Systems Cell and Developmental Biology
BME 220	Sensory Motor Systems
BME 221	Organ Transport Systems
BME 230A	Applied Engineering Mathematics I
BME 230B	Applied Engineering Mathematics II

BME 233	Dynamic Systems in Biology and Medicine
BME 251	Engineering Medical Optics
BME 260	Microfluids and Lab-On-A-Chip
BME 262	Microimplants
<b>Chemical and Biomolecular Engineering:</b>	
CBE 249	Special Topics in Chemical Engineering
CBE 261	Molecular Biotechnology
CBE 263	Kinetics of Biochemical Networks
CBE 264	Drug Delivery
CBE 276	Nuclear and Radiochemistry
CBE 282	Colloid Science and Engineering
CBE 288	Optoelectronics Packaging
MSE 241	Nano-Scale Materials and Applications
<b>Civil Engineering:</b>	
ENGRCEE 220A	Travel Demand Analysis I
ENGRCEE 221A	Transportation Systems Analysis I
ENGRCEE 225B	Transportation Planning Models II
ENGRCEE 229A	Traffic Systems Operations and Control I
ENGRCEE 249	Earthquake Engineering
ENGRCEE 250	Finite Element Method in Structural Engineering
ENGRCEE 258	Earthquake Resistant Structural Design
ENGRCEE 262	Environmental Chemistry II
ENGRCEE 263	Advanced Biological Treatment Processes
ENGRCEE 264	Carbon and Energy Footprint Analysis
ENGRCEE 265	Physical-Chemical Treatment Processes
ENGRCEE 266	Drinking Water and Wastewater Biotechnology
ENGRCEE 272	Groundwater Hydrology
ENGRCEE 273	Watershed Modeling
ENGRCEE 276	Hydrology
ENGRCEE 281	Structural Reliability
<b>Electrical and Computer Engineering:</b>	
EECS 202A	Principles of Imaging
EECS 203A	Digital Image Processing
EECS 211	Advanced System Software
EECS 213	Computer Architecture
EECS 215	Design and Analysis of Algorithms
EECS 217	VLSI System Design
EECS 221	Topics in Computer Engineering
EECS 222	Embedded System Modeling
EECS 225	Embedded Systems Design
EECS 230	Energy Efficiency
EECS 241A	Digital Communications I
EECS 248A	Computer and Communication Networks
EECS 250	Digital Signal Processing I
EECS 261A	Linear Optimization Methods
EECS 267A	Industrial and Power Electronics
EECS 277C	Nanotechnology
EECS 278	Micro-System Design
EECS 279	Micro-Sensors and Actuators
<b>Materials Science and Engineering:</b>	
CBE 264	Drug Delivery
EECS 277C	Nanotechnology

MSE 200	Crystalline Solids: Structure, Imperfections, and Properties
MSE 241	Nano-Scale Materials and Applications
MSE 249	Special Topics in Materials Science and Engineering
ENGRMAE 252	Fundamentals of Microfabrication
MSE 254	Polymer Science and Engineering
MSE 255A	Design with Ceramic Materials
MSE 256A	Mechanical Behavior of Engineering Materials
<b>Mechanical and Aerospace Engineering:</b>	
ENGRMAE 207	Methods of Computer Modeling in Engineering and the Sciences
ENGRMAE 212	Engineering Electrochemistry: Fundamentals and Applications
ENGRMAE 218	Sustainable Energy Systems
ENGRMAE 242	Robotics
ENGRMAE 247	Micro-System Design
ENGRMAE 249	Micro-Sensors and Actuators
ENGRMAE 250	Biorobotics
ENGRMAE 252	Fundamentals of Microfabrication
ENGRMAE 253	Advanced BIOMEMS Manufacturing Techniques
ENGRMAE 259	Mechanical Behavior of Solids - Atomistic Theories
ENGRMAE 270A	Linear Systems I
ENGRMAE 274	Optimal Control

## Engineering, B.S.

The Henry Samueli School of Engineering offers a general undergraduate major in Engineering to upper-division students who wish to pursue broad multidisciplinary programs of study or who wish to focus on a special area not offered in the six departments. Examples of other areas that may be of interest are biochemical engineering, electromechanical engineering, project management, or hydrology. The program of study in any area, aside from the established specializations, is determined in consultation with a faculty advisor.

Faculty in the Departments of Biomedical Engineering, Chemical and Biomolecular Engineering, Civil and Environmental Engineering, Electrical Engineering and Computer Science, Materials Science and Engineering, and Mechanical and Aerospace Engineering also teach courses in the major in Engineering program.

The general major in Engineering is only open to junior-standing students who have completed the required lower-division courses with a high level of achievement. Freshmen are not eligible to apply for this major. The sequential nature of the Engineering program and the fact that many courses are offered only once a year make it beneficial for students to begin their studies in the fall quarter.

**Transfer Students:** The general Engineering major is a specialized program for students who are seeking careers in areas other than traditional engineering disciplines and is open to upper-division students only. Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following **required** courses: one year of approved calculus, one year of calculus-based physics with laboratories (mechanics, electricity and magnetism), one course in computational methods (e.g., C, C++), and one year of general chemistry (with laboratory).

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division coursework may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at 949-824-4334.

Credit for at least 180 units, and no more than 196 units. All courses must be approved by a faculty advisor and the Associate Dean of Student Affairs prior to enrollment in the program.

**All students must meet the University Requirements.**

**All students must meet the School Requirements.**

### Major Requirements

**Mathematics and Basic Science Courses:** MATH 2A-MATH 2B-MATH 2D, MATH 2E, MATH 3A, and MATH 3D. PHYSICS 7C, PHYSICS 7LC, PHYSICS 7D, and PHYSICS 7LD. With the approval of a faculty advisor and the Associate Dean, students select all additional Mathematics and Basic Science courses.

**Engineering Topics Courses:** ENGRMAE 10 or equivalent. With the approval of a faculty advisor and the Associate Dean, students select all additional Engineering Topics courses.

Design unit values are indicated at the end of each course description. The faculty advisors and the Student Affairs Office can provide necessary guidance for satisfying the design requirements.

Students should keep in mind that the program for the major in Engineering is based upon a rigid set of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Therefore, the course sequence should not be changed except for the most compelling reasons. Students must have their programs approved by an academic counselor in Engineering. A sample program of study is available in the Student Affairs Office.

## Engineering, M.S. (Concentration in Materials and Manufacturing Technology)

**Lorenzo Valdevit, Director and Graduate Advisor**

204 Rockwell Engineering Center; 949-824-8090

<http://engineering.uci.edu/interdisciplinary-graduate-programs/materials-and-manufacturing-technology> (<http://engineering.uci.edu/interdisciplinary-graduate-programs/materials-and-manufacturing-technology/>)

Materials and Manufacturing Technology (MMT) is concerned with the generation and application of knowledge relating the composition, structure, and processing of materials to their properties and applications, as well as the manufacturing technologies needed for production. During the past two decades, MMT has become an important component of modern engineering education, partly because of the increased level of sophistication required of engineering materials in a rapidly changing technological society, and partly because the selection of materials has increasingly become an integral part of almost every modern engineering design. In fact, further improvements in design are now viewed more and more as primarily materials and manufacturing issues. Both the development of new materials and the understanding of present-day materials demand a thorough knowledge of basic engineering and scientific principles including, for example, crystal structure, mechanics, mechanical behavior, electronic, optical and magnetic properties, thermodynamics, phase equilibria, heat transfer, diffusion, and the physics and chemistry of solids and chemical reactions.

The field of MMT ranks high on the list of top careers for scientists and engineers. The services of these engineers and scientists are required in a variety of engineering operations dealing, for example, with design of semiconductors and optoelectronic devices, development of new technologies based on composites and high-temperature materials, biomedical products, performance (quality, reliability, safety, energy efficiency) in automobile and aircraft components, improvement in nondestructive testing techniques, corrosion behavior in refineries, radiation damage in nuclear power plants, fabrication of steels, and construction of highways and bridges.

Subjects of interest in Materials and Manufacturing Technology cover a wide spectrum, ranging from metals, optical and electronic materials to superconductive materials, ceramics, advanced composites, and biomaterials. In addition, the emerging new research and technological areas in materials are in many cases interdisciplinary. Accordingly, the principal objective of the graduate curriculum is to integrate a student's area of emphasis—whether it be chemical processing and production, electronic and photonic materials and devices, electronic manufacturing and packaging, or materials engineering—into the whole of materials and manufacturing technology. Such integration will increase familiarity with other disciplines and provide students with the breadth they need to face the challenges of current and future technology.

Students with a bachelor's degree may pursue either the M.S. or Ph.D. in Engineering with a concentration in Materials and Manufacturing Technology (MMT). If students choose to enter the Ph.D. program directly, it is a requirement that they earn an M.S. along the way toward the completion of their Ph.D.

Given the nature of Materials and Manufacturing Technology as an interdisciplinary program, students having a background and suitable training in either Materials, Engineering (Biomedical, Civil, Chemical, Electrical, and Mechanical), or the Physical Sciences (Physics, Chemistry, Geology) are encouraged to participate. Recommended background courses include an introduction to materials, thermodynamics, mechanical properties, and electrical/optical/magnetic properties. A student with an insufficient background may be required to take remedial undergraduate courses following matriculation as a graduate student.

### Core Requirements

Because of the interdepartmental nature of the concentration, it is important to establish a common foundation in Materials and Manufacturing Technology (MMT) for students from various backgrounds. This foundation is sufficiently covered in MMT courses that are listed below and that deal with the following topics: MSE 200 Crystalline Solids: Structure, Imperfections, and Properties; ENGRMAE 252 Fundamentals of Microfabrication or ENGR 265 Advanced Manufacturing; ENGRMAE 259 Mechanical Behavior of Solids - Atomistic Theories. Core courses must be completed with a grade of B (3.0) or better.

### Electives

Electives are grouped into four areas of emphasis.

#### Chemical Processing and Production:

CHEM 213	Chemical Kinetics
CBE 200	Applied Engineering Mathematics I
CBE 210	Reaction Engineering

CBE 220A	Transport Phenomena I
CBE 240	Advanced Engineering Thermodynamics
ENGRCEE 262	Environmental Chemistry II
ENGRCEE 265	Physical-Chemical Treatment Processes
ENGRCEE 266	Drinking Water and Wastewater Biotechnology
ENGRCEE 276	Hydrology
<b>Electronic and Photonic Materials and Devices:</b>	
BME 210	Molecular and Cellular Engineering
BME 225	Tissue and Organ Biophotonics
BME 251	Engineering Medical Optics
CHEM 242A	Physical and Geometrical Optics
EECS 174	Semiconductor Devices
EECS 176	Fundamentals of Solid-State Electronics and Materials
EECS 188	Optical Electronics
EECS 277A	Advanced Semiconductor Devices I
EECS 277B	Advanced Semiconductor Devices II
EECS 277C	Nanotechnology
EECS 285A	Optical Communications
EECS 285B	Lasers and Photonics
EECS 280A	Advanced Engineering Electromagnetics I
EECS 280B	Advanced Engineering Electromagnetics II
ENGRMAE 220	Conduction Heat Transfer
ENGRMAE 221	Convective Heat and Mass Transfer
<b>Biomedical and Electronic Manufacturing:</b>	
BME 222	Biofluid Mechanics
BME 251	Engineering Medical Optics
BME 260	Microfluids and Lab-On-A-Chip
BME 262	Microimplants
CBE 288	Optoelectronics Packaging
EECS 279/ENGRMAE 249	Micro-Sensors and Actuators
ENGRMAE 212	Engineering Electrochemistry: Fundamentals and Applications
ENGRMAE 242	Robotics
ENGRMAE 247/EECS 278	Micro-System Design
ENGRMAE 250	Biorobotics
ENGRMAE 253	Advanced BIOMEMS Manufacturing Techniques
<b>Materials Engineering:</b>	
CHEM 225	Polymer Chemistry: Synthesis and Characterization of Polymers
MSE 241	Nano-Scale Materials and Applications
ENGRCEE 242	Advanced Strength of Materials
ENGRCEE 243	Mechanics of Composite Materials
ENGRCEE 254	Advanced Reinforced Concrete Behavior and Design
ENGRCEE 255	Advanced Behavior and Design of Steel Structures
ENGRMAE 212	Engineering Electrochemistry: Fundamentals and Applications
ENGRMAE 224	Advanced Transport Phenomena
ENGRMAE 230A	Inviscid Incompressible Fluid Mechanics I
ENGRMAE 230B	Viscous Incompressible Fluid Mechanics II
ENGRMAE 230C	Compressible Fluid Dynamics
ENGRMAE 254	Mechanics of Solids and Structures
ENGRMAE 255	Composite Materials and Structures
ENGRMAE 258	Mechanical Behavior of Solids - Continuum Theories
MSE 205	Materials Physics
MSE 254	Polymer Science and Engineering



MSE 255A	Design with Ceramic Materials
MSE 256A	Mechanical Behavior of Engineering Materials
MSE 259	Transmission Electron Microscopy
MSE 264	Scanning Electron Microscopy
MSE 265	Phase Transformations
MSE 273	Electroceramics & Solid State Electrochemical Systems
PHYSICS 238A- 238B- 238C	Condensed Matter Physics and Condensed Matter Physics and Condensed Matter Physics

It should be noted that specific course requirements within the area of emphasis are decided based on consultation with the Director of the MMT concentration.

Two options are available for M.S. students: a thesis option and a comprehensive examination option. Both options require the completion of at least 12 courses of study.

### Plan I. Thesis Option

For the thesis option, students are required to complete an original research project and write an M.S. thesis. A committee of three full-time faculty members is appointed to guide the development of the thesis. Students must also obtain approval for a complete program of study from the program director. At least seven courses (3-unit or 4-unit) must be taken from courses numbered 200–289, among which at least four courses (3-unit or 4-unit) are from MMT core courses and at least three courses (3-unit or 4-unit) are in the area of emphasis approved by the faculty advisor and the graduate advisor. Four units of BME 296, CBE 296, EECS 296, ENGR 296, ENGRCEE 296, or ENGRMAE 296 count as the equivalence of one course. Up to three courses equivalent of BME 296, CBE 296, EECS 296, ENGR 296, ENGRCEE 296, or ENGRMAE 296 and up to two courses (3-unit or 4-unit) of upper-division undergraduate elective courses taken as a graduate student at UCI can be applied toward the 12-course requirement.

### Plan II. Comprehensive Examination Option

For the comprehensive examination option, students are required to complete minimally 12 courses (3-unit or 4-unit) of study. At least eight courses (3-unit or 4-unit) must be taken from courses numbered 200–289, among which at least four courses (3-unit or 4-unit) are from MMT core courses and at least four courses (3-unit or 4-unit) are in the area of emphasis approved by the faculty advisor and the graduate advisor. Four units of BME 299, CBE 299, EECS 299, ENGRCEE 299, or ENGRMAE 299 count as the equivalence of one course. One course equivalent of BME 299, CBE 299, EECS 299, ENGRCEE 299, or ENGRMAE 299 and up to two courses (3-unit or 4-unit) of upper-division undergraduate elective courses taken as a graduate student at UCI can be applied toward the 12-course requirement.

In the last quarter, an oral comprehensive examination on the contents of study will be given by a committee of three faculty members including the advisor and two members appointed by the program director. Part-time study for the M.S. is available and encouraged for engineers working in local industries. Registration for part-time study must be approved in advance by the MMT program director, the School's Associate Dean, and the Graduate Dean.

In addition to fulfilling the course requirements outlined above, it is a University requirement for the Master of Science degree that students fulfill a minimum of 36 units of study.

Ozdal Boyraz (integrated optics, silicon photonics, optical communications systems and microwave photonics)

Peter J. Burke (nano-electronics, bio-technology)

Zhongping Chen (biomedical optics, optical coherence tomography, bioMEMS, and biomedical devices)

James C. Earthman (biomaterials, compositionally complex materials, nanocrystalline alloys, quantitative percussion diagnostics, deformation and damage processes)

Rahim Esfandypour (nanotechnology and nanoscience, flexible electronics, MEMS and NEMS fabrication and modeling, stretchable and wearable bio devices, translational micro/nanotechnologies, biological and chemical sensors, microfluidics, microelectronics circuits and systems, physiological monitoring, Internet of Things(IOT) bio devices, technology development for personalized/precision medicine, and Point of Care(POC) diagnostics)

Franco De Flaviis (microwave systems, wireless communications, electromagnetic circuit simulations)

Manuel Gamero-Castaño (electric propulsion, with emphasis on colloid thruster technology for precision formation flying missions and Hall thrusters, electrohydrodynamic atomization of liquids and related problems like electrospray ionization and technological applications of electrosprays, aerosol diagnostics)

Alon A. Gorodetsky (cephalopods, adaptive materials, camouflage, bioelectronics)

Michelle Khine (development of novel nano- and micro-fabrication technologies and systems for single cell analysis, stem cell research, in vitro diagnostics)

John C. LaRue (heat transfer, turbulence)

Abraham Lee (integrated point-of-care diagnostics, engineered “theranostic” vesicles and particles, active cell sorting microdevices, microphysiological microsystems, and high throughput droplet bioassays)

Chin C. Lee (electronic packaging, bonding technology, metallurgy, thermal design, semiconductor devices, electromagnetic theory, acoustics and optoelectronics)

Jaeho Lee (heat transfer, thermal management, thermoelectronics, phononics, nanomaterials)

Henry P. Lee (photonics, fiber-optics and compound semiconductors)

Guann Pyng Li (micro/nano technology for sensors and actuators, internet of things (IoT), smart manufacturing, biomedical devices and millimeter wave wireless communication)

Michael McCarthy (design of mechanical systems, computer aided design, kinematic theory of spatial motion)

Marc J. Madou (fundamental aspects of micro/nano-electro-mechanical systems [MEMS/NEMS], biosensors, nanofluidics, biomimetics)

Martha L. McCartney (ceramics for energy applications and for use in extreme environments, flash sintering, interfacial design of thermal conductivity, transmission electron microscopy)

Farghalli A. Mohamed (mechanical behavior of engineering materials such as metals, composites and ceramics, the correlation between behavior and microstructure, creep, and superplasticity, mechanisms responsible for strengthening and fracture)

Ayman S. Mosallam (advanced composites and hybrid systems, seismic repair and rehabilitation of structures, diagnostic/prognostic structural health monitoring techniques, 3D printing in construction and sustainable and green building technology)

Daniel R. Mumm (development of materials for power generation systems, propulsion, integrated sensing advanced vehicle concepts and platform protection)

Xiaoqing Pan (atomic-scale structure, properties and dynamic behaviors of advanced materials including thin films and nanostructures for memories, catalysts, and energy conversion and storage devices)

Regina Ragan (exploration and development of novel materials systems for nanoscale electronic and optoelectronic devices)

Timothy J. Rupert (mechanical behavior, nanomaterials, structure-property relationships, microstructural stability, grain boundaries and interfaces, materials characterization)

Andrei M. Shkel (design and advanced control of micro-electro-mechanical systems (MEMS); high precision micro-machined gyroscopes; MEMS-enhanced optical systems, tools and prosthetic appliances; electromechanical and machine-information systems integration)

Frank G. Shi (optoelectronic devices and materials, optoelectronic device packaging materials, optoelectronic medical devices and packaging, white LED technologies, high power LED packaging)

Lizhi Sun (CEE) (micro- and nano-mechanics, composites and nanocomposites, smart materials and structures, multiscale modeling, elastography)

William Tang (micro-electro-mechanical systems (MEMS) nanoscale engineering for biomedical applications, microsystems integration, microimplants, microbiomechanics, microfluidics)

Chen S. Tsai (integrated microwave magnetics, ultrasonic atomization for nanoparticles synthesis, silicon photonics)

Lorenzo Valdevit, Director (architected materials, mechanical metamaterials, additive manufacturing, optimal design)

Yoon Jin Won (multi-scale structures for thermal and energy applications, in particular fabrication, characterization, and integration of structured materials)

Albert Yee (materials science aspects of polymers and soft materials, particularly on how they are used to impact nanotechnology)

## Engineering, Ph.D. (Concentration in Materials and Manufacturing Technology)

**Lorenzo Valdevit, Director and Graduate Advisor**  
204 Rockwell Engineering Center; 949-824-8090

<http://engineering.uci.edu/interdisciplinary-graduate-programs/materials-and-manufacturing-technology> (<http://engineering.uci.edu/interdisciplinary-graduate-programs/materials-and-manufacturing-technology/>)

The Ph.D. in Engineering with a concentration in Materials and Manufacturing Technology requires a commitment on the part of the student to dedicated study and collaboration with the faculty. Ph.D. students are selected on the basis of outstanding demonstrated potential and scholarship. Applicants must hold the appropriate prerequisite degrees from recognized institutions of high standing. Students entering with a master's degree may be required to take additional course work, to be decided in consultation with the graduate advisor and the program director. Students without a master's degree may be admitted into the Ph.D. program. However, these students will be required to complete the degree requirements above for the master's degree prior to working on doctoral studies. After substantial academic preparation, Ph.D. candidates work under the supervision of faculty advisors. The process involves immersion in a research atmosphere and culminates in the production of original research results presented in a dissertation.

Milestones to be passed in the Ph.D. program include the following: acceptance into a research group by the faculty advisor during the student's first year of study, successful completion of the Ph.D. preliminary examination during years one or two, development of a research proposal, passing the qualifying examination during year three (second year for those who entered with a master's degree), and the successful completion and defense of the dissertation during the fourth or fifth year. There is no foreign language requirement.

The degree is granted upon the recommendation of the doctoral committee and the Dean of Graduate Division. The normative time for completion of the Ph.D. is five years (four years for students who entered with a master's degree). The maximum time permitted is seven years.

### **Concurrent Study in the Program in Law and Graduate Studies (PLGS)**

Students have the option to pursue a coordinated curriculum leading to a J.D. degree from the School of Law in conjunction with a Master's or Ph.D. in Engineering with a concentration in Materials and Manufacturing Technology. For students pursuing the M.S. thesis option, 8 units of research can be substituted for law electives, and comprehensive exam students can petition two course (non-course or area of emphasis courses) to be substituted by law electives.

Ozdal Boyraz (integrated optics, silicon photonics, optical communications systems and microwave photonics)

Peter J. Burke (nano-electronics, bio-technology)

Zhongping Chen (biomedical optics, optical coherence tomography, bioMEMS, and biomedical devices)

James C. Earthman (biomaterials, compositionally complex materials, nanocrystalline alloys, quantitative percussion diagnostics, deformation and damage processes)

Rahim Esfandypour (nanotechnology and nanoscience, flexible electronics, MEMS and NEMS fabrication and modeling, stretchable and wearable bio devices, translational micro/nanotechnologies, biological and chemical sensors, microfluidics, microelectronics circuits and systems, physiological monitoring, Internet of Things(IOT) bio devices, technology development for personalized/precision medicine, and Point of Care(POC) diagnostics)

Franco De Flaviis (microwave systems, wireless communications, electromagnetic circuit simulations)

Manuel Gamero-Castaño (electric propulsion, with emphasis on colloid thruster technology for precision formation flying missions and Hall thrusters, electrohydrodynamic atomization of liquids and related problems like electrospray ionization and technological applications of electrosprays, aerosol diagnostics)

Alon A. Gorodetsky (cephalopods, adaptive materials, camouflage, bioelectronics)

Michelle Khine (development of novel nano- and micro-fabrication technologies and systems for single cell analysis, stem cell research, in vitro diagnostics)

John C. LaRue (heat transfer, turbulence)

Abraham Lee (integrated point-of-care diagnostics, engineered "theranostic" vesicles and particles, active cell sorting microdevices, microphysiological microsystems, and high throughput droplet bioassays)

Chin C. Lee (electronic packaging, bonding technology, metallurgy, thermal design, semiconductor devices, electromagnetic theory, acoustics and optoelectronics)

Jaeho Lee (heat transfer, thermal management, thermoelectronics, phononics, nanomaterials)

Henry P. Lee (photonics, fiber-optics and compound semiconductors)

Guann Pyng Li (micro/nano technology for sensors and actuators, internet of things (IoT), smart manufacturing, biomedical devices and millimeter wave wireless communication)

Michael McCarthy (design of mechanical systems, computer aided design, kinematic theory of spatial motion)

Marc J. Madou (fundamental aspects of micro/nano-electro-mechanical systems [MEMS/NEMS], biosensors, nanofluidics, biomimetics)

Martha L. McCartney (ceramics for energy applications and for use in extreme environments, flash sintering, interfacial design of thermal conductivity, transmission electron microscopy)

Farghalli A. Mohamed (mechanical behavior of engineering materials such as metals, composites and ceramics, the correlation between behavior and microstructure, creep, and superplasticity, mechanisms responsible for strengthening and fracture)

Ayman S. Mosallam (advanced composites and hybrid systems, seismic repair and rehabilitation of structures, diagnostic/prognostic structural health monitoring techniques, 3D printing in construction and sustainable and green building technology)

Daniel R. Mumm (development of materials for power generation systems, propulsion, integrated sensing advanced vehicle concepts and platform protection)

Xiaoqing Pan (atomic-scale structure, properties and dynamic behaviors of advanced materials including thin films and nanostructures for memories, catalysts, and energy conversion and storage devices)

Regina Ragan (exploration and development of novel materials systems for nanoscale electronic and optoelectronic devices)

Timothy J. Rupert (mechanical behavior, nanomaterials, structure-property relationships, microstructural stability, grain boundaries and interfaces, materials characterization)

Andrei M. Shkel (design and advanced control of micro-electro-mechanical systems (MEMS); high precision micro-machined gyroscopes; MEMS-enhanced optical systems, tools and prosthetic appliances; electromechanical and machine-information systems integration)

Frank G. Shi (optoelectronic devices and materials, optoelectronic device packaging materials, optoelectronic medical devices and packaging, white LED technologies, high power LED packaging)

Lizhi Sun (CEE) (micro- and nano-mechanics, composites and nanocomposites, smart materials and structures, multiscale modeling, elastography)

William Tang (micro-electro-mechanical systems (MEMS) nanoscale engineering for biomedical applications, microsystems integration, microimplants, microbiomechanics, microfluidics)

Chen S. Tsai (integrated microwave magnetics, ultrasonic atomization for nanoparticles synthesis, silicon photonics)

Lorenzo Valdevit, Director (architected materials, mechanical metamaterials, additive manufacturing, optimal design)

Yoon Jin Won (multi-scale structures for thermal and energy applications, in particular fabrication, characterization, and integration of structured materials)

Albert Yee (materials science aspects of polymers and soft materials, particularly on how they are used to impact nanotechnology)

## Master of Engineering

**Fadi J. Kurdahi, Program Director**

949-824-8090

The Master of Engineering Program is administered by faculty of the Henry Samueli School of Engineering. The program offers the Master of Engineering degree in multiple concentrations and specializations.

The curriculum includes foundational courses that vary by specialization as well as an entrepreneurial/intrapreneurial sequence of courses that is common to all the specializations. The degree has a strong experiential learning component embodied in a capstone project supervised by faculty members. The M.Eng. program was developed, in part, to serve the needs of domestic and international students, and working professionals among whom the leaders of their respective specializations are especially likely to come.

Potential graduate students for the M.Eng. Program can apply via the Graduate Division's online application and indicate on their applications their interest in the program. Students apply directly to the concentration of their choice. Applicants are expected to hold a Bachelor's degree in an Engineering or Computer Science discipline. Students from other disciplines may be considered for admission if they have sufficient background in the basics of their target specialization. Applicants will be evaluated on the basis of their prior academic record and their potential for carrying out graduate-level work as demonstrated in submitted application materials. These materials include official university transcripts, letters of recommendation, GRE scores, and a Statement of Purpose where students can explain their relevant experience (academic or industry). Students with industry experience will be considered favorably, especially if their experience is relevant to the areas emphasized by their target specialization.

An admissions committee composed of senate faculty members will evaluate the applicant files and make admissions decisions based on the overall file presented by the student.

Overall, students will be admitted using criteria similar to those used in traditional M.S. degree from relevant departments.

## Master of Engineering Program Requirements

The Master of Engineering (M.Eng) consists of six concentrations electives specific to each concentration, plus 8 units of project courses leading to a final project. In addition, a common layer of three courses in Business/Communication/Leadership is required in all of the specializations.

A. Complete:

ENGR 200AP	Entrepreneurship Science and Engineering: Innovation
ENGR 200BP	Entrepreneurship Science and Engineering: Build
ENGR 200CP	Entrepreneurship Science and Engineering: Launch

B. Complete six technical courses. Acceptable courses for each concentration/specialization are listed below:

### Biomedical Engineering Concentration

Students in the BME Concentration select six courses from the following:

BME 234P	Neuroimaging Data Analysis
BME 262P	Microimplants
BME 295P	Special Topics in Biomedical Engineering

### Electrical Engineering and Computer Science Concentration

Students in the EECS Concentration select from two specializations:

Digital and Image Signal Processing

Complete the following:

EECS 213P	Computer Architecture
EECS 220P	Advanced Digital Signal Processing Architecture
EECS 250P	Digital Signal Processing I

Select three from the following:

EECS 202BP	Techniques in Medical Imaging: X-ray, Nuclear, and NMR Imaging
EECS 211P	Advanced System Software
EECS 215P	Design and Analysis of Algorithms
EECS 223P	Real-Time Computer Systems
EECS 240P	Random Processes
EECS 241AP	Digital Communications I
EECS 295P	Special Topics in Electrical Engineering and Computer Science

High Speed Communication Circuits and Systems

Complete:

EECS 241AP	Digital Communications I
EECS 244P	Wireless Communications
EECS 270AP	Advanced Analog Integrated Circuit Design I
EECS 285AP	Optical Communications

Select two from the following:

EECS 240P	Random Processes
EECS 241BP	Digital Communications II
EECS 250P	Digital Signal Processing I
EECS 270DP	Radio-Frequency Integrated Circuit Design
EECS 270BP	Advanced Analog Integrated Circuit Design II
EECS 280AP	Advanced Engineering Electromagnetics I
EECS 284P	RF Antenna Design
EECS 295P	Special Topics in Electrical Engineering and Computer Science

### Mechanical and Aerospace Engineering Concentration

Students in the MAE Concentration select from two specializations:

Energy Systems

Select six courses from the following:

ENGRMAE 209P	Energy Efficiency Technology
ENGRMAE 211P	Energy Storage Systems and Technology
ENGRMAE 212P	Engineering Electrochemistry: Fundamentals and Applications

ENGRMAE 214AP	Fuel Cell Fundamentals and Technology
ENGRMAE 217P	Generalized Thermodynamics
ENGRMAE 218P	Sustainable Energy Systems
ENGRMAE 219P	Solar and Renewable Energy Systems
ENGRMAE 295P	Special Topics in Mechanical and Aerospace Engineering

## Nanotechnology

Select six courses from the following:

ENGRMAE 229P	Nanoscale Materials for Modern Electronics
ENGRMAE 247P	Micro-System Design
ENGRMAE 252P	Fundamentals of Microfabrication
ENGRMAE 254P	Mechanics of Solids and Structures
ENGRMAE 257P	Fabrication and Characterization of Nanomaterials
ENGRMAE 259P	Mechanical Behavior of Solids - Atomistic Theories
ENGRMAE 295P	Special Topics in Mechanical and Aerospace Engineering

## C. Complete:

ENGR 210P	Capstone Project (8 units) <sup>1</sup>
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<sup>1</sup> Students are required to complete a project that deals with a specific emphasis of their concentration/specialization. The project will be mentored by a faculty member and approved by the student's advisor and the Concentration Director. A project report must be submitted in partial fulfillment of the degree requirements. The project report needs to be approved by the mentor, the student's advisor and the director of the M.Eng. Program.

# The Paul Merage School of Business

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## Eric Spangenberg, Dean

The Paul Merage School of Business (<http://merage.uci.edu/>) offers the B.A. in Business Administration, the B.S. in Business Information Management (offered jointly with the Donald Bren School of Information and Computer Sciences), the M.B.A. (Master of Business Administration), the MPAc (Master of Professional Accountancy), the Master of Finance, the Master of Innovation and Entrepreneurship, the M.S. in Business Analytics, the M.S. in Biotechnology Management (offered jointly with the School of Biological Sciences and The Henry Samueli School of Engineering), the M.S. in Engineering Management (offered jointly with The Henry Samueli School of Engineering), the Ph.D. in Management, and undergraduate minors in Management, Accounting, and Innovation and Entrepreneurship. The Master's degree is professional in nature and is intended to provide future managers with a firm foundation in the basic disciplines and in management tools and techniques; the Ph.D. in Management is for those who wish to pursue a career in scholarly research.

The undergraduate minor in Management is designed for those who wish to gain some insight into issues of modern management, as well as those who anticipate future graduate work in management. In establishing the undergraduate minor in Accounting, the faculty anticipated two types of students to be drawn to courses in accounting: (1) students preparing for careers in accounting or in other fields that require some knowledge of accounting, and (2) students planning to pursue a graduate degree in accounting who wish early guidance and undergraduate work appropriate to this career objective. The minor in Innovation and Entrepreneurship provides extensive academic and practical training for students to embark on careers as entrepreneurs (innovating to form new companies) and intrapreneurs (innovating within existing companies).

## Honors

**Graduation with Honors.** Honors at graduation, e.g., *cum laude*, *magna cum laude*, *summa cum laude*, are awarded to approximately the top 16 percent of the graduating seniors. To be eligible for honors, a general criterion is that students must have completed at least 72 units in residence at the University of California. The student's cumulative record at the end of the final quarter is the basis for consideration for awarding Latin honors. Other important factors are considered visit at Honors Recognition.

## Merage Career Center

The Merage Career Center, located within the Merage School, assists students with taking the next steps in their professional career. The Center has two main functions: (1) helping students develop lifelong career management skills through career and professional development activities, job search training, and personalized coaching services and (2) facilitating connections with organizations that hire for internships and full-time jobs. The relatively small size of the MBA program allows students to develop a close working relationship with the Career Center staff.

## Graduate Educational Objectives

The Paul Merage School of Business offers a general management MBA degree and a learning experience that prepares graduates for a lifetime of professional and personal growth with increasingly important enterprise-wide responsibilities. The rigorous curriculum, combined with extensive professional and interpersonal training made available through the School's Career Center, allows students to gain theoretical perspectives that are in turn tested and affirmed with practical application. The result is an environment that fosters the development of professional and personal skills vital to executives and managers. Students are encouraged to develop their ability to lead change by mastering communication skills, to work productively and actively within a team-oriented environment, to gain a solid grasp of quantitative skills, and to appreciate and effectively employ those solutions that integrate information and technology to offer creatively viable business options.

The School has developed a thematic approach to business education: leadership for a digitally-driven world. The goal is to graduate leaders with the exceptional ability to grow their organizations through strategic innovation supported by data analytics, information technology, and collaborative execution. Although a solid grounding in basic business disciplines provides the foundation for effective management, graduates are encouraged to aim higher. They learn about change as it takes place within the context of a knowledge-based, technology-driven society where information and its effective use are vital to establishing a competitive edge. Students, whether they are interested in finance, marketing, general management, strategic planning, accounting, operations, health care, human resources, international business, or other areas, will be thoroughly imbued and comfortable with the nature and importance of strategic innovation and how crucial it is toward sustaining growth in today's competitive global economy. Further, they will understand the impacts of technology and the technological processes that enable the gathering, analysis, dissemination, and use of information to change the way business is done. The thematic approach of the School provides a skill-set, core understanding, and depth of knowledge that will enable its graduates to be effective managers who are not only proficient in business procedures but have the leadership qualities and conceptual framework to affect change by transforming conventional business practices or perhaps even inventing new business processes and management techniques.

The Paul Merage School of Business also offers a number of specialized and joint master's programs, including: the Master of Professional Accountancy (MPAc); the Master of Finance (MFin); the Master of Innovation and Entrepreneurship (MIE); the M.S. in Business Analytics (MSBA); the M.S. in Engineering Management (MSEM), offered jointly with The Henry Samueli School of Engineering; and the M.S. in Biotechnology Management (MSBTM), offered jointly with the Department of Molecular Biology and Biochemistry (MB&B) in the School of Biological Sciences and the Department of Biomedical Engineering in The Henry Samueli School of Engineering. Joint M.D./MBA and J.D./MBA programs are also available.

- Accounting, Minor
- Biotechnology Management, M.S.



- Business Administration, B.A.
- Business Analytics, M.S.
- Business Information Management, B.S.
- Engineering Management, M.S.
- Innovation and Entrepreneurship, Minor
- J.D./M.B.A. Program
- M.D./M.B.A. Program
- Management, Minor
- Management, Ph.D.
- Master of Business Administration
- Master of Business Administration, Executive
- Master of Business Administration, Fully Employed
- Master of Finance
- Master of Innovation and Entrepreneurship
- Master of Professional Accountancy

Evaluation of the applicant's file for admission to the Master's and Ph.D. degree programs will consist of an integrated assessment of all materials (test scores, transcripts of previous academic work, work experience, essays, and letters of recommendation). The University admission standard of a 3.0 or better undergraduate grade point average (on a 4.0 scale) is preferred. The minimum TOEFL (Test of English as a Foreign Language) score acceptable for study at the School for all MBA and specialized master's programs is 80 or better on the Internet-based test. The Ph.D. program minimum acceptable score is 100 on the TOEFL Internet-based test. International MBA and specialized master's programs applicants may also take the Pearson Test of English (PTE), where the minimum score required for admission is 53; or the International English Language Testing System (IELTS), where the minimum score required is 7. Substantive work experience is considered for applicants to MBA programs.

Requests for application material should be addressed to either the Full-Time MBA (SB1 5400), Fully Employed MBA (SB1 4200), Executive MBA (SB1 4200), Ph.D. Program (SB1 3235), or Master of Professional Accountancy Program (SB1 4500), Master of Finance Program (SB1 4500), Master of Innovation and Entrepreneurship (SB1 4500), or M.S. in Business Analytics Program (SB1 4500) at

The Paul Merage School of Business  
University of California, Irvine  
Irvine, CA 92697-3125  
949.824.4565  
MBAPrograms@exchange.uci.edu

## Centers of Excellence

At The Paul Merage School of Business, the Centers of Excellence serve as the bridge between campus and community. The Merage School also offers specialized M.B.A. certificates in partnership with the Centers, including certificates in Digital Transformation, Innovation and Entrepreneurship, and Real Estate and Urban Development.

### Beall Center for Innovation & Entrepreneurship

Founded in 2007, The Beall Center for Innovation & Entrepreneurship (<http://merage.uci.edu/ResearchAndCenters/Beall/>) provides thought leadership in the fields of entrepreneurship education and innovation research to both the students and faculty of The Paul Merage School of Business and the greater worldwide academic community. Through the Center and its activities, a campuswide community of involvement for students and researchers passionate about innovation and entrepreneurship has been organized around a nexus of active volunteers, board members, and alumni who provide world-class programs, resources, and relationships to the University in the areas of entrepreneurship and new venture creation.

### Center for Global Leadership

The Center for Global Leadership (<http://merage.uci.edu/ResearchAndCenters/CLTD/>) is an important resource for UC Irvine and The Paul Merage School of Business students. This Center seeks to inspire global leadership by being the best place to learn, study, and develop ideas to improve socially responsible global leadership. This is done by enabling collaboration between leading scholars, students, and the global leadership community to generate innovative ideas and best practices to address the current and future challenges of an increasingly integrated world. The Center works with experienced leaders to identify practical global-leadership knowledge needs and then develops systematic research on these questions, sharing that knowledge through conferences and our Research Translations. We use this knowledge to develop co-curricular programs for students such as the Executive Mentoring Program and the Social Responsibility Initiative that connect students with community leaders.

### Center for Real Estate

The Center for Real Estate (<http://merage.uci.edu/ResearchAndCenters/CRE/>) at The Paul Merage School of Business is an integral and indispensable component of the program in Real Estate and Urban Development at UC Irvine. In addition to offering eight real estate elective courses, it provides

students with a network of connections to the business community, including members of its Advisory Board, industry leaders, and alumni. The Center offers fellowships, extracurricular activities, and resources that enhance the M.B.A. learning experience.

## **Center for Health Care Management and Policy**

The Center for Health Care Management and Policy (<http://merage.uci.edu/ResearchAndCenters/healthcare/>) at The Paul Merage School of Business advances knowledge through research and education while providing forums for dialogue on crucial challenges and concerns facing the nation's health care system today. This interdisciplinary research institute brings together health care scholars, policy experts, and industry professionals to share vital information and a range of perspectives on such fundamental issues as quality of care, cost, and access. A wide range of programs contribute to the debate on national health care policy and help leaders in government, business, and nonprofit organizations make better-informed decisions. The Center's activities build on the Merage School's health care-oriented educational programs, including its M.D./M.B.A. joint degree program.

## **Center for Digital Transformation**

The Center for Digital Transformation (CDT) (<http://merage.uci.edu/ResearchAndCenters/CDT/>) generates and disseminates knowledge that helps businesses, governments, and society adapt to and leverage the possibilities enabled by emerging digital technologies. Research themes include Digital Economics, Digital Business Models and Processes, Digital Services Delivery, and Big Data & Analytics. CDT serves as an interdisciplinary research institute, drawing on economists, behavioral scientists, sociologists, and computer scientists. The Center deploys an open innovation model, partnering with companies, nonprofits, experts, and the community at large to identify and address critical research questions. CDT hosts several outreach initiatives which support and educate students, as well as connects them to key industry professionals.

## **Center for Investment and Wealth Management**

The Center for Investment and Wealth Management (<http://merage.uci.edu/ResearchAndCenters/ciwm/>) is dedicated to the mission of educating Merage School M.B.A. students in the area of investment and wealth management. The Center seeks to enhance students' educational experience and help them to advance their professional expertise and growth at the same time. The education that the Center provides is a collaborative effort between UC Irvine's expert faculty and seasoned professionals dedicated to sharing their experience and knowledge. The concept is to create cutting-edge curriculum with the flexibility to teach students topics in real time. This year, a number of the Center's board members have participated as distinguished lecturers. They are prominently known in the wealth management community and speak to students about their career path, the industry, and ways to achieve success. They are from a wide array of backgrounds including financial institutions, investment companies, law firms, accounting firms, and wealth management companies in Orange County and beyond.

## **John S. and Marilyn Long U.S.-China Institute for Business and Law**

The John S. and Marilyn Long U.S.-China Institute for Business and Law (<http://longinstitute.uci.edu/>) at UC Irvine is a premier research entity established to facilitate and further develop legal and commercial relationships between the United States and China. The Long Institute is a collaborative effort between The Paul Merage School of Business and the School of Law at UC Irvine and will involve chaired professors with extensive expertise in the areas of both business and law as it relates to the U.S and China. The Institute serves to promote a bilateral understanding and engagement between the two economic superpowers and will feature events and research involving both scholars and practitioners from various industries engaging in U.S.-China trade. Students and faculty can also be involved by participating in exchange programs with major Chinese universities.

## **Faculty**

Dennis Aigner, Ph.D. University of California, Berkeley, *Professor Emeritus of Paul Merage School of Business*

Alpesh N. Amin, M.D. M.B.A. Northwestern University, *Department Chair and Thomas and Mary Cesario Endowed Chair in Medicine and Professor of Medicine; Biomedical Engineering; Paul Merage School of Business; Program in Public Health; Radiological Sciences*

Christopher Bauman, Ph.D. University of Illinois at Chicago, *Associate Professor of Paul Merage School of Business*

David Blake, Ph.D. Rutgers, The State University of New Jersey, *Professor Emeritus of Paul Merage School of Business*

Kevin Bradford, Ph.D. University of Florida, *Assistant Professor of Teaching of Paul Merage School of Business* (personal setting, sales management, distribution of firearms, marketing practices of guns, gun culture)

Tonya Bradford, Ph.D. Northwestern University, *Assistant Professor of Paul Merage School of Business* (rituals, market exchange, gift-giving, communities)

Philip Bromiley, Ph.D. Carnegie Mellon University, *Professor of Paul Merage School of Business*

Nai-Fu Chen, Ph.D. University of California, Los Angeles, *Professor Emeritus of Paul Merage School of Business*

Vidyanand Choudhary, Ph.D. Purdue University, *Professor of Paul Merage School of Business*

Elizabeth Chuk, Ph.D. University of Washington, *Assistant Professor of Paul Merage School of Business* (financial reporting, consequences of accounting standards, defined benefit pensions, earnings management)

- N. Edward Coulson, Ph.D. University of California, San Diego, *Professor of Paul Merage School of Business; Economics; Psychological Science*
- Imran Currim, Ph.D. Stanford University, *UCI Chancellor's Professor of Paul Merage School of Business*
- Sanjeev Dewan, Ph.D. University of Rochester, *Professor of Paul Merage School of Business*
- Joseph DiMento, Ph.D. University of Michigan, *Professor of School of Law; Criminology, Law and Society; Paul Merage School of Business; Urban Planning and Public Policy*
- Martha S. Feldman, Ph.D. Stanford University, *Roger W. and Janice M. Johnson Chair in Civic Governance and Public Management and Professor of Urban Planning and Public Policy; Paul Merage School of Business; Sociology* (organization theory and behavior, stability and change in organizations, decision-making and information processing, public management, qualitative research methods)
- Paul Feldstein, Ph.D. University of Chicago, *Professor Emeritus of Paul Merage School of Business*
- Mary Gilly Graham, Ph.D. University of Houston, *Professor of Paul Merage School of Business*
- John Graham, Ph.D. University of California, Berkeley, *Professor Emeritus of Paul Merage School of Business*
- Luyi Gui, Ph.D. Georgia Institute of Technology, *Assistant Professor of Paul Merage School of Business*
- Vijay Gurbaxani, Ph.D. University of Rochester, *Taco Bell Chair in Information Technology Management and Professor of Paul Merage School of Business; Informatics* (economics of information systems management, impact of information technology on organization and market structure)
- David Hirshleifer, Ph.D. University of Chicago, *Paul Merage Chair in Business Growth and Distinguished Professor of Paul Merage School of Business; Economics*
- Siew Hong Teoh Hirshleifer, Ph.D. University of Chicago, *Professor of Paul Merage School of Business*
- Joanna Ho, Ph.D. University of Texas at Austin, *Professor of Paul Merage School of Business*
- Chong Huang, Ph.D. University of Pennsylvania, *Assistant Professor of Paul Merage School of Business*
- Mireille Jacobson, Ph.D. Harvard University, *Associate Professor of Paul Merage School of Business*
- Philippe Jorion, Ph.D. University of Chicago, *Professor of Paul Merage School of Business; Economics*
- John Joseph, Ph.D. Northwestern University, *Associate Professor of Paul Merage School of Business*
- Lynn Robin Keller, Ph.D. University of California, Los Angeles, *Professor of Paul Merage School of Business*
- Sreya Kolay, Ph.D. University of Rochester, *Assistant Professor of Paul Merage School of Business*
- Sharon Koppman, Ph.D. University of Arizona, *Assistant Professor of Paul Merage School of Business; Sociology* (work and occupations, sociology of culture, creative industries)
- Kenneth Kraemer, Ph.D. University of Southern California, *Professor Emeritus of Paul Merage School of Business*
- Loraine Lau, Ph.D. University of California, Los Angeles, *Associate Professor of Paul Merage School of Business*
- Ben Lourie, Ph.D. University of California, Los Angeles, *Assistant Professor of Paul Merage School of Business*
- Radhika Lunawat, Ph.D. University of Minnesota, *Assistant Professor of Paul Merage School of Business; Economics*
- Newton Margulies, Ph.D. University of California, Los Angeles, *Professor Emeritus of Paul Merage School of Business*
- Peter Navarro, Ph.D. Harvard University, *Professor Emeritus of Paul Merage School of Business*
- David Neumark, Ph.D. Harvard University, *Distinguished Professor of Economics; Paul Merage School of Business*
- Tingting Nian, Ph.D. New York University, *Assistant Professor of Paul Merage School of Business*
- Gerardo Okhuysen, Ph.D. Stanford University, *Professor of Paul Merage School of Business*
- Judith Olson, Ph.D. University of Michigan, *Professor Emeritus of Informatics; Paul Merage School of Business; Urban Planning and Public Policy* (interactive and collaborative technology, human-computer interaction, computer-supported cooperative work)
- Jone Pearce, Ph.D. Yale University, *Professor of Paul Merage School of Business*

Cornelia Pechmann, Ph.D. Vanderbilt University, *Professor of Paul Merage School of Business*

Morton Pincus, Ph.D. Washington University, *Professor of Paul Merage School of Business*

Andrew Policano, Ph.D. Brown University, *Professor Emeritus of Paul Merage School of Business*

Judy Rosener, Ph.D. Claremont Graduate University, *Professor of Teaching Emerita of Paul Merage School of Business*

Maritza Salazar, Ph.D. New York University, *Assistant Professor of Paul Merage School of Business; Psychological Science* (team science, group dynamics and processes, team-based organizations, global teams, impact of culture on work behavior, international management, management of innovation and learning)

Claudia Schoonhoven, Ph.D. Stanford University, *Professor Emerita of Paul Merage School of Business*

Christopher Schwarz, Ph.D. University of Massachusetts, *Associate Professor of Paul Merage School of Business*

Carlton Scott, Ph.D. University of New South Wales, *Professor Emeritus of Paul Merage School of Business*

Devin Shanthikumar, Ph.D. Stanford University, *Assistant Professor of Paul Merage School of Business*

Terrence Shevlin, Ph.D. Stanford University, *Paul Merage Chair in Business Growth and Professor of Paul Merage School of Business*

Kut So, Ph.D. Stanford University, *Professor of Paul Merage School of Business*

Eric Spangenberg, Ph.D. University of Washington, M.B.A. Portland State University, *Dean of The Paul Merage School of Business and Professor of Paul Merage School of Business; Psychological Science* (sensory cues in the retail environment and the effects of self-prediction on behavior)

Zheng Sun, Ph.D. New York University, *Associate Professor of Paul Merage School of Business*

Eli Talmor, Ph.D. University of North Carolina at Chapel Hill, *Professor Emeritus of Paul Merage School of Business*

John Turner, Ph.D. Carnegie Mellon University, *Associate Professor of Paul Merage School of Business*

Rajeev Tyagi, Ph.D. University of Pennsylvania, *Walter B. Gerken Chair in Enterprise and Society and Professor of Paul Merage School of Business*

Kerry Vandell, Ph.D. Massachusetts Institute of Technology, *Professor Emeritus of Paul Merage School of Business; School of Law; Urban Planning and Public Policy*

Alladi Venkatesh, Ph.D. Syracuse University, *Professor of Paul Merage School of Business* (social impacts of information technology, Internet and the New Economy, Smart Home technologies, children and multimedia)

Libby Weber, Ph.D. University of Southern California, *Associate Professor of Paul Merage School of Business*

Patricia A. Wellmeyer, M.S. California State University, Fullerton, *Assistant Professor of Teaching of Paul Merage School of Business*

Margarethe Wiersema, Ph.D. University of Michigan, *Professor of Paul Merage School of Business*

Mingdi Xin, Ph.D. New York University, *Assistant Professor of Paul Merage School of Business*

David Yang, Ph.D. Harvard University, *Assistant Professor of Paul Merage School of Business*

Shuya Yin, Ph.D. University of British Columbia, *Associate Professor of Paul Merage School of Business*

Maia Young, Ph.D. Stanford University, *Assistant Professor of Paul Merage School of Business*

Lu Zheng, Ph.D. Yale University, *Professor of Paul Merage School of Business*

## Accounting Courses

### **MPAC 200A. Intermediate Accounting Intensive I. 4 Units.**

Designed to provide students with technical U.S. accounting theory and principles background necessary for graduate work in accounting. Current international accounting convergence issues and standards will be discussed on emerging topics.

Repeatability: May be taken for credit 2 times.

Restriction: Accountancy Majors only.

**MPAC 200B. Foundations of Taxation Intensive. 4 Units.**

Provides students with the basic concepts of federal income taxation applicable to all taxpayers. Specifically, principles of taxation for individuals, corporations, and partnerships are discussed.

Repeatability: May be taken for credit 2 times.

Restriction: Accountancy Majors only.

**MPAC 200C. Intermediate Accounting Intensive II and Special Topics. 4 Units.**

Designed to provide students with the technical U.S. accounting theory and principles background necessary for graduate work in accounting. Current international accounting convergence issues and standards will be discussed on emerging topics.

Repeatability: May be taken for credit 2 times.

Restriction: Accountancy Majors only.

**MPAC 200D. Auditing Intensive. 4 Units.**

Designed to provide students with an understanding of the fundamental principles, processes, and ethical considerations involved in the performance of a financial statement audit under U.S. auditing standards.

Repeatability: May be taken for credit 2 times.

Restriction: Accountancy Majors only.

**MPAC 230. Accounting ProSeminar: Career and Professional Development. 2 Units.**

Provides students with information and practical skills for success in the program and for professional accounting and business career planning, and with discussions of current issues confronting the accounting profession.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 2 times.

Restriction: Accountancy Majors only.

**MPAC 231A. Financial Statement Analysis and Forecasting. 4 Units.**

Develops skills to analyze corporate financial reports. Topics include profitability, risk analysis, cash flow analysis, revenue and asset recognition, and forecasting. The skills are useful for students to evaluate financial reporting quality, detect earnings management, and predict firms' financial performance.

Prerequisite: Intermediate accounting.

Restriction: Accountancy Majors only.

**MPAC 231B. Advanced Financial Statement Analysis. 4 Units.**

Develops skills to analyze corporate financial reports with a focus on liabilities, stockholders' equity, and valuation. Topics include forecasting financial statements, cash flows- and earnings-based equity, and valuation models, accounting analysis of mergers and acquisitions, lease pensions, and derivatives.

Restriction: Accountancy Majors only.

**MPAC 232. Taxes and Business Strategy. 4 Units.**

Develops a student's ability to identify, understand, and evaluate tax-planning opportunities. The focus is on tax planning concepts and the effects of taxes on business decisions rather than on detailed tax rules, compliance, or legal research.

Restriction: Accountancy Majors only.

**MPAC 233. Non-for-Profit Accounting. 4 Units.**

Focuses on the accounting and reporting for governmental and non-for-profit entities. Topics include preparation of fund basis financial statements and related reporting and auditing issues. Use of non-financial performance measures for non-for-profit entities is also discussed.

Restriction: Accountancy Majors only.

**MPAC 234. Accounting Policy and Research. 2 Units.**

Considers issues in contemporary accounting standard setting and regulation by examining academic accounting research of the various issues. Enables students to develop their knowledge and better appreciate current debates in accounting.

Restriction: Accountancy Majors only.

**MPAC 235. Advanced Managerial Accounting. 4 Units.**

Design of cost information and systems used to plan and control organizational activities; procedures used to account for unit, process, and program costs; cybernetic evaluation of costing procedures; cost estimation, analysis, and accounting via computers.

Restriction: Accountancy Majors only.

**MPAC 236. Forensic Accounting . 2 Units.**

Elective course focuses on the principles, and application of forensic accounting. Topics include the identification, detection, and prevention of fraud, valuations, damage calculations, and litigation support. The role of forensic accountants in the legal system will also be discussed.

Restriction: Accountancy Majors only.

**MPAC 237. International Accounting. 4 Units.**

An online course. A comprehensive study of differences between US GAAP and International Financial Reporting Standards (IFRS).

Prerequisite: Intermediate accounting.

Restriction: Accountancy Majors only.

**MPAC 238. Advanced Auditing and Assurance Services. 4 Units.**

Designed to provide advanced coverage of topics and emerging issues in auditing and assurance services. Provides a deeper understanding of the fundamental concepts of auditing, assurance services, and developing hot-topics within the auditing profession.

Prerequisite: Intermediate accounting and basic auditing.

Restriction: Accountancy Majors only.

**MPAC 239. Ethics in Accounting and Business. 4 Units.**

Designed to introduce students to the intellectual principles of ethical decision making by emphasizing the theories of ethics and their application in the business, and specifically, accounting professions. MPAC capstone course with a final comprehensive exam for the program.

Restriction: Accountancy Majors only.

**MPAC 241. Accounting Internship. 2-4 Units.**

Provides students with the opportunity to apply accounting knowledge through actual work experiences. The internship experience will provide students with knowledge of career opportunities, an understanding of how accounting plays in today's business environment, and prepare students for success.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Accountancy Majors only.

**MPAC 290. Special Topic Seminars. 2-4 Units.**

Studies in selected area of Accounting. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Accountancy Majors only.

**MPAC 291. Professional Research and Communication. 4 Units.**

Combines research of the professional accounting literature on a range of technical topics with a written communication and oral presentations of the findings.

Restriction: Accountancy Majors only.

**MPAC 299. Individual Study. 1-4 Units.**

Individual study under the direction of a selected faculty member.

Repeatability: May be repeated for credit unlimited times.

Restriction: Accountancy Majors only.



## Business Analytics Courses

### **BANA 200. Foundations of Business Analytics. 2 Units.**

Provides overview of the field of business analytics, and the theory and practice underpinnings of the three MSBA curricular tracks: Data Analytics, Marketing Analytics, and Operations Analytics. Provides students with a working knowledge of the R programming language.

Restriction: Graduate students only. Business Analytics Majors only.

### **BANA 201A. Statistics for Data Science. 4 Units.**

Methods of statistical inference, emphasizing applications to administrative and management decision problems. Topics include classical estimation and hypothesis testing, regression, correlation, analysis of variance, decision analysis, and forecasting.

Restriction: Graduate students only. Business Analytics Majors only.

### **BANA 201B. Management Science for Analytics. 4 Units.**

An introduction to computer-based models for decision making. Topics include optimization (linear programming, integer programming, network flow models) and computer simulation. Uses spreadsheets extensively, including Excel built-in and add-in packages.

Restriction: Graduate students only. Business Analytics Majors only.

### **BANA 205. Foundations of Marketing. 4 Units.**

Introduction to the field of marketing. Objectives include developing familiarity with fundamental concepts, theories, and techniques in marketing, and acquainting students with the type of decisions made by marketing managers, including customer targeting, product, pricing, distribution, promotion, and research.

Restriction: Graduate students only. Business Analytics Majors only.

### **BANA 211. MSBA ProSeminar.**

Provides students in the Merage School Master of Science in Business Analytics program with information and practical skills for success in the MSBA program and for business career planning.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Business Analytics Majors only.

### **BANA 212. Data and Programming for Analytics. 4 Units.**

Challenges and teaches students how to handle data, from initial data acquisition to final data analysis. Provides students with a working knowledge of the Python programming language.

Prerequisite: Basic familiarity with programming is recommended.

Restriction: Graduate students only. Business Analytics Majors only.

### **BANA 241. Business Analytics Internship. 2-4 Units.**

Students apply analytics and big data knowledge obtained from classroom theory through work experiences. Provides knowledge of career opportunities, an understanding of the role analytics plays in business environments, and preparation for the business analytics profession.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Business Analytics Majors only.

### **BANA 257. Marketing on the Internet for Business Analytics. 4 Units.**

Examines the impact of the Internet on traditional methods of doing marketing, and explores its existing and future uses. Discusses how to capitalize on and increase the Internet's utility as a tool that can increase marketing effectiveness, efficiency, and competitiveness.

Restriction: Graduate students only.

### **BANA 271. Marketing Analytics. 4 Units.**

Introduces students to quantitative marketing analytics methods and teaches them how to apply the methods to business problems of interest. Topics include: resource allocation and ROI, marketing mix analytics, customer analytics, market segmentation and targeting, advertising, promotions, and digital marketing.

Restriction: Graduate students only.



**BANA 273. Machine Learning for Analytics. 4 Units.**

Introduces methods to mine data repositories for business intelligence to facilitate analytical decision-making. Topics include clustering for market segmentation, association rules to discover relationships between different purchase decisions, and Naive-Bayes classification techniques for decision making using decision-trees.

Restriction: Graduate students only. Business Analytics Majors only.

**BANA 275. Natural Language Processing and Applications. 4 Units.**

Focuses on providing students knowledge of advanced techniques for data analytics. Students deepen their understanding of topics including: dimension reduction, text mining and topic modeling, sentiment analysis, collaborative filtering, and causal estimation.

Restriction: Graduate students only.

**BANA 277. Customer and Social Analytics. 4 Units.**

Examines how business managers can leverage Web 2.0 and social media analytics to create value for their organizations and customers. Topics include digital and social strategies; Web and search analytics; display and mobile advertising; social networks and influence; social media.

Restriction: Graduate students only.

**BANA 288. Predictive Analytics. 4 Units.**

Deals with predicting entities (forecasting) and predicting membership of known groups (classification). Blends methodologies of forecasting and data mining, focusing on multiple regression, logistic regression, neural nets, ARIMA, discriminate analysis, and k-nearest neighbors, and applying these methods to managerial problems/decision-making.

Restriction: Graduate students only.

**BANA 290. Special Topics in Business Analytics. 4 Units.**

Studies in selected areas of business analytics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**BANA 294. Big Data Analytics with Hadoop. 4 Units.**

In-depth hands-on exploration of various cutting-edge information technologies used for big data analytics. Focuses on using Hadoop, Sqoop, Pig, and Hive for ETL operations and on understanding the MapReduce algorithm using Apache Mahout for data mining algorithms.

Restriction: Business Analytics Majors only.

**BANA 295. Big Data Management Systems. 4 Units.**

Provides an introductory-level overview to the emerging technologies in database systems. Students gain critical insight into big data challenges, the choices of different systems and technologies available, relative advantages/disadvantages, and unique aspects of different systems.

Restriction: Graduate students only.

**BANA 298A. Business Analytics Capstone Prep. 2 Units.**

Prep course for the required capstone project. Students apply the knowledge and methods acquired through the program's coursework to an applied business analytics problem. Requirements include project selection, submission of project plan, and data collection/analysis.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Business Analytics Majors only.

**BANA 298B. Business Analytics Capstone Project. 4 Units.**

Continuation of the capstone project. Students apply the knowledge and methods acquired through the coursework in the program to an applied business analytics problem. Work includes data analysis, completed research paper, and final presentation.

Prerequisite: BANA 298A

Restriction: Graduate students only. Business Analytics Majors only.

**BANA 299. Individual Study. 1-4 Units.**

Individual study under the direction of a selected faculty member.

Repeatability: May be repeated for credit unlimited times.

## Executive MBA Courses

### **MGMT EP 200. Thinking Strategically in the Digital Age for Executives. 6 Units.**

Focuses on the strategic and organizational challenges that a rapidly changing environment poses to the firm's management and frames them according to Merage's strategic emphasis on analytical decision making, innovation, and information technology.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Administration - Executive Majors only.

### **MGMT EP 201A. Business Analytics: Decision-Making for Executives. 4 Units.**

Methods of statistical inference, emphasizing applications to administrative and management decision problems. Topics include classical estimation, hypothesis testing, regression, correlation, analysis of variance, decision analysis, and forecasting.

Restriction: Graduate students only. Administration - Executive Majors only.

### **MGMT EP 202. Organizational Leadership for Executives. 4 Units.**

Develops a better understanding of individual and group behavior in and across organizations, and the frameworks by which to analyze and understand behavior in complex organizations. Enhances the skills required to manage collaboration and lead. Every other weekend course.

Restriction: Graduate students only. Administration - Executive Majors only.

### **MGMT EP 203A. Financial Reporting Policies for Executives. 4 Units.**

Involves the development, analysis, and interpretation of financial accounting information for external reporting purposes. Emphasis on measurement and valuation issues in decision-making problems and cases. Every other weekend course format.

Restriction: Graduate students only. Administration - Executive Majors only.

### **MGMT EP 203B. Managerial Accounting for Executives. 4 Units.**

Involves developing and using internal financial and non-financial information to help organizations make planning, budgeting, control, operating, and performance evaluation decisions. Every other weekend course format.

Prerequisite: MGMT EP 203A. MGMT EP 203A with a grade of C or better

Restriction: Graduate students only. Administration - Executive Majors only.

### **MGMT EP 204A. Microeconomics for Executives in the Digital Age. 4 Units.**

Provides basic tools for analyzing economic decisions of consumers and firms. Topics include demand and supply analysis, production and cost theory, perfect competition, monopoly, market failures, and introductory game theory. Every other weekend course format.

Restriction: Graduate students only. Administration - Executive Majors only.

### **MGMT EP 204B. Macroeconomics for Executives. 4 Units.**

Introduces use of macroeconomic analysis to manage the business cycle for competitive advantage. 'Business cycle-sensitive' management is explored within the context of marketing, operations management, HRM, merger and acquisition activity, and capital financing and expenditures. Every other weekend course format.

Prerequisite: MGMT EP 204A. MGMT EP 204A with a grade of C or better

Restriction: Graduate students only. Administration - Executive Majors only.

### **MGMT EP 205. Marketing Leadership. 4 Units.**

Introduction to marketing. Topics include developing familiarity with fundamental marketing concepts, theories, and techniques; acquainting students with the type of decisions made by executives, including customer targeting, product, pricing, place, promotion, and research. Every other weekend course format.

Restriction: Graduate students only. Administration - Executive Majors only.

### **MGMT EP 207. Competing with Digital: Technology, Analytics, Business Models. 4 Units.**

Focuses on how information technology is used to create value in organizations through product, process, and strategy innovation. Aims to help managers understand the strategic role of key information technologies in managing organizations. Every other weekend course format.

Restriction: Graduate students only. Administration - Executive Majors only.

**MGMT EP 208. Operational Excellence: Processes, Strategy, and Analytics. 4 Units.**

Introduction to strategic and tactical issues in production and operations management. A blend of quantitative and qualitative considerations. Topics include product planning, process design, capacity management, production planning, inventory control, just-in-time manufacturing, and quality management. Every other weekend course format.

Restriction: Graduate students only. Administration - Executive Majors only.

**MGMT EP 209A. Managerial Finance for Executives. 4 Units.**

Introduces students to financial theory and concepts. Topics include time value of money, valuation of stocks and bonds, capital budgeting, portfolio theory, and capital structure choice. Every other weekend course format.

Prerequisite: MGMT EP 201A and MGMT EP 203A and MGMT EP 204A. MGMT EP 201A with a grade of C or better. MGMT EP 203A with a grade of C or better. MGMT EP 204A with a grade of C or better

Restriction: Graduate students only. Administration - Executive Majors only.

**MGMT EP 210. Strategy for Executives: Foundations and Dynamics . 4 Units.**

Provides conceptual frameworks and techniques to analyze and develop firm strategies. Through case analysis/discussion, helps improve strategic thinking by developing frameworks by which to assess, evaluate, and respond to different business situations. Every other weekend course format.

Prerequisite: MGMT EP 200 and MGMT EP 202 and MGMT EP 205 and MGMT EP 209A. MGMT EP 200 with a grade of C or better. MGMT EP 202 with a grade of C or better. MGMT EP 205 with a grade of C or better. MGMT EP 209A with a grade of C or better

Restriction: Graduate students only. Administration - Executive Majors only.

**MGMT EP 219. Practice of General Management for Executives. 4 Units.**

Teaches the graduating MBA how the best managers actually manage. Students develop a toolkit of proven concepts and practices that will help them succeed as managers at any level.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT EP 225. Negotiations For Executives. 4 Units.**

Using a combination of theory and practice via negotiation simulations, students expand their repertoire of negotiating skills and develop their ability to analyze different negotiation situations and contexts. Every other weekend course format.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT EP 290. Special Topics in Business. 2-4 Units.**

Studies in selected areas of business. Topics addressed vary each quarter.

Repeatability: May be repeated for credit unlimited times.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT EP 295A. Global Business I for Executives. 4 Units.**

Fundamentals of global strategy, economics, and financial issues. Topics include global manager's environment, global strategy, impact of national culture on business systems, strategies and practices, foreign direct investment, corporate governance, human resources, and international marketing. Every other weekend course format.

Restriction: Graduate students only. Administration - Executive Majors only.

**MGMT EP 295B. Global Business II for Executives. 4 Units.**

Emphasizes and reinforces international perspectives contained in the M.B.A. curriculum by providing a week-long intensive seminar abroad in the second year. Scholars and business people from the host country instruct Executive M.B.A. students in designed class sessions and company visits.

Restriction: Graduate students only. Administration - Executive Majors only.

**MGMT EP 296. Executive Leadership. 4 Units.**

Focuses on the conceptual, practical, and personal dimensions of executive leadership. Past and current leadership theories are addressed. Individual personal assessment and diagnosis. Every other weekend course format.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Administration - Executive Majors only.

**MGMT EP 299. Individual Study. 1-8 Units.**

Individual Study under the direction of a selected faculty member.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**Fully Employed MBA Courses****MGMT FE 200. Thinking Strategically in the Digital Age for Managers. 6 Units.**

Focuses on the strategic and organizational challenges that a rapidly changing environment poses to the firm's management and frames them according to Merage's strategic emphasis on analytical decision making, innovation, and information technology.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 201A. Business Analytics: Decision-Making for Managers. 4 Units.**

Methods of statistical inference, emphasizing applications to administrative and management decision problems. Topics include classical estimation, hypothesis testing, regression, correlation, analysis of variance, decision analysis, and forecasting. Evening or weekend course format.

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 201B. Management Science for Managers. 4 Units.**

Uses both prescriptive analysis and risk analysis to explore linear programming models, network problems, and simulation. The goal is to introduce and help students acquire some skills of logical thinking with formal models and improve students' decision making capability.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 202. Organizational Leadership for Managers. 4 Units.**

Develops a better understanding of individual and group behavior in and across organizations; the frameworks by which to analyze and understand behavior in complex organizations; and enhances the skills required to manage collaboration and lead. Evening or weekend course format.

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 203A. Financial Reporting for Managers. 4 Units.**

Involves the development, analysis, and interpretation of financial accounting information for external reporting purposes. Emphasis on measurement and valuation issues in decision-making problems and cases. Evening or weekend course format.

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 203B. Driving Profitability Through Managerial Accounting. 4 Units.**

Teaches skills for making vital strategic and tactical decisions (e.g., outsourcing; adding/dropping product lines), to maximize profitability while managing risk. Also covers managerial tools (e.g., budgeting, cost-volume-profit analysis) to drive strategy implementation and incentivize employees. Taught in an evening/weekend format.

Prerequisite: MGMT FE 203A or MGMTMBA 203A. MGMT FE 203A with a grade of C or better. MGMTMBA 203A with a grade of C or better

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 204A. Microeconomics for Managers in the Digital Age. 4 Units.**

Provides basic tools for analyzing economic decisions, the determinants and consequences of market structure and market failure. Topics include demand and supply analysis, production and cost theory, perfect competition, monopoly, and introductory game theory. Evening and weekend course format.

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 204B. Macroeconomics for Managers. 4 Units.**

Introduces use of macroeconomic analysis to manage the business cycle for competitive advantage. 'Business cycle-sensitive' management is explored within the context of marketing, operations management, HRM, merger and acquisition activity, and capital financing and expenditures. Evening and weekend course format.

Prerequisite: MGMT FE 204A or MGMTMBA 204A

Restriction: Graduate students only. Business Administration Majors only.

**MGMT FE 205. Marketing Management. 4 Units.**

Introduction to marketing. Develops familiarity with fundamental concepts, theories, and techniques in marketing and acquaints students with the type of decisions made by marketing managers including customer targeting, product, pricing, placement, promotion, and research. Evening or weekend course format.

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 206. Business and Government for Managers. 4 Units.**

Introduces students to the many non-market issues that affect today's managers, such as environment protection, health and safety, intellectual property protection, antitrust, and lobbying. Takes an interdisciplinary approach using economics, political science, public policy, and law. Evening and weekend course.

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 207. Competing with Digital. 4 Units.**

Focuses on the technological and managerial issues surrounding the development and use of IT in organizations. Examines how technology can be used to execute an organization's business strategy and to enable new, innovative business strategies. Evening or weekend course format.

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 208. Operational Excellence: Processes, Principles, and Analytics. 4 Units.**

Introduction to strategic and tactical issues in production and operations management. Blend of quantitative and qualitative considerations. Topics include product planning, process design, capacity management, production planning, inventory control, distribution management, just-in-time manufacturing, quality management. Evening or weekend course format.

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 209A. Finance for Managers. 4 Units.**

Introduces students to financial theory and concepts. Topics include time value of money, valuation of stocks and bonds, capital budgeting, portfolio theory, and capital structure choice. Evening or weekend course format.

Prerequisite: MGMT FE 201A and MGMT FE 203A and MGMT FE 204A

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 209B. Investments for Managers. 4 Units.**

Foundations of investment management. Theory and empirical evidence related to portfolio theory, market efficiency, and valuation models for equities, bonds, and options. Emphasis on practical applications, including optimal investment strategies. Evening or weekend course format.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 210. Strategy for Managers: Foundations and Dynamics . 4 Units.**

Provides conceptual frameworks and techniques to analyze and develop firm strategies. Through case analysis and discussion, helps improve strategic thinking by developing frameworks by which to assess, evaluate, and respond to different business situations. Evening or weekend course format.

Prerequisite: MGMT FE 200 and MGMT FE 202 and MGMT FE 205 and MGMT FE 209A

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 211. Networks, Platforms, and Ecosystems . 4 Units.**

Focuses on unique strategic issues raised by multi-sided platform businesses that facilitate interaction among different parties. Combining economic theory and case examples to unpack subtle factors making multi-sided businesses different. From value propositions to pricing strategies to design decisions.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 212. Business Growth Strategies for Managers. 4 Units.**

Focuses on management of growth opportunities in industries where applied innovation, usually in the form of technology, people, or processes, creates distinct competitive advantages.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 214. Entrepreneurship. 4 Units.**

A project course in which student teams develop a business plan to launch a new venture. Drafts of sections of the plan are due throughout the course. Evening or weekend course format.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 215. Strategy in a Digital Age. 4 Units.**

Focuses on applying unchanging basic principles of strategy, economics, and organization to digital technologies. Studies historical and contemporary competitive situations to work out key underlying digital mechanisms that shape competition over time.

Restriction: Master of Business Admin Degree students only.

**MGMT FE 217. Competitive Intelligence for Managers. 4 Units.**

Focuses on how to design a competitive intelligence program, which is a core foundation upon which competitive strategies and execution tactics are developed, assessed, and modified. Evening or weekend course format.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 219. Practice of General Management. 4 Units.**

Designed to teach the graduating M.B.A. students how the best managers actually manage. Students will develop a toolkit of proven concepts and practices that will help them succeed as managers at any level.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 220. Organizational Change in a Digital World for Managers. 4 Units.**

Focuses on the implementation of change. Identifies the features of successful changes in organizations of varying sizes and configurations, with an emphasis on the reasons why individuals resist or embrace change. Evening or weekend course format.

Prerequisite: MGMT FE 202 or MGMTMBA 202

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 222. Performance Management in 21st Century Organizations . 4 Units.**

The key to sustained competitive advantage in a 21st century organization. Performance management is all about aligning employee attitudes and behaviors with firm goals and performance.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 225. Negotiations For Managers. 4 Units.**

Using a combination of theory and practice via negotiation simulations, students expand their repertoire of negotiating skills and develop their ability to analyze different negotiation situations and contexts. Evening or weekend course format.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 227. Global Negotiations. 4 Units.**

Emphasizes economic, political, social, and cultural environments of international business negotiations. Topics include self-assessment/analysis, environmental analysis, international team building, negotiation processes and strategies, resources, skills, pre-negotiation preparations, agreements, and post-contract negotiations. Specific emphasis will be placed on cross-cultural problem-solving.

Restriction: Graduate students only.

**MGMT FE 228. International Management for Managers. 4 Units.**

Introduction to the effects of different national cultures, and political and economic systems on the assumptions, expectations, organizational practices, and organizational forms needed to conduct cross-national organizational work. Evening or weekend course format.

Prerequisite: MGMT FE 202

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 229. Building Your Leadership Toolkit. 2 Units.**

Provides insights/perspectives about the study and development of leadership. Helps students answer three questions: Where am I currently as a leader? What tools can I use to improve my leadership? What is my plan for the future as a leader.

Prerequisite: MGMT FE 202 or MGMTMBA 202. MGMT FE 202 with a grade of C or better. MGMTMBA 202 with a grade of C or better

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 231A. Financial Statement Analysis and Valuation for Managers I. 4 Units.**

Develops skills essential to using financial statements for business analysis by examining financial information quality, profitability and risk analysis, earnings management, revenue recognition, asset recognition and valuation, and how financial reporting is related to the business environment and managerial incentives.

Prerequisite: MGMT FE 203A or MGMT MBA 203A. MGMT FE 203A with a grade of C or better. MGMT MBA 203A with a grade of C or better

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 231B. Financial Statement Analysis and Valuation for Managers II. 4 Units.**

Focuses on the financial statement analysis of liabilities and stockholders' equity. Topics include forecasting financial statements, earnings-based valuation models, accounting analysis of mergers and acquisitions, leases, bankruptcy prediction, and derivatives. Evening or weekend course format.

Prerequisite: MGMT FE 203A or MGMT MBA 203A. MGMT FE 203A with a grade of C or better. MGMT MBA 203A with a grade of C or better

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 233. Wealth Management for Managers. 4 Units.**

Aims to integrate behavioral finance, psychology, personal financial planning, risk management, and asset management to provide students with the theoretical and practical knowledge to effectively build and manage wealth.

Restriction: Admin - Fully Employed Majors only.

**MGMT FE 245. FinTech and the Digital Economy. 4 Units.**

Provides working knowledge of the role of IT-enabled innovation in financial markets to help students acquire an understanding of broad economic issues that are of wide applicability in many areas of FinTech. Both qualitative analysis and quantitative applications are explored.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 246A. Introduction to the Real Estate Process. 4 Units.**

Introductory survey course providing an understanding of the real estate market. Topics include real estate economics, valuation, feasibility, investment, tax considerations, financing, development, and corporate real estate asset management. Hands-on lectures, with guest lectures by real estate professionals.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 246B. International Real Estate. 4 Units.**

Survey of international real estate investment opportunities. Topics include size and breadth; opportunities and challenges (tax treatment, currency/political/market risks, transaction costs, lack of local knowledge); ownership vehicles (REITs, joint ventures, equity funds, etc.). Global cast of guest lecturers supplements lectures.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 246C. Real Estate Capital Markets. 4 Units.**

Understanding the four sectors of real estate capital markets: public debt, private debt, public equity, private equity; estate investment, key players, investment types drive capital solutions, underwriting strategies, and vehicle structuring, debt versus equity source characteristics and implications for returns.

**MGMT FE 246D. The Real Estate Development Process. 4 Units.**

Nature and composition of development community and development process. Emphasis on role of conflicting interests, values and goals, and market uncertainty. Special attention paid to deal structuring and risk management. Lectures, guest lecturers, team projects evaluating actual development project.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 246F. Seminar in Management of the Real Estate Enterprise. 4 Units.**

Beyond 'The Deal' to management of the real estate enterprise itself. Explores aspects of decision-making focused upon strategic objectives: goal setting, legal/tax structures, family-owned firms, going public, corporate ethics, capital structure, diversification, core competencies, technology. Guest professionals.

Restriction: Graduate students only. Master of Business Admin Degree students only.



**MGMT FE 246G. Applied Real Estate Security Analysis and Portfolio Management. 4 Units.**

Provides an understanding of the public real estate investment trust (REIT) market and its place in modern investment strategies, presents methods for analyzing and valuing companies, and introduces basic concepts for constructing and managing a real estate investment portfolio.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 247. Venture Capital and Private Equity for Managers. 4 Units.**

Geared to students who are seeking a career in finance and/or in working with venture capital firms, private equity/buyout firms, investment banks, commercial lenders, mezzanine fund investors, corporate finance, and entrepreneurial firms.

Restriction: Master of Business Admin Degree students only.

**MGMT FE 249. Derivatives for Managers. 4 Units.**

Studies financial derivatives instruments, including forward contracts, futures, swaps, and options. Advanced applications of these instruments, including pricing and risk management, are emphasized. Evening or weekend course format.

Prerequisite: MGMT FE 209A or MGMTMBA 209A

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 251A. Marketing Research for Managers. 4 Units.**

Qualitative and quantitative marketing techniques that generate customer insights. Discusses problem formulation, data collection, statistical analyses, formulating managerial recommendations, implementation, and how research is used by companies. Evening or weekend course format.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 252A. Managing Advertising and Communications. 4 Units.**

Integrated marketing communications, including advertising, sale promotions, public relations, and direct mail. Exposure to elements of a communications plan; marketing research, including copy testing and tracking; creating brand value; media strategies; metrics. Evening or weekend course format.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 255. Business to Business Selling and Sales Management. 4 Units.**

Sales is the interpersonal process where the needs of the buyer are uncovered and satisfied, to the long-term benefit of both parties. Students explore sales force management and personal selling in a dynamic, digital environment.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 257. Marketing on the Internet for Managers. 4 Units.**

Examines the Internet's impact on traditional methods of marketing. Discusses how to capitalize on and increase the Internet's utility as a tool that can increase marketing effectiveness, efficiency, and competitiveness. Evening or weekend course format.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 258. Marketing Strategies for High Technology for Managers. 4 Units.**

Framework and tools for managing technology-intensive businesses. Product and pricing policies; network externalities; compatibility concerns; systems competitions; technological and market uncertainty; technology licensing strategies; contracting in high-tech markets; product line design; product bundling strategies; usage-based pricing; pricing of networks; auctions.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 259. Strategic Brand Management for Managers. 4 Units.**

Addresses important branding decisions faced by organizations. A computer simulation allows students hands-on experience in making decisions about their brand and seeing the results of those decisions. Evening or weekend course format.

Prerequisite: MGMT FE 205 or MGMTMBA 205

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 273. Business Intelligence for Analytical Decisions for Managers. 4 Units.**

Introduces methods to mine data repositories for business intelligence to facilitate analytical decision-making. Topics include clustering for market segmentation; association rules to discover relationships between different purchase decisions; Naive-Bayes classification techniques for decision making using decision-trees. Evening or weekend format.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 278. Data and Programming for Analytics. 4 Units.**

Challenges and teaches students to handle data that come in a variety of forms and sizes. Guides students through the whole data management process, from initial data acquisition to final data analysis.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 279. Digital Strategies and Markets. 4 Units.**

Examines how online social media are impacting organizations and markets. Topics include collective intelligence, online social influence, social networks, and social media monetization. The target audience consists of students interested in IT consulting, competitive strategy, marketing, and entrepreneurship.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 281. Analytical Decision Models for Managers. 4 Units.**

An introduction of analytics tools for decision making. Topics include linear and non-linear optimization and simulation models. Excel Solver will be used as the optimization tool and Risk Solver Platform will be used as the simulation tool. Evening or weekend.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 282. Revenue Management for Managers. 4 Units.**

Students learn to apply advanced analytics to earn incremental revenue through the efficient use of resources and science-based pricing methods. Statistics and optimization (using Excel and Excel Solver). Industry-specific implementation issues.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 283. Decision Analysis for Managers. 4 Units.**

Models of preferences and uncertainty; exercises in creative problem solving. Assessment and use of preference models for private, public, and not-for-profit decision making. Assessment and use of subjective probabilities in decision making. Evening or weekend course format.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 288. Predictive Analytics. 4 Units.**

Deals with predicting entities, such as demand for a product or service (forecasting) and predicting membership of known groups (classification). Blends methodologies of forecasting and data mining and focuses on the application of these methods to managerial problems and decision-making.

Restriction: Graduate students only.

**MGMT FE 290. Special Topics in Business. 2-4 Units.**

Studies in selected areas of Business. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 292. Business Law for Managers. 4 Units.**

Detailed study from a business viewpoint of contract theories, assignments, delegation of duties, third-party beneficiary contracts, defenses to consensual contracts, types of conditions, methods of excusing conditions, remedies, and types of damages. Evening or weekend course format.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 293. Information, Communication, and Coordination: Practicum for Analyzing Organizations. 4 Units.**

Use of contextual inquiry and ethnographic methods to assess real world contexts. Exploring culture, power, physical layout, and the role of artifacts in information flow, communication practices, and coordination through qualitative fieldwork in an organization.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMT FE 294. EDGE for Managers. 4 Units.**

Explores the crucial roles of external forces: globalization, technology, shifting demographics - as transformative catalysts for change - opening markets, erasing boundaries, and transforming industries. This course prepares future business leaders to innovate and successfully compete.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 295A. Introduction to Global Business for Managers.**

Fundamentals of global strategy, economics, and financial issues. Topics include global manager's environment, global strategy, impact of national culture on business systems, strategies and practices, foreign direct investment, corporate governance, human resources, and international marketing. Evening and weekend course format.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 295B. Global Business for Managers. 4 Units.**

Emphasizes and reinforces international perspectives contained in the FEMBA curriculum by providing a week-long intensive seminar abroad in the second year. Scholars and business people from the host country instruct FEMBA students in specially designed class sessions and company visits.

Prerequisite: MGMT FE 295A. MGMT FE 295A with a grade of B or better

Restriction: Graduate students only. Admin - Fully Employed Majors only.

**MGMT FE 296. Executive Leadership. 6 Units.**

Provides perspectives on leadership. Helps students answer three questions: Where am I currently as a leader? What tools can I use to improve my leadership? What is my plan for the future as a leader? Evening or weekend course format.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 298. Merage Consulting Projects for Managers. 4 Units.**

Provides students the opportunity to put into practice concepts, skills, and tools acquired in other parts of the MBA program. Seminars augment internship experiences with analyses of relevant administrative issues.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT FE 299. Individual Directed Study. 1-8 Units.**

Individual study under the direction of a selected faculty member.

Restriction: Graduate students only. Master of Business Admin Degree students only.

## Health Care MBA Courses

**MGMT HC 200. Responding to Dynamic Times: Thinking Strategically for Healthcare Executives. 7 Units.**

Focuses on the strategic and organizational challenges that a rapidly changing environment poses to the firm's management and frames them according to Merage's strategic emphasis on analytical decision making, innovation, and information technology.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 201A. Statistics for Healthcare Executives . 5 Units.**

Methods of statistical inference, emphasizing applications to administrative and management decision problems. Topics include classical estimation, hypothesis testing, regression, correlation, analysis of variance, decision analysis, and forecasting.

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 201B. Operations Analytics for Healthcare Executives. 5 Units.**

An introduction to computer-based models for decision making. Topics include optimization (linear programming, integer programming, network flow models) and computer simulation. Uses spreadsheets extensively, including Excel built-in and add-in packages. Once a month weekend course format.

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 202. Organizational Behavior for Healthcare Executives. 5 Units.**

Develops a better understanding of individual and group behavior in and across organizations, the frameworks by which to analyze and understand behavior in complex organizations; enhances the skills required to manage collaboration and lead. Once a month weekend course format.

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 203A. Financial Reporting for Healthcare Executives. 5 Units.**

Involves the development, analysis, and interpretation of financial accounting information for external reporting purposes. Emphasis on measurement and valuation issues in decision-making problems and cases. Once a month weekend course format.

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 203B. Managerial Accounting for Healthcare Executives. 5 Units.**

Involves developing and using internal financial and non-financial information to help organizations make planning, budgeting, control, operating, and performance evaluation decisions. Once a month weekend course format.

Prerequisite: MGMT HC 203A

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 204A. Microeconomics for Healthcare Executives. 5 Units.**

Provides basic tools for analyzing economic decisions of consumers and firms. Topics include demand and supply analysis, production and cost theory, perfect competition, monopoly, market failures, and introductory game theory. Once a month weekend course format.

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 205. Marketing for Healthcare Executives. 5 Units.**

Introduction to marketing. Develops familiarity with fundamental marketing concepts, theories, and techniques, and acquainting students with the type of decisions made by marketing managers, including customer targeting, product, pricing, place, promotion, and research. Once a month weekend course format.

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 206. Business and Government for Healthcare Executives. 2 Units.**

Introduces students to the many non-market issues that affect today's managers: environment protection, health and safety, intellectual property protection, antitrust, and lobbying. Takes an interdisciplinary approach using economics, political science, public policy, and law. Once a month weekend course format.

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 207. Competing with Digital in Healthcare: Analytics, Platforms, and Business Models. 5 Units.**

Focuses on how information technology is used to create value in healthcare-related organizations through product, process, and strategy innovation. Aims to help managers and healthcare professionals understand the strategic role of technology. Every other weekend course format.

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 209A. Managerial Finance for Healthcare Executives. 5 Units.**

Introduces students to financial theory and concepts. Topics include time value of money, valuation of stocks and bonds, capital budgeting, portfolio theory, capital structure choice. Once a month weekend course format.

Prerequisite: MGMT HC 201A and MGMT HC 203A and MGMT HC 204A

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 209B. Investments for Healthcare Executives. 3 Units.**

Foundations of investment management. Theory and empirical evidence related to portfolio theory, market efficiency, and valuation models for equities, bonds, and options. Emphasis on practical applications, including optimal investment strategies. Once a month weekend course format.

Prerequisite: MGMT HC 209A

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 210. Strategic Management for Healthcare Executives. 5 Units.**

Provides conceptual frameworks and techniques to analyze and develop firm strategies. Through case analysis and discussion, helps students improve analytical and strategic thinking by which to assess, evaluate, and respond to different business situations. Once a month weekend course format.

Prerequisite: MGMT HC 200 and MGMT HC 202 and MGMT HC 205 and MGMT HC 209A

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 225. Negotiations For Healthcare Executives. 5 Units.**

Using a combination of theory and practice via negotiation simulations, students expand their repertoire of negotiating skills and develop their ability to analyze different negotiation situations and contexts. Once a month weekend course format.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT HC 267. Understanding Managed Care. 2-5 Units.**

This course is designed to increase understanding of the various concepts of managed health care with an emphasis on the organizational processes required to make it work, and explore the economics and financial pressures these organizations face.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT HC 290. Special Topics in Business. 2-5 Units.**

Studies in selected areas of business. Topics addressed vary each quarter.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMT HC 295. Federal Policy in Health Care. 8 Units.**

National/international one-week residential course exploring political analysis as related to management of health care organizations. Topics include political environment of management, concepts, and processes central to political analysis, bureaucratic politics, politics, and the manager.

Restriction: Graduate students only. Administration - Health Care Majors only.

**MGMT HC 296. Leadership for Healthcare Executives. 7 Units.**

Focuses on the conceptual, practical, and personal dimensions of executive leadership. Past and current leadership theories are addressed. Individual personal assessment and diagnosis. Once a month weekend course format.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Administration - Health Care Majors only.

## Innovation and Entrepreneurship Courses

**INNO 202. Leadership for Entrepreneurs. 4 Units.**

Assists experienced and inexperienced entrepreneurs with some of the challenges of managing others, and helps them build their understanding and skills so they can become more successful managers of people.

Restriction: Graduate students only.

**INNO 203. Financial Accounting for Entrepreneurs. 2 Units.**

Provides the building blocks of financial accounting that are essential to entrepreneurs. Covers financial ratios and statements, including forecasting financial statements, basic transaction analysis, and generally accepted accounting principles.

Restriction: Graduate students only.

**INNO 205. Marketing for Entrepreneurs. 4 Units.**

Develops familiarity with fundamental concepts, theories, and techniques in marketing, and acquaints students with the type of decisions made by marketing managers including customer targeting, product, pricing, placement, promotion, and research.

Restriction: Graduate students only.

**INNO 209. Managerial Finance for Entrepreneurs. 2 Units.**

Provides the building blocks of finance knowledge that are essential to entrepreneurs. Covers investment and financing decisions, including the time value of money, cash flow creation, cost of capital, and capital budgeting.

Restriction: Graduate students only.

**INNO 211. MIE Pre-Accelerator .**

Prepares students for the New Venture Competition in spring quarter. Students form teams to create a startup, submit concept paper, pitch ideas, and attend workshops throughout the academic year.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Master of Innovation and Entrepreneurship Degree students only. Graduate students only.

**INNO 212. Business Growth Strategies for Entrepreneurs. 4 Units.**

Focuses on management of growth opportunities in industries where applied innovation, usually in the form of technology, people, or processes, creates distinct competitive advantages.

Restriction: Graduate students only.

**INNO 214. Entrepreneurship. 4 Units.**

Student teams develop a business plan to launch a new venture. Drafts of sections of the plan are due throughout the course.

Restriction: Master of Innovation and Entrepreneurship Degree students only.

**INNO 215. Lean Startup. 4 Units.**

Exposes students to an entrepreneurial experience with the same pressures and demands of an early-stage startup to provide a real-world, hands-on learning experience in starting a company.

Restriction: Master of Innovation and Entrepreneurship Degree students only.

**INNO 218. Venture Capital for Entrepreneurs. 2 Units.**

Overview of venture capital and private equity, which constitute the alternative asset class (as opposed to conventional investments). Many start-up and entrepreneurial firms require substantial capital, and venture capital and private equity organizations finance these high-risk but potentially high-reward companies.

Restriction: Graduate students only.

**INNO 252D. New Product Development for Entrepreneurs. 4 Units.**

Designed to introduce the new product development process and techniques to identify markets, develop new product ideas, measure consumer preferences, position and design new products, and test them prior to launch. Evening or weekend course format.

Restriction: Graduate students only.

**INNO 257. Marketing on the Internet for Entrepreneurs. 4 Units.**

Examines impact of the internet on traditional methods of marketing. Discusses how to capitalize on and increase the internet's utility as a tool that can increase marketing effectiveness, efficiency, and competitiveness. Evening or weekend course format.

Restriction: Graduate students only.

**INNO 275. Innovation Internship. 2-4 Units.**

Students apply innovative and creative knowledge obtained from classroom theory through work experiences. Provides knowledge of career opportunities, an understanding of the role innovation plays in business environments, and preparation to become an entrepreneur.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Master of Innovation and Entrepreneurship Degree students only.

**INNO 290. Special Topics in Innovation and Entrepreneurship. 4 Units.**

Studies in selected areas of innovation and entrepreneurship. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

**INNO 292. Business Law for Entrepreneurs. 2 Units.**

Focuses on educating individuals starting, or investing in, a new business in the U.S. Provides an overview to common legal issues faced by entrepreneurs, such as business formation and structure, governance and employment contracts, and intellectual property and taxation.

Restriction: Graduate students only.

**INNO 294. Edge: Innovation in the New Digital Age. 4 Units.**

Explores the strategic and operational issues that business leaders face in adapting to the new business environment, what we call innovating, managing, and competing at the edge.

Restriction: Master of Innovation and Entrepreneurship Degree students only.

**INNO 298. Merage Consulting Projects for Entrepreneurs. 4 Units.**

Provides students the opportunity to put into practice concepts, skills, and tools acquired in other parts of the MBA program. Seminars augment internship experiences with analyses of relevant administrative issues.

Restriction: Graduate students only.

**INNO 299. Individual Study. 1-8 Units.**

Individual study under the direction of a selected faculty member.

Repeatability: May be repeated for credit unlimited times.

## Management MBA Courses

**MGMTMBA 200. Thinking Strategically in the Digital Age. 4 Units.**

Focuses on the strategic and organizational challenges that a rapidly changing environment poses to the firm's management and frames them according to Merage's strategic emphasis on analytical decision making, innovation, and information technology.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Business Administration Majors only.

**MGMTMBA 201A. Business Analytics: Decision-Making. 4 Units.**

Methods of statistical inference, emphasizing applications to administrative and management decision problems. Topics include classical estimation and hypothesis testing, regression, correlation, analysis of variance, decision analysis, and forecasting.

Prerequisite: Courses in basic statistics with probability.

Restriction: Graduate students only. Business Administration Majors only.

**MGMTMBA 201B. Management Science. 4 Units.**

An introduction to computer-based models for decision making. Topics include optimization (linear programming, integer programming, network flow models) and computer simulation. Uses spreadsheets extensively, including Excel built-in and add-in packages.

Restriction: Graduate students only. Business Administration Majors only.

**MGMTMBA 202. Organizational Leadership for Management. 4 Units.**

Develops a better understanding of the causes and consequences of individual and group behavior, and the frameworks by which to analyze and understand complex organizations; and enhances the skills required to manage and lead an organization.

Restriction: Graduate students only. Business Administration Majors only.

**MGMTMBA 203A. Financial Reporting. 4 Units.**

Involves the development, analysis, and interpretation of financial accounting information for external reporting purposes.

Restriction: Graduate students only. Business Administration Majors only.

**MGMTMBA 203B. Driving Profitability Through Management Accounting. 4 Units.**

Teaches core skills for making vital strategic and tactical decisions (e.g., outsourcing; adding/dropping product lines), to maximize profitability while managing risk. Also covers operational and managerial tools (e.g., budgeting, planning, cost-volume-profit analysis) to drive strategy implementation and incentivize employees.

Prerequisite: MGMTMBA 203A or MGMT FE 203A

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 204A. Microeconomics for Management in the Digital Age. 4 Units.**

Provides basic tools for analyzing economic decisions of consumers and firms. Topics include demand and supply analysis, production and cost theory, perfect competition, monopoly, market failures, and introductory game theory.

Restriction: Graduate students only. Business Administration Majors only.

**MGMTMBA 204B. Macroeconomics for Management. 4 Units.**

Introduces use of macroeconomic analysis to manage the business cycle for competitive advantage. Such 'business cycle-sensitive' management is explored within the context of marketing, operations management, HRM, merger and acquisition activity, and capital financing and expenditures.

Prerequisite: MGMTMBA 204A or MGMT FE 204A

Restriction: Graduate students only. Business Administration Majors only.



**MGMTMBA 205. Marketing Principles. 4 Units.**

Introduction to the field of marketing. Objectives include developing familiarity with fundamental concepts, theories, and techniques in marketing, and acquainting students with the type of decisions made by marketing managers including customer targeting, product, pricing, distribution, promotion, and research.

Restriction: Graduate students only. Business Administration Majors only.

**MGMTMBA 207. Competing with Digital: Technology, Analytics, and Platforms. 4 Units.**

Focuses on the technological and managerial issues surrounding the development and use of IT in organizations. Examines role of technology in organizations, how technology can be used to execute an organization's business strategy and to enable new, innovative business strategies.

Restriction: Graduate students only. Business Administration Majors only.

**MGMTMBA 208. Operational Excellence: Processes, Models, and Analytics. 4 Units.**

Introduction to strategic and tactical issues in production and operations management. A blend of quantitative and qualitative considerations. Topics include product planning, process design, capacity management, production planning, inventory control, distribution management, just-in-time manufacturing, quality management.

Restriction: Graduate students only. Business Administration Majors only.

**MGMTMBA 209A. Managerial Finance. 4 Units.**

Introduces students to financial theory and concepts. The main topics covered are time value of money, valuation of stocks and bonds, capital budgeting, portfolio theory, capital structure choice.

Prerequisite: MGMTMBA 201A and MGMTMBA 203A and MGMTMBA 204A

Restriction: Graduate students only. Business Administration Majors only.

**MGMTMBA 209B. Investments. 4 Units.**

Foundations of investment management. Theory and empirical evidence related to portfolio theory, market efficiency, asset pricing models, factor models, and option pricing theory. Students are expected to combine market research results and electronic information sources to create optimal investment strategies.

Prerequisite: MGMTMBA 209A or MGMT FE 209A

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 210. Strategy: Foundations and Dynamics. 4 Units.**

Provides conceptual frameworks and techniques to analyze and develop firm strategies. Through case analysis and discussion, helps improve strategic thinking by developing frameworks by which to assess, evaluate, and respond to different business situations.

Prerequisite: MGMTMBA 200 and MGMTMBA 202 and MGMTMBA 205 and MGMTMBA 209A

Restriction: Graduate students only. Business Administration Majors only.

**MGMTMBA 211. MBA Proseminar.**

Provides students in the Merage School Full-time MBA Program with information and practical skills for success in the MBA program, and for business career planning.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 213. New Venture Management. 4 Units.**

Teaches students how to launch and manage a new business by providing an overview of the start-up process, including how to identify new business opportunities and how to develop a sound operating model, value new ventures, and understand capital financing.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 214. Entrepreneurship: Planning the New Venture. 4 Units.**

Project course in which student teams develop a business plan to launch a new venture. The final business plan is presented to an expert panel.

Prerequisite: (MGMTMBA 202 or MGMT FE 202) and (MGMTMBA 205 or MGMT FE 205) and (MGMTMBA 210 or MGMT FE 210)

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 215. Global Competitive Strategy. 4 Units.**

Explores advanced topics in managing the geographic scope of the firm: locating activities in the right places, which markets to penetrate, horizontal integration across countries, and multinational partnering.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 217. Competitive Intelligence. 4 Units.**

The course focuses on how to design a competitive intelligence program which is a core foundation upon which competitive strategies and execution tactics are developed, assessed, and modified.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 218. Business Dynamics. 4 Units.**

Enhances students' analytical skills by analyzing complex challenges that businesses face and to quickly implement a winning response.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 220. Organizational Change. 4 Units.**

Focuses on the implementation of change, including identifying the features of successful change in organizations of varying sizes and configurations, with an emphasis on the reasons why individuals resist or embrace change.

Prerequisite: MGMTMBA 202 or MGMT FE 202

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 225. Negotiations. 4 Units.**

Using a combination of theory and practice via negotiation simulations, students expand their repertoire of negotiating skills and develop their ability to analyze different negotiation situations and contexts.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 228. International Management. 4 Units.**

Introduction to the effects of different national cultures, political and economic systems on the assumptions, expectations, organizational practices, and organizational forms needed to conduct cross-national organizational work.

Prerequisite: MGMTMBA 202 or MGMT FE 202

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 229. Leadership Strategies. 4 Units.**

Provides insight/perspectives about the study and development of leadership. Helps students answer three questions: Where am I currently as a leader? What tools can I use to improve my leadership? What is my plan for the future as a leader. Materials fee.

Prerequisite: MGMTMBA 202 or MGMT FE 202. MGMTMBA 202 with a grade of C or better. MGMT FE 202 with a grade of C or better

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 231A. Financial Statement Analysis and Valuation I. 4 Units.**

Develops skills essential to using financial statements for business analysis by examining financial information quality, profitability and risk analysis, earnings management, revenue recognition, asset recognition and valuation, and how financial reporting is related to the business environment and managerial incentives.

Prerequisite: MGMTMBA 203A or MGMT FE 203A. MGMTMBA 203A with a grade of C or better. MGMT FE 203A with a grade of C or better

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 243. Bonds and Fixed Income. 4 Units.**

Fixed-income markets include treasury bonds, corporate bonds, and asset-backed securities. Focuses on techniques and methodologies for valuing different types of debt as well as their uses.

Prerequisite: (MGMTMBA 209A or MGMT FE 209A) and (MGMTMBA 209B or MGMT FE 209B)

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 244. Multinational Finance. 4 Units.**

Focuses on financial issues facing multinational corporations, the most important of which is the management of foreign exchange risk. Other topics include investments and financing decisions in international capital markets.

Prerequisite: MGMTMBA 209A or MGMT FE 209A

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 245. FinTech and the Digital Economy for Business. 4 Units.**

Provides working knowledge of the role of IT-enabled innovation in financial markets to help students acquire an understanding of broad economic issues that are of wide applicability in many areas of FinTech. Both qualitative analysis and quantitative applications are explored.

Restriction: Master of Business Admin Degree students only.

**MGMTMBA 247. Venture Capital and Private Equity. 4 Units.**

Geared to students who are seeking a career in finance and/or in working with venture capital firms, private equity/buyout firms, investment banks, commercial lenders, mezzanine fund investors, corporate finance, and entrepreneurial firms.

Restriction: Master of Business Admin Degree students only.

**MGMTMBA 248. Corporate Valuation. 4 Units.**

Studies cases that expand concepts covered in the introductory corporate finance course and focuses on estimating the value of firms and projects in diverse settings.

Prerequisite: (MGMTMBA 209A or MGMT FE 209A) and (MGMTMBA 209B or MGMT FE 209B)

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 249. Derivatives. 4 Units.**

Studies financial derivatives instruments, including forward contracts, futures, swaps, and options. Advanced applications of these instruments, including pricing and risk management, are emphasized.

Prerequisite: MGMTMBA 209A or MGMT FE 209A

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 250. Consumer Behavior. 4 Units.**

Examines the consumer decision-making process with an emphasis on application of concepts and research findings from behavioral sciences for solution of marketing problems. Includes models of consumer decision-making, information processing theories, and sociological influences on consumer decision-making.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 251A. Marketing Research. 4 Units.**

Covers conducting marketing research to generate consumer insights that will drive sales, market share, and profitability and/or realize other quantitative objectives. Discusses problem formulation, data collection, statistical analyses, formulating managerial recommendations, implementation, and how research is used by companies.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 252D. New Product Development. 4 Units.**

Designed to introduce the new product development process and techniques to identify markets, develop new product ideas, measure consumer preferences, position and design new products, as well as test them prior to launch. Analytical thinking and techniques are emphasized.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 254. Global Marketing. 4 Units.**

Provides an understanding of the problems and perspectives of marketing across national boundaries, and develops analytical abilities for structuring and controlling marketing programs related to overseas business. Financial, legal, and cultural barriers to international marketing are emphasized.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 257. Marketing on the Internet. 4 Units.**

Examines the impact of the Internet on traditional methods of doing marketing, and explores its existing and future uses. Discusses how to capitalize on and increase the Internet's utility as a tool that can increase marketing effectiveness, efficiency, and competitiveness.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 262. Managing Nonprofits. 4 Units.**

Focuses on the similarities and differences between for-profit and nonprofit organizations, with emphasis on the management of nonprofits. Topics include: marketing, fundraising, staffing, management/director relationships, use of volunteers, and emerging career opportunities.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 263. Economics of Information. 4 Units.**

Provides students with an understanding of fundamental economic principles governing information technology industries. Particularly, implications for optimal pricing strategies, determinants/consequences of market structure, and the role and rationale for government intervention and the implications for business strategy.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 270. Data Camp for Managers. 2 Units.**

Provides an overview of R for basic data analytics and visualization with hands-on training using Data Camp. This project is meant to foreshadow the analysis that students will be doing in their electives.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 274. Data and Programming for Analytics. 4 Units.**

Challenges and teaches students to handle data that come in a variety of forms and sizes. Guides students through the whole data management process, from initial data acquisition to final data analysis.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 276. Analytics and Technology Consulting. 4 Units.**

Focuses on elements of analytics and personalized engagement. Students work on a project using a real-life business problem and data to get hands-on understanding.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 277. Blockchain and Cryptocurrency. 2 Units.**

Provides students with an introduction to and an architectural understanding of 'why' and 'how' Blockchain was created, an overview of altcoins, and provide an understanding of the challenges and risks involved with this new Blockchain technology and cryptocurrency landscape.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 279. Digital Strategies and Markets. 4 Units.**

Examines how online social media are impacting organizations and markets. Topics include collective intelligence, online social influence, social networks, and social media monetization. The target audience consists of students interested in IT consulting, competitive strategy, marketing, and entrepreneurship.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 283. Decision Analysis. 4 Units.**

Models of preferences and uncertainty; exercises in creative problem solving. Assessment and use of preference models (von Neumann-Morgenstern expected utility and measurable value functions) for private, public, and not-for-profit decision making. Assessment and use of subjective probabilities in decision making.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 285. Supply Chain Analytics. 4 Units.**

Introduces students to the use of advanced analytics and data-driven methods to successfully manage uncertainty in supply chains, meeting customer needs in the most timely and cost effective manner, and driving business disruptions through innovations.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 286. Fundamentals of Business Analytics. 4 Units.**

Focuses on the business understanding, on the process of business analytics, and teaching a framework to understand the key drivers that could be fed into a mathematical model. Emphasizes how to make use of information to drive digital change.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 287. Project Management. 4 Units.**

Examines the fundamental components of project management and its role in the modern corporation. Emphasis on how to initiate, implement, control, and terminate a project. Use of computer package for project management.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 288. Predictive Analytics for Business. 4 Units.**

Deals with predicting entities, such as demand for a product or service (forecasting) and predicting membership of known groups (classification). Blends methodologies of forecasting and data mining and focuses on the application of these methods to managerial problems and decision-making.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 290. Field Studies in Management. 2-4 Units.**

Each quarter a number of special topic seminars are offered in the 290 series. Examples of possible topics include Communication in Organizations, Power and Authority in Organizations, International Management, Health Care Administration, Real Estate Development.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 292. Business Law. 4 Units.**

Detailed study from a business viewpoint of contract theories, assignments, delegation of duties, third-party beneficiary contracts, defenses to consensual contracts, types of conditions, methods of excusing conditions, remedies, and types of damages.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 293. Biotech Management . 5 Units.**

Taught jointly by Bio Sci and Merage School faculty, the course addresses fundamental aspects within, and associated with, the biotechnology industry. Curriculum is focused largely on management issues, including finance, product development, pharmaceuticals, project management, regulatory affairs, and ethics.

Same as MOL BIO 253.

Restriction: Graduate students only. Biotechnology Majors only.

**MGMTMBA 294. Edge. 4 Units.**

Edge explores the crucial roles of external forces - globalization, technology, shifting demographics - as transformative catalysts for change - opening markets, erasing boundaries, and transforming industries. This course prepares future business leaders to innovate and compete successfully.

Restriction: Graduate students only. Master of Business Admin Degree students only.

**MGMTMBA 295B. Micromarketing with Digital Footprints. 2-4 Units.**

How businesses use digital footprints from household data and point-of-purchase data to customize product offerings and delivery, store locations, advertising, and promotions to households and neighborhoods with the highest market potential. Hands-on experience with Geographic Information System (GIS) mapping software.

Corequisite: MGMTMBA 205 or MGMT FE 205.

Restriction: Master of Business Admin Degree students only. Graduate students only.

**MGMTMBA 298. Merage Consulting Projects. 4 Units.**

Provides students the opportunity to put into practice concepts, skills, and tools acquired in other parts of the M.B.A. program. Seminars augment internship experiences with analyses of relevant administrative issues.

Restriction: Second-year MBA students only.

**MGMTMBA 299. Individual Study . 1-12 Units.**

Individual study under the direction of the selected faculty member.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

## Management PhD Courses

### **MGMTPHD 291. Ph.D. Special Topics Seminar. 2-12 Units.**

Each quarter a number of special topic seminars are offered in the 291 series for Ph.D. students. Examples include topics such as methods seminar, experimental design, qualitative research, structural equation modeling.

Repeatability: Unlimited as topics vary.

### **MGMTPHD 292. Pre-Colloquium Seminar . 0-2 Units.**

Seeks to facilitate discussion of upcoming Colloquium research papers increasing the likelihood that Ph.D. students are active participants in all of the Colloquia. Active participation enhances exposure of Ph.D. students to visiting scholars.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

Restriction: Graduate students only. Management Majors only.

### **MGMTPHD 297A. Doctoral Proseminar. 2 Units.**

Analysis of the central theories and theoretical controversies in the field of management. Examination of the formal education for managerial careers and exploration of issues relating to professional careers in research and scholarship in the field of management.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only.

### **MGMTPHD 297B. University Teaching.**

Designed to prepare students for teaching career; incorporates seminars addressing topics of classroom dynamics, syllabus preparation, teaching techniques; establishes mentor relationship with faculty member in student's teaching area, provides classroom experience and includes option of videotape analysis of teaching style.

Restriction: Graduate students only.

### **MGMTPHD 297D. Philosophy of Science. 4 Units.**

Provides exposure to fundamental issues regarding how knowledge is created, defended, and replaced both in the natural and social sciences. Covers current debates on the meaning of the term "scientific" and the validity of the scientific method.

Restriction: Graduate students only.

### **MGMTPHD 297F. Doctoral Research Methods. 4 Units.**

An introduction to the fundamentals of social science research: theory development, research design, methods, data management, and writing for scholarly publications; for doctoral students intending scholarly research careers. Involves hands-on practice in formulating hypotheses, designing research, and conducting journal reviews.

Restriction: Graduate students only. Management Majors only.

### **MGMTPHD 297H. Experimental Design. 4 Units.**

Advanced course provides experience in planning and implementing an experiment or quasi-experiment, including choice of topic, study design, data analysis, and manuscript preparation. Data analysis topics include ANOVA, ANCOVA, repeated measures, logistic regression, chi-square, and tests of mediation.

Restriction: Graduate students only.

### **MGMTPHD 297I. Applied Multivariate Statistics. 2-4 Units.**

Provides an overview of the most common techniques for multivariate analysis: principal component analysis, factor analysis, cluster analysis, MANOVA, regression with continuous variables, and regression with discrete variables.

Restriction: Graduate students only.

### **MGMTPHD 297K. Advanced Qualitative Methods: Analyzing Qualitative Data. 4 Units.**

Introduction to the theory and practice of analyzing qualitative data. Students must have already learned about data collection and research design for qualitative research and must have qualitative data they can analyze.

Same as UPPP 213, POL SCI 273A.

Restriction: Graduate students only.

**MGMTPHD 297L. Writing for Scholarly Publication. 4 Units.**

Introduces methods for planning and carrying out scholarly writing.

Restriction: Graduate students only.

**MGMTPHD 297M. SAS Boot Camp . 2 Units.**

Teaches basics of SAS programming for empirical research. No prior knowledge of SAS or other computer programming language is required. Provides knowledge and tools to replicate an empirical study and learn how to perform very advanced data procedures.

Restriction: Graduate students only.

**MGMTPHD 297Q. Game-Theoretic Models for Management Research. 4 Units.**

Introduces some classic game-theoretic models for management research. It is about modeling strategic interactions between business competitors and/or partners in an analytical framework. Various applications will be discussed, e.g., pricing strategies, business alliances, e-commerce, negotiations, and contracts, etc.

Restriction: Graduate students only.

**MGMTPHD 297R. Theories of Power and Empowerment. 4 Units.**

Studies different ways of thinking about power and its uses. Explores theories of power that inform various notions of empowerment, including resistance, participatory democracy, and workplace empowerment.

Same as UPPP 279, POL SCI 223A.

Restriction: Graduate students only.

**MGMTPHD 297T. Decision Theory. 2-4 Units.**

Decision theories and preference models: How models are elicited or theories are experimentally tested, relevance to different management research areas, alternative theories, applications in management practice, and interpretations for the general public.

Restriction: Graduate students only.

**MGMTPHD 297U. Foundational Theories of Organizations. 4 Units.**

Covers major economic and sociological perspectives guiding the study of organizations (i.e., transaction cost economics, agency theory, institutional theories, organizational ecology, network and diffusion theories, behavioral theories, resource dependence), and examines how different theoretical perspectives are tested.

Restriction: Graduate students only.

**MGMTPHD 297V. Information, Psychology, and Social Processes. 4 Units.**

In the marketplace for ideas, which succeed and which fail? How do ideas and information spread between individuals, and how do populations of ideas evolve? This course reviews recent research on these issues and applications to business.

Restriction: Graduate students only.

**MGMTPHD 297W. Establishing Your Academic Career. 4 Units.**

Overview of the best practices for succeeding in an academic career. Presenting oneself in conversation, in written documents, in research talks, and in teaching.

Restriction: Graduate students only.

**MGMTPHD 299. Individual Directed Study. 1-12 Units.**

Individual study under the direction of a selected faculty member.

Repeatability: May be taken for credit for 12 units.

Restriction: Graduate students only.

**MGMTPHD 399. University Teaching. 2-4 Units.**

Limited to teaching assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.



## Management Courses

### **MGMT 1. Introduction to Business and Management. 4 Units.**

Rigorous overview of major business functions and management topics. Addresses the global and fast-changing environment in which modern business enterprises operate as well as the challenges posed by concerns about sustainable growth, ethics, and social responsibility.

Restriction: Business Administration Majors have first consideration for enrollment.

### **MGMT 4A. Basic Economics for Managers I. 4 Units.**

Microeconomic principles for managers. Useful applications of basic economic principles to situations in business as well as in various professions. Materials fee.

Overlaps with ECON 23, ECON 20A.

Restriction: Business Administration Majors have first consideration for enrollment. For School of Social Sciences majors, MGMT 4A may not be used as a substitute for ECON 20A.

(III)

### **MGMT 4B. Basic Economics for Managers II. 4 Units.**

Macroeconomic principles for managers. Useful applications of basic economic principles to situations in business as well as in various professions.

Prerequisite: MGMT 4A or ECON 20A

Overlaps with ECON 20B.

Restriction: Business Administration Majors have first consideration for enrollment. For School of Social Sciences majors, MGMT 4B may not be used as a substitute for ECON 20B.

(III)

### **MGMT 5. Management of Contemporary Organizations. 4 Units.**

Equips students with working knowledge of several major subject areas within the context of business and society studies. Topics include: role of management in organizations, corporate social responsibility and responsiveness, ethics and values in business, government regulation, and international business.

### **MGMT 7. Statistics for Business Decision Making. 4 Units.**

Basics of data analysis and the fundamental notion of statistical inference emphasizing applications to administrative and management decision problems. Classical estimation and hypotheses testing, regression, correlation, analysis of variance, nonparametric methods, and statistical probability.

Overlaps with STAT 7, STAT 8, ECON 15A, ECON 15B.

Restriction: Business Administration Majors have first consideration for enrollment.

(Va)

### **MGMT 10. Business Management in the World Today. 4 Units.**

Accounting scandals, e-commerce, and globalization are only a few examples that show the profound impact of business practices on individuals and on society at large. Provides students with a broad overview of business functions and management practices.

### **MGMT 30A. Principles of Accounting I. 4 Units.**

First in a two course introductory series. Emphasis on financial accounting concepts and practices essential to the administration of business enterprises; including recording and valuation of financial transactions, and preparation, analysis, and interpretation of financial statements.

Overlaps with ECON 25.

Restriction: Business Administration Majors have first consideration for enrollment.

### **MGMT 30B. Principles of Accounting II. 4 Units.**

Second in a two-course introductory series. Emphasis is on the introduction of managerial accounting concepts and techniques as tools to aid management in carrying out the primary internal functions of planning, control, and decision-making.

Prerequisite: MGMT 30A

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 90. Special Topics in Management. 1 Unit.**

Studies in selected areas of management. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

**MGMT 101. Management Science. 4 Units.**

Concepts and methods of management science, which applies mathematical modeling and analysis to management problems. Topics include linear and integer programming, project scheduling, inventory management, queuing analysis, decision analysis, and simulation.

Prerequisite: MGMT 7

Restriction: Upper-division students only. Business Administration Majors have first consideration for enrollment.

**MGMT 102. Managing Organizational Behavior. 4 Units.**

Basic theory and concepts which provide the manager with tools for understanding behavior of people in organizations. Areas such as individual, group, and organizational determinants of attitudes, turnover, and job performance.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 105. Introduction to Marketing. 4 Units.**

Basic marketing concepts; discussion of the role marketing plays in modern society. Topics include industrial and consumer marketing, promotion, distribution, and pricing theory.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 107. Introduction to Management Information Systems. 4 Units.**

Information Technology (IT) continues to drive rapid productivity growth and structural changes in the economy. Topics include what IT is, and how companies can use IT to improve business processes, enhance customer services, and gain competitive advantage over rivals.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 109. Introduction to Managerial Finance. 4 Units.**

Basics of financial administration. Capital budgeting, cost of capital, cash budgeting, working capital management, and long-term sources of funds. Provides a basic understanding of issues and techniques involved in financial decision making.

Prerequisite: MATH 2B and MGMT 30A

Overlaps with ECON 134A.

Restriction: Upper-division students only. Business Administration Majors have first consideration for enrollment.

**MGMT 110. Strategic Management. 4 Units.**

Addresses management of the entire business. Role of the general manager in organizations, industry analysis, core competencies, growth through vertical integration, innovation, acquisition and diversification, globalization, strategy implementation, and the ethical and moral responsibility of a manager.

Prerequisite: MGMT 102 and MGMT 105 and MGMT 109

Overlaps with ECON 147B.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 111. China and the Global Order. 4 Units.**

Introduces students to China's economic and military relations with the world, assessment of likelihood for conflict, and how to strategically manage business risk from regional conflict. Includes an original documentary series and engaging discussion.

**(VIII)**

**MGMT 113. New Ventures: A Course in Entrepreneurship. 4 Units.**

Introduction to the survival and growth of new ventures. Methods include analysis of live cases, guest speakers, discussion, and field projects with contemporary new ventures to learn about new venture management and surviving the liabilities of newness.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 115. Lean Startup. 4 Units.**

Based on the well-known Lean Launchpad course currently used by a growing segment of the startup world. Students work in teams to ideate, develop a Business Model Canvas, and gather customer/market feedback.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 123. Learning to Think Creatively and Innovate. 4 Units.**

Learn about your own thinking process; develop the ability to think both logically and creatively and to understand how emotions affect your thinking. Class sessions involve discussion and experiential exercises. Business problems and issues are used for discussion and exercises.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 124. Human Resources Management. 4 Units.**

Theory and practice of managing human resources. Students will identify and analyze HR dilemmas, apply labor law, and design systems and processes to develop the human resources needed to help organizations achieve their goals.

Restriction: Business Administration Majors have first consideration for enrollment. Business Information Mgmt Majors have first consideration for enrollment.

**MGMT 125. Negotiations. 4 Units.**

The objective is to assist students in developing an understanding of different theoretical perspectives and develop their skills in negotiating. Exploration of feelings and beliefs about negotiation, negotiation skills, and putting theory into action by practicing new negotiation skills.

Prerequisite: MGMT 102

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 126. Foundations of Teams. 4 Units.**

Social and psychological processes that detract from effective teamwork and collaboration. Tools to understand how to be a better team member are introduced. Provides the foundation for students to become effective team leaders and to manage difficult team situations.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 128. International Management. 4 Units.**

Impact of different cultures and political/economic systems on assumptions, expectations, and organizational practices relevant to conducting business in different national settings. Understanding of the challenges of cross-national management and resources utilized to work and conduct business outside the United States.

Restriction: Business Administration Majors have first consideration for enrollment.

**(VIII)****MGMT 129. Leadership. 4 Units.**

Case analyses, free-form discussion, and written assignments designed to develop critical thinking skills, as well as knowledge of approaches to differing leadership challenges. Experiential exercises encourage students to develop their ability to innovate, foster collaboration, manage conflict, and value diversity.

Prerequisite: MGMT 102

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 131A. Intermediate Accounting I. 4 Units.**

First course in a series of two intermediate-level courses in financial accounting theory and practice. Concepts include the measurement, valuation and reporting of current and long-term assets, current liabilities, and revenue recognition issues.

Prerequisite: MGMT 30A and MGMT 30B

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 131B. Intermediate Accounting II. 4 Units.**

Second course in a series of two intermediate-level courses in financial accounting theory and practice. Concepts include the measurement, valuation, and reporting of long-term liabilities and contingencies, accounting for stockholders' equity, and the Statement of Cash Flows.

Prerequisite: MGMT 131A

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 131C. Intermediate Accounting III. 4 Units.**

Third in a three-part series (A, B, and C). Focuses on developing knowledge related to investments, debt/equity issues, accounting for income taxes, pensions, leases, and revenue recognition.

Prerequisite: MGMT 131B

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 132A. Individual Taxation. 4 Units.**

Fundamentals of federal income taxation pertaining to individuals. Topics include income, deductions, credits, property transactions, and the impact of taxes on business and investment decisions.

Prerequisite: MGMT 30B

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 133. Corporate and Partnership Taxation. 4 Units.**

Fundamentals of federal income taxation pertaining to partnerships and corporations, including subchapter S corporations. Emphasis on the tax issues associated with formation, operation, and termination of these entities.

Prerequisite: MGMT 132A

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 136. Accounting Information Systems & Spreadsheets. 4 Units.**

Fundamentals of accounting information systems including internal controls and transaction processing cycles. Development of efficient spreadsheets as applied to financial and managerial accounting concepts.

Prerequisite: MGMT 30B

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 137. Advanced Accounting. 4 Units.**

Covers advanced concepts in accounting theory and practice. Topics include business combinations, consolidated financial statements, foreign exchange transactions, international, and governmental/nonprofit accounting standards.

Prerequisite: MGMT 131B

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 138. Auditing. 4 Units.**

An introduction to auditing practice with emphasis on the verification of financial statements and related information. Topics include professional ethics, assessment of audit risk, study and evaluation of internal control, gathering and evaluating audit evidence, and audit reporting.

Prerequisite: MGMT 131B

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 141. Investments. 4 Units.**

Foundations of investment management. Theory and empirical evidence related to portfolio theory, market efficiency, asset pricing models, factor models, and option pricing theory. Students are expected to combine market research results and electronic information sources to create optimal investment strategies.

Prerequisite: MGMT 109

Overlaps with ECON 132A.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 144. Multinational Finance. 4 Units.**

Focuses on financial issues facing multinational corporations, the most important of which is the management of foreign exchange risk. Introduction to investments and financing decisions in international capital markets.

Prerequisite: MGMT 109 and (ECON 20A or MGMT 4A) and (ECON 20B or MGMT 4B)

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 146A. Introduction to the Real Estate Process. 4 Units.**

Introductory survey course providing a working knowledge of the real estate market, both residential and commercial. Topics include real estate economics, appraisal, feasibility, investment, tax considerations, financing, and development. Lectures and cases, with supplemental presentations by real estate professionals.

Restriction: Upper-division students only. Business Administration Majors have first consideration for enrollment.

**MGMT 147. Applied Financial Valuation. 4 Units.**

Case study course designed to confront students with real-world financial valuation problems. Situations are chosen to enhance students' understanding of the application of finance theory. The principal focus is on estimating the value of firms and projects in diverse settings.

Prerequisite: MGMT 109 and MGMT 141

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 149. Derivatives. 4 Units.**

Introduction to financial derivatives. Covers forward contracts, futures, swaps, and options. Applications of these instruments, including pricing and risk management, are emphasized.

Prerequisite: MGMT 109

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 150. Consumer Behavior. 4 Units.**

Application of the behavioral sciences to understanding buyer behavior. Topics include perception, memory, affect, learning, persuasion, motivation, behavioral decision theory, social and culture influences, and managerial implications.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 151. Marketing Research. 4 Units.**

Research to aid managerial decisions for products and services; problem formulation, research design, data collection, sampling, statistical analyses, managerial recommendations, and implementation in several real-world settings.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 153. Sales Management. 4 Units.**

Designed for students interested in learning about sales force management and personal selling by firms engaged in business-to-business and consumer goods/services marketing. Covers advantages of personal selling, how to perform sales calls, challenges of sales managers, roles of buying centers.

Restriction: Business Information Mgmt Majors have first consideration for enrollment. Business Administration Majors have first consideration for enrollment.

**MGMT 154. Global Marketing. 4 Units.**

Students are exposed to the challenges and opportunities facing marketers in the international marketplace. Special attention is given to the management of cultural differences in product development, distribution systems, pricing, and promotion.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 155. Brand Management. 4 Units.**

Introduction to issues in planning, implementing, and evaluating brand strategies, relevant theories, models, and tools for the making of brand decisions; application of these principles.

Prerequisite: MGMT 105

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 156. Pricing Strategy . 4 Units.**

Provides a framework for designing and analyzing pricing strategies. Emphasizes role of pricing in the marketing-mix decisions and broader marketing strategy of a firm. Incorporates study of various economic, psychological, competitive, and organizational foundations that enter into effective pricing decisions.

Prerequisite: MGMT 105

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 157. Marketing on the Internet. 4 Units.**

Recent developments in interactive technologies indicate that marketing on the internet is becoming a serious business activity, with exponential growth. How to do marketing on the Internet and identify the key issues pertaining to the marketing process.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 165. U.S. Healthcare Systems. 4 Units.**

Providers, suppliers, payers, consumers, and the unique market dynamics among these players. Structure, organization, and financing of health care. The health care industry's relationship to the overall economy will be explored.

Restriction: Business Administration Majors have first consideration for enrollment. Business Information Mgmt Majors have first consideration for enrollment.

**MGMT 166. Business of Medicine. 4 Units.**

In order to improve the quality and efficiency of health care delivery one must understand the design and management of health care operations. Opportunities for innovation and changes needed to design a simple, accessible, fair, and effective health care system.

Restriction: Business Administration Majors have first consideration for enrollment. Business Information Mgmt Majors have first consideration for enrollment.

**MGMT 171. Social Media. 4 Units.**

Covers theoretical aspects and business applications of social media tools including blogs, wikis, social networking platforms, immersive environments, and other social computing technologies. Also covers business value of social-media-enabled processes.

Restriction: Business Administration Majors have first consideration for enrollment. Business Information Mgmt Majors have first consideration for enrollment.

**MGMT 173. Business Intelligence for Analytical Decisions. 4 Units.**

BI from both managerial and technical perspectives. Learn to apply a variety of data mining techniques to learn business intelligence embedded in data, and apply that intelligence to run your business more efficiently. These techniques are useful in different areas.

Prerequisite: MGMT 107

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 174. Database Management and Applications. 4 Units.**

Query, manipulate, and understand data and learn about leading edge applications for databases. Database fundamentals including entity relationship design, creating database tables, normalization, and data querying. Contemporary applications of database using case studies. Applications include data warehousing, data mining.

Prerequisite: MGMT 107

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 176. Digital Strategies. 4 Units.**

Covers business strategies for firms that make technology products. Insights are applicable not only to industries that make information and technology goods but also to industries that leverage digitization and network effects for their products.

Restriction: Business Administration Majors only.

**MGMT 178. Management of Information Technology. 4 Units.**

Strategic use and impact of information technology (IT) in organizations. Covers what IT is, and how it works, business value of IT, and IT strategies that organizations can employ to create value.

Prerequisite: MGMT 107

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 182. Supply Chain Management. 4 Units.**

Flows of materials and information among all of the firms that contribute to a product or service. Forecasting, demand management, logistical networks, inventory management, supplier contracting, sourcing, information technology, flexibility, globalization, and performance management.

Prerequisite: MGMT 101

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 189. Operations Management. 4 Units.**

Managing the productive resources, from which raw materials as inputs are being transformed into useful outputs of final products and services. Explanation of issues pertaining to both manufacturing and services-oriented systems.

Prerequisite: MGMT 101

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 190. Special Topics in Management. 2-4 Units.**

Studies in selected areas of management. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 191W. Business Communication. 4 Units.**

Provides students with a solid foundation in business communication. Emphasis is placed on improving students' written and oral communication skills to help them succeed in (1) upper-division Business Administration courses, (2) graduate school, and (3) work and career activities.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Restriction: Business Administration Majors only.

(Ib)

**MGMT 192. Business Law. 4 Units.**

A study of the legal environment of business. Topics include contracts, agency, partnerships, corporations, and other basic principles of law as they relate to business transactions.

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 194. Financial Statement Analysis. 4 Units.**

Study of financial statements and their related footnotes; tools and procedures common to financial statement analysis; relationships among business transactions, environmental forces (political, economic, social), and reported financial statement information; how financial statement information can help solve certain business problems.

Prerequisite: MGMT 30A and MGMT 30B

Restriction: Business Administration Majors have first consideration for enrollment.

**MGMT 198A. Administrative Internship. 4 Units.**

Selected undergraduates serve as managers within administrative units on campus with a three-quarter course which complements the intern experience. Topics include management ethics, study of non- and for-profit institutions, career management, and the changing nature of the workforce.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**MGMT 198B. Administrative Internship. 4 Units.**

Selected undergraduates serve as managers within administrative units on campus with a three-quarter course which complements the intern experience. Topics include management ethics, study of non- and for-profit institutions, career management, and the changing nature of the workforce.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.

**MGMT 198C. Administrative Internship. 4 Units.**

Selected undergraduates serve as managers within administrative units on campus with a three-quarter course which complements the intern experience. Topics include management ethics, study of non- and for-profit institutions, career management, and the changing nature of the workforce.

Grading Option: Pass/no pass only.

Repeatability: May be taken for credit 3 times.



**MGMT 199. Independent Study. 1-4 Units.**

Individual study under the direction of a selected faculty member.

Repeatability: May be repeated for credit unlimited times.

## Accounting, Minor

The Paul Merage School of Business faculty offers an undergraduate minor in Accounting consisting of seven upper-division courses. In addition, two lower-division introductory accounting courses, one lower-division microeconomics course, and one lower-division single variable calculus course are prerequisites to the minor program.

In establishing the undergraduate minor in Accounting, the faculty anticipated two types of students to be drawn to courses in accounting: (1) students preparing for careers in accounting or in other fields that require some knowledge of accounting, and (2) students planning to pursue a graduate degree in accounting who wish early guidance and undergraduate work appropriate to this career objective.

Students are eligible to apply for the minor in Accounting if they have upper-division standing and have completed MGMT 30A and MGMT 30B with a grade no lower than B (3.0) and all other prerequisite courses with a grade no lower than C (2.0). Completion of the prerequisite courses does not guarantee admission to the minor in Accounting. Admission is on a competitive basis, and students must submit an application, transcripts, and a statement of purpose. Applications are accepted on a quarterly basis. Interested students are encouraged to obtain further information from the Undergraduate Programs Office, SB2 202; or visit the Undergraduate Programs website (<https://merage.uci.edu/programs/undergraduate/minors.html>).

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### Prerequisite Courses

The following are prerequisites for enrolling in the upper-division undergraduate minor courses:

ECON 20A	Basic Economics I
MATH 2A	Single-Variable Calculus
MGMT 30A	Principles of Accounting I
MGMT 30B	Principles of Accounting II

Transfer students should check with their college counselor for established equivalencies for these prerequisite courses. Students not taking MGMT 30A and MGMT 30B at UCI during regular session or summer session must complete MGMT 131A with a minimum grade of B.

NOTE: Individual courses that students may select within the minor may require additional prerequisites.

### Requirements for the Undergraduate Minor in Accounting

Completion of seven courses:

A. Three core accounting courses:

MGMT 131A	Intermediate Accounting I
MGMT 131B	Intermediate Accounting II
MGMT 132A	Individual Taxation

B. Select two accounting elective courses from the following:

MGMT 133	Corporate and Partnership Taxation
MGMT 136	Accounting Information Systems & Spreadsheets
MGMT 137	Advanced Accounting
MGMT 138	Auditing
MGMT 194	Financial Statement Analysis

C. Select two additional courses from the following:

an upper-division accounting elective course list above	
MGMT 1	Introduction to Business and Management
MGMT 101	Management Science
MGMT 102	Managing Organizational Behavior
MGMT 105	Introduction to Marketing
MGMT 107	Introduction to Management Information Systems
MGMT 109	Introduction to Managerial Finance
MGMT 110	Strategic Management
MGMT 113–129, 141–184	
MGMT 189	Operations Management
MGMT 192	Business Law
MGMT 190	Special Topics in Management (provided topics have not been covered in other accounting courses)

With Merage School faculty approval, a student may substitute a maximum of one minor course.

NOTE: Students may not receive both the minor in Accounting and the minor in Management.

## Business Administration, B.A.

### Office of Admission

Undergraduate Major (<http://www.admissions.uci.edu>):

Office of Admissions and Relations with Schools (<http://www.admissions.uci.edu/>)

Phone: 949-824-6703

Fax: 949-824-2951

The undergraduate Business Administration program at The Paul Merage School of Business educates students to understand and apply the theories and concepts of effective business and management and prepares students for a wide variety of careers and life experiences. Business Administration majors can pursue careers in the for-profit and not-for-profit sectors or can proceed on to graduate school in several disciplines including business, economics, and law. The program provides a broad learning experience in a multidisciplinary and global context and focuses on the development of essential managerial skills, especially critical thinking, quantitative and qualitative analysis, and effective communication skills.

### Program Information

The Business Administration major at The Paul Merage School of Business offers a traditional business curriculum similar to those at other top business schools in the country. The major is broad, drawing on the social sciences more generally to study organizations, interpersonal communication skills, individual and group behavior, leadership, strategy, financial and accounting issues, ethics, information technology, marketing, and a variety of other topics in the context of a rapidly changing global environment.

The faculty strongly encourages majors to create an educational program composed of courses within and outside the Merage School that provide substance and focus to their careers and enable them to pursue their own personal interests. While preparing students for careers in management, the Merage School, through academic advising, will help students fashion an undergraduate program that they can tailor to their own unique career objectives. Examples of programs of study that allow Business Administration majors to blend management education with specific industry areas include (but are not limited to) bioscience business, government service, international commerce, arts management, entrepreneurship in computer gaming, and other combinations. Through appropriate choice of courses, students can prepare to pursue a law degree, a master's degree in a variety of areas including accounting, or a doctoral program in business or related disciplines.

Students are required to complete 11 business courses that provide a foundation in essential core business competencies, followed by a minimum of 5 business electives to include one emphasis. Students select a minimum of one of six emphases in Accounting, Finance, Information Systems, Marketing, Operations and Decision Technologies, or Organization and Management. This program of study enables students to develop areas of focus as they pursue the Business Administration major. Because much business is conducted on a global scale, students are required to either participate in the University's Education Abroad Program or to take one of a number of designated courses that stresses the international dimension of a business area. Students interested in learning more about the full array of requirements for professional licensing in Accounting are encouraged to visit the California Board of Accountancy (<http://www.dca.ca.gov/cba/>) and American Institute of CPAs (<http://www.aicpa.org/BecomeACPA/CPAExam/Pages/CPAExam.aspx>) websites.

While academic course content is crucial to an undergraduate business major, auxiliary noncurricular programs also are important to students' academic experience. The Merage School incorporates a cocurricular element into the classroom experience. Drawing from Merage School and University resources, students are exposed to opportunities to enhance communication and presentations skills, attend formal speaker events, and engage in

mentoring. The Merage faculty is committed to ensuring that undergraduate majors have ample opportunity to enhance their writing and presentation skills through class assignments and a business communication course.

Students are strongly encouraged to become involved with the Merage Undergraduate Student Association and with the many affiliated business clubs. These high-profile student groups promote interaction between students and the surrounding business community through their Corporate Speaker Series, social activities, and student/employer receptions. Students with an entrepreneurial interest are invited to participate in the annual Merage School New Venture Competition offered by the Don Beall Center for Innovation and Entrepreneurship.

Work experience is an important way to learn about business and management. UCI's Internship Program, sponsored by the UCI Division of Career Pathways, can assist students in finding opportunities to work in either voluntary or paid positions in business, nonprofit, or industrial settings. Students who plan to enter business or apply to a graduate school of business or management in the future will find it necessary to supplement their academic work with a variety of practical experiences.

Another opportunity is UCI's Undergraduate Administrative Intern Program, which offers selected students the opportunity to assume one-year positions under the guidance of University administrators. Students can choose from a range of offices in which they will be asked to undertake special projects specifically related to the management and administration of UCI and higher education in general. These internships are supplemented by a two-quarter management seminar and by field trips to administrative conferences such as meetings of The Regents of the University of California.

## Admission to the Major in Business Administration

In the event that the number of students who elect Business Administration as a major exceeds the number of positions available, applicants may be subject to screening beyond minimum University of California admissions requirements.

**Freshmen:** Preference will be given to those who rank the highest using the selection criteria as stated in the Undergraduate Admissions section of the *Catalogue*.

**Transfer students:** Junior-level applicants with the highest grades overall (minimum cumulative GPA of 3.0) and who satisfactorily complete lower-division courses equivalent to UCI's calculus (MATH 2A-MATH 2B), economics (ECON 20A-ECON 20B or MGMT 4A-MGMT 4B), and statistics and accounting (MGMT 7, MGMT 30A, MGMT 30B) will be given preference for admission. MGMT 1 may be completed at UCI. Admission to the major will be competitive due to limited space availability.

## Change of Major

Students who wish to declare the Business Administration major should contact The Paul Merage School of Business Undergraduate Programs Office (<http://merage.uci.edu/undergrad/>), SB2 202, for information about change-of-major requirements, procedures, and policies. Students should carefully review criteria for each major they are considering on the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>). Review of applications and selection to the major is governed by the Undergraduate Programs Committee. Admission to the major is very competitive due to limited space availability. Completion of the prerequisite courses does not guarantee admission into the major.

**All students must meet the University Requirements.**

### Business Administration Major Requirements

#### A. Lower-Division:

MATH 2A	Single-Variable Calculus
MATH 2B	Single-Variable Calculus
MGMT 1	Introduction to Business and Management
MGMT 4A	Basic Economics for Managers I
or ECON 20A	Basic Economics I
MGMT 4B	Basic Economics for Managers II
or ECON 20B	Basic Economics II
MGMT 7	Statistics for Business Decision Making
MGMT 30A	Principles of Accounting I
MGMT 30B	Principles of Accounting II

#### B. Upper-Division Core:

MGMT 101	Management Science
MGMT 102	Managing Organizational Behavior
MGMT 105	Introduction to Marketing
MGMT 107	Introduction to Management Information Systems
MGMT 109	Introduction to Managerial Finance
MGMT 110	Strategic Management
MGMT 191W	Business Communication

C. Business Electives: Select 5 upper-division Merage School electives numbered 111-196, to include completion of one of the defined emphases below:<sup>1</sup>

Emphasis in Accounting:

MGMT 131A	Intermediate Accounting I
MGMT 131B	Intermediate Accounting II
MGMT 132A	Individual Taxation

Emphasis in Finance:

MGMT 141	Investments
and select two of the following:	
MGMT 144	Multinational Finance
MGMT 147	Applied Financial Valuation
MGMT 149	Derivatives

Emphasis in Information Systems:

Select three of the following:	
MGMT 171	Social Media
MGMT 173	Business Intelligence for Analytical Decisions
MGMT 174	Database Management and Applications
MGMT 178	Management of Information Technology

Emphasis in Marketing:

Select three of the following:	
MGMT 150	Consumer Behavior
MGMT 151	Marketing Research
MGMT 154	Global Marketing
MGMT 155	Brand Management

Emphasis in Operations and Decision Technologies:

MGMT 189	Operations Management
and complete the following:	
MGMT 180	
MGMT 182	Supply Chain Management

Emphasis in Organization and Management:

Select three of the following:	
MGMT 125	Negotiations
MGMT 126	Foundations of Teams
MGMT 128	International Management
MGMT 129	Leadership

D. International Business Requirement: Fulfillment of the International Business requirement by:

1. Selecting one of the following (which may also be used for specified category C requirements above):<sup>1</sup>

MGMT 128	International Management
MGMT 144	Multinational Finance
MGMT 154	Global Marketing

2. or, participating in select UC Education Abroad Program options, with prior approval of the Associate Dean.

<sup>1</sup> By exception, students may petition the Associate Dean to accept an upper-division elective that has business content equivalent to a stated Merage elective.

NOTE: Students majoring in Business Administration may not minor in Management, Accounting, or Innovation and Entrepreneurship or double major in Business Information Management. Students may pursue more than one Merage School emphasis via the Business Electives in the category C requirements above. Students are strongly advised to work closely with faculty, staff, and career advisors to tailor a course of study optimal for their educational and career plans. Pairing of particular emphases could be beneficial; examples include Accounting and Finance, Marketing and Information Systems, Operations and Decision Technologies and Information Systems, or Health Care Management and Organization and Management. Students are permitted to pursue additional courses within an area of emphasis to exceed the required three.

## Business Analytics, M.S.

M.S. in Business Analytics (<https://merage.uci.edu/programs/masters/master-science-business-analytics/>)

Email: [msba@merage.uci.edu](mailto:msba@merage.uci.edu) (%20msba@merage.uci.edu)

Business analytics involves the application of sophisticated statistical and analytical methods to extract business value and strategic advantage from the growing availability of large data sets. The ability to effectively analyze evidence-based data is becoming critical for every firm in every industry, so that the demand for professionals with business analytics skill sets far outstrips the supply of such individuals. Big data and analytics have become an essential factor of production at par with traditional labor and capital inputs.

Responsive to these trends, the Paul Merage School of Business offers a Master of Science in Business Analytics, a one-year self-supporting full-time degree targeted at a mix of individuals with and without work experience.

Applicants may apply directly to the Paul Merage School of Business. Applicants must meet all the prerequisite requirements at the time of matriculation into the program. Admission to graduate-level standing in the Paul Merage School of Business is accorded to those possessing an undergraduate degree with an acceptable level of scholarship from an institution of recognized standing. A quantitative background is encouraged, so undergraduate degrees in mathematics, computer science, economics, statistics, engineering, and physics are recommended.

Applicants for admission will be evaluated on their academic record and potential for leadership, as demonstrated by the materials submitted in the application. These materials must include official university transcripts, two letters of recommendations, two essays, a resume, and a personal interview (by invitation only). The GMAT or GRE are not required but strongly recommended for applicants with GPA's under a 3.3. While these tests are not required, the admissions team is looking for evidence of strong verbal and quantitative skills.

If the potential applicant received his/her undergraduate degree from a foreign country and his/her primary language is not English, s/he will be responsible to take the TOEFL exam with a minimum score of 80 on the internet-based test. A Pearson Test of English (PTE) may be substituted for the TOEFL. The minimum score for the PTE is 53.

The curriculum explores three essential areas of training: data management, analytics methods, and business context. Students learn how to handle large data sets, and apply a range of analytics methods – including data analytics, marketing analytics, and operation analytics – to gain business insights relevant to a specific business context.

The program consists of 10 core courses (32 units) and five elective courses (20 units), for a total of 52 units to be completed in 12 months. The required courses are as follows:

A. Complete the following:

BANA 200	Foundations of Business Analytics
BANA 201A	Statistics for Data Science
BANA 201B	Management Science for Analytics
BANA 205	Foundations of Marketing
BANA 211	MSBA ProSeminar (four quarters)
BANA 212	Data and Programming for Analytics
BANA 273	Machine Learning for Analytics
BANA 277	Customer and Social Analytics
BANA 298A	Business Analytics Capstone Prep
BANA 298B	Business Analytics Capstone Project

B. Select five BANA or other Merage graduate program elective course offerings.

## Innovation and Entrepreneurship, Minor

The minor in Innovation and Entrepreneurship provides extensive academic and practical training for students to embark on careers as entrepreneurs (innovating to form new companies) and intrapreneurs (innovating within existing companies).

The program provides students with knowledge and practical experience on certain core topics on the process of innovation and entrepreneurship, i.e., planning a new venture, lean startup methodology, venture capital, private equity, etc. Students are strongly encouraged to apply the associated business skills in the New Venture Competition and in internships.

Students will be eligible to apply for the minor in Innovation and Entrepreneurship if they have completed MGMT 1 with a grade no lower than "C" (2.0) and will have junior status upon entry. Elective offerings in the minor may have additional prerequisites. Completion of the prerequisite course does not guarantee admission to the minor in Innovation and Entrepreneurship. Admission is on a competitive basis and students must submit an application, transcripts, and a statement of purpose. Applications are accepted on a quarterly basis. Interested students are encouraged to obtain further information from the Undergraduate Programs Office, SB2 202; or visit the Undergraduate Programs website (<http://merage.uci.edu/undergrad/>).

A. Complete the following:

MGMT 1	Introduction to Business and Management
MGMT 113	New Ventures: A Course in Entrepreneurship

MGMT 115	Lean Startup
B. Select at least four electives from the following:	
MGMT 30A	Principles of Accounting I
MGMT 102	Managing Organizational Behavior
MGMT 105	Introduction to Marketing
MGMT 109	Introduction to Managerial Finance
MGMT 110	Strategic Management
MGMT 125	Negotiations
MGMT 126	Foundations of Teams
MGMT 129	Leadership
MGMT 151	Marketing Research
MGMT 192	Business Law

With Merage School faculty approval, a student may substitute a maximum of one minor course.

NOTE: Students may not receive both the minor in Management and the minor in Innovation and Entrepreneurship. Students in the B.A. in Business Administration and B.S. in Business Information Management Programs are not eligible to minor in Innovation and Entrepreneurship.

## J.D./M.B.A. Program

Highly qualified students interested in combining the study of law with professional qualifications in business are invited to undertake concurrent degree study under the auspices of UC Irvine's Program in Law and Graduate Studies (PLGS). Students approved for this concurrent degree program pursue a coordinated curriculum leading to a J.D. from the School of Law in conjunction with an MBA from The Paul Merage School of Business. The objective of the program is to promote interdisciplinary study of law while also enabling students to obtain both a J.D. and a business degree in less time than would be required to acquire both degrees separately. The normative time for completion of the J.D./MBA program is four years.

UC Irvine's PLGS program is well suited to students interested in professional or academic careers focused on the interdisciplinary or multidisciplinary study of law and legal institutions, policy analysis, and/or applied research in law-related fields (for example, taxation, corporate reporting and governance, regulation and compliance, discrimination, securities, property, real estate, and intellectual property).

Applicants must submit separate applications for admission to the School of Law and to the Merage School. Once admitted for study into both components of the program, concurrent degree students will work with the PLGS director and the director of the Full-Time MBA program to develop a program of study that will permit efficient pursuit of both degrees. Concurrent degree students' law enrollments will include a required 1-unit "Graduate Legal Studies" colloquium and a 3-unit "Interdisciplinary Perspectives on Law" course. Concurrent degree students will be eligible to apply for financial support through the Merage School while pursuing their MBA and through the School of Law while pursuing law studies.

**Program Structure.** Students in the program complete a four-year combined curriculum leading to a J.D. from the UCI School of Law and an MBA from the The Paul Merage School of Business.

**Program Overview.** The School of Law requires students to complete 86 law semester units of study for the J.D., 68 of which must be classroom units of law instruction. The remaining 18 law units can be completed outside the School of Law, at the student's discretion, and with approval of the School's Dean of Students. Ten of these 18 law units of non-law instruction can be obtained in courses undertaken in the concurrent degree department. The remaining eight law units are typically spent in non-classroom clinical practice.

The Full-Time MBA program operates on a quarter system and J.D./MBA students are required to complete a minimum of 76 MBA units. The curriculum consists of courses divided into two groups designed to achieve specific educational objectives. The courses are divided as follows: 10 required Common Core Courses (40 MBA units) and 36 MBA units of elective courses which students select to emphasize career goals and educational interests. A maximum number of 120 hours of classroom instruction, or 16 MBA units (normally four 4-unit quarter courses), may be utilized toward the MBA, total, from sources outside of UCI's Merage School. This includes any "non-Merage course approvals" taken in other UCI units, intercampus exchange courses, etc.

The MBA component of the J.D./MBA requires that the 16 MBA units of electives permitted from outside the Merage School may be (but are not restricted to be) taken from among appropriate School of Law electives but may not be counted simultaneously toward satisfying concurrent degree requirements in the School of Law.

Detailed information about J.D./MBA curriculum paths is available online at the Dual Degree Program website (<http://www.law.uci.edu/academics/interdisciplinary-studies/concurrent-degrees.html>).



## M.D./M.B.A. Program

The M.D./MBA program requires five or six years for completion. It is aimed at individuals who are exceptional in ability and motivation and who seek a career as physicians with major responsibility for administration and management in health care organizations and institutions. Students in this program pursue a combined curriculum for an M.D. degree from the School of Medicine and an MBA from The Paul Merage School of Business.

Students must be currently enrolled in the M.D. program and in good academic standing in order to apply to the combined M.D./MBA program. During their second or third year of medical school, interested students submit an application to The Paul Merage School of Business Admissions Committee, after review by the School of Medicine. Final acceptance to the program is granted by The Paul Merage School of Business, and MBA course work begins following completion of the student's third year of medical school. Students should be aware that enrollment in the M.D. program does not guarantee acceptance into the MBA program.

The total number of units required to graduate for each program separately are satisfied in the M.D./MBA program. The Full-Time MBA program operates on a quarter system and M.D./MBA students are required to complete a minimum of 76 MBA units.

For more information about the M.D./MBA program, contact the School of Medicine's admissions office by phone at 949-824-5388 or by email at [medadmit@uci.edu](mailto:medadmit@uci.edu) (%20medadmit@uci.edu).

## Management, Minor

The Paul Merage School of Business faculty offers an undergraduate minor in Management which consists of seven courses. In addition, prerequisites include one lower-division microeconomics course and one course or one sequence selected from the statistics courses outlined below. MGMT 1 serves as a prerequisite and also counts as one of the seven courses required for the minor.

In establishing the undergraduate minor, the faculty anticipated three types of students to be drawn to courses in administration: (1) students who wish to learn about the management of organizations as a way of preparing for a career in business, (2) students preparing for careers in other fields that require some knowledge of management, and (3) students who expect to go on to graduate work in management who wish early guidance and undergraduate work appropriate to this career objective.

Students are eligible to apply for the minor in Management if they have completed all prerequisite courses (including MGMT 1 ) with a grade no lower than C (2.0) and have upper-division standing. Completion of the prerequisite courses does not guarantee admission to the minor in Management. Admission is on a competitive basis, and students must submit an application, transcripts, and a statement of purpose. Applications are accepted on a quarterly basis. Interested students are encouraged to obtain further information from the Undergraduate Programs Office, SB2 202; or visit the Undergraduate Programs website (<http://merage.uci.edu/undergrad/>).

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Students are eligible to apply for the minor in Management if they have completed all prerequisite courses (including MGMT 1) with a grade no lower than C (2.0) and have upper-division standing. Completion of the prerequisite courses does not guarantee admission to the minor in Management. Admission is on a competitive basis, and students must submit an application, transcripts, and a statement of purpose. Applications are accepted on a quarterly basis. Interested students are encouraged to obtain further information from the Undergraduate Programs Office, SB2 202; or visit the Undergraduate Programs website (<http://merage.uci.edu/undergrad/>).

## Prerequisite Courses

The following are prerequisites for enrolling in the upper-division undergraduate minor courses:

MGMT 1	Introduction to Business and Management
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ECON 20A	Basic Economics I
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and one course or one sequence selected from:

ANTHRO 10A- 10B- 10C	Probability and Statistics and Probability and Statistics and Probability and Statistics
ENGRCEE 11	Methods II: Probability and Statistics
ECON 15A- 15B	Probability and Statistics in Economics I and Probability and Statistics in Economics II



MGMT 7	Statistics for Business Decision Making
STATS 7	Basic Statistics
STATS 8	Introduction to Biological Statistics
STATS 67	Introduction to Probability and Statistics for Computer Science
SOCECOL 13	Statistical Analysis in Social Ecology
PSYCH 10A- 10B- 10C	Probability and Statistics in Psychology I and Probability and Statistics in Psychology II and Probability and Statistics in Psychology III
SOC SCI 10A- 10B- 10C	Probability and Statistics in Social Sciences I and Probability and Statistics in Social Sciences II and Probability and Statistics in Social Sciences III
SOCIOL 10A- 10B- 10C	Probability and Statistics and Probability and Statistics and Probability and Statistics

Transfer students should check with their college counselor for established equivalencies for these prerequisite courses.

NOTE: Individual courses that students may select within the minor may require additional prerequisites, including MATH 2A.

## Requirements for the Undergraduate Minor in Management

Completion of seven courses:

A. One lower-division core course:

MGMT 1	Introduction to Business and Management
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B. Select four core courses from the following:

MGMT 30A	Principles of Accounting I
MGMT 101	Management Science
MGMT 102	Managing Organizational Behavior
MGMT 105	Introduction to Marketing
MGMT 107	Introduction to Management Information Systems
MGMT 109	Introduction to Managerial Finance
MGMT 110	Strategic Management

C. Select two of the following:

a course from the core course list above	
MGMT 113–129, 141–184	
MGMT 189	Operations Management
MGMT 192	Business Law
MGMT 190	Special Topics in Management (provided specific topics have not been covered in other courses)

With Merage School faculty approval, a student may substitute a maximum of one course. Students participating in the UC Education Abroad Program may substitute a maximum of two courses, with Merage School faculty approval.

NOTE: Students may not receive both the minor in Management and the minor in Accounting. Students may not receive both the minor in Management and the minor in Innovation and Entrepreneurship.

## Management, Ph.D.

Ph.D. (<http://merage.uci.edu/PhD/>)

Email: [phd@merage.uci.edu](mailto:phd@merage.uci.edu)

Phone: 949-824-8318

The Paul Merage School of Business admits students for the Ph.D. in the fall quarter only. The deadline for application is January 4. The Ph.D. program requires a commitment to full-time study. In addition to the other requirements, Ph.D. applicants are encouraged to submit a previously prepared paper (research report, research essay, case study) which may be indicative generally of the applicant's interests and capabilities.

The School offers the Ph.D. in Management to students with backgrounds in a variety of disciplines. While a master's degree is preferred, students may be admitted to the doctoral program directly from the baccalaureate degree. There are many appropriate undergraduate majors, including (but not limited to) psychology, political science, business or public administration, mathematics, computer sciences, economics, sociology, and so forth.

Students with academic strengths in disciplines not usually considered as precursors for management (e.g., natural sciences, humanities, and the arts) are encouraged to apply. The Ph.D. program is designed to prepare students for academic careers in a number of the fields of management, e.g., organization and management, strategy, operations and decision technologies, management information systems, finance, accounting, and marketing. Requirements of the Ph.D. program include a broad knowledge of core management disciplines. In addition, the Ph.D. student must qualify as a skilled researcher and must complete a dissertation demonstrating these skills.

In addition to the usual University of California requirements for admission to graduate study, students must provide one of the following:

- the Graduate Management Admissions Test (GMAT) or the Graduate Record Exam (GRE) verbal and quantitative parts
- a cumulative GPA of 3.0 or above
- statement of purpose
- minimum of three references, of which two should be from academic sources.

Students holding an appropriate Baccalaureate degree may be admitted directly to graduate study leading to the Ph.D. in Management.

## Admission

In addition to the usual University of California requirements for admission to graduate study, students must provide one of the following:

- the Graduate Management Admissions Test (GMAT) or the Graduate Record Exam (GRE) verbal and quantitative parts
- a cumulative GPA of 3.0 or above
- statement of purpose
- minimum of three references, of which two should be from academic sources.

Students holding an appropriate Baccalaureate degree may be admitted directly to graduate study leading to the Ph.D. in Management.

## Teaching Requirements

All degree candidates are required to complete the Teaching Development course MGMTPHD 297B. The objective of the course is to ensure that our Ph.D. students are adequately prepared to assume academic teaching responsibilities upon completion of their programs and to ensure that business doctoral students who teach classes at UCI are adequately prepared to do so effectively.

## Coursework and Degree Requirements

The Ph.D. Program in The Paul Merage School of Business is divided into phases, Qualifying and Dissertation. The objective and requirements of each phase are outlined below.

### Phase I (Qualifying)

Provides students with a general exposure to their fields of emphasis, the discipline of management, and methodological tools. This phase must be completed within nine quarters. At the end of either year 1 or year 2 (depending on the field of emphasis), students will take a written comprehensive field examination covering material within their specific fields of emphasis.

### Course Requirements

The Merage School doctoral courses are offered on a two-part School-wide menu: Theoretical Breadth and Research Methods. Courses may be added to the two menus as needed or availability as determined by the faculty.

1. **Specialization requirement:** Two courses in the student's primary area of specialization (one of the seven fields of emphasis offered by The Merage School of Business. At least one of these courses must be a Ph.D.-level seminar or Independent Study at the doctoral level. Requirements in the student's area of specialization are determined by the faculty in that area within the guidelines of doctoral study.
2. **Breadth requirement:** All doctoral students are required to take four breadth courses. Breadth courses are defined as the courses on the School-wide menus and courses offered in areas other than the student's area of specialization. These could be courses offered by other areas within Merage or departments outside of Merage. Students must take (at least) two courses from the School-wide menus, and (at least) two additional Ph.D.-level courses pertinent to the academic area of study.
3. **Research skills requirements:** Two courses that emphasize research skills that contribute to the development of research capabilities, as determined by the faculty in the area of specialization.
4. MGMTPHD 297A- Doctoral Proseminar and MGMTPHD 297B - University Teaching. These course requirements are common to all students, regardless of area of specialization.

This phase is also designed to prepare students for research and scholarship in their areas of emphasis. Following successful passage of the written comprehensive field examination, the student should select a Chair and, together with that Chair, identify a three-or four-member 'working' committee of the five-member Candidacy Committee. The 'working' committee, in consultation with the student, develops a program for the remainder of the Qualifying Phase. The program consists of the specification of the content of the student's area of emphasis, requirements for the completion of written papers, and the methods by which the student will demonstrate readiness to conduct original research and scholarship. Students usually enroll in independent study with faculty advisors, as well as other courses as appropriate each quarter. During this period of advanced study, students gain a

thorough understanding of their specific fields of emphasis, including detailed knowledge of the current literature and research trends. In this phase, students will prepare themselves to become scholars who, through meaningful research, will make a significant contribution to the advancement of their chosen fields.

Phase I is completed upon successful passage of a formal oral qualifying examination conducted by the Candidacy Committee comprised of five faculty members, a majority of whom are affiliated with the Merage School.

### Phase II (Dissertation)

This phase requires the completion of a significant original research project and a dissertation which demonstrates the candidate's creativity and ability to launch and sustain a career in research. Phase II typically ranges from 12 to 18 months in duration. The type of research project selected will be an important determinant of the amount of time a student will spend in this phase. Upon approval of the dissertation and final dissertation defense, the student's Dissertation Committee recommends conferral of the Ph.D. degree.

### Course Requirements

Students enroll in 12.0 of Individual Study units under their Faculty Advisor's supervision for research/dissertation work until they defend their dissertation and graduate.

### Advancement to Candidacy

The student undertakes advancement to candidacy or the Ph.D. upon successfully demonstrating a high level of scholarship in full-time study at the doctoral level, when all preparatory work has been completed and the student is ready to proceed to the dissertation phase, as signified by successfully passing the oral qualifying examination at the end of Phase I.

The normative time for advancement to candidacy is three years. The normative time for completion of the Ph.D. is five years, and the maximum time permitted is six years.

## Master of Business Administration

Full-Time M.B.A. (<http://merage.uci.edu/FullTimeMBA/>)

Email: [mba@merage.uci.edu](mailto:mba@merage.uci.edu)

Phone: 949-824-4622

The Paul Merage School of Business offers a variety of programs leading to the MBA (Master of Business Administration) degree. This includes a two-year, Full-Time MBA program.

The Paul Merage School of Business admits students to the two-year, Full-Time MBA program or a Full-Time MBA with a concentration in Analytics in Digital Leadership in the fall quarter. Students from a variety of undergraduate disciplines, including liberal arts, social sciences, physical or biological sciences, computer science, and engineering, are encouraged to apply. In addition to the general University rules governing admission to graduate study, the School normally requires the completion of the Graduate Management Admission Test (GMAT) or the Graduate Record Examination (GRE). There are no specific prerequisite requirements for the Full-Time MBA program. However, the Admissions Committee does look for evidence of quantitative proficiency and strong verbal skills in all applicants. The final deadline for completion of all phases of the application procedure is generally around April 1. However, since admissions are received on a rolling basis, applicants are encouraged to check with the MBA Admissions Office regarding application submission.

The evaluation of an applicant's file for admission consists of an integrated assessment of all materials submitted including test scores, transcripts of previous academic work, work experience, essays, and letters of recommendation. A quantitative background is encouraged for the Full-Time MBA with a STEM-certified concentration in Analytics in Digital Leadership, such as undergraduate degrees in mathematics, computer science, economics, statistics, engineering, and/or physics. The Full-Time MBA program at the Paul Merage School is distinctive for its focus on providing students the capabilities and skills to succeed in a digitally-driven world. The Merage School's curriculum distinguishes students as leaders in data-driven decision-making, the role of information technology, and digitally-driven leadership.

The Full-Time MBA program requires a minimum of 92 units with a minimum grade point average of 3.0 in the core curriculum and overall. Students in the concentration that do not meet this GPA requirements will be advised to transfer out of the concentration to ensure their academic success. The curriculum consists of courses divided into two groups designed to achieve specific educational objectives. Ten required Common Core Courses (40 units) and 52 units of elective courses which students select to emphasize career goals and educational interests. For those students pursuing a concentration in Analytics in Digital Leadership, students must enroll in four electives from the below concentration list as well one required elective: MGMTMBA 270. A thesis is not required.

### Course Requirements

A. Complete:

MGMTMBA 200	Thinking Strategically in the Digital Age
MGMTMBA 201A	Business Analytics: Decision-Making
MGMTMBA 202	Organizational Leadership for Management

MGMTMBA 203A	Financial Reporting
MGMTMBA 204A	Microeconomics for Management in the Digital Age
MGMTMBA 205	Marketing Principles
MGMTMBA 207	Competing with Digital: Technology, Analytics, and Platforms
MGMTMBA 208	Operational Excellence: Processes, Models, and Analytics
MGMTMBA 209A	Managerial Finance
MGMTMBA 210	Strategy: Foundations and Dynamics
B. Select 52 units of electives	

### Concentration in Analytics in Digital Leadership Course Requirements

A. Complete:

MGMTMBA 270	Data Camp for Managers
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B. Select 16 units from the following list of electives:

MGMTMBA 201B or MGMT FE 281	Management Science Analytical Decision Models for Managers
MGMTMBA 215 or MGMT FE 215	Global Competitive Strategy Strategy in a Digital Age
MGMTMBA 245 or MGMT FE 245	FinTech and the Digital Economy for Business FinTech and the Digital Economy
MGMTMBA 273 or MGMT FE 273	Business Intelligence for Analytical Decisions for Managers
MGMTMBA 274 or MGMT FE 278	Data and Programming for Analytics Data and Programming for Analytics
MGMTMBA 285 or MGMT FE 285	Supply Chain Analytics
MGMTMBA 288 or MGMT FE 288	Predictive Analytics for Business Predictive Analytics
MGMTMBA 294 or MGMT FE 294	Edge EDGE for Managers

C. Select 34 units of electives

**Residence Requirement.** Five quarters.

**International Requirement.** Students must fulfill the requirement in one of the following ways: completion of a Paul Merage School of Business international elective in a functional area; participation in a Paul Merage School of Business international exchange program; or completion of an upper-division or graduate international course offered by another UC school, with the approval of The Paul Merage School of Business Associate Dean.

**Electives.** In addition to the core courses, 52 more units of elective courses are required. Of the 52 units of electives, 18 units for the Analytics in Digital Leadership concentration are outlined above. The major emphasis in the elective courses is to develop additional depth in a discipline or interdisciplinary area or specialized competence in the use of a particular set of technical tools and methods. Students select their electives in light of their educational and career goals and interests.

Further information may be obtained by contacting the University of California, Irvine, Full-Time MBA Program Office, The Paul Merage School of Business, SB1 5400, Irvine, CA 92697-3125; 949-824-4622; or visit the Full-Time MBA website (<http://merage.uci.edu/FullTimeMBA/>).

## Master of Business Administration, Executive

Executive M.B.A (<http://merage.uci.edu/ExecutiveMBA/>).

Email: [mbaprograms@exchange.uci.edu](mailto:mbaprograms@exchange.uci.edu)

Phone: 949-824-4565

Fax: 949-824-0522

The Executive MBA (EMBA) program presents a challenging 21-month course of study specifically designed for executives, senior managers, professionals, entrepreneurs, and technical experts throughout Southern California. Participants have an average of 15 years work experience (with a minimum of eight years), demonstrated leadership abilities, and a proven track record of success. Commencing each fall, students meet for seven consecutive quarters on four class weekends scheduled on Friday and Saturday at The Paul Merage School of Business. The cohort program gives students the opportunity to actively participate in class discussions and interact closely with their peers.

The program offers an applications-oriented curriculum with an international and digital focus designed to give the seasoned working professional contemporary management tools for successfully leading organizations in a changing business environment. The EMBA program is a 76-unit program and offers a maximum amount of core and elective course material presented in an accelerated timetable.

MGMT EP 200	Thinking Strategically in the Digital Age for Executives
MGMT EP 202	Organizational Leadership for Executives
MGMT EP 207	Competing with Digital: Technology, Analytics, Business Models
MGMT EP 201A	Business Analytics: Decision-Making for Executives
MGMT EP 203A	Financial Reporting Policies for Executives
MGMT EP 204A	Microeconomics for Executives in the Digital Age
MGMT EP 208	Operational Excellence: Processes, Strategy, and Analytics
MGMT EP 209A	Managerial Finance for Executives
MGMT EP 205	Marketing Leadership
MGMT EP 210	Strategy for Executives: Foundations and Dynamics

B. Select 34 units of electives.

In addition to the two, four-day residentials, students participate in an in-depth academic, week-long global residential course abroad. This provides a unique opportunity to experience global business firsthand from a corporate, academic, and cultural standpoint.

Further information may be obtained by contacting the University of California, Irvine, Executive MBA Programs, The Paul Merage School of Business, SB1 4200, CA 92697-3125; 949-824-4565; or visit the Executive MBA website (<https://merage.uci.edu/programs/mba/executive-mba/>).

## Master of Business Administration, Fully Employed

Fully Employed M.B.A (<http://merage.uci.edu/FullyEmployedMBA/>).

Email: [mbaprograms@exchange.uci.edu](mailto:mbaprograms@exchange.uci.edu)

Phone: 949-824-4565

The Fully Employed MBA (FEMBA) program gives emerging managers an opportunity to earn an MBA with minimal disruption to their professional lives. Students attend classes delivered in-person or hybrid (online and in-person) during the program. The FEMBA Program enrolls new students in spring and fall. Students that begin the program in spring attend classes nine consecutive quarters, including summers, and complete the program within 27 months. Students that begin the program in fall attend classes during the Fall-Spring academic year and complete the program within 33 months. Students also have the opportunity to accelerate their program to graduate in 21 months.

The program consists of both core courses and electives, allowing students to establish a solid foundation of traditional business skills and then customize their education based on personal interests and goals. The curriculum provides constant interaction between information presented in the classroom and what is being used on the job, reinforcing and enhancing the student's learning experience.

A. Complete:

MGMT FE 200	Thinking Strategically in the Digital Age for Managers
MGMT FE 201A	Business Analytics: Decision-Making for Managers
MGMT FE 202	Organizational Leadership for Managers
MGMT FE 203A	Financial Reporting for Managers
MGMT FE 204A	Microeconomics for Managers in the Digital Age
MGMT FE 205	Marketing Management
MGMT FE 207	Competing with Digital
MGMT FE 208	Operational Excellence: Processes, Principles, and Analytics
MGMT FE 209A	Finance for Managers
MGMT FE 210	Strategy for Managers: Foundations and Dynamics

B. Select 36 units of electives.

In addition to classroom work, students attend three experiential residential courses including one abroad focusing on global markets. In this concentrated setting, students and faculty have an in-depth opportunity to explore a variety of business challenges and how those challenges can best be met using contemporary management tools.

Further information may be obtained by contacting the University of California, Irvine, Fully Employed MBA Program Office, The Paul Merage School of Business, SB1 4200, Irvine, CA 92697-3125; 949-824-4565; or visit the Fully Employed MBA website (<https://merage.uci.edu/programs/masters/fully-employed-mba/>).

## Master of Finance

Master of Finance (<http://sites.uci.edu/masteroffinance/>)

**Phone: 949-824-9859**

Email: [mfin@merage.uci.edu](mailto:mfin@merage.uci.edu) ([mpac@merage.uci.edu](mailto:mpac@merage.uci.edu))

The Master of Finance program provides extensive and practical training for quantitative and analytical jobs in the field of finance. The program prepares graduates for entry- and mid-level positions in the field of finance, and opportunities to specialize in areas such as corporate finance, investments management, wealth management, and real estate. The program is a one-year, self-supporting terminal master's degree, which includes opportunities for extra-curricular internships or practicums.

Students build a strong understanding of modern finance, as well as the quantitative and analytical skills needed to address complex problems found in the field of finance today. Graduates will be prepared for positions in such finance fields as risk management, asset and wealth management, real estate management, and forecasting. Longer term career paths could include chief finance officer, risk managers, chief risk officer, and portfolio managers at banks, asset management companies, and investment funds.

Further information may be obtained by contacting the University of California Irvine, Master of Finance Program Office, The Paul Merage School of Business, SB1 4500, Irvine, CA 92697: 949-824-9859 or visit the Master of Finance website (<https://merage.uci.edu/programs/masters/master-finance/>).

Applicants may apply directly to the Paul Merage School of Business. Applicants must meet all the prerequisites requirements at the time of matriculation into the program. Admission to graduate-level standing in the Paul Merage School of Business is accorded to those possessing an undergraduate degree with an acceptable level of scholarship from an institution of recognized standing. A quantitative background in subjects such as calculus and intermediate statistics and probability is encouraged, and undergraduate degrees in sciences, engineering, mathematics, economics, and business programs are recommended.

Applicants for admission will be evaluated on their academic record and potential for leadership, as demonstrated by the materials submitted in the application. These materials must include official university transcripts, two letters of recommendation, two essays, a resume, and a personal interview (by invitation only). The GMAT or GRE are not required but strongly recommended for applicants with GPA's under a 3.3. While these tests are not required, the admissions team is looking for evidence of strong verbal and quantitative skills. If the potential applicant received his/her undergraduate degree from a foreign country and his/her primary language is not English, then s/he will be responsible to take the TOEFL exam with a minimum score of 80 on the internet-based test. A Pearson Test of English (PTE) may be substituted for the TOEFL. The minimum score for the PTE is 53. Scores are valid for two years.

The program consists of seven required courses (24 units) and seven electives (28 units), for a total of 52 units to be completed in 12 months. The required courses are as follows:

A. Complete the following:

FIN 203A	Financial Reporting for Management
FIN 240	Financial Research Methodology
FIN 210	Foundations of Finance
FIN 241	Risk Management
FIN 249	Derivatives
FIN 296	Master of Finance Capstone
FIN 211	Master of Finance ProSeminar <sup>1</sup>

B. Select seven electives from FIN and/or other Merage graduate programs elective course offerings.

<sup>1</sup> Must be taken during the fall, winter, and spring quarters.

## Master of Innovation and Entrepreneurship

The Master of Innovation and Entrepreneurship (MIE) provides extensive academic and practical training for students to embark on careers as entrepreneurs (innovating to form new companies), and as intrapreneurs (innovating within existing companies).

The program provides students with knowledge and experience on core topics on the process of innovation and entrepreneurship, i.e., identifying new venture opportunities through lean startup methodology, developing a business model, preparing a business plan, assembling a team, raising the necessary financing including venture capital, and launching a new business. The program is a self-supporting terminal master's degree, which includes opportunities for extra-curricular internships or practicums.

Students participate in the New Venture Competition at the Merage School, jointly run by the Beall Center for Innovation and Entrepreneurship and UCI Applied Innovation, from November through May. Students participating in the competition are coached and judged by entrepreneurs, business leaders, angel investors, and venture capitalists, and will have the option of attending several lunch and learns, and short workshops on a variety of topics aimed at increasing the odds of success in the competition. Post May, students have the opportunity to enter the Wayfinder incubator at UCI



Applied Innovation where Innovation Advisors (IAs) through a broad set of available resources, help student teams build relationships with investors, advisors, and community partners to pave the path for successful capital raising, advancement of technology, and refinement of their business models, among other significant milestones.

Applicants may apply directly to the Paul Merage School of Business. Applicants must meet all the prerequisite requirements at the time of matriculation into the program. Admission to graduate level standing in the Paul Merage School of Business is accorded to those possessing an undergraduate degree with an acceptable level of scholarship from an institution of recognized standing.

Applicants for admission are evaluated on their academic record and potential for leadership, as demonstrated by the materials submitted in the application. These materials must include official university transcripts, two letters of recommendation, two essays, a resume, and a personal interview (by invitation only). The GMAT or GRE are strongly recommended for applicants with GPAs under a 3.3. While these tests are not required, the admissions team is looking for evidence of strong verbal and quantitative skills. If the potential applicant received his/her undergraduate degree from a foreign country and his/her primary language is not English, then s/he is responsible to take the TOEFL exam with a minimum score of 80 on the internet-based test. A Pearson Test of English (PTE) may be substituted for the TOEFL. The minimum score for the PTE is 53.

### Admission

Applicants may apply directly to the Paul Merage School of Business. Applicants must meet all the prerequisite requirements at the time of matriculation into the program. Admission to graduate level standing in the Paul Merage School of Business is accorded to those possessing an undergraduate degree with an acceptable level of scholarship from an institution of recognized standing.

Applicants for admission are evaluated on their academic record and potential for leadership, as demonstrated by the materials submitted in the application. These materials must include official university transcripts, two letters of recommendation, two essays, a resume, and a personal interview (by invitation only). The GMAT or GRE are strongly recommended for applicants with GPAs under a 3.3. While these tests are not required, the admissions team is looking for evidence of strong verbal and quantitative skills. If the potential applicant received his/her undergraduate degree from a foreign country and his/her primary language is not English, then s/he is responsible to take the TOEFL exam with a minimum score of 80 on the internet-based test. A Pearson Test of English (PTE) may be substituted for the TOEFL. The minimum score for the PTE is 53.

### Requirements

The program consists of 10 required courses (28 units) and two electives (8 units), for a total of 36 units. The degree can be completed full-time over three quarters or part-time over six quarters. The maximum time to degree is two years. The required courses are as follows:

#### A. Complete:

INNO 202	Leadership for Entrepreneurs
INNO 203	Financial Accounting for Entrepreneurs
INNO 205	Marketing for Entrepreneurs
INNO 209	Managerial Finance for Entrepreneurs
INNO 211	MIE Pre-Accelerator <sup>1</sup>
INNO 214	Entrepreneurship
INNO 215	Lean Startup
INNO 218	Venture Capital for Entrepreneurs
INNO 292	Business Law for Entrepreneurs
INNO 294	Edge: Innovation in the New Digital Age

#### B. Select two electives from the following:

INNO 212	Business Growth Strategies for Entrepreneurs
INNO 252D	New Product Development for Entrepreneurs
INNO 257	Marketing on the Internet for Entrepreneurs
INNO 298	Merage Consulting Projects for Entrepreneurs

<sup>1</sup> Must be taken during the fall, winter, and spring quarters.

## Master of Professional Accountancy

Master of Professional Accountancy (<http://merage.uci.edu/go/mpac/>)

Email: [mpac@merage.uci.edu](mailto:mpac@merage.uci.edu)

Phone: 949-824-9240

The Master of Professional Accountancy (MPAc) program provides an intensive, focused level of training that will prepare graduates for entering positions within an accounting firm, private company, or public/nonprofit organization. Combined with undergraduate preparation in accounting, the MPAc program will enable students to meet the State of California Board of Accountancy educational standards for licensure as a certified public



accountant in California. The program is a self-supporting terminal master's degree and includes the opportunity for a one-quarter internship. The program is offered as a full-time, one-year program or on a part-time basis in which students complete the program requirements over two years.

Students who complete this program will possess the necessary knowledge to solve fundamental and strategic issues in accounting. They will learn to apply both critical thinking and established accounting processes to issues crucial to the audit and accountability of an organization. The coursework will have a pedagogical underpinning of ethical behavior and professional conduct. The underlying philosophy in the program's framework is intended to develop a foundational understanding of key accounting principles and concepts while also offering a breadth of broader issues and topics relevant to the discipline.

Further information may be obtained by contacting the University of California, Irvine, Master of Professional Accountancy Program Office, The Paul Merage School of Business, SB1 4500, Irvine, CA 92697-3125; 949-824-9240; or visit the Master of Professional Accountancy website (<http://merage.uci.edu/MPAc/>).

Applicants may apply directly to The Paul Merage School of Business. Applicants to the fall class must meet all prerequisite requirements at the time of matriculation into the program. Specifically, an applicant must have satisfactorily completed the following prerequisite courses (or their equivalent) in accounting (although students lacking up to two upper-division undergraduate accounting courses will be permitted to petition to enroll in those courses as an additional part of the MPAC program): The minimum coursework that must be completed or in progress at the time of application submission is: Introductory Financial and Managerial Accounting (two courses). The following courses will need to be completed before the program begins in Fall: at least 6 upper-division U.S. accounting-based courses: Intermediate Accounting I, Intermediate Accounting II, Individual Taxation, Auditing, and 2 upper-division accounting electives (recommended electives include: Corporate and Partnership Taxation, Accounting Information Systems, Advanced Accounting, Cost Accounting, and International Accounting. At the discretion of the Admissions Committee, "provisional admission status" will be offered to highly qualified candidates who have met most, but not all, of the prerequisite requirements and will satisfy the requirements prior to matriculation. The GMAT or GRE are not required but strongly recommended for applicants with GPA's under a 3.3. While these tests are not required, the admissions team is looking for evidence of strong verbal and quantitative skills.

Other highly qualified applicants who do not meet the entrance requirements to begin the program in the fall quarter will be offered an opportunity to enroll in an intensive summer pre-session at The Paul Merage School of Business. The pre-session will be required of those who possess an excellent undergraduate record of achievement, strong letters of recommendation, and a clear focus relative to a career in accounting; and, who need specific prerequisite coursework in accounting and business. The summer pre-session will include four courses. Students must successfully complete all of the pre-session coursework to meet the course prerequisites of the MPAC program in order to enter the program in the fall quarter. Pre-session coursework will be done over the two designated Summer Sessions. Students will enroll in a curriculum of two courses in Summer Session I and two courses in Summer Session II. The courses are as follows:

MPAC 200A	Intermediate Accounting Intensive I
MPAC 200B	Foundations of Taxation Intensive
MPAC 200C	Intermediate Accounting Intensive II and Special Topics
MPAC 200D	Auditing Intensive

Admission to graduate standing in The Paul Merage School of Business is accorded to those possessing an undergraduate degree with an acceptable level of scholarship from an institution of recognized standing. Applicants for admission will be evaluated on their academic record and potential for leadership as demonstrated in submitted application materials. These materials will include official university transcripts and resume, two letters of recommendation, a statement of purpose, and an essay. A personal interview, by invitation only, will be part of the admission process. We highly recommend that applicants take the GMAT or GRE. While these tests are not required, the admissions team is looking for evidence of strong quantitative skills. In lieu of evidence for a strong quantitative background in the form of previous coursework or relevant professional experience, the school can use the GMAT/GRE test as evidence of such a skill set. Those students educated from a country where English is not the primary language will be required to possess a minimum score on the Test of English for Foreign Language (TOEFL) of 600 for the paper-based test and 80 for the Internet-based test. Further, international applicants may also take the Pearson Test of English (PTE). The minimum required score for admission is 53. Scores are valid for two years.

The program requires students to complete no less than 11 courses and a minimum of 44 units. Of the minimum of 11 courses needed to complete the program, students must satisfactorily complete seven required courses. The required courses are as follows:

MPAC 230	Accounting ProSeminar: Career and Professional Development (Students must enroll in both Proseminar courses.)
MPAC 231A	Financial Statement Analysis and Forecasting
MPAC 232	Taxes and Business Strategy
MPAC 235	Advanced Managerial Accounting
MPAC 238	Advanced Auditing and Assurance Services
MPAC 239	Ethics in Accounting and Business
MPAC 291	Professional Research and Communication

Students will be expected to enroll in and successfully complete at least 16 units of elective work as part of the program requirements. Students will be permitted to enroll in M.B.A. or MPAC level courses if the student has met the prerequisites and there is space allowed in the course. Further, students will be encouraged to pursue a formal internship experience in the winter and/or spring quarters by enrolling in MPAC 241 Accounting Internship, a 2-4 unit course.

# UCI Faculty Lists

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## UCI Faculty Distinctions

The 2007 Nobel Peace Prize was awarded to the Intergovernmental Panel on Climate Change (IPCC) and former Vice President Al Gore. Several UC Irvine climate scientists have played a part in writing, reviewing, and editing IPCC climate change reports over the last decade, including Michael Prather, *Professor of Earth System Science and Fred Kavli Chair in Earth System Science*; Donald R. Blake, *Professor of Chemistry and Earth System Science*; Michael L. Goulden, *Associate Professor of Earth System Science and of Ecology and Evolutionary Biology*; Gudrun Magnusdottir, *Professor of Earth System Science*; James T. Randerson, *Associate Professor of Earth System Science*; Soroosh Sorooshian, *Director of the Center for Hydrometeorology and Remote Sensing (CHRS)*, and *UCI Distinguished Professor of Civil and Environmental Engineering and of Earth System Science*; Susan E. Trumbore, *Professor of Earth System Science*; Stanley C. Tyler, *Researcher, Department of Earth System Science*; Jin-Yi Yu, *Associate Professor of Earth System Science*; and Charles S. Zender, *Associate Professor of Earth System Science*.

## UCI Nobel Laureates

### Nobel Prize in Chemistry, 2004

Irwin Rose, *UCI Distinguished Professor Emeritus, Department of Physiology and Biophysics* (d. 2015)

### Nobel Prize in Chemistry, 1995

F. Sherwood Rowland, *Research Professor Emeritus of Chemistry and Earth System Science, and Bren Chair* (d. 2012)

### Nobel Prize in Physics, 1995

Frederick Reines, *UCI Distinguished Professor Emeritus of Physics* (d. 1998)

## UCI Endowed Chairs

### Daniel G. Aldrich, Jr. Endowed Chair

Frank L. Meyskens, Jr., *Director of the Chao Family Comprehensive Cancer Center and Professor of Medicine*

### Louise Turner Arnold Chair in the Neurosciences

Daniele Piomelli, *Professor of Anatomy and Neurobiology; Pharmacology; Biological Chemistry*

### Howard Baskerville Professor of Humanities

Nasrin Rahimieh, *Professor of Comparative Literature; Culture and Theory; Gender and Sexual Studies*

### Arnold and Mabel Beckman Chair in Laser Biomedicine

Michael W. Berns, *Professor of Surgery; Developmental and Cell Biology; Biomedical Engineering*

### Grace Beekhuis Bell Chair in Biological Chemistry

Suzanne B. Sandmeyer, *Professor of Biological Chemistry; Microbiology and Molecular Genetics; Chemical Engineering and Materials Science*

### Warren L. Bostick Chair in Pathology

Edwin Monuki, *Professor of Pathology and Laboratory Medicine*

### Donald Bren Professors, The Donald L. Bren Endowment

Geoffrey Bowker, *Professor of Informatics*

Michael Carey, *Professor of Computer Science*

Steven Frank, *Professor of Ecology and Evolutionary Biology*

Sheldon Greenfield, *Professor of Medicine*

Wilson Ho, *Professor of Physics and Astronomy; Chemistry*

Anthony James, *Professor of Microbiology and Molecular Genetics; Molecular Biology and Biochemistry*

Ramesh C. Jain, *Professor of Information and Computer Sciences*

Arthur D. Lander, *Director, Center for Complex Biological Systems and Professor of Developmental and Cell Biology; Biomedical Engineering; Pharmacology*

Eric Rignot, *Professor of Earth System Science*

Paolo Sassone-Corsi, *Director of the Center for Epigenetics and Metabolism and UCI Distinguished Professor, Departments of Biological Chemistry; Pharmaceutical Sciences; Microbiology and Molecular Genetics*

Leslie Thompson, *Professor of Psychiatry and Human Behavior*

**Conexant-Broadcom Chair in the Center for Pervasive Communications**

Hamid Jafarkhani, *UCI Chancellor's Professor of Electrical Engineering and Computer Science*

**Thomas and Mary Cesario Endowed Chair in Medicine**

Alpesh Amin, *Professor of Medicine; Management; Biomedical Engineering*

**Ralph V. Clayman Endowed Chair in Endourology**

Ralph V. Clayman, *Professor of Urology*

**John E. Connolly Chair in Surgery**

Ninh Tuan Nguyen, *Department Chair and Professor of Surgery*

**Dean's Leadership Circle Endowed Professorship**

Andrew J. Policano, *Professor of Management; Economics*

**Edward A. Dickson Emerti Professor**

Sidney Golub, *Professor Emeritus of Microbiology and Molecular Genetics*

Timothy Tackett, *Professor Emeritus of History*

**Ralph J. and Carol M. Cicerone Chair in Earth System Science**

James Randerson, *Professor of Earth System Science*

**Endowed Chair in Developmental and Cell Biology**

Kavita Arora, *Department Chair and Professor of Developmental and Cell Biology*

**Philip J. DiSaia Chair in Gynecologic Oncology**

Robert E. Bristow, *Director of the Division of Gynecologic Oncology and Professor, Department of Obstetrics and Gynecology (Gynecologic Oncology)*

**Suzanne Dykema Endowed Chair In Pancreatic Cancer**

David Imagawa, *Professor of Clinical Surgery*

**Endowed Chair for the Center for Diversity in Engineering Education**

Regina Ragan, *Director for the Center for Diversity of Engineering Education and Professor of Chemical Engineering and Materials Science*

**Endowed Chair in Gastrointestinal Endoscopic Oncology**

Kenneth Chang, *Professor in Clinical Medicine*

**Walter B. Gerken Chair in Enterprise and Society**

Rajeev K. Tyagi, *Professor of Management*

**Endowed Chair in Ecology and Evolutionary Biology**

Kathleen Treseder, *Professor of Ecology and Evolutionary Biology*

**Falmagne Endowed Chairs in Mathematical Psychology and Cognitive Sciences**

Zygmunt Pizlo, *Professor of Cognitive Sciences*

Jeffrey Rouder, *Professor Cognitive Sciences*

**Walter B. Gerken Chair in Enterprise and Society**

Rajeev Tyagi, *Professor of Business*

**Clifford S. Heinz Chair**

Stergios Skaperdas, *Professor of Economics*

**Roger W. and Janice M. Johnson Chair in Civic Governance and Public Management**

Martha Feldman, *Professor of Planning, Policy, and Design; Management; Political Science; Sociology*

**Fred Kavli Chair in Earth System Science**

Ellen Druffel, *Professor of Earth System Science*

**The Robert A. and Barbara L. Kleist Chair in Informatics**

Gillian Hayes, *Professor of Informatics; Education*

**William J. Link Chair in Biomedical Engineering**

Abraham Lee, *Department Chair and Professor of Biomedical Engineering and Professor of Mechanical and Aerospace Engineering*

**John S. and Marilyn Long Chair in U.S.-China Business Law**

Ji Li, *Professor of Law*

**John D. and Catherine T. MacArthur Foundation Chair in Digital Media and Learning**

Mizuko "Mimi" Ito, *Professor in Residence of Anthropology; Education; Informatics*

**Dorothy J. Marsh Chair in Reproductive Biology**

Philip J. Di Saia, *Chief of Gynecology and Gynecologic Oncology and Professor of Obstetrics and Gynecology; Radiation Oncology*

**Della Martin Chair in Psychiatry**

William E. Bunney, Jr., *UCI Distinguished Professor Emeritus of Psychiatry and Human Behavior*

**Maseeh Chair in Persian Studies and Culture**

Touraj Daryaee, *Director of the Dr. Samuel M. Jordan Center for Persian Studies and Culture and Professor of History*

**Maseeh Professor in Persian Performing Arts**

Hossein Omoumi, *Professor of Music and of Persian Performing Arts*

**Gary McCue Administrative Term Chair in Cosmology**

James Bullock, *Professor of Physics and Astronomy*

**James L. McGaugh Chair in the Neurobiology of Learning and Memory**

Craig Stark, *Professor of Neurobiology and Behavior*

**Abraham I. Melden Chair in Moral Philosophy**

Margaret Gilbert, *Professor of Philosophy*

**Paul Merage Chair in Business Growth**

David A. Hirshleifer, *Professor of Management; Economics*

Terrence J. Shevlin, *Professor of Management*

**Eric L. and Lila D. Nelson Chair in Neuropharmacology**

Olivier Civelli, *Department Chair of Pharmacology and Professor, Departments of Pharmacology; Developmental and Cell Biology; Pharmaceutical Sciences*

**Stacey Nicholas Endowed Chair for Diversity in Engineering Education**

Regina Ragan, *Professor of Chemical Engineering and Materials Science*

**Nichols Term Chair in Neuroscience**

Claudia Kawas, *Professor of Neurology, Neurobiology and Behavior*

**Jack W. Peltason Endowed Chair**

Bernard N. Grofman, *Professor of Political Science; Economics*

**The Robert and Marjorie Rawlins Chair of Music**

Michael Dessen, *Associate Professor of Music*

**Ronald W. Reagan Endowed Chair in Geriatrics**

Lisa Gibbs, *Chief of the Division of Geriatric Medicine and Gerontology and Professor of Family Medicine*

**Reeve-Irvine Chair in Spinal Cord Injury Research**

Oswald Steward, *Director, Reeve-Irvine Research Center; Senior Associate Dean for Research, School of Medicine; and Professor, Departments of Anatomy and Neurobiology; Neurobiology and Behavior*

**Chair in Rhetoric and Communication**

Virginia Jackson, *Associate Professor of English*

**Norman Rostoker Chair in Applied Physics**

Toshiki Tajima, *Professor of Physics and Astronomy*

**Henry Samueli Endowed Chairs**

Xiaoqing Pan, *Professor of Chemical Engineering and Materials Science; Physics and Astronomy*

William A. Sirignano, *Professor of Mechanical and Aerospace Engineering*

H. Kumar Wickramasinghe, *Department Chair and Professor of Electrical Engineering and Computer Science; Biomedical Engineering; Chemical Engineering and Materials Science*

**Susan Samuelli Chair in Integrative Medicine**

Shaista Malik, *Director of the Susan Samuelli Center for Integrative Medicine, Professor of Medicine*

**Walter R. Schmid Chair in Pediatric Urology**

Antoine Khoury, *Professor, Department of Urology*

**Danette (Dee Dee) Shepard Chair in Neurological Studies**

Tallie Z. Baram, *Professor of Pediatrics; Neurology; Physiology and Biophysics; Anatomy and Neurobiology*

**Gerald B. Sinykin, M.D. Chair in Family Medicine**

Emily Dow, *Interim Chair and Professor of Family Medicine*

**Jack H. Skirball Endowed Chair**

James V. Jester, *Professor of Ophthalmology; Biomedical Engineering*

**Ted and Janice Smith Family Foundation Endowed Chair in Information and Computer Science**

Marios Papaefthymiou, *Dean of the Donald Bren School of Information and Computer Sciences*

**Robert R. Sprague Chair in Brain Imaging**

Steven G. Potkin, *Director of the Brain Imaging Center and Professor of Psychiatry and Human Behavior*

**Roger F. Steinert, MD, Endowed Chair in Ophthalmology**

Baruch Kuppermann, *Professor of Ophthalmology*

**Taco Bell Chair in Information Technology Management**

Vijay Gurbaxani, *Professor of Management; Informatics*

**Teller Family Chair in Jewish History**

Matthias Lehmann, *Professor of History; European Languages and Studies*

**Edward and Vivian Thorp Chair in Mathematics**

Karl C. Rubin, *Department Chair and Professor of Mathematics*

**Thomas T. and Elizabeth C. Tierney Chair in Global Peace and Conflict Studies**

Etel Solingen, *Professor of Political Science*

**Claire Trevor Endowment for the Dean of the Claire Trevor School of the Arts**

Stephen Barker, *Dean of the Claire Trevor School of the Arts and Professor of Drama*

**Claire Trevor Professors in the Arts**

Daniel Joseph Martinez, *Professor of Arts*

Bryan Reynolds, *Professor of Drama*

**Fong and Jean Tsai Chair in Women's Imaging**

Stephen Feig, *Division Director of Mammography and Professor of Clinical Radiological Sciences, Department of Radiological Sciences*

**UCI Excellence in Teaching Chair in Mathematics**

Richard Schoen, *Professor of Mathematics*

**Chair in Urology, Oncology**

Thomas Ahlering, *Professor of Urology*

**Dr. Stanley van den Noort Endowed Chair**

Tahseen Mozaffar, *Professor of Neurology*

**Drew, Chace, and Erin Warmington Chair in the Social Ecology of Peace and International Cooperation**

Scott A. Bollens, *Professor of Planning, Policy, and Design*

**UCI Chancellor's Fellows**

Sharon Block, *Professor of History*

Yong Chen, *Professor of History*

Mahtab Jafari, *Professor of Pharmaceutical Sciences*

Elizabeth Jarvo, *Professor of Chemistry*

Matthew Law, *Professor of Chemistry*

Jennifer Lee, *Professor of Sociology*

Mona Lynch, *Professor of Criminology, Law and Society*

Jennifer Martiny, *Professor of Ecology and Evolutionary Biology*

Robert Spitale, *Professor of Pharmaceutical Sciences*

Isabella Velicogna, *Professor of Earth System Science*

Geoff Ward, *Professor of Criminology, Law, and Society*

Michael Yassa, *Professor of Neurobiology and Behavior*

## UCI Chancellor's Professors

Kei Akagi, *UCI Chancellor's Professor of Music; Asian American Studies*

Jonathan Alexander, *Campus Writing Coordinator and UCI Chancellor's Professor of English; Culture and Theory; Education; Gender and Sexuality Studies*

Pierre F. Baldi, *UCI Chancellor's Professor of Computer Science; Biological Chemistry; Biomedical Engineering; Developmental and Cell Biology*

Jeffrey Barrett, *UCI Chancellor's Professor of Logic and Philosophy of Science*

Emiliana Borrelli, *Professor of Microbiology and Molecular Genetics*

Kieron Burke, *UCI Chancellor's Professor of Chemistry; Physics and Astronomy*

Kitty C. Calavita, *UCI Chancellor's Professor Emerita of Criminology, Law and Society*

Chuansheng Chen, *UCI Chancellor's Professor of Psychology and Social Behavior; Education*

Carol McDonald Connor, *UCI Chancellor's Professor of Education*

Rina Dechter, *UCI Chancellor's Professor of Computer Science*

James P. Dourish, *UCI Chancellor's Professor of Informatics; Computer Science*

David A. Eppstein, *UCI Chancellor's Professor of Computer Science*

Michael S. Franz, *UCI Chancellor's Professor of Computer Science; Electrical Engineering and Computer Science*

Charles Gabe, *UCI Chancellor's Professor of Molecular Biology and Biochemistry*

Michael T. Goodrich, *UCI Chancellor's Professor of Computer Science; Electrical Engineering and Computer Science*

Michael R. Gottfredson, *UCI Chancellor's Professor of Criminology, Law and Society; School of Law; Sociology*

Douglas Granger, *UCI Chancellor's Professor of Psychology and Social Behavior*

Hamid Jafarkhani, *Conexant-Broadcom Chair in the Center for Pervasive Communications and UCI Chancellor's Professor of Electrical Engineering and Computer Science*

Zeev Kain, *UCI Chancellor's Professor of Anesthesiology and Perioperative Care*

Natalia Komorova, *UCI Chancellor's Professor of Mathematics*

Frank M. LaFerla, *Dean of School of Biological Sciences and UCI Chancellor's Professor of Neurobiology and Behavior; Neurology*

Eva Y. Lee, *UCI Chancellor's Professor Emerita of Biological Chemistry*

Peter Li, *UCI Chancellor's Professor Emeritus of Mathematics*



John S. Lowengrub, *UCI Chancellor's Professor of Mathematics; Biomedical Engineering; Chemical Engineering and Materials Science*

Steven J. Mailloux, *UCI Chancellor's Professor of English; Comparative Literature*

Qing Nie, *UCI Chancellor's Professor of Mathematics*

Margot Norris, *UCI Chancellor's Professor Emerita of English; Comparative Literature*

Eric Pearlman, *Director of the Institute of Immunology and UCI Chancellor's Professor of Physiology and Biophysics; Ophthalmology*

Duncan Pritchard, *UCI Chancellor's Professor of Philosophy*

Charles C. Ragin, *UCI Chancellor's Professor of Sociology*

Markus W. Ribbe, *UCI Chancellor's Professor of Molecular Biology and Biochemistry; Chemistry*

Rozanne Sandri-Goldin, *UCI Chancellor's Professor of Microbiology and Genetics*

Eli Simon, *UCI Chancellor's Professor of Drama*

Padhraic Smyth, *UCI Chancellor's Professor of Computer Science*

Hal Stern, *UCI Chancellor's Professor of Statistics*

Daniel Stokols, *UCI Chancellor's Professor Emeritus of Psychology and Social Behavior; Planning, Policy, and Design; Program in Public Health*

Richard N. Taylor, *UCI Chancellor's Emeritus Professor of Informatics*

Brook Thomas, *UCI Chancellor's Professor Emerita of English*

Leslie Thompson, *UCI Chancellor's Professor of Psychiatry and Human Behavior*

Gene Tsudik, *UCI Chancellor's Professor of Computer Science*

Jeffrey N. Wasserstrom, *UCI Chancellor's Professor of History*

Cécile Marie Whiting, *Department Chair and UCI Chancellor's Professor of Art History; Visual Studies*

Hong-Kai Zhao, *UCI Chancellor's Professor of Mathematics; Computer Science*

Albert Zlotnik, *UCI Chancellor's Professor of Physiology and Biophysics*

## UCI Faculty Membership in Prestigious and Highly Prestigious Learned Societies

Alexander Von Humboldt Foundation: 2

Alfred P. Sloan Foundation: 47

American Academy of Arts and Sciences: 15

American Association for the Advancement of Science: 105

American Association of University Women (AAUW): 7

American Council of Learned Societies: 26

American Philosophical Society: 5

American Psychological Association: 6

Association for Psychological Science: 11

Center for Advanced Studies in the Behavioral Sciences: 2

Center for Hellenic Studies: 2

Center for the Advanced Study in the Visual Arts: 2

David and Lucile Packard Foundation: 2

Entomological Society of America: 1

Institute for Advanced Study: 4

John Simon Guggenheim Memorial Foundation: 27

MacArthur Foundation: 1

National Academy of Education: 22

National Academy of Engineering: 6

National Academy of Sciences: 14

National Endowment for the Humanities (NEH): 21

National Humanities Center: 4

Newberry Library: 1

Optical Society of America, The (OSA): 5

Princeton University Center for Human Values: 2  
Radcliffe Institute for Advanced Study: 6  
Renaissance Society of America: 1

*Faculty current as of Fall 2019. Source Academic Analytics awards matches full data (release AAD2018.07.01535). Awards as of 6/29/2020.*

## UCI Distinguished Professors

Aijaz Ahmad, *UCI Distinguished Professor of Comparative Literature*

Hoda Anton-Culver, *UCI Distinguished Professor of Epidemiology*

Diran Apelian, *UCI Distinguished Professor of Materials Science and Engineering*

V. Ara Apkarian, *UCI Distinguished Professor of Chemistry*

Kyriacos Athanasiou, *UCI Distinguished Professor of Biomedical Engineering*

Satya N. Atluri, *UCI Distinguished Professor Emeritus of Mechanical and Aerospace Engineering*

John C. Avise, *UCI Distinguished Professor of Ecology and Evolutionary Biology*

Pierre Baldi, *UCI Distinguished Professor of Computer Science*

Tallie Z. Baram, *UCI Distinguished Professor of Pediatrics*

Alan Barbour, *UCI Distinguished Professor of Microbiology and Molecular Genetics*

Christopher Barty, *UCI Distinguished Professor of Physics and Astronomy*

Frank D. Bean, *UCI Distinguished Professor of Sociology; Economics; Education*

Ermanno Bencivenga, *UCI Distinguished Professor Emeritus of Philosophy*

Michael Berns, *UCI Distinguished Professor of Surgery*

Donald R. Blake, *UCI Distinguished Professor of Chemistry*

Andrew Borovik, *UCI Distinguished Professor of Chemistry*

Philip Bromiley, *UCI Distinguished Professor of Business*

Jan Brueckner, *UCI Distinguished Professor of Economics*

William E. Bunney, Jr., *Della Martin Chair in Psychiatry and UCI Distinguished Professor Emeritus of Psychiatry and Human Behavior*

Michael D. Cahalan, *UCI Distinguished Professor of Physiology and Biophysics*

Michael Carey, *UCI Distinguished Professor of Computer Science*

Ronald Carson, *UCI Distinguished Professor of English*

Leo Chavez, *UCI Distinguished Professor of Anthropology*

Jerome Christensen, *UCI Distinguished Professor Emeritus of English*

Olivier Civelli, *UCI Distinguished Professor of Pharmacology*

Ralph Clayman, *UCI Distinguished Professor of Urology*

Robert Corn, *UCI Distinguished Professor of Chemistry*

Carl Cotman, *UCI Distinguished Professor of Neurology*

Imran Currim, *UCI Distinguished Professor of Business*

Rina Dechter, *UCI Distinguished Professor of Computer Science*

Luis De La Maza, *UCI Distinguished Professor of Pathology*

Joseph Dimento, *UCI Distinguished Professor of Professor*

Barbara A. Doshier, *UCI Distinguished Professor of Cognitive Sciences*

Michael V. Drake, *UCI Distinguished Professor of Ophthalmology*

Ellen Druffel, *UCI Distinguished Professor of Earth System Science*

Greg Duncan, *UCI Distinguished Professor of Education; Economics; and Psychology and Social Behavior*

Nikil Dutt, *UCI Distinguished Professor of Computer Science*

Jacquelynn S. Eccles, *UCI Distinguished Professor of Education; Psychology and Social Behavior*

Said E. Elghobashi, *UCI Distinguished Professor of Mechanical and Aerospace Engineering*

William J. Evans, *UCI Distinguished Professor of Chemistry*

George Farkas, *UCI Distinguished Professor of Education*

Howard Federoff, *UCI Distinguished Professor of Neurology*

Barbara J. Finlayson-Pitts, *Director of AirUCI and UCI Distinguished Professor of Chemistry*

Zachary Fisk, *UCI Distinguished Professor of Physics and Astronomy*

Matthew Foreman, *UCI Distinguished Professor of Mathematics*

Efi Foufoula-Georgiou, *UCI Distinguished Professor of Civil and Environmental Engineering*

Steven Frank, *UCI Distinguished Professor of Ecology and Evolutionary Biology*

Christine Gall, *UCI Distinguished Professor of Anatomy and Neurobiology*

Bryant Garth, *UCI Distinguished Professor Emeritus of Law*

Jean-Luc Gaudiot, *UCI Distinguished Professor of Electrical Engineering and Computer Science*

Tryphon Georgiou, *UCI Distinguished Professor of Mechanical and Aerospace Engineering*

Margaret Gilbert, *UCI Distinguished Professor of Philosophy*

Charles Gabe, *UCI Distinguished Professor of Molecular Biology and Biochemistry*

David Golberg, *UCI Distinguished Professor of Comparative Literature*

Steven Goldstein, *UCI Distinguished Professor of Physiology and Biophysics*

Michael Goodrich, *UCI Distinguished Professor of Computer Sciences*

Enrico Gratton, *UCI Distinguished Professor of Biomedical Engineering*

Sheldon Greenfield, *UCI Distinguished Professor of Medicine*

Bernard Grofman, *UCI Distinguished Professor of Political Science*

Stephan Hanessian, *UCI Distinguished Professor of Pharmaceutical Sciences*

John Hemminger, *UCI Distinguished Professor of Chemistry*

David Hirshleifer, *UCI Distinguished Professor of Business*

Wilson Ho, *UCI Distinguished Professor of Physics and Astronomy*

Ramesh Jain, *UCI Distinguished Professor of Computer Sciences*

Anthony James, *UCI Distinguished Professor of Microbiology and Molecular Genetics*

Svetlana Jitomirskaya, *UCI Distinguished Professor of Mathematics*

Pramod Khargonekar, *UCI Distinguished Professor of Electrical Engineering and Computer Science*

Abel Klein, *UCI Distinguished Professor of Mathematics*

Judith Kroll, *UCI Distinguished Professor of Language Science*

Arthur Lander, *UCI Distinguished Professor of Developmental and Cell Biology*

Andrew Lankford, *UCI Distinguished Professor of Physics and Astronomy*

Enrique Lavernia, *UCI Provost and UCI Distinguished Professor of Chemical Engineering and Material Science*

Ellis Levin, *UCI Distinguished Professor of Medicine*

Elizabeth F. Loftus, *UCI Distinguished Professor of Psychology and Social Behavior; Cognitive Sciences; Criminology, Law and Society; School of Law*

Lar Lubovitch, *UCI Distinguished Professor of Dance*

Gary Lynch, *UCI Distinguished Professor of Psychiatry and Human Behavior*

Penelope J. Maddy, *UCI Distinguished Professor of Logic and Philosophy of Science; Mathematics; Philosophy*

Catherine Malabou, *UCI Distinguished Professor of Comparative Literature*

David B. Malament, *UCI Distinguished Professor Emeritus of Logic and Philosophy of Science*

Mihai Maniutiu, *UCI Distinguished Professor of Drama*

George Marcus, *UCI Distinguished Professor of Anthropology*

James L. McGaugh, *UCI Distinguished Professor Emeritus of Neurobiology and Behavior*

Bruce L. McNaughton, *UCI Distinguished Professor of Neurobiology and Behavior*

Carrie Menkel-Meadow, *UCI Distinguished Professor of Law*

Frank Meyskens, *UCI Distinguished Professor of Medicine*

John Miles, *UCI Distinguished Professor of English*

J. Hillis Miller, *UCI Endowed Chair and UCI Distinguished Professor Emeritus of Comparative Literature; English*

Kristen Monroe, *UCI Distinguished Professor of Political Science*

Shaul Mukamel, *UCI Distinguished Professor of Chemistry; Physics and Astronomy*

Gonzalo Navajas, *UCI Distinguished Professor of Spanish and Portuguese*

David Neumark, *UCI Distinguished Professor of Economics*

Alexandru Nicolau, *UCI Distinguished Professor of Computer Sciences*

Adeli Nyamathi, *UCI Distinguished Professor of Nursing*

Larry E. Overman, *UCI Distinguished Professor of Chemistry*

Ian Parker, *UCI Distinguished Professor of Neurobiology and Behavior*

Jone Pearce, *UCI Distinguished Professor Emeritus of Business*

Reginald Penner, *UCI Distinguished Professor of Chemistry*

Daniele Piomelli, *UCI Distinguished Professor of Anatomy and Neurobiology*

Thomas Poulos, *UCI Distinguished Professor of Molecular Biology and Biochemistry*

Michael Prather, *UCI Distinguished Professor of Earth System Science*

Duncan Pritchard, *UCI Distinguished Professor of Philosophy*

Rajagopalan Radhakrishnan, *UCI Distinguished Professor of English*

Yvonne Rainer, *Claire Trevor Professor and UCI Distinguished Professor Emerita of Art*

Wilfred Recker, *UCI Distinguished Professor of Civil and Environmental Engineering*

Karen S. Rook, *UCI Distinguished Professor Emeritus of Psychological Science*

Michael Rose, *UCI Distinguished Professor of Ecology and Evolutionary Biology*

Karl Rubin, *UCI Distinguished Professor Emeritus of Mathematics*

Vicki Ruiz, *UCI Distinguished Professor of History; Chicano/Latino Studies*

Ruben G. Rumbaut, *UCI Distinguished Professor of Sociology; Criminology, Law and Society; Education*

Michael Ryan, *UCI Distinguished Professor of English*

Scott Rychnovsky, *UCI Distinguished Professor of Chemistry*

Donald G. Saari, *UCI Distinguished Professor of Economics; Logic and Philosophy of Science; Mathematics*

Hamid Said, *UCI Distinguished Professor of Medicine*

Eric Saltzman, *UCI Distinguished Professor of Earth System Science*

Paolo Sassone-Corsi, *UCI Distinguished Professor of Biological Chemistry*

Richard Schoen, *UCI Distinguished Professor of Mathematics*

Gabriele Schwab, *UCI Distinguished Professor of Comparative Literature*

Bert L. Semler, *UCI Distinguished Professor of Microbiology and Molecular Genetics*

Kenneth J. Shea, *UCI Distinguished Professor of Chemistry; Chemical Engineering and Materials Science*

Alice Silverberg, *UCI Distinguished Professor Emeritus of Mathematics*

William Sirignano, *UCI Distinguished Professor of Mechanical and Aerospace Engineering*

Brian Skyrms, *UCI Distinguished Professor of Logic and Philosophy of Science*

David W. Smith, *UCI Distinguished Professor of Philosophy*

David A. Snow, *UCI Distinguished Professor Emeritus of Sociology*

Etel Solingen, *UCI Distinguished Professor of Political Science*

Soroosh Sorooshian, *UCI Distinguished Professor of Civil and Environmental Engineering*

George Sperling, *UCI Distinguished Professor Emeritus Cognitive Sciences*

Eric J. Stanbridge, *UCI Distinguished Professor Emeritus of Microbiology and Molecular Genetics*

Oswald Steward, *UCI Distinguished Professor of Neurobiology and Behavior*

Andre Tenner, *UCI Distinguished Professor of Molecular Biology and Biochemistry*

Julian Thayer, *UCI Distinguished Professor of Psychological Science*

Ngugi Wa Thiong'O, *UCI Distinguished Professor of Comparative Literature: English*

Steven C. Topik, *UCI Distinguished Professor Emeritus of History*

Judith Treas, *UCI Distinguished Professor of Sociology*

Chen Tsai, *UCI Distinguished Professor of Electrical Engineering and Computer Science*

Gene Tsudik, *UCI Distinguished Professor of Computer Science*

Vijay Vazirani, *UCI Distinguished Professor of Computer Science*

Steven R. White, *UCI Distinguished Professor of Physics and Astronomy*

H. Kumar Wickramasinghe, *UCI Distinguished Professor of Electrical Engineering and Computer Science*

Samuel Wilson, *UCI Distinguished Professor Emeritus of Surgery*

## Faculty

Kevork N. Abazajian, Ph.D. University of California, San Diego, *Professor of Physics and Astronomy*

M. Ackbar Abbas, M.Phil. University of Hong Kong, *Professor of Comparative Literature* (Hong Kong culture and postcolonialism, visual culture, architecture and cinema, cultural theory, globalization)

Pablo J. Abbona, M.D. National University of Cuyo, *Health Sciences Clinical Professor of Radiological Sciences*

Geoffrey W. Abbott, Ph.D. University of London, *Senior Associate Dean for Academic Personnel and Vice Dean for Basic Science Research and Professor of Physiology and Biophysics; Physiology and Biophysics*

Hermelinda G. Abcede, M.D. Medical College of Wisconsin, *Health Sciences Assistant Clinical Professor of Neurology*

Mohammad Javad Abdolhosseini Qomi, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Civil and Environmental Engineering* (mechanics and physics of multi-scale porous materials, nano- and meso-chemo-mechanics, engineering advanced materials for sustainable infrastructures)

Nadine Abi-Jaoudeh, M.D. University of Montreal, *Professor of Radiological Sciences*

Tayloria Adams, Ph.D. Michigan Technological University, *Assistant Professor of Chemical and Biomolecular Engineering* (dielectrophoresis, microfluidic devices, stem cells, biomarker development, cell membrane biophysics, cell sorting)

Adeyemi Adeleye, Ph.D. University of California, Santa Barbara, *Assistant Professor of Civil and Environmental Engineering* (water/environmental chemistry, environmental nanotechnology, pollution remediation, fate and effects of emerging contaminants)

Felice C. Adler-Shohet, M.D. Vanderbilt University, *Health Sciences Associate Clinical Professor of Pediatrics*

Behnoosh Afghani, M.D. University of Southern California, *Health Sciences Clinical Professor of Pediatrics*

Neerja Aggarwal, Ph.D. University of California, Irvine, *Lecturer of Economics*

Amir Aghakouchak, Ph.D. University of Stuttgart, *Professor of Civil and Environmental Engineering* (hydrology, climatology, remote sensing of environment, climate extremes, compound and cascading hazards, climate change, stochastic modeling, water resources management)

Hamidreza Aghasi, Ph.D. Cornell University, *Assistant Professor of Electrical Engineering and Computer Science* (analog circuit design, mm-wave and terahertz integrated circuits, high resolution integrated sensing and imaging, neuromorphic computation, emerging device technologies)

Nancy M. Aguilar-Roca, Ph.D. University of California, San Diego, *Associate Professor of Teaching of Ecology and Evolutionary Biology*

Aijaz Ahmad, *Distinguished Professor of Comparative Literature* (critical theory, world literature, marxism, tricontinental social thought)

Iftekhar Ahmed, Ph.D. Oregon State University, *Assistant Professor of Informatics* (data mining, software engineering, software testing and analysis, software maintenance, empirical studies)

Zahra G. Ahmed, Ph.D. University of California, Irvine, *Senior Lecturer of Undergraduate Education*

Jane C. Ahn, M.D. City University of New York, Mount Sinai, *Health Sciences Associate Clinical Professor of Anesthesiology and Perioperative Care*

June Ahn, Ph.D. University of Southern California, *Associate Professor of Education*

Kyle Ahn, M.D. New York Medical College, *Vice Chair for Academic Affairs and Health Sciences Associate Clinical Professor of Anesthesiology and Perioperative Care*

Dennis Aigner, Ph.D. University of California, Berkeley, *Professor Emeritus of Paul Merage School of Business*

Shlomit Aizik, Ph.D. Tel Aviv University, *Associate Professor of Pediatrics*

Kei Akagi, B.A. International Christian University, *Professor of Music; Asian American Studies*

Takeo Akasaki, Ph.D. University of California, Los Angeles, *Professor Emeritus of Mathematics* (ring theory)

Yama Akbari, Ph.D. University of California, Irvine, *Assistant Professor of Neurology; Neurological Surgery*

Mohammad A. Al Faruque, Ph.D. University of Kaiserslautern, *Chair of Emulex Career Development and Associate Professor of Electrical Engineering and Computer Science; Computer Science; Mechanical and Aerospace Engineering* (cyber-physical systems, internet of things, embedded systems, CPS security)



Samar Al-Bulushi, Ph.D. Yale University, *Assistant Professor of Anthropology* (surveillance, policing, and militarized urbanisms; Islam, Africa, and the racialized geopolitics of the war on terror; elites, diplomacy, and transnational governance)

Yousuf Al-Bulushi, Ph.D. University of North Carolina at Chapel Hill, *Assistant Professor of Global and International Studies*

Amal Alachkar, Ph.D. University of Manchester, *Associate Professor of Teaching of Pharmaceutical Sciences* (neurotransmitter systems, molecular pharmacology, neuropsychopharmacology)

Nurudeen O. Alao, Ph.D. Northwestern University, *Lecturer of Social Sciences*

Bruce Albala, Ph.D. Syracuse University, *Associate Dean of Innovation of Clinical Trials and Adjunct Professor of Neurology*

Lonnie R. Alcaraz, M.F.A. University of California, Irvine, *Professor of Drama* (lighting design, digital imaging)

Navid Alem, M.D. University of California, Irvine, *Health Sciences Associate Clinical Professor of Anesthesiology and Perioperative Care*

Jonathan Alexander, Ph.D. Louisiana State University, *Associate Dean, Division of Undergraduate Education and Campus Writing Coordinator and Chancellor's Professor of English; Culture and Theory; Education; Gender and Sexuality Studies; Informatics* (writing studies, sexuality studies, queer theory, new media studies)

Nicolaos G. Alexopoulos, Ph.D. University of Michigan, *Professor Emeritus of Electrical Engineering and Computer Science* (high-frequency integrated circuit antennas, wireless communication, materials)

Shannon L. Alfaro, M.S. University of California, Irvine, *Continuing Lecturer of Computer Science* (design/analysis of combinational and sequential systems using SSI/MSI/LSI modules, hardware/firmware implementation of algorithms)

Isabel M. Algaze Gonzalez, M.D. University of Puerto Rico, *Health Sciences Assistant Clinical Professor of Emergency Medicine*

Michael T. Alkire, M.D. University of California, Los Angeles, *Professor in Residence of Anesthesiology and Perioperative Care*

David Allan, Choreographer/Former Soloist, National Ballet of Canada; Choreographer, ballet companies, operas, film, and television, *Professor Emeritus of Dance* (ballet, pas de deux, choreography)

Jun F. Allard, Ph.D. University of British Columbia, *Associate Professor of Mathematics; Physics and Astronomy* (mathematical and computational biology)

Bobbie J. Allen, Ph.D. University of Washington, *Lecturer of English*

Elizabeth G. Allen, Ph.D. University of Michigan, *Associate Professor of English; Comparative Literature; European Languages and Studies; Religious Studies* (Chaucer, Gower, 15th century poetry; exemplary literature, romance, chronicle, episodic form; intersections between ethics and politics, politics and religion; hospitality, sovereignty, legal and constitutional history of England)

Steven D. Allison, Ph.D. Stanford University, *Professor of Ecology and Evolutionary Biology; Earth System Science*

Ana Maria Amar Sanchez, Ph.D. University of Buenos Aires, *Professor Emerita of Spanish and Portuguese*

Edwin Amenta, Ph.D. University of Chicago, *Professor of Sociology; Political Science* (political sociology, historical and comparative sociology, social movements, social policy)

Alpesh N. Amin, M.D. M.B.A. Northwestern University, *Department Chair and Thomas and Mary Cesario Endowed Chair in Medicine and Professor of Medicine; Biomedical Engineering; Paul Merage School of Business; Program in Public Health; Radiological Sciences*

Eyal Amiran, Ph.D. University of Virginia, *Professor of Comparative Literature* (digital media theory, twentieth-century literature, narrative and textual theory, psychoanalysis, modern and postmodern intellectual history)

Animashree Anandkumar, Ph.D. Cornell University, *Assistant Professor of Computer Science* (statistical inference and learning of graphical models, scalable network algorithms)

Rhea Anastas, Ph.D. The Graduate Center of The City University of New York, *Associate Professor of Art* (20th century experimentalism in the visual arts, critical theory, cultural theory)

Arash Anavim, M.D. University of Tehran, *Health Sciences Clinical Professor of Radiological Sciences*

Bogi Andersen, M.D. University of Iceland, *Professor of Medicine; Biological Chemistry*

Aileen J. Anderson, Ph.D. University of California, Irvine, *Director of the Sue and Bill Gross Stem Cell Research Center and Professor of Physical Medicine and Rehabilitation; Anatomy and Neurobiology*



Michael Andreasen, M.F.A. University of California, Irvine, *Lecturer of English*

Katherine M. Andreeff, M.D. Wayne State University, *Health Sciences Associate Clinical Professor of Pediatrics*

Ioan Andricioaei, Ph.D. Boston University, *Professor of Chemistry; Physics and Astronomy* (chemical biology, physical chemistry and chemical physics, theoretical and computational)

Alfredo H.-S. Ang, Ph.D. University of Illinois at Urbana-Champaign, *Professor Emeritus of Civil and Environmental Engineering* (structural and earthquake engineering, risk and reliability engineering)

Ara Apkarian, Ph.D. Northwestern University, *UCI Distinguished Professor of Chemistry* (physical chemistry and chemical physics)

Kevin H. Appel, M.F.A. University of California, Los Angeles, *Department Chair and Executive Director of University Art Galleries and Professor of Art* (painting)

Ramesh D. Arasasingham, Ph.D. University of California, Davis, *Professor of Teaching of Chemistry* (chemical education and inorganic chemistry)

Joseph Arditti, Ph.D. University of Southern California, *Professor Emeritus of Developmental and Cell Biology* (developmental physiology of orchids)

Shane Ardo, Ph.D. Johns Hopkins University, *Associate Professor of Chemistry; Chemical and Biomolecular Engineering; Materials Science and Engineering* (inorganic and organometallic, physical chemistry and chemical physics, polymer, materials, nanoscience)

Elham Arghami, M.D. Mashhad University of Medical Sciences, *Health Sciences Assistant Clinical Professor of Family Medicine*

Jeffrey Armstrong, M.D. University of South Carolina, *Health Sciences Associate Clinical Professor of Pediatrics*

Kavita Arora, Ph.D. University of Bombay, *Professor of Developmental and Cell Biology* (Drosophila development; TGF- $\beta$  signal transduction; cell signaling)

Antonio C. Arrieta, M.D. Cayetano Heredia University, *Health Sciences Clinical Professor of Pediatrics*

Jeffrey S. Arroyo, M.D. University of California, Los Angeles, *Health Sciences Assistant Clinical Professor of Family Medicine*

Vellore Arthi, Ph.D. University of Oxford, *Assistant Professor of Economics*

Richard Arum, Ph.D. University of California, Berkeley, *Dean of the School of Education and Professor of Education; Criminology, Law and Society; Sociology*

Muhammad Aslam, M.D. Punjab University, *Health Sciences Clinical Professor of Pediatrics*

Dana W. Aswad, Ph.D. University of California, Berkeley, *Professor Emeritus of Molecular Biology and Biochemistry*

Plamen Atanassov, Ph.D. Bulgarian Academy of Sciences, *UCI Chancellor's Professor of Chemical and Biomolecular Engineering; Chemistry; Materials Science and Engineering* (electrocatalysis and electrocatalysts for energy conversion processes; bio-electrocatalysis and energy harvesting systems)

Kyriacos Athanasiou, Ph.D. Columbia University, *Henry Samueli Chair in Engineering and Director of DELTAi (Directing Engineering and Life Science Translational Advances at Irvine) and Distinguished Professor of Biomedical Engineering* (understanding and enhancing the healing processes of musculoskeletal tissues as well as the body's cartilaginous tissues, effecting translation of engineering innovations to clinical use, especially in terms of instruments and devices)

Satya N. Atluri, ScD Massachusetts Institute of Technology, *Professor Emeritus of Mechanical and Aerospace Engineering*

Peter R. Atsatt, Ph.D. University of California, Los Angeles, *Professor Emeritus of Ecology and Evolutionary Biology*

Scott Atwood, Ph.D. University of Oregon, *Assistant Professor of Developmental and Cell Biology; Dermatology*

Stephanie Au, M.S.N. California State University, Long Beach, *Health Sciences Assistant Clinical Professor of Nursing*

Luis Avilés, Ph.D. Brown University, *Professor of Spanish and Portuguese* (Golden Age literature and critical theory)

John C. Avise, Ph.D. University of California, Davis, *UCI Distinguished Professor of Ecology and Evolutionary Biology*

Sarah Awad, M.F.A. University of California, Los Angeles, *Assistant Professor of Teaching of Art* (drawing, painting)

Ender Ayanoglu, Ph.D. Stanford University, *Professor of Electrical Engineering and Computer Science* (communication systems, communication theory, communication networks)

Manny Azizi, Ph.D. University of Massachusetts, *Associate Professor of Ecology and Evolutionary Biology*

Nader Bagherzadeh, Ph.D. University of Texas at Austin, *Professor of Electrical Engineering and Computer Science; Computer Science* (parallel processing, computer architecture, computer graphics, memory systems, 3-D ICs, heterogeneous computing, low-power processing)

Donna G. Baick, M.D. Finch University of Health Sciences, The Chicago School of Medicine, *Health Sciences Associate Clinical Professor of Obstetrics and Gynecology*

Drew Bailey, Ph.D. University of Missouri, *Associate Professor of Education; Cognitive Sciences; Psychological Science*

Stanley Bailey, Ph.D. University of California, Los Angeles, *Professor of Sociology; Religious Studies* (race and ethnicity, religion, immigration, Latin America)

Rachel Baker, Ph.D. Stanford University, *Assistant Professor of Education*

Brigitte Baldi, Ph.D. Massachusetts Institute of Technology, *Lecturer of Statistics*

Pierre F. Baldi, Ph.D. California Institute of Technology, *Director of the Institute for Genomics and Bioinformatics and Distinguished Professor of Computer Science; Biological Chemistry; Biomedical Engineering; Developmental and Cell Biology; Mathematics* (artificial intelligence and machine learning, biomedical informatics, databases and data mining, environmental informatics, statistics and statistical theory)

Etienne Balibar, Ph.D. Catholic University of Nijmegen, *Professor Emeritus of French* (political philosophy, critical theory, epistemology of the social sciences, ethics)

Nina Bandelj, Ph.D. Princeton University, *Professor of Sociology* (economic sociology, culture, organizations, social networks, political economy, globalization, social change, central and eastern Europe)

Tirtha Banerjee, Ph.D. Duke University, *Assistant Professor of Civil and Environmental Engineering* (atmospheric boundary layer dynamics, turbulent fluid dynamics, land/water/vegetation - atmosphere interaction, wildfires, vegetation dynamics, carbon and water cycles, hydrology, wetlands and terrestrial aquatic interfaces)

Fayez M. Bany-Mohammed, M.D. University of Jordan, *Health Sciences Clinical Professor of Pediatrics*

Tallie Z. Baram, M.D., Ph.D. University of Miami, *Weizmann Institute of Science and Danette 'Dee Dee' Shepard Chair in Neurological Studies and Distinguished Professor of Pediatrics; Anatomy and Neurobiology; Neurology; Physiology and Biophysics*

Vladimir Baranovsky, Ph.D. University of Chicago, *Professor of Mathematics* (algebra and number theory)

Edward Barawid, D.O. Western University of Health Sciences, *Health Sciences Assistant Clinical Professor of Physical Medicine and Rehabilitation*

Alan G. Barbour, M.D. Tufts University, *Distinguished Professor of Microbiology and Molecular Genetics; Ecology and Evolutionary Biology; Medicine*

Lee Bardwell, Ph.D. Stanford University, *Professor of Developmental and Cell Biology* (intracellular signaling in development and disease)

Stephen F. Barker, Ph.D. University of Arizona, *Dean of the Claire Trevor School of the Arts and Professor of Drama* (post-modern theatre, Beckett, critical theory)

Stephen A. Barney, Ph.D. Harvard University, *Professor Emeritus of English*

Jeffrey A. Barrett, Ph.D. Columbia University, *Professor of Logic and Philosophy of Science; Philosophy*

Cristobal Barrios, M.D. University of Miami, *Assistant Dean of Admissions and Health Sciences Clinical Professor of Surgery*

James D. Barry, M.D. Uniformed Services University, *Health Sciences Clinical Professor of Emergency Medicine*

Scott Bartell, Ph.D. University of California, Davis, *Associate Professor of Program in Public Health; Environmental Health Sciences; Statistics*

Aaron J. Barth, Ph.D. University of California, Berkeley, *Professor of Physics and Astronomy*

Jami Bartlett, Ph.D. University of California, Berkeley, *Associate Professor of English* (The 19th-Century Novel, literature and philosophy, narrative theory)

Christopher P.J. Barty, Ph.D. Stanford University, *Distinguished Professor of Physics and Astronomy*

Steven W. Barwick, Ph.D. University of California, Berkeley, *Professor of Physics and Astronomy*

Victoria Basolo, Ph.D. University of North Carolina at Chapel Hill, *Professor of Urban Planning and Public Policy*

Cynthia M. Bassham, M.F.A. American Conservatory Theatre, *Associate Professor of Teaching of Drama* (voice, speech for actors, acting)

Anjan S. Batra, M.D. Ohio State University, *Professor of Pediatrics*

Amy Bauer, Ph.D. Yale University, *Associate Professor of Music*

Emily L. Baum, Ph.D. University of California, San Diego, *Associate Professor of History; Religious Studies* (modern Chinese history, history of medicine)

Christopher Bauman, Ph.D. University of Illinois at Chicago, *Associate Professor of Paul Merage School of Business*

Frank D. Bean, Ph.D. Duke University, *UCI Distinguished Professor of Sociology; Economics; Education* (international migration, demography, Mexican immigration, racial and ethnic relations, economic sociology, family)

Robert J. Beck, Ph.D. University of Chicago, *Senate Emeritus of Education*

Henry J. Becker, Ph.D. Johns Hopkins University, *Professor Emeritus of Education*

Matthew N. Beckmann, Ph.D. University of Michigan, *Associate Professor of Political Science* (presidency, congress, interest groups, mass media, and politics)

Haroutune Bedelian, M.A. Royal Academy of Arts, *Professor of Music*

Lorna Griffitt Bedelian, D.M.A. Indiana University, *Professor of Teaching of Music*

Kevin T. Beier, Ph.D. Harvard University, *Assistant Professor of Physiology and Biophysics; Pharmaceutical Sciences*

D. Bell, Ph.D. University of California, Berkeley, *Professor Emeritus of Economics*

James D. Belluzzi, Ph.D. University of Chicago, *Adjunct Professor of Pharmaceutical Sciences*

Catherine Benamou, Ph.D. New York University, *Associate Professor of Film and Media Studies; Culture and Theory; Visual Studies* (Hispanophone and Lusophone cinema and television, U.S. Latino media, Orson Welles and maverick cinema, transnational flows, spectatorship, cinematic memory and cultures of preservation)

Claudia Benavente, Ph.D. University of Arizona, *Assistant Professor of Pharmaceutical Sciences; Developmental and Cell Biology* (genetics, epigenetics, cancer, pediatric cancer, retinoblastoma, osteosarcoma)

Ruth M. Benca, M.D. Ph.D. University of Chicago, *Department Chair and Professor of Psychiatry and Human Behavior; Neurobiology and Behavior*

Ermanno Bencivenga, Ph.D. University of Toronto, *Professor of Philosophy; Humanities*

Miriam Bender, Ph.D. University of San Diego, *Assistant Professor of Nursing*

Gregory A. Benford, Ph.D. University of California, San Diego, *Professor Emeritus of Physics and Astronomy*

Lbachir Benmohamed, Ph.D. Pasteur Institute, *Professor of Ophthalmology*

Albert F. Bennett, Ph.D. University of Michigan, *Professor Emeritus of Ecology and Evolutionary Biology*

Frances Bennett, B.F.A. University of California, Irvine, *Lecturer of Music*

Houri Berberian, Ph.D. University of California, Los Angeles, *Director of the Armenian Studies Program and Meghrouni Family Chair in Armenian Studies and Professor of History; Religious Studies* (modern Armenian history, Middle East history)

Bruce G. Berg, Ph.D. Indiana University, *Associate Professor of Cognitive Sciences* (audition, auditory attention, psychophysics of complex sounds, computational models of hearing)

Jill Berg, Ph.D. University of Pittsburgh, *Professor Emerita of Nursing*

Alice C. Berghof, Ph.D. University of California, Irvine, *Lecturer of Humanities; English*

Oliver G. Berghof, Ph.D. University of California, Irvine, *Lecturer of Humanities*

Hillary Berk, Ph.D. University of California, Berkeley, *Assistant Professor of Teaching of Criminology, Law and Society* (sociology of law/law and society, gender, family, reproduction and surrogacy, law and emotion, civil rights, dispute resolution)

Rudi C. Berkelhamer, Ph.D. University of California, Berkeley, *Professor of Teaching Emerita of Ecology and Evolutionary Biology*

Michael W. Berman, M.D. George Washington University, *Professor Emeritus of Obstetrics and Gynecology*

Nicole P. Bernal, M.D. Case Western Reserve University, *Health Sciences Associate Clinical Professor of Surgery*

Victoria Bernal, Ph.D. Northwestern University, *Professor of Anthropology; Culture and Theory; Gender and Sexuality Studies; Religious Studies* (gender, war, cyberspace, Islam, transnationalism, Africa)

Hans-Ulrich Bernard, Ph.D. University of Goettingen, *Professor Emeritus of Molecular Biology and Biochemistry; Program in Public Health*

Sven D. Bernecker, Ph.D. Stanford University, *Professor of Philosophy*

Michael W. Berns, Ph.D. Cornell University, *Arnold and Mabel Beckman Chair in Laser Biomedicine and Professor of Surgery; Biomedical Engineering; Developmental and Cell Biology*

Veronica Berrocal, Ph.D. University of Washington, *Associate Professor of Statistics*

Neil J. Bershad, Ph.D. Rensselaer Polytechnic Institute, *Professor Emeritus of Electrical Engineering and Computer Science* (communication and information theory, signal processing)

Elizabeth Bess, Ph.D. University of Utah, *Assistant Professor of Chemistry* (chemical biology)

Nakia C. Best, Ph.D. University of North Carolina at Chapel Hill, *Assistant Professor of Nursing*

Brittany M. Betancourt, B.A. University of California, Irvine, *Senior Lecturer of Undergraduate Education*

Roland Betancourt, Ph.D. Yale University, *Director of the Graduate Program in Visual Studies and Chancellor's Fellow and Associate Professor of Art History; Religious Studies; Visual Studies* (Byzantine and Medieval art, critical and queer theory; histories of race, gender, and sexuality)

Rishi Bhargava, M.D. Indiana University, *Health Sciences Assistant Clinical Professor of Emergency Medicine*

Nitin Narain Bhatia, M.D. Baylor College of Medicine, *Department Chair and Professor of Orthopaedic Surgery*

Jianming Bian, Ph.D. Chinese Academy of Sciences, *Assistant Professor of Physics and Astronomy*

Lubomir Bic, Ph.D. University of California, Irvine, *Professor of Computer Science* (parallel and distributed computing, mobile agents, networks, and distributed systems)

Zuzana Bic, Dr.P.H. Loma Linda University, *Associate Professor of Teaching of Program in Public Health*

Edna E. Biddy, M.D. Universidad Autonoma de Baja California, *Health Sciences Assistant Clinical Professor of Family Medicine*

Anke Biendarra, Ph.D. University of Washington, *Associate Professor of German* (20th- and 21st-century German literature, culture, and film, cultural studies)

John T. Billimek, Ph.D. University of California, Irvine, *Associate Professor of Family Medicine*

Arnold Binder, Ph.D. Stanford University, *Professor Emeritus of Criminology, Law and Society* (research methodology, juvenile delinquency, police organization and methods)

Biraj Bista, M.D. Kasturba Medical College and Hospital, *Health Sciences Assistant Clinical Professor of Radiological Sciences*

Rebecca W. Black, Ph.D. University of Wisconsin-Madison, *Associate Professor of Informatics; Education* (digital media and learning, fan studies)

David Blake, Ph.D. Rutgers, The State University of New Jersey, *Professor Emeritus of Paul Merage School of Business*

Donald R. Blake, Ph.D. University of California, Irvine, *UCI Distinguished Professor of Chemistry* (analytical, atmospheric, environmental)

Josh D. Blank, J.D. Harvard Law School, LL.M. New York University School of Law, *Professor of School of Law*

Sharon B. Block, Ph.D. Princeton University, *Professor of History* (digital humanities, early American, race and sexuality)

Suzanne A. Blum, Ph.D. University of California, Berkeley, *Professor of Chemistry; Chemistry* (inorganic and organometallic, organic and synthetic, physical chemistry and chemical physics, polymer, materials, nanoscience)

Bruce Blumberg, Ph.D. University of California, Los Angeles, *Professor of Developmental and Cell Biology; Biomedical Engineering; Environmental Health Sciences; Pharmaceutical Sciences* (gene regulation by nuclear hormone receptors in vertebrate development physiology, endocrine disruption)

Mathew M. Blurton-Jones, Ph.D. University of California, San Diego, *Associate Professor of Neurobiology and Behavior*

James E. Bobrow, Ph.D. University of California, Los Angeles, *Professor Emeritus of Mechanical and Aerospace Engineering* (robotics, mechatronics, and design optimization)

Maureen E. Bocian, M.D. University of Illinois, *Senate Emerita of Pediatrics; Genetic Counseling*

Hans R. Bode, Ph.D. Yale University, *Professor Emeritus of Developmental and Cell Biology* (molecular basis of pattern formation in Hydra)

Thomas D. Boellstorff, Ph.D. Stanford University, *Professor of Anthropology* (virtual worlds, sexuality, postcoloniality, HIV/AIDS, mass media and popular culture, language and culture, Indonesia, Southeast Asia)

Daniel E. Bogart, Ph.D. University of California, Los Angeles, *Professor of Economics*

Alexander D. Boiko, Ph.D. University of Illinois at Urbana–Champaign, *Assistant Professor of Molecular Biology and Biochemistry*

Scott A. Bollens, Ph.D. University of North Carolina at Chapel Hill, *Drew, Chace and Erin Warmington Chair in the Social Ecology of Peace and International Cooperation and Professor of Urban Planning and Public Policy*

Catherine I. Bolzendahl, Ph.D. Indiana University, *Associate Professor of Sociology* (gender, gender and sexuality studies, the welfare state, political sociology, comparative sociology, family, quantitative methodology)

Anna Boncompagni, Ph.D. University of Roma Tre Italy, *Assistant Professor of Philosophy*

Stephen C. Bondy, Ph.D. University of Birmingham, *Professor of Medicine; Environmental Health Sciences; Program in Public Health*

Boris H. Borazjani, M.D. University of California, Irvine, *Health Sciences Assistant Clinical Professor of Surgery*

Andrew L. Borba, M.F.A. New York University, *Co-Head of Acting and Assistant Professor of Drama* (acting)

Jessica Borelli, Ph.D. Yale University, *Associate Professor of Psychological Science* (developmental psychopathology, attachment, emotion, prevention on mental health problems in children and adolescents)

Peyman Borghei, M.D. Tehran University of Medical Sciences, *Health Sciences Assistant Clinical Professor of Radiological Sciences*

Aaron Bornstein, Ph.D. New York University, *Assistant Professor of Cognitive Sciences* (memory, decision-making, reinforcement learning, neuroimaging, computational cognitive neuroscience)

Jennifer Bornstein, M.F.A. University of California, Los Angeles, *Associate Professor of Art* (photography)

Andrew Borovik, Ph.D. University of North Carolina at Chapel Hill, *Professor of Chemistry* (chemical biology, inorganic and organometallic, organic and synthetic)

Emiliana Borrelli, Ph.D. University of Strasbourg, *Chancellor's Professor of Microbiology and Molecular Genetics; Pharmaceutical Sciences*

Alex Borucki, Ph.D. Emory University, *Associate Professor of History; African American Studies* (African diaspora, early modern Atlantic world, slave trade, colonial Latin America)

Ramin Bostanabad, Ph.D. Northwestern University, *Assistant Professor of Mechanical and Aerospace Engineering* (design under uncertainty, probabilistic machine learning, materials informatics, computational microstructure characterization, topology optimization)

Daniela A. Bota, M.D., Ph.D. Carol Davila University of Medicine and Pharmacy, *Chief Scientific Officer, Center for Clinical Research and Vice Dean for Clinical Research and Associate Professor of Neurology; Neurological Surgery; Pathology and Laboratory Medicine*

Elliot L. Botvinick, Ph.D. University of California, San Diego, *Professor of Surgery; Biomedical Engineering*

Graeme T. Boushey, Ph.D. University of Washington, *Associate Professor of Political Science; Urban Planning and Public Policy* (California politics and statewide elections, American politics, state and federal policy-making, ballot measures and the initiative process)

Geoffrey C. Bowker, Ph.D. University of Melbourne, *Chancellor's and Donald Bren Professor of Informatics; Visual Studies* (values in design, social studies of databases, science and technology studies)

Peter A. Bowler, Ph.D. University of California, Irvine, *Professor of Teaching of Ecology and Evolutionary Biology*

John P. Boyd, Ph.D. University of Michigan, *Professor Emeritus of Anthropology*

Ozdal Boyraz, Ph.D. University of Michigan, *Professor of Electrical Engineering and Computer Science* (integrated optics, silicon photonics, optical communications systems, and microwave photonics)

Elaheh Bozorgzadeh, Ph.D. University of California, Los Angeles, *Professor of Computer Science* (computer architecture and design, design automation and synthesis for embedded systems, VLSI CAD, reconfigurable computing)

Matthew E. Bracken, Ph.D. Oregon State University, *Professor of Ecology and Evolutionary Biology*



Kevin Bradford, Ph.D. University of Florida, *Assistant Professor of Teaching of Paul Merage School of Business* (personal setting, sales management, distribution of firearms, marketing practices of guns, gun culture)

Tonya Bradford, Ph.D. Northwestern University, *Assistant Professor of Paul Merage School of Business* (rituals, market exchange, gift-giving, communities)

Timothy J. Bradley, Ph.D. University of British Columbia, *Professor Emeritus of Ecology and Evolutionary Biology*

Matthew T. Brady, M.D. Tufts University, *Health Sciences Assistant Clinical Professor of Surgery*

William A. Branch, Ph.D. University of Oregon, *Department Chair and Professor of Economics*

Paulo Brando, Ph.D. University of Florida, *Assistant Professor of Physics and Astronomy*

Alexander U. Brandt, M.D. Charite - Universitaetsmedizin Berlin, *Associate Adjunct Professor of Neurology*

Stacy Branham, Ph.D. Virginia Tech, *Assistant Professor of Informatics* (human-computer interaction, design, assistive technology, safe and brave space, well-being, disability, feminism, marginality, inclusion, interdependence)

David A. Brant, Ph.D. University of Wisconsin-Madison, *Professor Emeritus of Chemistry* (biophysical)

Emily M. Brauer, M.A. University of Southern California, *Lecturer of English*

Richard A. Brestoff, M.F.A. New York University, *Professor of Drama* (film and television acting)

Alyssa Brewer, Ph.D. Stanford University, *Associate Professor of Cognitive Sciences; Language Science* (neuroimaging of visual perception, visual deficits, neurological disorders)

Gregory Brewer, Ph.D. University of California, San Diego, *Adjunct Professor of Biomedical Engineering* (neuronal networks, decoding brain learning and memory, brain-inspired computing, Alzheimer's disease, brain aging, neuron cell culture)

Adriana D. Briscoe, Ph.D. Harvard University, *Professor of Ecology and Evolutionary Biology*

Robert E. Bristow, M.D. M.B.A. University of Southern California; Johns Hopkins University, *Edward J. Quilligan Administrative Chair in Obstetrics and Gynecology and Philip J. Di Saia, M.D., Prestigious Chair in Gynecologic Oncology and Department Chair and Professor of Obstetrics and Gynecology*

David Brodbeck, Ph.D. University of Pennsylvania, *Professor of Music; European Languages and Studies*

James P. Brody, Ph.D. Princeton University, *Associate Professor of Biomedical Engineering* (bioinformatics, micro-nanoscale systems)

Philip Bromiley, Ph.D. Carnegie Mellon University, *Professor of Paul Merage School of Business*

Yvette Brooks, M.D. University of Cincinnati, *Health Sciences Assistant Clinical Professor of Emergency Medicine*

Liane R. Brouillette, Ph.D. University of Colorado Boulder, *Professor of Education* (educational policy, arts-based learning)

Ashley Broussard, M.D. Tulane University, *Health Sciences Associate Clinical Professor of Anesthesiology and Perioperative Care*

Jacob Brouwer, Ph.D. Massachusetts Institute of Technology, *Professor of Mechanical and Aerospace Engineering; Civil and Environmental Engineering* (fuel cells, energy systems dynamics, electrochemical systems design and analysis, chemical kinetics, reacting flows)

Donald J. Brown, Ph.D. University of Colorado Denver, *Senate Emeritus of Ophthalmology*

Sara Brown, Ed.D. College of Saint Mary, *Health Sciences Assistant Clinical Professor of Nursing*

Susan K. Brown, Ph.D. University of Washington, *Professor of Sociology; Religious Studies* (immigration, inequality, urban sociology)

Andrew Browne, M.D., Ph.D. University of Cincinnati, *Health Sciences Assistant Clinical Professor of Ophthalmology; Biomedical Engineering*

David Brownstone, Ph.D. University of California, Berkeley, *Professor Emeritus of Economics*

Tim-Allen Bruckner, Ph.D. University of California, Berkeley, *Associate Professor of Program in Public Health; Urban Planning and Public Policy*

Jan K. Brueckner, Ph.D. Stanford University, *Distinguished Professor of Economics; Urban Planning and Public Policy*

Taylor J. Brueseke, M.D. Pennsylvania State University, *Health Sciences Assistant Clinical Professor of Obstetrics and Gynecology*

Daniel R. Brunstetter, Ph.D. University of California, Davis, *Associate Professor of Political Science; European Languages and Studies* (political theory, international relations, French political thought)

Peter J. Bryant, Ph.D. University of Sussex, *Research Professor and Professor Emeritus of Developmental and Cell Biology* (tumor-suppressor genes of *Drosophila* and humans)

Susan V. Bryant, Ph.D. University of London, *Professor Emerita of Developmental and Cell Biology* (molecular basis of limb development and regeneration)

David K. Buchbinder, M.D. Medical College of Wisconsin, *Health Sciences Associate Professor of Pediatrics*

Michael J. Buchmeier, Ph.D. McMaster University, *Professor of Medicine; Microbiology and Molecular Genetics; Molecular Biology and Biochemistry*

Long T. Bui, Ph.D. University of California, San Diego, *Assistant Professor of Global and International Studies*

Rémi Buisson, Ph.D. Université Laval, *Assistant Professor of Biological Chemistry; Pharmaceutical Sciences*

James S. Bullock, Ph.D. University of California, Santa Cruz, *Dean of the School of Physical Sciences and Professor of Physics and Astronomy*

Steven J. Bunch, M.D. University of Utah, *Health Sciences Assistant Clinical Professor of Emergency Medicine*

David A. Buote, Ph.D. Massachusetts Institute of Technology, *Professor of Physics and Astronomy*

Dan L. Burk, J.D. Arizona State University, *UCI Chancellor's Professor of School of Law*

Carol M. Burke, Ph.D. University of Maryland, College Park, *Professor Emerita of English; Religious Studies* (literary and cultural theory, literary journalism, new media studies)

Kieron Burke, Ph.D. University of California, Santa Barbara, *Professor of Chemistry; Physics and Astronomy* (physical chemistry and chemical physics, theoretical and computational)

Leanne Burke, Ed.D. Southern Connecticut State University, *Health Sciences Associate Clinical Professor of Nursing*

Peter J. Burke, Ph.D. Yale University, *Professor of Electrical Engineering and Computer Science; Biomedical Engineering; Materials Science and Engineering* (nano-electronics, bio-nanotechnology)

Amanda Burkhardt, Ph.D. University of California, Irvine, *Assistant Adjunct Professor of Physiology and Biophysics*

Nancy T. Burley, Ph.D. University of Texas at Austin, *Professor of Ecology and Evolutionary Biology*

Keith R. Burnett, M.D. Creighton University, *Health Sciences Clinical Professor of Radiological Sciences*

Joseph E. Burns, M.D. McGill University, *Health Sciences Associate Clinical Professor of Radiological Sciences*

Michael J. Burns, M.D. University of California, Irvine, *Health Sciences Clinical Professor of Emergency Medicine; Medicine*

Ellen S. Burt, Ph.D. Yale University, *Professor Emerita of English* (eighteenth-century French literature and nineteenth-century poetry)

Candace Burton, Ph.D. University of California, San Francisco, *Assistant Professor of Nursing*

Michael L. Burton, Ph.D. Stanford University, *Professor Emeritus of Anthropology*

Anton Burtsev, Ph.D. University of Utah, *Assistant Adjunct Professor of Computer Science* (novel low-latency datacenters, microkernels, virtualization, datacenter environments)

Jorge A. Busciglio, Ph.D. Universidad Nacional de Córdoba, *Professor of Neurobiology and Behavior*

Robin M. Bush, Ph.D. University of Michigan, *Professor Emeritus of Ecology and Evolutionary Biology*

Claudia Buss, Ph.D. McGill University, *Associate Adjunct Professor of Pediatrics*

Andres Bustamante, Ph.D. University of Miami, *Assistant Professor of Education*

Natascha Buswell, Ph.D. Purdue University, *Assistant Professor of Teaching of Mechanical and Aerospace Engineering* (graduate engineering education, faculty development, engineering teaching, engineering education research methods)

Jennifer R. Butler, M.D. University of Virginia, *Health Sciences Associate Clinical Professor of Obstetrics and Gynecology*

John A. Butler, M.D. Loyola University Chicago, *Professor of Surgery*

Carter Butts, Ph.D. Carnegie Mellon University, *Professor of Sociology; Computer Science; Electrical Engineering and Computer Science; Statistics* (mathematical sociology, social networks, quantitative methodology, human judgment and decision making, economic sociology)



Lee Cabatingan, Ph.D. University of Chicago, *Assistant Professor of Criminology, Law and Society; Anthropology* (Caribbean law and sovereignty; construction of authority at the Caribbean Court of Justice)

Michael D. Cahalan, Ph.D. University of Washington, *Department Chair and Distinguished Professor of Physiology and Biophysics*

Lawrence F. Cahill, Ph.D. University of California, Irvine, *Professor of Neurobiology and Behavior; Psychological Science*

Vincent J. Caiozzo, Ph.D. University of California, Irvine, *Professor Emeritus of Orthopaedic Surgery; Environmental Health Sciences*

Kitty C. Calavita, Ph.D. University of Delaware, *Professor Emerita of Criminology, Law and Society* (sociology of law, criminology, social deviance, immigration, inequality)

James L. Calderwood, Ph.D. University of Washington, *Professor Emeritus of English*

Anne L. Calof, Ph.D. University of California, San Francisco, *Professor of Anatomy and Neurobiology; Developmental and Cell Biology*

Alejandro E. Camacho, J.D., LL.M. Harvard University, Georgetown University, *Professor of School of Law; Political Science*

Diane R. Campbell, Ph.D. Duke University, *Professor of Ecology and Evolutionary Biology*

Joan E. Campbell, M.D. University of California, San Diego, *Health Sciences Clinical Professor of Radiological Sciences*

Richard D. Campbell, Ph.D. The Rockefeller University, *Professor Emeritus of Developmental and Cell Biology* (Morphogenesis; biology of Hydra; fractal geometry of biological forms)

Sarah Campbell, M.S. University of California, Irvine, *Health Sciences Assistant Clinical Professor of Nursing*

Shanyce L. Campbell, Ph.D. University of North Carolina at Chapel Hill, *Assistant Professor of Education*

Belinda Campos, Ph.D. University of California, Berkeley, *Associate Professor of Chicano/Latino Studies; Family Medicine; Psychological Science* (culture, relationships, positive emotion, health)

Francis A. Cancian, Ph.D. Harvard University, *Professor Emeritus of Anthropology*

Elizabeth M. Cane, M.F.A. University of California, Los Angeles, *Lecturer of Film and Media Studies*

Matthew P. Canepa, Ph.D. University of Chicago, *Elahe Omidyar Mir-Djali Presidential Chair and Professor of Art History; Religious Studies; Visual Studies* (Achaemenid, Seleucid, Parthian, and Sasanian art and archaeology; Iranian visual cultures and Afro-Eurasian exchange; critical approaches to space, place, landscape, urbanism, and memory)

Hung Cao, Ph.D. University of Texas at Arlington, *Assistant Professor of Electrical Engineering and Computer Science; Biomedical Engineering* (MEMS, sensors, implants, heart disease, neurological disease, wireless biomedical systems)

Penghui Cao, Ph.D. Boston University, *Assistant Professor of Mechanical and Aerospace Engineering; Materials Science and Engineering* (fundamental understanding of the mechanisms by which materials plastically deform and fail, particularly in extreme environments)

Filippo Capolino, Ph.D. University of Florence, *Professor of Electrical Engineering and Computer Science* (optics/electromagnetics in nanostructures and sensors, antennas/microwaves, RF and wireless systems)

Fabio Cappuccini, M.D. University of Bologna, *Health Sciences Clinical Professor of Obstetrics and Gynecology*

Michael Carey, Ph.D. University of California, Berkeley, *Donald Bren Professor of Information & Computer Sciences and Distinguished Professor of Computer Science* (databases and data mining, parallel and distributed systems)

Ronald Carlson, M.A. University of Utah, *Professor Emeritus of English* (creative writing, fiction, contemporary literature, short stories)

Ann Marie Carlton, Ph.D. Rutgers University, *Associate Professor of Chemistry* (atmospheric and environmental, physical chemistry and chemical physics, theoretical and computational)

Joseph C. Carmichael, M.D. University of Missouri-Columbia, *Health Sciences Associate Clinical Professor of Surgery*

F. Lynn Carpenter, Ph.D. University of California, Berkeley, *Professor Emerita of Ecology and Evolutionary Biology*

Juliette A. Carrillo, M.F.A. Yale University, *Assistant Professor of Drama* (directing)

David Carroll, Ph.D. Johns Hopkins University, *Professor Emeritus of French* (critical theory and twentieth-century French literature)

Juli C. Carson, Ph.D. Massachusetts Institute of Technology, *Professor of Art* (art history, critical theory, curatorial practice )

David O. Carter, J.D. University of California, Los Angeles, *Lecturer of Political Science*

Marie Cartier, Ph.D. Claremont Graduate University, *Lecturer of Film and Media Studies*

Jean-Paul Carvalho, Ph.D. Oxford University, *Associate Professor of Economics; Logic and Philosophy of Science; Religious Studies*

Anita Casavantes Bradford, Ph.D. University of California, San Diego, *Associate Professor of Chicano/Latino Studies; Asian American Studies; History* (20th century U.S., U.S. in the world, Cuba and the Caribbean; history of childhood; history of immigration, race and ethnicity; transnational and comparative Latina/o history; religion, politics and social movements)

David W. Casper, Ph.D. University of Michigan, *Associate Professor of Physics and Astronomy*

Dennis R. Castellano, M.F.A. University of California, Irvine, *Professor of Teaching Emeritus of Drama* (music theatre)

Jeanett Castellanos, Ph.D. Washington State University, *Associate Professor of Teaching of Social Sciences*

Larisa T. Castillo, Ph.D. University of California, Irvine, *Lecturer of Humanities*

Elizabeth E. Cauffman, Ph.D. Temple University, *Professor of Psychological Science; Criminology, Law and Society; Education; School of Law* (adolescent development, mental health, juvenile justice, legal and social policy)

Jennifer N. Cech, Ph.D. University of Washington, *Health Sciences Assistant Clinical Professor of Pediatrics; Genetic Counseling*

Bharath Chakravarthy, M.D. Boston University, *Associate Clinical Professor of Emergency Medicine; Program in Public Health*

A. Richard Chamberlin, Ph.D. University of California, San Diego, *Department Chair and Professor Emeritus of Pharmaceutical Sciences; Chemistry* (chemical biology, organic and synthetic)

Mark D. Chambers, M.D. University of Illinois at Urbana–Champaign, *Health Sciences Associate Clinical Professor of Radiological Sciences*

Simone Chambers, Ph.D. Columbia University, *Professor of Political Science* (democratic theory, ethics, secularism, rhetoric, civility, and the public sphere)

Alexandre Chan, Pharm.D. Rutgers University, *Department Chair and Professor of Clinical Pharmacy Practice*

Jefferson Chan, M.D. Ph.D. University of California, San Francisco, *Professor of Pathology and Laboratory Medicine; Environmental Health Sciences*

Gary A. Chanan, Ph.D. University of California, Berkeley, *Professor Emeritus of Physics and Astronomy*

Vishal S. Chandan, M.D. Maharashtra University of Health Sciences, *Health Sciences Clinical Professor of Pathology and Laboratory Medicine*

Nahum D. Chandler, Ph.D. University of Chicago, *Professor of African American Studies; Asian American Studies; Comparative Literature; English; European Languages and Studies* (modern philosophy, intellectual history, history of the human sciences)

Aparna Chandramowlishwaran, Ph.D. Georgia Institute of Technology, *Assistant Professor of Electrical Engineering and Computer Science; Computer Science; Mechanical and Aerospace Engineering* (high-performance computing, domain-specific compilers, algorithm-architecture co-design, data analysis, and scientific computing)

Vanitha Chandrasekhar, Ed.D. University of California, Irvine, *Lecturer of Education* (education technology)

Carrie E. Chandwani, M.D. Chicago Medical School, *Health Sciences Associate Clinical Professor of Emergency Medicine*

Melissa Chang, M.D. University of Alabama, *Health Sciences Assistant Clinical Professor of Anesthesiology and Perioperative Care*

Pei Lin Chang, M.D. Chicago Medical School, *Health Sciences Assistant Clinical Professor of Pediatrics*

Peter Chang, M.D. Northwestern University, *Assistant Professor in Residence of Radiological Sciences; Computer Science; Pathology and Laboratory Medicine*

Wayne Wei Chung Chang, M.D. Saint Louis University, *Health Sciences Clinical Professor of Medicine; Program in Public Health*

Elizabeth C. Chao, M.D. University of California, Irvine, *Assistant Adjunct Professor of Pediatrics; Genetic Counseling*

John Charles Chaput, Ph.D. University of California, Riverside, *Professor of Pharmaceutical Sciences; Chemistry; Molecular Biology and Biochemistry* (chemical and synthetic biology)

Susan T. Charles, Ph.D. University of Southern California, *Department Chair and Professor of Psychological Science* (emotional processes across the adult life span, subjective experience and cognitive processes, health and emotion)

Vinayak Chaturvedi, Ph.D. University of Cambridge, *Associate Professor of History; Culture and Theory; European Languages and Studies; Religious Studies* (modern South Asia, social and intellectual history)

Anthony Chau, M.D. University of California, Los Angeles, *Health Sciences Assistant Clinical Professor of Surgery*

Leo Chavez, Ph.D. Stanford University, *Distinguished Professor of Anthropology* (migration, media, discourse analysis, visual semiotics, medicine)

David Chaylan, M.D. University of Iowa, *Assistant Adjunct Professor of Radiological Sciences*

Allen M. Chen, M.D. Yale University, *Department Chair and Professor of Radiation Oncology*

Chuansheng Chen, Ph.D. University of Michigan, *UCI Chancellor's Professor of Psychological Science; Education* (cross-cultural psychology, adolescent development, cognitive neuroscience, genes and behavior)

Dongbao Chen, Ph.D. China (Beijing) Agricultural University, *Professor of Obstetrics and Gynecology*

Jefferson W. Chen, M.D. Ph.D. Johns Hopkins University, *Health Sciences Clinical Professor of Neurological Surgery*

Jessica Chen, M.A. California State University, Long Beach, *Lecturer of Chinese*

Jiawei Chen, Ph.D. Johns Hopkins University, *Associate Professor of Economics*

Lily K. Chen, D.O. Western University of Health Sciences, *Health Sciences Assistant Clinical Professor of Physical Medicine and Rehabilitation*

Liu Chen, Ph.D. University of California, Berkeley, *Research Professor and Professor Emeritus of Physics and Astronomy*

Long Chen, Ph.D. Pennsylvania State University, *Professor of Mathematics* (applied and computational mathematics)

Lulu Y. Chen, Ph.D. University of California, Irvine, *Assistant Professor of Anatomy and Neurobiology*

Mu-Chun Chen, Ph.D. University of Colorado Boulder, *Professor of Physics and Astronomy*

Nai-Fu Chen, Ph.D. University of California, Los Angeles, *Professor Emeritus of Paul Merage School of Business*

Phang-Lang Chen, Ph.D. University of California, San Diego, *Associate Professor of Biological Chemistry*

Qi Alfred Chen, Ph.D. University of Michigan, *Assistant Professor of Computer Science* (smart systems and IoT)

Tempe K. Chen, M.D. Albert Einstein College of Medicine, *Health Sciences Assistant Clinical Professor of Pediatrics*

Yong Chen, Ph.D. Cornell University, *Associate Dean of Curriculum and Student Services and Professor of History; Asian American Studies; Religious Studies* (Asian American history and immigration, food and culture, U.S./China economic and cultural interactions)

Yunan Chen, Ph.D. Drexel University, *Associate Professor of Informatics; Program in Public Health* (medical informatics, human computer interaction)

Amy H. Cheng, M.D. Georgetown University, *Health Sciences Assistant Clinical Professor of Pediatrics*

Nadia Chernyak, Ph.D. Cornell University, *Assistant Professor of Cognitive Sciences* (cognitive development, social cognition, prosocial behavior, moral cognition, agency and free will, conceptual development)

Alexander L. Chernyshev, Ph.D. Russian Academy of Sciences, *Professor of Physics and Astronomy*

Natalia Chernyshoff, Ph.D. University of California, Davis, *Lecturer of Economics*

Kenneth S. Chew, Ph.D. University of California, Berkeley, *Professor of Teaching of Urban Planning and Public Policy*

James T. Chiampi, Ph.D. Yale University, *Professor Emeritus of Italian; Religious Studies* (Dante and Italian Renaissance)

Chieh L. Chieng, M.F.A. University of California, Irvine, *Lecturer of English*

Theresa Lynn Chin, M.D. Virginia Commonwealth University, *Health Sciences Assistant Clinical Professor of Surgery*

Katherine Chiu, M.D. University of California, Irvine, *Health Sciences Assistant Clinical Professor of Anesthesiology and Perioperative Care*

Ken W. Cho, Ph.D. University of Pennsylvania, *Professor of Developmental and Cell Biology* (TGF- $\beta$  signaling, gene regulatory networks in development)

Eleanore Choate, M.A. California State University, Long Beach, *Lecturer of Music*

Hyunju Choe, M.A. University of Utah, *Lecturer of Korean*

Bernard H. Choi, Ph.D. University of Texas at Austin, *Professor of Surgery; Biomedical Engineering*

Chungmoo Choi, Ph.D. Indiana University, *Associate Professor of Korean Culture; Religious Studies* (women's literature and film, Christianity and ethics, popular culture, anthropology)

Ho Joon Choi, M.D. Seoul National University, *Health Sciences Clinical Professor of Anesthesiology and Perioperative Care*

Michael Choi, Ph.D. University of Wisconsin, Madison, *Assistant Professor of Economics*

Yoon Jae Choi, M.D. Korea University, *Health Sciences Assistant Clinical Professor of Neurology*

Chinsui J. Chou, M.D. University of California, Irvine, *Health Sciences Assistant Clinical Professor of Anesthesiology and Perioperative Care*

Pai H. Chou, Ph.D. University of Washington, *Professor Emeritus of Electrical Engineering and Computer Science* (embedded systems, low-power design, wireless sensing systems, energy harvesting, wearable medical devices, real-time systems, hardware/software co-design)

Vidyanand Choudhary, Ph.D. Purdue University, *Professor of Paul Merage School of Business*

Daniel Chow, M.D. University of California, Los Angeles, *Assistant Professor in Residence of Radiological Sciences; Neurology; Pathology and Laboratory Medicine*

Jerome C. Christensen, Ph.D. Cornell University, *Professor Emeritus of English* (Hollywood motion pictures, corporate authorship, romantic literature)

Eleanor Chu, M.D. New York Medical College, *Health Sciences Assistant Clinical Professor of Radiological Sciences*

Nkiruka Chuba, M.D. University of California, San Francisco, *Health Sciences Assistant Clinical Professor of Obstetrics and Gynecology*

Elizabeth Chuk, Ph.D. University of Washington, *Assistant Professor of Paul Merage School of Business* (financial reporting, consequences of accounting standards, defined benefit pensions, earnings management)

Judith H. Chung, M.D. Ph.D. University of Pennsylvania; University of California, Los Angeles, *Professor of Obstetrics and Gynecology*

Peter J. Chung, M.D. Columbia University, *Health Sciences Assistant Clinical Professor of Pediatrics*

Olivier Cinquin, Ph.D. University College London, *Associate Professor of Developmental and Cell Biology* (mathematical modeling of networks, systems biology)

Olivier Civelli, Ph.D. Swiss Federal Institute of Technology in Zurich, *Professor of Pharmaceutical Sciences; Developmental and Cell Biology* (novel neuroactive molecules, molecular neuropharmacology)

Damon Clark, Ph.D. Oxford University, *Associate Professor of Economics; Urban Planning and Public Policy*

Michael P. Clark, Ph.D. University of California, Irvine, *Professor Emeritus of English*

Michael T. Clegg, Ph.D. University of California, Davis, *Donald Bren Professor and Professor Emeritus of Ecology and Evolutionary Biology*

Patricia Cloud, M.M. University of Southern California, *Lecturer of Music*

Katherine E. Coakley, M.D. Boston University, *Health Sciences Assistant Clinical Professor of Obstetrics and Gynecology*

Melitza J. Cobham-Browne, M.D. Universidad de Panamá, *Health Sciences Clinical Professor of Pediatrics*

Melanie Cocco, Ph.D. Pennsylvania State University, *Associate Professor of Molecular Biology and Biochemistry; Pharmaceutical Sciences*

Amber R. Coffey-Leis, M.D. Johns Hopkins University, *Health Sciences Assistant Clinical Professor of Orthopaedic Surgery; Plastic Surgery*

Allen J. Cohen, M.D. University of Miami, *Health Sciences Clinical Professor of Radiological Sciences*

Robert S. Cohen, D.F.A. Yale University, *Professor Emeritus of Drama* (acting theory, acting, directing)

Susana Cohen-Cory, Ph.D. The Rockefeller University, *Professor of Neurobiology and Behavior*

Benjamin N. Colby, Ph.D. Harvard University, *Professor Emeritus of Anthropology*

Simon A. Cole, Ph.D. Cornell University, *Professor of Criminology, Law and Society; History; School of Law* (science, technology, law, criminal justice)

Rebecca J. Coleman, M.D. University of California, San Francisco, *Health Sciences Associate Clinical Professor of Pediatrics*

Annalisa Coliva, Ph.D. University of St. Andrews, *Professor of Philosophy*

Ian Collier, Ph.D. University of Melbourne, *Professor of History; European Languages and Studies* (Europe and the Muslim world, the French Revolution and the global history of the Revolutionary age)

Penelope R. Collins, Ph.D. University of Toronto, *Associate Professor of Education*

Philip Collins, Ph.D. University of California, Berkeley, *Professor of Physics and Astronomy*

Rachael L. Collins, Ph.D. University of California, Irvine, *Lecturer of English*

Lisa Colosimo, D.O. Midwestern University - Arizona College of Osteopathic Medicine, *Health Sciences Assistant Clinical Professor of Anesthesiology and Perioperative Care*

Freddie Combs, M.D. University of Arizona, *Health Sciences Associate Clinical Professor of Radiological Sciences*

Gilberto Q. Conchas, Ph.D. University of Michigan, *Professor of Education; Asian American Studies; Sociology* (urban education, sociology of education, comparative race and ethnicity)

AnneMarie M. Conley, Ph.D. University of Michigan, *Associate Professor of Education*

Christine Connell, Ph.D. University of California, Irvine, *Lecturer of Humanities*

Ross F. Conner, Ph.D. Northwestern University, *Professor Emeritus of Urban Planning and Public Policy*

Kwasi M. Connor, Ph.D. University of Southern California, *Assistant Professor of Ecology and Evolutionary Biology*

Bridget R. Cooks Cumbo, Ph.D. University of Rochester, *Associate Professor of African American Studies; Art History; Culture and Theory; Visual Studies* (African American art, museum studies, feminist and post-colonial theory)

Miles C. Coolidge, M.F.A. California Institute of the Arts, *Professor of Art* (photography)

Dan M. Cooper, M.D. University of California, San Francisco, *Senior Associate Dean, Clinical Translational Science and Associate Vice Chancellor, Clinical Translational Research and Professor of Pediatrics; Biomedical Engineering; Pharmaceutical Sciences*

Michael Cooper, Ph.D. University of California, Berkeley, *Professor of Physics and Astronomy*

William J. Cooper, Ph.D. University of Miami, *Professor Emeritus of Civil and Environmental Engineering; Urban Planning and Public Policy* (environmental chemistry, advanced oxidation processes for water treatment, aquatic photochemistry of carbon cycling)

Asantha R. Cooray, Ph.D. University of Chicago, *Professor of Physics and Astronomy*

David Copp, Ph.D. University of California, Santa Barbara, *Assistant Professor of Teaching of Mechanical and Aerospace Engineering* (optimal control and estimation, hybrid dynamical systems, energy storage, pedagogy)

Mary Corey, M.A. University of California, Riverside; Certified Professional Labanotator, *Professor of Dance* (dance history, dance notation and reconstruction)

Robert Corn, Ph.D. University of California, Berkeley, *UCI Distinguished Professor of Chemistry; Biomedical Engineering* (analytical, chemical biology, physical chemistry and chemical physics, polymer, materials, nanoscience)

Maria M. Corrada-Bravo, Sc.D. Johns Hopkins University, *Professor in Residence of Neurology; Epidemiology*

Miles Corwin, M.A. University of Missouri-Columbia, *Professor of English* (law enforcement, the criminal justice system, homicide, inner-city education, affirmative action)

Carl W. Cotman, Ph.D. Indiana University, *Professor of Neurology; Neurobiology and Behavior*

N. Edward Coulson, Ph.D. University of California, San Diego, *Professor of Paul Merage School of Business; Economics; Psychological Science*

Ardith Courtney, D.O. University of North Texas, *Health Sciences Associate Clinical Professor of Neurology*

Susan B. Coutin, Ph.D. Stanford University, *Professor of Criminology, Law and Society; Anthropology; Religious Studies* (law, culture, immigration, human rights, citizenship, political activism, Central America)

Alicia Cox, Ph.D. University of California, Riverside, *Assistant Professor of Comparative Literature; English* (19th-century American literature; Native American and Indigenous literature and cultural studies; gender and sexuality studies; queer Indigenous studies; Indigenous feminisms; autobiography; American Indian boarding school studies; settler colonialism)

Elana M. Craemer, M.D. Albert Einstein College of Medicine, *Health Sciences Assistant Clinical Professor of Family Medicine*



Karina S. Cramer, Ph.D. California Institute of Technology, *Professor of Neurobiology and Behavior*

Michael C. Cranston, Ph.D. University of Minnesota, *Department Chair and Professor of Mathematics* (probability)

John L. Crawford, Media Artist and Software Designer, *Professor of Dance; Informatics* (screendance, interactive media, telematic performance, motion capture, digital arts)

Thomas J. Crawford, Ph.D. Harvard University, *Professor of Teaching Emeritus of Psychological Science* (attitude theory and social problems research)

Bridgit O. Crews, Ph.D. University of California, Santa Barbara, *Health Sciences Assistant Clinical Professor of Pathology and Laboratory Medicine*

David H. Cribbs, Ph.D. West Virginia University, *Professor Emeritus of Neurology*

Elizabeth D. Crook, Ph.D. University of California, Santa Cruz, *Assistant Professor of Teaching of Earth System Science*

Roderic N. Crooks, Ph.D. University of California, Los Angeles, *Assistant Professor of Informatics* (science and technology studies, education technology, critical data studies, data visualization, community archives)

Rachel E. Croskery-Roberts, J.D. University of Michigan, *Clinical Professor of Law of School of Law*

Robert W. Crow, M.D. University of Southern California, *Health Sciences Associate Clinical Professor of Ophthalmology; Neurology*

Anne J. Cruz, Ph.D. Stanford University, *Professor Emerita of Spanish and Portuguese*

Jose B. Cruz, Ph.D. University of Illinois at Urbana-Champaign, *Professor Emeritus of Electrical Engineering and Computer Science*

Brian J. Cummings, Ph.D. University of California, Irvine, *Associate Dean of Faculty Development - Senate and Professor of Physical Medicine and Rehabilitation; Anatomy and Neurobiology*

Michael G. Cumsy, Ph.D. University of California, Berkeley, *Professor of Teaching of Molecular Biology and Biochemistry*

Lucia G. Cunningham, Ph.D. University of Kansas, *Professor Emerita of Spanish and Portuguese*

Elliott P. Currie, Ph.D. University of California, Berkeley, *Professor of Criminology, Law and Society* (criminal justice policy in the U.S. and other countries, causes of violent crime, social context of delinquency and youth violence, etiology of drug abuse and assessment of drug policy, race and criminal justice)

Imran Currim, Ph.D. Stanford University, *UCI Chancellor's Professor of Paul Merage School of Business*

James Cyriac, M.D. SUNY Upstate Medical University, *Health Sciences Associate Clinical Professor of Anesthesiology and Perioperative Care*

Dvora Cyrlak, M.D. Yale University, *Health Sciences Clinical Professor of Radiological Sciences*

Claudia I. Czimczik, Ph.D. Max Planck Institute, *Associate Professor of Earth System Science*

Thomas M. D'Zmura, Ph.D. University of Rochester, *Professor of Cognitive Sciences* (vision, hearing, language, brain-computer interfaces)

Nancy A. Da Silva, Ph.D. California Institute of Technology, *Professor of Chemical and Biomolecular Engineering; Biomedical Engineering* (molecular biotechnology, metabolic engineering and synthetic biology, eukaryotic expression systems, biorenewable chemicals)

Donald Dabdub, Ph.D. California Institute of Technology, *Associate Dean, Undergraduate Education and Professor of Mechanical and Aerospace Engineering; Civil and Environmental Engineering* (mathematical modeling of urban and global air pollution, dynamics of atmospheric aerosols, secondary organic aerosols, impact of energy generation on air quality, chemical reactions at gas-liquid interfaces)

Maria G. Dacoste-Iyer, M.D. Topiwala National Medical College, *Health Sciences Clinical Professor of Pathology and Laboratory Medicine*

Donald C. Dafoe, M.D. University of Wisconsin Madison, *Professor of Surgery*

Xing Dai, Ph.D. University of Chicago, *Professor of Biological Chemistry; Dermatology*

Teresa A. Dalton, Ph.D. University of Denver, *Associate Professor of Teaching of Criminology, Law and Society* (quantitative methodology, criminology, law and social sciences)

Anthony V. Daly, M.F.A. University of California, Irvine, *Lecturer of Physical Sciences*

Shaun Daly, M.D. Rush Medical College, *Health Sciences Assistant Clinical Professor of Surgery*

Quoc-Viet Dang, Ph.D. University of California, Irvine, *Assistant Professor of Teaching of Electrical Engineering and Computer Science* (e-learning, data analysis, autonomous vehicle racing, cyber-physical systems, making the world a better place)

Mark W. Daniels, M.D. Stanford University, *Health Sciences Assistant Clinical Professor of Pediatrics*

Keith Danner, Ph.D. University of California, Riverside, *Lecturer of English*

James N. Danziger, Ph.D. Stanford University, *Professor Emeritus of Political Science*

Eve Darian-Smith, Ph.D. University of Chicago, *Department Chair and Professor of Global and International Studies; Anthropology; Criminology, Law and Society*

Touraj Daryaei, Ph.D. University of California, Los Angeles, *UCI Endowed Chair in Persian Studies and Culture and Professor of History; Religious Studies* (Iran, Zoroastrianism, Ancient Medieval World)

Cyrus Dastur, M.D. Drexel University, *Health Sciences Associate Clinical Professor of Neurology; Neurological Surgery*

Desha Dauchan, M.F.A. University of California, Los Angeles, *Lecturer of Film and Media Studies*

Sohail Daulatzai, Ph.D. University of Southern California, *Associate Professor of Film and Media Studies; African American Studies; Visual Studies* (decolonization, empire, race, Muslim studies, Black studies)

David Huw Davies, Ph.D. University College London, *Assistant Adjunct Professor of Physiology and Biophysics*

Christopher J. Davis, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Teaching of Mathematics* (algebra and number theory)

Jonathan Davis, D.M.A. Juilliard School, *Lecturer of Music*

Kristen A. Davis, Ph.D. Stanford University, *Associate Professor of Civil and Environmental Engineering; Earth System Science* (coastal oceanography, fluid mechanics, turbulent flows)

Rebecca Davis, Ph.D. University of Notre Dame, *Associate Professor of English; Religious Studies* (Old and Middle English literature, Piers Plowman, medieval religious culture, women's writing, medieval philosophy)

Steven J. Davis, Ph.D. Stanford University, *Associate Professor of Earth System Science; Civil and Environmental Engineering*

Rakhi Dayal, M.D. Maulana Azad Medical College, *Health Sciences Associate Clinical Professor of Anesthesiology and Perioperative Care*

Franco De Flaviis, Ph.D. University of California, Los Angeles, *Professor of Electrical Engineering and Computer Science* (microwave systems, wireless communications, electromagnetic circuit simulations)

Helen De La Maza, M.A. Oregon State University, *Lecturer of Education*

Luis M. De La Maza, M.D., Ph.D. University of Minnesota, *Professor of Pathology and Laboratory Medicine*

Nzola De Magalhaes, Ph.D. University of California, Irvine, *Assistant Adjunct Professor of Surgery*

Arthur S. De Vany, Ph.D. University of California, Los Angeles, *Professor Emeritus of Economics*

Myrona L. DeLaney, Ed.D. University of California, Irvine, *Head of Music Theatre and Associate Professor of Teaching of Drama* (music theatre, singing, acting)

Louis DeSipio, Ph.D. University of Texas at Austin, *Professor of Chicano/Latino Studies; Political Science* (ethnic politics, Latino politics, immigration, naturalization, U.S. electoral politics)

Rina Dechter, Ph.D. University of California, Los Angeles, *UCI Chancellor's Professor of Computer Science* (automated reasoning, knowledge-representation, planning and learning)

Lorene D. Delany-Ullman, M.F.A. University of California, Irvine, *Lecturer of English*

Tony Delap, Claremont Graduate University, *Professor Emeritus of Art*

Michael Demetriou, M.D. Ph.D. University of Toronto, *Professor of Neurology; Microbiology and Molecular Genetics*

Darren Denenberg, Ph.D. University of Maryland, *Lecturer of Informatics*

Michael B. Dennin, Ph.D. University of California, Santa Barbara, *Professor of Physics and Astronomy*

Amy Dent, Ph.D. Duke University, *Assistant Professor of Teaching of Psychological Science* (meta-analysis, academic context and consequences of self-regulation, educational and developmental psychology of academic learning)

Amy Depaul, B.A. Boston University, *Lecturer of English*



Suvarna Ajay Deshmukh-Rane, M.D. Bharti Vidyapeeth Medical College, *Health Sciences Assistant Clinical Professor of Pathology and Laboratory Medicine*

Prajakta Deshpande, M.D. Seth G.S. Medical College, *Health Sciences Assistant Clinical Professor of Family Medicine*

Michael Dessen, Ph.D. University of California, San Diego, *Professor of Music*

Robert C. Detrano, M.D. Sapienza University of Rome, *Health Sciences Clinical Professor of Radiological Sciences; Medicine; Program in Public Health*

Russell L. Detwiler, Ph.D. University of Colorado Boulder, *Associate Professor of Civil and Environmental Engineering* (groundwater hydrology, contaminant fate and transport, subsurface process modeling, groundwater/surface-water interaction)

Sanjeev Dewan, Ph.D. University of Rochester, *Professor of Paul Merage School of Business*

Vijay Dhar, M.D. Gauhati Medical College, *Health Sciences Clinical Professor of Pediatrics*

Taizoon Q. Dhoon, M.D. University of Utah, *Health Sciences Assistant Clinical Professor of Anesthesiology and Perioperative Care*

Fabrizio Di Maio, Ph.D. University of Rome II Tor Vergata, *Director of Italian Language Program and Lecturer of Italian* (didactics of Italian as a foreign language, Italian historical novels, politically engaged literature)

Joseph DiMento, Ph.D. University of Michigan, *Professor of School of Law; Criminology, Law and Society; Paul Merage School of Business; Urban Planning and Public Policy*

Justin T. Diedrich, M.D. Case Western Reserve University, *Health Sciences Assistant Clinical Professor of Obstetrics and Gynecology*

Diane L. Diefenderfer, Former Soloist, Los Angeles Ballet, Eglevsky Ballet Company, Frankfurt Ballet Company, Director of Pilates Program for Dance Wellness, Undergraduate Advisor, *Associate Professor of Teaching of Dance* (ballet, pointe, repertory)

Michelle Digman, Ph.D. University of Illinois at Chicago, *Associate Professor of Biomedical Engineering; Developmental and Cell Biology* (biophotonics, fluorescence Spectroscopy and microscopy, nano-scale imaging, mechanotransduction, cancer cell migration, fluorescence lifetime and metabolic mapping)

Michael B. Dillencourt, Ph.D. University of Maryland, College Park, *Professor of Computer Science* (algorithms and complexity, networks and distributed systems, data structures, computational geometry, graph algorithms)

Huanjun Ding, Ph.D. University of Rochester, *Assistant Adjunct Professor of Radiological Sciences*

Peter H. Ditto, Ph.D. Princeton University, *Professor of Psychological Science* (social psychology, judgment and decision making, political and moral reasoning)

Hamid Djalilian, M.D. University of Minnesota, *Professor of Otolaryngology; Biomedical Engineering*

Andrew Djunaide, M.D. Georgetown University, *Health Sciences Assistant Clinical Professor of Anesthesiology and Perioperative Care*

An H. Do, M.D. University of California, Los Angeles, *Health Sciences Assistant Clinical Professor of Neurology*

John Christopher Dobrian, Ph.D. University of California, San Diego, *Professor of Music; Informatics*

Robert J. Doedens, Ph.D. University of Wisconsin-Madison, *Professor Emeritus of Chemistry* (inorganic and organometallic)

Rainer B. Doemer, Ph.D. Dortmund University, *Professor of Electrical Engineering and Computer Science; Computer Science* (system-level design, embedded computer systems, design methodologies, specification and modeling languages, advanced parallel simulation, integration of hardware and software systems)

Mine Dogucu, Ph.D. Ohio State University, *Assistant Professor of Teaching of Statistics*

Matthew O. Dolich, M.D. State University of New York at Stony Brook, *Associate Dean of Graduate Medical Education and Health Sciences Clinical Professor of Surgery*

Franklin Dollar, Ph.D. University of Michigan, *Associate Professor of Physics and Astronomy* (applied physics)

John D. Dombrink, Ph.D. University of California, Berkeley, *Professor Emeritus of Criminology, Law and Society* (crime and criminal justice, deviance and social control)

Neil Donaldson, Ph.D. University of Bath, *Lecturer of Mathematics* (differential geometry)

Carlos E. Donayre, M.D. University of Florida, *Professor of Surgery*

Vy M. Dong, Ph.D. California Institute of Technology, *Professor of Chemistry* (organic and synthetic)

Yingying Dong, Ph.D. Boston College, *Associate Professor of Economics*

Joseph H. Donnelly, M.D. Georgetown University, *Health Sciences Clinical Professor of Pediatrics*

Peter J. Donovan, Ph.D. University College London, *Professor of Biological Chemistry; Developmental and Cell Biology*

C. David Dooley, Ph.D. University of California, Los Angeles, *Professor Emeritus of Psychological Science* (community psychology, epidemiology, economic change)

Shayan Doroudi, Ph.D. Carnegie Mellon University, *Assistant Professor of Education; Informatics* (learning analytics, learning sciences, educational technology)

Barbara A. Doshier, Ph.D. University of Oregon, *UCI Distinguished Professor of Cognitive Sciences* (human information processing, memory retrieval, attention, visual perception)

Kimberly A. Douglas, M.D. Creighton University, *Health Sciences Associate Clinical Professor of Pediatrics*

James P. Dourish, Ph.D. University College London, *Chancellor's Professor of Informatics* (human-computer interaction, computer-supported cooperative work)

Emily E. Dow, M.D. University of Cincinnati, *Health Sciences Clinical Professor of Family Medicine*

Nia Dowell, Ph.D. The University of Memphis and Institute for Intellect Systems, *Assistant Professor of Education* (learning analytics, online group interaction, computational linguistics, technology, STEM)

Timothy L. Downing, Ph.D. University of California, Berkeley, *Assistant Professor of Biomedical Engineering; Microbiology and Molecular Genetics* (stem cells and tissue engineering, regenerative biology, cell programming, epigenomics, mechanobiology)

Ellen R. Druffel, Ph.D. University of California, San Diego, *Fred Kavli Chair in Earth System Science and Distinguished Professor of Earth System Science*

Jaya Dubey, M.A. University of California, Irvine, *Lecturer of English*

Sue P. Duckles, Ph.D. University of California, San Francisco, *Professor Emeritus of Pharmaceutical Sciences*

John Duffy, Ph.D. University of California, Los Angeles, *Professor of Economics*

Benjamin Duncan, Ph.D. University of Memphis, *Lecturer of Academic English/English as a Second Language*

Greg Duncan, Ph.D. University of Michigan, *UCI Distinguished Professor of Education; Economics; Psychological Science* (economics of education, program evaluation, child development)

Derek Dunn-Rankin, Ph.D. University of California, Berkeley, *Professor Emeritus of Mechanical and Aerospace Engineering; Civil and Environmental Engineering; Environmental Health Sciences* (combustion, optical particle sizing, particle aerodynamics, laser diagnostics and spectroscopy)

Holly Durbin, M.F.A. University of California, Los Angeles, *Professor of Drama* (costume design)

Anthony J. Durkin, Ph.D. University of Texas at Austin, *Associate Professor of Biomedical Engineering* (spatial frequency domain imaging, wide field functional imaging, quantitative near-infrared spectroscopy of superficial tissues, chemometrics, fluorescence spectroscopy, quantitative spectral imaging)

Nikil D. Dutt, Ph.D. University of Illinois at Urbana–Champaign, *UCI Chancellor's Professor of Computer Science; Cognitive Sciences; Electrical Engineering and Computer Science* (embedded systems, computer architecture, electronic design automation, software systems, brain-inspired architectures and computing)

Igor E. Dzyaloshinskii, Ph.D. Moscow State University, *Professor Emeritus of Physics and Astronomy*

James Earthman, Ph.D. Stanford University, *Professor of Materials Science and Engineering; Biomedical Engineering* (biomaterials, compositionally complex materials, nanocrystalline alloys, quantitative percussion diagnostics, deformation and damage processes)

Kathryn Eason, M.A. University of Colorado Boulder, *Lecturer of English*

Loren P. Eason, Ph.D. University of California, Irvine, *Lecturer of English*

Jacquelynne S. Eccles, Ph.D. University of California, Los Angeles, *UCI Distinguished Professor of Education; Psychological Science* (academic motivation and achievement, school and family influences on adolescent development, gender and ethnicity in STEM fields)

Aimee Lara Edinger, Ph.D. University of Pennsylvania, *Associate Professor of Developmental and Cell Biology* (cancer biology and metabolism, growth control, protein trafficking)

Lilangi Ediriwickrema, M.D. Yale University, *Health Sciences Assistant Clinical Professor of Ophthalmology*

Karen L. Edwards, Ph.D. University of Washington, *Department Chair and Professor of Epidemiology; Program in Public Health*

Kimberly D. Edwards, Ph.D. University of California, Irvine, *Department Vice Chair and Professor of Teaching of Chemistry* (general chemistry, chemical education)

Robert A. Edwards, M.D., Ph.D. Baylor College of Medicine, *Associate Professor of Pathology and Laboratory Medicine*

Rufus D. Edwards, Ph.D. Rutgers, The State University of New Jersey, *Professor of Program in Public Health; Environmental Health Sciences; Epidemiology*

Benis Egoh, Ph.D. Stellenbosch University, *Assistant Professor of Earth System Science*

Paul C. Eklof, Ph.D. Cornell University, *Professor Emeritus of Mathematics* (logic and algebra)

Magda S. El Zarki, Ph.D. Columbia University, *Professor of Computer Science; Informatics* (telecommunications, networks, wireless communication, video transmission)

Said E. Elghobashi, Ph.D. University of London, *Distinguished Professor Emeritus of Mechanical and Aerospace Engineering* (direct numerical simulation of turbulent, chemically reacting and dispersed two-phase flows)

Jennifer Elia, M.D. Jefferson Medical College, *Health Sciences Assistant Clinical Professor of Anesthesiology and Perioperative Care*

Salma Elmalaki, Ph.D. University of California, Los Angeles, *Assistant Professor of Teaching of Electrical Engineering and Computer Science* (mobile computing, pervasive autonomous system, personalized computing, and internet-of-things (IoT))

Ahmed Aly Elrefaie, M.D. Wake Forest University, *Health Sciences Assistant Clinical Professor of Emergency Medicine*

Ahmed Eltawil, Ph.D. University of California, Los Angeles, *Professor of Electrical Engineering and Computer Science* (design of system and architectures for computing and communication devices, low power implementations and architectures for digital signal processing)

James J. Emerson, Ph.D. University of Chicago, *Assistant Professor of Ecology and Evolutionary Biology*

German A. Enciso Ruiz, Ph.D. Rutgers, the State University of New Jersey, *Professor of Mathematics; Developmental and Cell Biology* (applied and computational mathematics, mathematical and computational biology)

Scott A. Engwall, M.D. University of Florida, *Department Chair and Health Sciences Clinical Professor of Anesthesiology and Perioperative Care*

Laura Enriquez, Ph.D. University of California, Los Angeles, *Assistant Professor of Chicano/Latino Studies; Asian American Studies; Sociology* (undocumented 1.5 generation young adults, immigration, citizenship, Latino families)

Sonja Entringer, Ph.D. University of Trier, *Associate Adjunct Professor of Pediatrics*

Dae Seok Eom, Ph.D. The University of Texas at Austin, *Assistant Professor of Developmental and Cell Biology* (cellular projection mediated long-range cell-to-cell communication)

David A. Eppstein, Ph.D. Columbia University, *UCI Chancellor's Professor of Computer Science* (algorithms and complexity; computer graphics and visualization; geometric optimization)

Daniel Epstein, Ph.D. University of Washington, *Assistant Professor of Informatics; Computer Science* (human-computer interaction, personal informatics, ubiquitous computing, social computing, health informatics)

Rahim Esfandypour, Ph.D. Stanford University, *Assistant Professor of Electrical Engineering and Computer Science; Biomedical Engineering* (nanotechnology and nanoscience, flexible electronics, MEMS and NEMS fabrication and modeling, stretchable and wearable bio devices, translational micro/nanotechnologies, biological and chemical sensors, microfluidics, microelectronics circuits and systems, physiological monitoring, Internet of Things (IoT) bio devices, technology development for personalized/precision medicine, and Point of Care (POC) diagnostics)

Lorraine S. Evangelista, Ph.D. University of California, Los Angeles, *Professor Emerita of Nursing*

Dennis Evans, Ed.D. University of Southern California, *Non-Senate Academic Emeritus of Education*

Gregory R.D. Evans, M.D. University of Southern California, *Department Chair and Professor of Plastic Surgery; Biomedical Engineering; Surgery*

William J. Evans, Ph.D. University of California, Los Angeles, *UCI Distinguished Professor of Chemistry* (inorganic and organometallic)

Marc-Eivind C. Evensen, M.D. University of California, Irvine, *Health Sciences Clinical Professor of Physical Medicine and Rehabilitation*

Kai Evers, Ph.D. Duke University, *Associate Professor of German* (20th-century German literature and film, modernism and Holocaust literature, theories of violence and catastrophic imagination)

Alice Fahs, Ph.D. New York University, *Professor Emerita of History* (Civil War America, American cultural history, gender)

Celia Faiola, Ph.D. Washington State University, *Assistant Professor of Ecology and Evolutionary Biology; Chemistry*

Christopher Fan, Ph.D. University of California, Berkeley, *Assistant Professor of English; Asian American Studies* (transnational Asia American, 20th, and 21st century literature, speculative fiction, political economy)

Hung Y. Fan, Ph.D. Massachusetts Institute of Technology, *Professor Emeritus of Molecular Biology and Biochemistry*

Herschel Farbman, Ph.D. Yale University, *Department Chair and Associate Professor of Comparative Literature; French* (modernism, critical theory)

Hamed Farid, M.D. University of California, San Diego, *Health Sciences Associate Clinical Professor of Radiological Sciences*

Marjan Farid, M.D. University of California, San Diego, *Health Sciences Clinical Professor of Ophthalmology*

George Farkas, Ph.D. Cornell University, *UCI Distinguished Professor of Education; Sociology* (educational achievement gaps, interventions, educational policy)

Sarah Bennett Farmer, Ph.D. University of California, Berkeley, *Associate Professor of History* (modern French history, twentieth-century Europe, social and cultural history)

Ted Farzaneh, M.D. Shaheed Beheshti University of Medical Sciences, *Health Sciences Assistant Clinical Professor of Pathology and Laboratory Medicine*

Clifford L. Faulkner, M.A. California State University, Long Beach, *Professor of Teaching Emeritus of Drama* (scenery design, history of design, gay theatre)

Katherine Faust, Ph.D. University of California, Irvine, *Professor of Sociology* (social networks, animal social organization, population processes and social networks, research methods)

Howard J. Federoff, M.D. Ph.D. Albert Einstein College of Medicine, *Professor of Neurobiology and Behavior; Neurology*

David Fedman, Ph.D. Stanford University, *Assistant Professor of History* (Japan and Korea, environmental history, historical geography, global history, modern war)

Stephen Feig, M.D. New York University, *Fong and Jean Tsai Chair in Women's Imaging and Professor of Radiological Sciences*

David Feldman, Ph.D. University of Missouri-Columbia, *Professor of Urban Planning and Public Policy; Political Science*

Julian Feldman, Ph.D. Carnegie Institute of Technology, *Professor Emeritus of Computer Science*

Martha S. Feldman, Ph.D. Stanford University, *Roger W. and Janice M. Johnson Chair in Civic Governance and Public Management and Professor of Urban Planning and Public Policy; Paul Merage School of Business; Sociology* (organization theory and behavior, stability and change in organizations, decision-making and information processing, public management, qualitative research methods)

Paul Feldstein, Ph.D. University of Chicago, *Professor Emeritus of Paul Merage School of Business*

Philip Felgner, Ph.D. Michigan State University, *Director of the Vaccine Research and Development Center and Professor in Residence of Physiology and Biophysics*

Jonathan L. Feng, Ph.D. Stanford University, *Professor of Physics and Astronomy*

Asaf Ferber, Ph.D. Tel Aviv University, *Assistant Professor of Mathematics* (combinatorics and probability)

Julie E. Ferguson, Ph.D. Oxford University, *Associate Professor of Teaching of Earth System Science*

Amanda N. Fernandez, M.D. University of the East, Ramon Magsaysay Memorial Medical Center, *Health Sciences Associate Clinical Professor of Pediatrics*

Nohema Fernandez, D.M.A. Stanford University, *Professor Emerita of Music*

Dayantha Fernando, M.D. Georgetown University, *Health Sciences Associate Clinical Professor of Radiological Sciences*

Raúl A. Fernández, Ph.D. Claremont Graduate University, *Executive Secretary of the UC-Cuba Academic Initiative and Professor Emeritus of Chicano/Latino Studies; Social Sciences*

Leonard A. Ferrari, Ph.D. University of California, Irvine, *Professor Emeritus of Electrical Engineering and Computer Science* (machine vision, signal processing, computer graphics)

Robert R. Field, M.D. University of Kansas, *Health Sciences Associate Clinical Professor of Anesthesiology and Perioperative Care*

Gordon J. Fielding, Ph.D. University of California, Los Angeles, *Professor Emeritus of Economics*

Aleksandr Figotin, Ph.D. Tashkent University of Information Technologies, *Professor of Mathematics* (applied and computational mathematics, mathematical physics)

Sarah Finkeldei, Ph.D. RWTH Aachen University, *Assistant Professor of Chemistry; Materials Science and Engineering* (nuclear chemistry)

Mark Finkelstein, Ph.D. Stanford University, *Professor Emeritus of Mathematics; Center for Educational Partnerships* (analysis)

Barbara J. Finlayson-Pitts, Ph.D. University of California, Riverside, *Director of AirUCI and UCI Distinguished Professor of Chemistry* (analytical, atmospheric and environmental, physical chemistry and chemical physics)

Marcello Fiocco, Ph.D. University of California, Santa Barbara, *Associate Professor of Philosophy*

Anita W. Fischer, M.A. Loyola Marymount University, *Lecturer of English*

Chanel E. Fischetti, M.D. University of California, Irvine, *Health Sciences Assistant Clinical Professor of Emergency Medicine*

Jennifer J. Fisher, Ph.D. University of California, Riverside; founder and editor of Dance Major Journal, *Professor of Dance* (critical dance studies)

Mark J. Fisher, M.D. University of Cincinnati, *Professor of Neurology; Anatomy and Neurobiology; Political Science*

Zachary Fisk, Ph.D. University of California, San Diego, *UCI Distinguished Professor Emeritus of Physics and Astronomy*

Laura E. Fitzmaurice, M.D. University of California, Los Angeles, *Health Sciences Associate Clinical Professor of Obstetrics and Gynecology*

Lisa Flanagan-Monuki, Ph.D. University of California, San Diego, *Associate Professor of Neurology; Anatomy and Neurobiology; Biomedical Engineering*

Victor Fleischer, J.D. Columbia Law School, *Professor of School of Law*

Angela G. Fleischman, M.D. Stanford University, *Assistant Professor of Medicine; Biological Chemistry*

Pamela L. Flodman, M.S. University of California, Irvine, *Adjunct Professor of Pediatrics; Genetic Counseling*

Glenda M. Flores, Ph.D. University of Southern California, *Associate Professor of Chicano/Latino Studies; Sociology* (Latina/o sociology, gender and work, middle-class minorities, education, urban ethnography)

Ryuko Flores, M.A. University of California, Los Angeles, *Lecturer of Japanese*

David Floriolli, M.D. University of California, Irvine, *Health Sciences Associate Clinical Professor of Radiological Sciences*

Giovanna A. Fogli, Ph.D. Yale University, *Lecturer of Humanities*

Vivian R. Folkenflik, M.A. Cornell University, *Non-Senate Academic Emerita of Humanities*

Matthew Foreman, Ph.D. University of California, Berkeley, *Distinguished Professor of Mathematics; Logic and Philosophy of Science* (ergodic theory and dynamical systems, logic and foundations)

Donald N. Forthal, M.D. University of California, Irvine, *Professor of Medicine; Molecular Biology and Biochemistry*

Michelle A. Fortier, Ph.D. University of Nebraska Lincoln, *Associate Professor of Nursing; Nursing; Psychological Science*

Norbert Fortin, Ph.D. Boston University, *Associate Professor of Neurobiology and Behavior*

Kim Fortun, Ph.D. Rice University, *Department Chair and Professor of Anthropology* (environmental problems and science, science and technology, environmental health, disaster, India)

Michael Fortun, Ph.D. Harvard University, *Associate Professor of Anthropology* (anthropology of science, air pollution science, data science, genetics, history of science, United States, Iceland)

Donald E. Fosket, Ph.D. University of Idaho, *Professor Emeritus of Developmental and Cell Biology* (regulation of cytoskeleton formation and function)



Efi Foufoula-Georgiou, Ph.D. University of Florida, *Distinguished Professor of Civil and Environmental Engineering* (hydrology and geomorphology with emphasis on modeling the interactions between the atmosphere, land, and the terrestrial environment at plot to large-watershed scale)

Christie Fowler, Ph.D. Florida State University, *Assistant Professor of Neurobiology and Behavior*

Edward B. Fowler, Ph.D. University of California, Berkeley, *Professor Emeritus of Japanese* (modern Japanese literature, cultural studies, film)

Keith Fowler, D.F.A. Yale University, *Professor Emeritus of Drama* (directing, acting)

Charles C. Fowlkes, Ph.D. University of California, Berkeley, *Professor of Computer Science; Cognitive Sciences* (artificial intelligence, computer vision, machine learning, computational biology)

John Christian Fox, M.D. Tufts University, *Department Chair and Professor of Emergency Medicine*

Roy Fox, Ph.D. The Hebrew University of Jerusalem, *Assistant Professor of Computer Science* (theory and applications of reinforcement learning, dynamical systems, information theory, robotics)

David John Frank, Ph.D. Stanford University, *Professor of Sociology; Education; Political Science* (globalization, sexuality, the natural environment, higher education)

Richard I. Frank, Ph.D. University of California, Berkeley, *Professor Emeritus of History* (Roman history, Classical tradition)

Steven A. Frank, Ph.D. University of Michigan, *Distinguished Professor and Donald Bren Professor of Ecology and Evolutionary Biology; Logic and Philosophy of Science*

Michael S. Franz, Ph.D. Swiss Federal Institute of Technology in Zurich, *UCI Chancellor's Professor of Computer Science; Electrical Engineering and Computer Science* (systems software, particularly compilers and virtual machines, trustworthy computing, software engineering)

Matthew Freedman, Ph.D. University of Maryland-College Park, *Professor of Economics*

Fillmore Freeman, Ph.D. Michigan State University, *Professor of Chemistry* (organic and synthetic, theoretical and computational)

Kathryn Steinhaus French, M.S. University of Colorado Denver, *Health Sciences Clinical Professor of Pediatrics; Genetic Counseling*

Michael D. Fried, Ph.D. University of Michigan, *Professor Emeritus of Mathematics* (arithmetic geometry and complex variables)

Marcia G. Froehlich, M.F.A. University of Michigan, *Assistant Professor of Drama* (costume design)

Daniel H. Frost, M.S. University of California, Irvine, *Professor of Teaching Emeritus of Computer Science* (artificial intelligence, software engineering, computer graphics, teaching of programming)

Ron D. Frostig, Ph.D. University of California, Los Angeles, *Professor of Neurobiology and Behavior; Biomedical Engineering*

John P. Fruehauf, M.D. Rush University, *Professor Emeritus of Medicine; Pharmaceutical Sciences*

David A. Fruman, Ph.D. Harvard University, *Professor of Molecular Biology and Biochemistry*

James A. Fujii, Ph.D. University of Chicago, *Associate Professor Emeritus of Japanese* (modern Japanese literature, human-animal relations, cultural studies)

Dorothy B. Fujita-Rony, Ph.D. Yale University, *Associate Professor of Asian American Studies; Culture and Theory; History* (U.S. history, Asian American studies)

Roy M. Fujitani, M.D. University of Hawaii at Manoa, *Professor of Surgery*

Michael A. Fuller, Ph.D. Yale University, *Professor of East Asian Studies; Chinese; Religious Studies* (Chinese poetry and poetics, the cultural and intellectual contexts for poetry, aesthetic theory, linguistic issues in classical Chinese)

Filipp Furche, Ph.D. University of Karlsruhe, *Professor of Chemistry* (physical chemistry and chemical physics, theoretical and computational)

Richard Futrell, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Computer Science; Language Science* (language processing, Bayesian modeling, NLP)

Israel Gabriel, Bat-Dor Dance Company; Former Assistant Artistic Director, *Associate Professor of Teaching Emeritus of Dance* (ballet, modern, pas de deux, repertory)

Sergio Gago-Masague, Ph.D., *Assistant Professor of Teaching of Computer Science* (pervasive computing, user-centric software design, human computer interaction, serious games)

Daniel D. Gajski, Ph.D. University of Pennsylvania, *Professor Emeritus of Electrical Engineering and Computer Science* (embedded systems, software/hardware design, design methodologies and tools, science of design)

Christine M. Gall, Ph.D. University of California, Irvine, *Department Chair and Distinguished Professor of Anatomy and Neurobiology; Neurobiology and Behavior*

Natalie M. Gallant, M.D. University of Southern California, *Health Sciences Associate Clinical Professor of Pediatrics; Genetic Counseling*

De Gallow, Ph.D. University of Southern California, *Senior Lecturer of Undergraduate Education*

Valerie B. Galvan-Turner, M.D. University of Texas Medical Branch, *Health Sciences Clinical Instructor of Obstetrics and Gynecology*

Manuel Gamero-Castaño, Ph.D. Yale University, *Associate Professor of Mechanical and Aerospace Engineering* (electric propulsion, with emphasis on colloid thruster technology for precision formation flying missions and Hall thrusters. Electrohydrodynamic atomization of liquids and related problems like electrospray ionization and technological applications of electrosprays, aerosol diagnostics)

Sunil P. Gandhi, Ph.D. University of California, San Diego, *Associate Professor of Neurobiology and Behavior*

Anand K. Ganesan, M.D., Ph.D. Medical College of Wisconsin, *Associate Professor of Dermatology; Biological Chemistry*

Joshua Garcia, Ph.D. University of Southern California, *Assistant Professor of Informatics* (software engineering, software security, software analysis and testing, software architecture, software maintenance)

Ajay Garde, Ph.D. University of Southern California, *Associate Professor of Urban Planning and Public Policy*

David M. Gardiner, Ph.D. University of California, San Diego, *Professor of Developmental and Cell Biology* (limb development and regeneration)

Michelle Garfinkel, Ph.D. Brown University, *Professor of Economics*

Sumit Garg, M.D. New York Medical College, *Health Sciences Associate Clinical Professor of Ophthalmology*

John Jay Gargus, M.D. Ph.D. Yale University, *Director of the Center for Autism Research and Translation and Professor Emeritus of Physiology and Biophysics; Genetic Counseling; Pediatrics*

Alejandra Garland Becerra, M.D. Universidad de San Martín de Porres, *Health Sciences Assistant Clinical Professor of Neurology*

Bryant G. Garth, J.D. Stanford University, *Senior Associate Dean of Academic Affairs and Vice Dean and UCI Chancellor's Professor of School of Law*

Armando S. Garza, M.D. University of California, Davis, *Health Sciences Assistant Clinical Professor of Radiological Sciences*

Irene Gassko, Ph.D. Boston University, *Lecturer of Computer Science*

Brandy Gatlin-Nash, Ph.D. Florida State University, *Assistant Professor of Education; Language Science*

Jean-Luc Gaudiot, Ph.D. University of California, Los Angeles, *Professor of Electrical Engineering and Computer Science; Computer Science* (parallel processing, computer architecture, processor architecture)

Brandon S. Gaut, Ph.D. University of California, Riverside, *Biological Sciences Associate Dean for Research and Innovation and Professor of Ecology and Evolutionary Biology*

Nien-Hui Ge, Ph.D. University of California, Berkeley, *Professor of Chemistry* (analytical, chemical biology, physical chemistry and chemical physics, polymer, materials, nanoscience)

Suzanne Gearhart, Ph.D. Johns Hopkins University, *Professor Emerita of French* (seventeenth- and eighteenth-century French literature, philosophy and literature)

Kelvin W. Gee, Ph.D. University of California, Davis, *Professor of Pharmaceutical Sciences*

Jean G. Gehricke, Ph.D. Free University of Berlin, *Associate Adjunct Professor of Pediatrics*

Alexander Gelley, Ph.D. Yale University, *Professor Emeritus of Comparative Literature* (eighteenth- and nineteenth-century European novel, critical theory)

Mary Gendy, M.D. Wright State University, *Health Sciences Assistant Clinical Professor of Emergency Medicine*

Linda M. Georgianna, Ph.D. Columbia University, *Professor Emerita of English*



Tryphon Georgiou, Ph.D. University of Florida, *Distinguished Professor of Mechanical and Aerospace Engineering* (dynamical systems and control, mathematical physics, applied mathematics. Current interests focus on stochastic control, geometry of optimal mass transport, inverse problems in physics and signal analysis, and topics related to the control of fluids, networks and thermodynamic systems)

Robert B. Gerber, Ph.D. Oxford University, *Professor Emeritus of Chemistry* (atmospheric and environmental, physical chemistry and chemical physics, theoretical and computational)

Donovan German, Ph.D. University of Florida, *Associate Professor of Ecology and Evolutionary Biology*

Paul David Gershon, Ph.D. University of Liverpool, *Professor of Molecular Biology and Biochemistry*

Amy Gerstler, M.F.A. Bennington College, *Professor Emerita of English* (poetry, creative writing, fiction, creative nonfiction, hybrid literature, visual art, lyric essay, art and science, women writers)

Michel Gervais, *Lecturer of Dance*

Martha Gever, Ph.D. City College of the City University of New York, *Professor Emerita of Art* (history and criticism: video, media studies, popular culture)

Zina Giannopoulou, Ph.D. University of Illinois at Urbana-Champaign, *Associate Professor of Classics; European Languages and Studies* (Plato, philosophy and literature, Greek tragedy and epic, film, and reception of classics)

Lisa M. Gibbs, M.D. Stanford University, *Ronald W. Reagan Chair in Geriatrics and Health Sciences Clinical Professor of Family Medicine*

Margaret P. Gilbert, Ph.D. Oxford University, *Abraham I. Melden Chair in Moral Philosophy and Professor of Philosophy*

Daniel L. Gillen, Ph.D. University of Washington, *Department Chair and Professor of Statistics; Program in Public Health*

Howard A. Gillman, Ph.D. University of California, Los Angeles, *Chancellor and Professor of Political Science; Criminology, Law and Society; History; School of Law*

Mary Gilly Graham, Ph.D. University of Houston, *Professor of Paul Merage School of Business*

Lindsay Gilmour, M.F.A. University of Wisconsin, Milwaukee, *Assistant Professor of Dance* (modern choreography, improvisation)

Kimberly Marie Gimenez, M.D. University of California, Irvine, *Health Sciences Clinical Professor of Anesthesiology and Perioperative Care*

Tony D. Givargis, Ph.D. University of California, Riverside, *Professor of Computer Science* (embedded systems, platform-based system-on-a-chip design, low-power electronics)

James B. Given, Ph.D. Stanford University, *Professor Emeritus of History*

Charles Glabe, Ph.D. University of California, Davis, *Professor of Molecular Biology and Biochemistry*

Jonathan D. Glater, J.D. Yale University, *Professor of School of Law*

Amihai Glazer, Ph.D. Yale University, *Professor of Economics*

Richard Godden, Ph.D. University of Kent, *Professor of English* (20th century and contemporary American literature, Faulkner)

Douglas S. Goheen, Ph.D. University of Denver, *Professor Emeritus of Drama* (scenery design, digital imaging)

June-Anne Gold, M.B.B.S., D.C.H., M.R.C.P. University of London, *Health Sciences Clinical Professor of Pediatrics; Genetic Counseling*

David Theo Goldberg, Ph.D. The Graduate Center, City University of New York, *Director of the UC Humanities Research Institute and Professor of Comparative Literature; Anthropology; Criminology, Law and Society* (race, racism, race and the law, political theory, South Africa, digital humanities)

Rachel E. Goldberg, Ph.D. Brown University, *Assistant Professor of Sociology* (health, social demography, family, children and youth, gender, migration)

Wendy A. Goldberg, Ph.D. University of Michigan, *Professor Emerita of Psychological Science; Education* (developmental psychology, work and family, infant sleep, transition to parenthood, autism)

Isaac Goldbring, Ph.D. University of Illinois at Urbana-Champaign, *Associate Professor of Mathematics; Logic and Philosophy of Science* (logic and foundations)

Emily B. Goldenberg, M.D. Virginia Commonwealth University, *Health Sciences Assistant Clinical Professor of Anesthesiology and Perioperative Care*

Alan L. Goldin, M.D. Ph.D. University of Michigan, *Professor of Microbiology and Molecular Genetics; Anatomy and Neurobiology; Physiology and Biophysics*

Ruth Goldstein, Ph.D. University of California, Berkeley, *Assistant Professor of Global and International Studies*

Steven A.N. Goldstein, M.D., Ph.D. Harvard University, *Vice Chancellor for Health Affairs and Distinguished Professor of Physiology and Biophysics*

Brandon Golob, Ph.D. University of Southern California, *Assistant Professor of Teaching of Criminology, Law and Society* (law-related educational programs; social media and online privacy; inclusive pedagogy; media effects; law and popular culture)

Maryam Golshan-Momeni, M.D. University of Tehran, *Health Sciences Associate Clinical Professor of Radiological Sciences*

Kiarash Golshani, M.D. Oregon Health & Science University, *Health Sciences Associate Clinical Professor of Neurological Surgery*

Sidney Golub, Ph.D. Temple University, *Edward A. Dickson Emeritus Professor and Professor Emeritus of Microbiology and Molecular Genetics*

Ramon Gomez, Ph.D. University of California, Los Angeles, *Assistant Adjunct Professor of Electrical Engineering and Computer Science* (analog and RF circuit design)

Gilbert G. Gonzalez, Ph.D. University of California, Los Angeles, *Professor Emeritus of Chicano/Latino Studies; Social Sciences*

Sara Goodman, Ph.D. Georgetown University, *Associate Professor of Political Science; European Languages and Studies* (citizenship policy, immigration, immigrant integration, ethnic diversity in democracies, diaspora)

Deborah Goodman-Gruen, M.D., Ph.D., M.P.H. University of California, Los Angeles, *Associate Adjunct Professor of Epidemiology*

Michael T. Goodrich, Ph.D. Purdue University, *UCI Chancellor's Professor of Computer Science* (computer security, algorithm design, data structures, Internet algorithmics, geometric computing, graphic drawing)

Shane Goodridge, Ph.D. University of Victoria, *Assistant Professor of Teaching of Education*

Michele B. Goodwin, J.D. Boston College, *Director, Center for Biotechnology and Global Health Policy and UCI's Chancellor's Professor of School of Law; Criminology, Law and Society; Gender and Sexuality Studies; Program in Public Health*

Scott C. Goodwin, M.D. Harvard University, *Hasso Brothers Endowed Chair in Radiological Sciences and Professor Emeritus of Radiological Sciences*

Charlotte Gore, M.D. University of California, San Diego, *Health Sciences Assistant Clinical Professor of Ophthalmology*

Anton Gorodetski, Ph.D. Moscow State University, *Professor of Mathematics* (ergodic theory and dynamical systems)

Alon A. Gorodetsky, Ph.D. California Institute of Technology, *Associate Professor of Chemical and Biomolecular Engineering; Chemistry; Materials Science and Engineering* (cephalopods, adaptive materials, camouflage, bioelectronics)

Michael R. Gottfredson, Ph.D. University at Albany, State University of New York, *Chancellor's Professor of Criminology, Law and Society; School of Law; Sociology* (criminology, juvenile delinquency, crime theory, public policy)

Michael L. Goulden, Ph.D. Stanford University, *Professor of Earth System Science; Ecology and Evolutionary Biology*

Celia Goulding, Ph.D. King's College London, *Professor of Molecular Biology and Biochemistry; Pharmaceutical Sciences*

Namita Goyal, M.D. Ross University, *Health Sciences Assistant Clinical Professor of Neurology*

Kyle Grady, Ph.D. University of Michigan, *Assistant Professor of English* (early modern literature and culture, African American literature and culture, critical race theory)

John Graham, Ph.D. University of California, Berkeley, *Professor Emeritus of Paul Merage School of Business*

Sergei A. Grando, M.D., Ph.D., D.Sc. Central Institute of Dermatology and Venereology, *Medical Institute, Kiev, Ukraine; PostGraduate Institute for Physicians, Kiev, Ukraine; Central Institute of Dermatology and Venereology, Moscow, Russia and Professor of Dermatology; Biological Chemistry*

Douglas A. Granger, Ph.D. University of California, Irvine, *Director of the Institute for Interdisciplinary Salivary Bioscience and Professor of Psychological Science* (psychoneuroendocrinology, salivary bioscience, hormone-behavior relationships across the lifespan, in high- and low-risk populations)

Richard H. Granger, Ph.D. Yale University, *Professor Emeritus of Computer Science*

Stanley B. Grant, Ph.D. California Institute of Technology, *Professor Emeritus of Civil and Environmental Engineering* (environmental engineering, inland and coastal water quality, coagulation and filtration of colloidal contaminants, environmental microbiology)

Lisa B. Grant Ludwig, Ph.D. California Institute of Technology, *Professor of Program in Public Health*

Enrico Gratton, Ph.D. University of Rome, *Distinguished Professor of Biomedical Engineering; Developmental and Cell Biology; Physics and Astronomy* (design of new fluorescence instruments, protein dynamics, single molecule, fluorescence microscopy, photon migration in tissues)

Elizabeth Greeban, M.A. University of California, Irvine, *Lecturer of Education*

Kim Green, Ph.D. University of Leeds, *Associate Professor of Neurobiology and Behavior*

Michael M. Green, Ph.D. University of California, Los Angeles, *Stacy Nicholas Dean of The Henry Samueli School of Engineering and Associate Dean for Undergraduate Student Affairs of The Henry Samueli School of Engineering and Professor of Electrical Engineering and Computer Science* (analog/mixed-signal IC design, broadband circuit design, theory of nonlinear circuits)

Michael T. Green, Ph.D. University of Chicago, *Professor of Molecular Biology and Biochemistry; Chemistry* (chemical, biology, inorganic and organometallic, physical chemistry and chemical physics, theoretical and computational)

Milton Greenberg, Ph.D. University of California, Irvine, *Assistant Adjunct Professor of Physiology and Biophysics*

Sean Greenberg, Ph.D. Harvard University, *Associate Professor of Philosophy; European Languages and Studies; Religious Studies*

Ellen Greenberger, Ph.D. Harvard University, *Professor Emerita of Psychological Science* (developmental psychology, social and cultural influences on adolescent and young adult development, family relationships and consequences throughout the lifespan)

Frederick Greene, B.M. University of Southern California, *Lecturer of Music*

Susan M. Greenhalgh, Ph.D. Columbia University, *Professor Emeritus of Anthropology*

Fred S. Greensite, M.D. University of California, San Diego, *Professor Emeritus of Radiological Sciences*

Charlotte Griffin, M.F.A. University of Texas, Austin, *Assistant Professor of Dance* (choreography, modern, screen dance)

Joshua Grill, Ph.D. Wake Forest University School of Medicine, *Associate Professor of Neurobiology and Behavior; Neurobiology and Behavior*

Nicole Grimes, Ph.D. University of Dublin, *Associate Professor of Music*

Bernard N. Grofman, Ph.D. University of Chicago, *Professor of Political Science; Economics* (public choice, mathematical models of collective decision making, formal democratic theory, politics of small groups, representation, voting rights)

Anna Grosberg, Ph.D. California Institute of Technology, *Associate Professor of Biomedical Engineering; Chemical and Biomolecular Engineering* (computational modeling of biological systems, biomechanics, cardiac tissue engineering)

Daniel Gross, Ph.D. University of California, Berkeley, *Professor of English* (emotion studies, history and theory of rhetoric, early modern literature and culture, Heidegger and rhetoric)

John E. Gross, M.D. University of Missouri-Columbia, *Vice Dean for Faculty and Clinical Affairs and Health Sciences Clinical Professor of Plastic Surgery*

Steven P. Gross, Ph.D. University of Texas at Austin, *Professor of Developmental and Cell Biology; Physics and Astronomy* (force generation by molecular motors in living cells)

Emily D. Grossman, Ph.D. Vanderbilt University, *Professor of Cognitive Sciences* (visual perception, neuroimaging)

Geeta Grover, M.D. University of California, Irvine, *Health Sciences Clinical Professor of Pediatrics*

Leonid Groyzman, M.D. Nicolae Testemianu State University of Medicine and Pharmacy, *Health Sciences Associate Clinical Professor of Neurology; Neurological Surgery*

Zhibin Guan, Ph.D. University of North Carolina at Chapel Hill, *Professor of Chemistry; Biomedical Engineering; Chemical and Biomolecular Engineering; Materials Science and Engineering* (chemical biology, organic and synthetic, polymer, materials, nanoscience)

Jody Guarino, Ed.D. Azusa Pacific University, *Lecturer and Supervisor of Teacher of Education*

Alex Guenther, Ph.D. Washington State University, *Professor of Earth System Science*

Arnold Guerra, Ph.D. University of California, Irvine, *Lecturer of Physics and Astronomy*

Nancy Guerra, Ed.D. Harvard University, *Dean of the School of Social Ecology and Professor of Psychological Science; Criminology, Law and Society* (childrens' aggression and behavior problems, prevention of youth violence, promotion of healthy youth development)

Luyi Gui, Ph.D. Georgia Institute of Technology, *Assistant Professor of Paul Merage School of Business*

Patrick Q. Guidotti, Ph.D. University of Zurich, *Professor of Mathematics* (analysis and partial differential equations, applied and computational mathematics)

- Susan Guilfoyle, M.S. University of Southern California, *Lecturer of Education* (reading, language and literacy)
- Michele Guindani, Ph.D. Universita Luiga Bocconi, *Professor of Statistics*
- Alberto D. Gullaba, M.F.A. University of California, Irvine, *Lecturer of English*
- Gultekin Gulsen, Ph.D. Bogazici University, *Associate Professor of Radiological Sciences; Biomedical Engineering; Physics and Astronomy*
- Yigit S. Guner, M.D. Rosalind Franklin University at Chicago Medical School, *Health Sciences Associate Clinical Professor of Surgery*
- Qitao Guo, Ph.D. University of California, Berkeley, *Associate Professor of History; Religious Studies* (social, cultural, and religious history of pre-modern China (the Ming and Qing dynasties))
- Yuqing Guo, Ph.D. University of Washington, *Assistant Professor of Nursing*
- Ranjan Gupta, M.D. Albany Medical College, *Professor of Orthopaedic Surgery; Biomedical Engineering*
- Vijay Gurbaxani, Ph.D. University of Rochester, *Taco Bell Chair in Information Technology Management and Professor of Paul Merage School of Business; Informatics* (economics of information systems management, impact of information technology on organization and market structure)
- Tatyana Gurvich, Pharm.D. University of Southern California, *Assistant Adjunct Professor of Family Medicine*
- Kaaryn Gustafson, J.D., Ph.D. University of California, Berkeley, *Co-Director, Center on Law, Equality and Race (CLEar) and Professor of School of Law*
- Elizabeth Guthrie, Ph.D. University of Illinois at Urbana-Champaign, *Professor of Teaching Emerita of French* (second-language acquisition and teaching)
- Gary L. Guymon, Ph.D. University of California, Davis, *Professor Emeritus of Civil and Environmental Engineering* (water resources, groundwater, modeling uncertainty)
- John F. Guzowski, Ph.D. University of California, Irvine, *Associate Professor of Neurobiology and Behavior*
- Linda G. Haas, Ph.D. University of South Florida, *Lecturer of English*
- Ali A. Habib, M.D. Aga Kahn University, *Health Sciences Associate Clinical Professor of Neurology*
- Bambi Haggins, Ph.D. University of California, Los Angeles, *Associate Professor of Film and Media Studies; African American Studies; Visual Studies* (Black [African American] comedy in film, television, digital media and performance, television history, comedy as social and political discourse, African-American studies, American studies)
- Casey A. Hall, Ph.D. University of California, Irvine, *Lecturer of Humanities*
- Chad Michael Hall, M.F.A. Ohio State University, *Artistic Director - MULTIPLEX DANCE and Assistant Professor of Dance* (contemporary technique, choreography, improvisation, dance, and video)
- James E. Hall, Ph.D. University of California, Riverside, *Professor Emeritus of Physiology and Biophysics*
- Herbert W. Hamber, Ph.D. University of California, Santa Barbara, *Professor Emeritus of Physics and Astronomy*
- Sherine Hamdy, Ph.D. New York University, *Associate Professor of Anthropology* (medical anthropology, science, technology and society, bioethics, comics, Islam, Egypt, middle east)
- Afshan B. Hameed, M.D. King Edward Medical College, *Health Sciences Clinical Professor of Obstetrics and Gynecology*
- Barbara A. Hamkalo, Ph.D. University of Massachusetts, *Professor Emerita of Molecular Biology and Biochemistry*
- Stephan Hammel, Ph.D. University of Pennsylvania, *Assistant Professor of Music*
- Jay J. Han, M.D. University of California, San Francisco, *Professor of Physical Medicine and Rehabilitation*
- Min Han, M.D. Xi'an Jiaotong University, *Health Sciences Assistant Clinical Professor of Pathology and Laboratory Medicine*
- Sora Han, Ph.D. University of California, Santa Cruz, *Director of the Graduate Program in Culture and Theory and Associate Professor of Criminology, Law and Society; African American Studies; Culture and Theory; School of Law* (law and popular culture, critical race theory, philosophies of punishment, feminism and psychoanalysis)
- Stephen Hanessian, Ph.D. Ohio State University, *Professor of Pharmaceutical Sciences; Chemistry* (organic chemistry, medicinal chemistry)
- John Wesley Hann, M.D. University of California, Los Angeles, *Health Sciences Assistant Clinical Professor of Family Medicine*

Janice L. Hansen, Ph.D. University of California, Irvine, *Lecturer of Education*

Cynthia Haq, M.D. Indiana University, *Gerald B. Sinykin, M.D., Chair in Family Medicine and Department Chair and Professor of Family Medicine*

Matthew Harding, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Economics; Statistics*

Heidi Hardt, Ph.D. Graduate Institute of International and Development Studies, *Assistant Professor of Political Science* (international security, international organizations, NATO, European Union, African Union, crisis management, organizational learning)

Scott Hardy, M.D., M.P.H. Saint Louis University School of Medicine, *Clinical Professor of Environmental Health Sciences; Program in Public Health*

Matthew Hare, D.M.A. University of Iowa, *Lecturer of Music*

Tabetha Ridgeway Harken, M.D. University of Colorado Boulder, *Health Sciences Associate Clinical Professor of Obstetrics and Gynecology*

Jason Harnell, *Lecturer of Music*

Martin Harries, Ph.D. Yale University, *Professor of English* (20th century theater, critical theory)

Anna L. Harris, M.D. Loma Linda University, *Health Sciences Clinical Professor of Anesthesiology and Perioperative Care*

Ian G. Harris, Ph.D. University of California, San Diego, *Professor of Computer Science; Electrical Engineering and Computer Science* (hardware/software covalidation, manufacturing test)

Gail K. Hart, Ph.D. University of Virginia, *Professor Emerita of German* (18th- and early-19th-century German drama and fiction, Schiller, history of punishment)

Patricia L. Hartz, Ph.D. University of California, Irvine, *Non-Senate Academic Emerita of Humanities*

George C. Harvey, M.F.A. University of California, Irvine, *Professor Emeritus of Drama* (artistic direction, producing, lighting design)

Sandra Harvey, Ph.D. University of California, Santa Cruz, *Assistant Professor of African American Studies; Culture and Theory* (black diasporas, sovereignty, indigeneity, visual art and culture, Enlightenment philosophy, feminist and queer theories)

Richard L. Hasen, J.D. University of California, Los Angeles, *UCI Chancellor's Professor of School of Law; Political Science*

Anton N. Hasso, Ph.D. Loma Linda University, *Professor of Radiological Sciences*

Kristen L. Hatch, Ph.D. University of California, Los Angeles, *Associate Professor of Film and Media Studies; Visual Studies* (classical Hollywood, stardom, melodrama, histories of gender, race and sexuality, girlhood studies)

Tamera J. Hatfield, M.D. Ph.D. University of California, Irvine; University of North Carolina, *Health Sciences Associate Clinical Professor of Obstetrics and Gynecology*

Jered Haun, Ph.D. University of Pennsylvania, *Associate Professor of Biomedical Engineering; Chemical and Biomolecular Engineering; Materials Science and Engineering* (nanotechnology, molecular engineering, computational simulations, targeted drug delivery, clinical cancer detection)

Bradford A. Hawkins, Ph.D. University of California, Riverside, *Professor Emeritus of Ecology and Evolutionary Biology*

Heather T. Hawthorne, M.D. University of Arkansas at Little Rock, *Health Sciences Clinical Professor of Pediatrics*

Erika Hayasaki, B.A. University of Illinois at Urbana-Champaign, *Associate Professor of English* (literary journalism in the digital age, narrative nonfiction, immersion journalism, youth, culture, crime, poverty, health, science, education, urban affairs, death)

Gillian Hayes, Ph.D. Georgia Institute of Technology, *Robert A. and Barbara L. Kleist Professor of Informatics; Education* (interactive and collaborative technology, human-computer interaction, computer-supported cooperative work, educational technology, ubiquitous computing)

Wayne B. Hayes, Ph.D. University of Toronto, *Associate Professor of Computer Science* (biomedical informatics and computational biology, computer vision, scientific and numerical computing)

Douglas M. Haynes, Ph.D. University of California, Berkeley, *Vice Chancellor for Equity, Diversity, and Inclusion and Professor of History; African American Studies* (social and cultural history of modern Britain, social history of modern medicine)

Elizabeth Head, Ph.D. University of Toronto, *Vice Chair for Research and Professor of Pathology and Laboratory Medicine*

Glenn E. Healey, Ph.D. Stanford University, *Professor of Electrical Engineering and Computer Science* (machine learning, data science, sabermetrics, physical modeling, computer vision, image processing)



Patrick L. Healey, Ph.D. University of California, Berkeley, *Professor Emeritus of Developmental and Cell Biology* (plant cellular differentiation and morphogenesis, ultrastructure and histochemistry of secretory systems, early reproductive development)

Gary Heaton-Smith, D.M.A. University of California, Los Angeles, *Lecturer of Music*

Jutta Heckhausen, Ph.D. University of Strathclyde, *Professor of Psychological Science; Education* (life-span developmental psychology, motivation, individual agency and social context)

William W. Heidbrink, Ph.D. Princeton University, *Professor of Physics and Astronomy*

Jeremy Heis, Ph.D. University of Pittsburgh, *Associate Professor of Logic and Philosophy of Science; Philosophy*

Rebeca Louise Helfer, Ph.D. Columbia University, *Associate Professor of English; European Languages and Studies* (Renaissance literature and culture, memory, Spenser)

Bhumi Dave Heliker, M.D. University of Pittsburgh, *Health Sciences Assistant Clinical Professor of Obstetrics and Gynecology*

Jeffrey S. Helmreich, Ph.D. University of California, Los Angeles, *Assistant Professor of Philosophy; School of Law*

Mohammad A. Helmy, M.D. University of California, Irvine, *Associate Dean of Academic Affairs - Clinical and Health Sciences Clinical Professor of Radiological Sciences*

John C. Hemminger, Ph.D. Harvard University, *UCI Distinguished Professor of Chemistry* (analytical, atmospheric and environmental, physical chemistry and chemical physics, polymer, materials, nanoscience)

Carrie Hempel, J.D. Yale University, *Associate Dean for Clinical Education and Service Learning and Clinical Professor of School of Law*

Andrea K. Henderson, Ph.D. University of Pennsylvania, *Professor of English* (19th century literature, literature and visual arts, literature and science)

James D. Herbert, Ph.D. Yale University, *Professor of Art History; Visual Studies* (modern European art)

June Herman, M.D. University of North Dakota, *Health Sciences Clinical Professor of Radiological Sciences*

L. R. Herman, B.S. University of California, Irvine, *Academic Coordinator of Biological Sciences*

Aleah Hernandez, Ph.D. University of California, Irvine, *Assistant Professor of Teaching of Classics* (Greek epic and tragedy, classical reception, gender studies in Classics)

Ivette N. Hernandez-Torres, Ph.D. Brown University, *Associate Professor of Spanish and Portuguese* (Colonial Latin America, Latin America and Caribbean literatures and cultures)

Amalia C. Herrmann, M.A. Cornell University, *Lecturer of Humanities*

Klemens J. Hertel, Ph.D. University of Colorado Boulder, *Associate Dean of Graduate and Postdoctoral Studies and Vice Chair and Professor of Microbiology and Molecular Genetics*

Payam Heydari, Ph.D. University of Southern California, *Professor of Electrical Engineering and Computer Science* (design and analysis of analog, radio-frequency, millimeter-wave and terahertz integrated circuits)

Alan F. Heyduk, Ph.D. Massachusetts Institute of Technology, *Department Vice Chair and Professor of Chemistry* (inorganic and organometallic)

Hamid Hezari, Ph.D. Johns Hopkins University, *Associate Professor of Mathematics* (analysis and partial differential equations)

Gregory S. Hickok, Ph.D. Brandeis University, *Professor of Cognitive Sciences; Language Science* (neuroanatomy of language, neural plasticity, neuroimaging, cognitive neuroscience)

James W. Hicks, Ph.D. University of New Mexico, *Department Chair and Professor of Ecology and Evolutionary Biology*

Elsie R. Hidalgo, M.D. University of California, Los Angeles, *Health Sciences Clinical Professor of Pediatrics*

Andrew Highsmith, Ph.D. University of Michigan, *Associate Professor of History* (United States history since 1865; cities and suburbs in American life; public policy history; political history; social inequality; land-use policy)

Lucas Hilderbrand, Ph.D. New York University, *Professor of Film and Media Studies; Visual Studies* (Queer cultures and media, cultural studies, documentary, pornography, popular music, video art, histories of technology)

Donald D. Hill, M.F.A. University of Southern California, *Department Chair and Co-Head of Stage Management, Associate Producer and Professor of Teaching of Drama* (stage management, directing, acting)

Lamar M. Hill, Ph.D. University of London, *Professor Emeritus of History*

Marcelo Hinojosa, M.D. University of California, Irvine, *Health Sciences Associate Clinical Professor of Surgery*

John R. Hipp, Ph.D. University of North Carolina at Chapel Hill, *Professor of Criminology, Law and Society; Sociology; Urban Planning and Public Policy* (community context of crime, household decisions and neighborhood change, research methods)

Ann Hironaka, Ph.D. Stanford University, *Professor of Sociology; Asian American Studies* (political sociology, war and peace, environmental sociology, ethnic and racial conflict)

Jan Hirsch, Ph.D. University of South Carolina, *Director and Founding Dean and Professor of Clinical Pharmacy Practice*

Dan S. Hirschberg, Ph.D. Princeton University, *Professor of Computer Science* (analyses of algorithms, concrete complexity, data structures, models of computation)

David Hirshleifer, Ph.D. University of Chicago, *Paul Merage Chair in Business Growth and Distinguished Professor of Paul Merage School of Business; Economics*

Siew Hong Teoh Hirshleifer, Ph.D. University of Chicago, *Professor of Paul Merage School of Business*

Jeffrey H. Ho, D.O. Touro U College of Osteopathic Medicine, *Health Sciences Assistant Clinical Professor of Pediatrics*

Joanna Ho, Ph.D. University of Texas at Austin, *Professor of Paul Merage School of Business*

Wilson Ho, Ph.D. University of Pennsylvania, *Donald Bren Professor and Professor of Physics and Astronomy; Chemistry*

Allon Hochbaum, Ph.D. University of California, Berkeley, *Associate Professor of Materials Science and Engineering; Chemical and Biomolecular Engineering; Chemistry* (nanoscale materials and hybrid bio-inorganic devices for applications in clean energy)

Alan R. Hoffer, Ph.D. University of Michigan, *Professor Emeritus of Education*

Paul L. Hoffman, J.D. New York University, *Adjunct Professor of School of Law*

Franz J. Hoffmann, Ph.D. University of Hohenheim, *Professor of Teaching Emeritus of Developmental and Cell Biology* (regeneration of cultured plant cells, somatic cell genetics)

Jessica M. Hoffmann, M.D. Creighton University, *Health Sciences Assistant Clinical Professor of Emergency Medicine*

Christine L. Hollister, M.D. Dartmouth College, *Health Sciences Clinical Professor of Anesthesiology and Perioperative Care*

John W. Hollowell, Ph.D. University of Michigan, *Professor of Teaching Emeritus of English*

E. Alison Holman, Ph.D. University of California, Irvine, *Associate Professor of Nursing*

Todd C. Holmes, Ph.D. Massachusetts Institute of Technology, *Department Vice Chair and Professor of Physiology and Biophysics*

Amanda J. Holton, Ph.D. University of California, Irvine, *Associate Professor of Teaching of Chemistry* (chemistry, chemical education)

Alice J. Hon, M.D. New Jersey Medical School, *Health Sciences Assistant Clinical Professor of Physical Medicine and Rehabilitation*

Juan Hong, Ph.D. Purdue University, *Professor Emeritus of Chemical and Biomolecular Engineering*

Michael K. Hooker, M.F.A. California Institute of the Arts, *Head of Design and Professor of Drama* (sound design)

Wirachin Hoonpongmanont, M.D. Mahidol University, *Assistant Professor of Emergency Medicine*

Suellen Hopfer, Ph.D. Pennsylvania State University, *Assistant Professor of Program in Public Health; Asian American Studies*

Herbert J. Hopster, Ph.D. Aachen University, *Professor Emeritus of Physics and Astronomy*

Naoto Hoshi, Ph.D. Kanazawa University, *Associate Professor of Pharmaceutical Sciences; Physiology and Biophysics*

Roosbeh Houshyar, M.D. Ross University, *Health Sciences Associate Clinical Professor of Radiological Sciences; Urology*

Douglas Houston, Ph.D. University of California, Los Angeles, *Associate Professor of Urban Planning and Public Policy*

Kristine Houston, M.S. National University, *Lecturer of Education*

Michael A. Hoyt, Ph.D. Arizona State University, *Associate Professor of Program in Public Health; Epidemiology; Psychological Science*



Jeffrey J. Hruby, M.A. California State University, Fullerton, *Lecturer of Education*

Ruohmei Hsieh, M.A. State University of New York at Stony Brook, *Academic Coordinator and Lecturer of Chinese*

Frank P.K. Hsu, M.D. University of Maryland, College Park, *Department Chair and Department Chair of Physical Medicine and Rehabilitation and Professor of Neurological Surgery; Biomedical Engineering; Otolaryngology*

Kuo-Lin Hsu, Ph.D. University of Arizona, *Professor of Civil and Environmental Engineering* (remote sensing of precipitation, hydrologic systems modeling, stochastic hydrology, water resources systems planning)

Yilin Hu, Ph.D. Loma Linda University, *Assistant Professor of Molecular Biology and Biochemistry*

Hu Ying, Ph.D. Princeton University, *Department Chair and Professor of Chinese; Comparative Literature* (narrative literature, translation theory, feminist theory)

Chong Huang, Ph.D. University of Pennsylvania, *Assistant Professor of Paul Merage School of Business*

Lan Huang, Ph.D. University of Florida, *Professor of Physiology and Biophysics; Biological Chemistry; Biomedical Engineering; Pharmaceutical Sciences*

Martin W. Huang, Ph.D. Washington University, St. Louis, *Professor of Chinese* (late imperial Chinese literature, culture, gender)

Kenneth B. Huber, Ph.D. University of California, Irvine, *Lecturer of Mathematics*

Matthew L. Huffman, Ph.D. University of California, Santa Barbara, *Professor of Sociology* (inequality, organizations, work and employment, research methods)

Bradley S. Hughes, Ph.D. University of California, Irvine, *Associate Professor of Teaching of Ecology and Evolutionary Biology; Education*

Christopher C. Hughes, Ph.D. University of London, *Director of Edwards Lifesciences Center for Advanced Cardiovascular Technology and Professor of Molecular Biology and Biochemistry; Biomedical Engineering* (tissue engineering, growth and patterning of blood vessels)

D'Iorah Hughes, J.D. Duke University School of Law, *Adjunct Professor of School of Law*

Elliot E. Hui, Ph.D. University of California, Berkeley, *Associate Professor of Biomedical Engineering* (microscale tissue engineering, bioMEMS, cell-cell interactions, global health diagnostics)

James R. Hull, Ph.D. University of North Carolina at Chapel Hill, *Assistant Professor of Teaching of Social Sciences* (social networks and social exchange, monetization, barter, multidimensional poverty measures, migration outcomes at origin, classroom technologies and scaling, student engagement, scholarship of teaching and learning)

Anneeth Kaur Hundle, Ph.D. University of Michigan, Ann Arbor, *Dhan Kaur Sahota Presidential Chair of Sikh Studies and Assistant Professor of Anthropology; Religious Studies* (Sikh studies, African and South Asian diaspora/studies; politics of afro-asianism; citizenship, race, and decolonization; minoritization and community formation, postcolonial and transnational feminisms; gender and sexuality; critical university studies; Uganda, East Africa, global south)

Juliette L. Hunt, M.D. University of California, Davis, *Health Sciences Associate Clinical Professor of Pediatrics*

Robert F. Hunt, Ph.D. University of Kentucky, *Assistant Professor of Anatomy and Neurobiology*

George L. Hunt, Jr., Ph.D. Harvard University, *Professor Emeritus of Ecology and Evolutionary Biology*

Joseph Huszti, MM Northwestern University, *Professor Emeritus of Music*

Simon Huttegger, Ph.D. University of Salzburg, *Department Chair and Professor of Logic and Philosophy of Science*

Kevin C. Hutton, M.D. Georgetown University, *Health Sciences Associate Clinical Professor of Emergency Medicine*

Travis E. Huxman, Ph.D. University of Nevada, *Professor of Ecology and Evolutionary Biology*

Karajeane Hyde, M.A. Vanguard University, *Lecturer of Education* (mathematics education)

Michael Hyland, Ph.D. Northwestern University, *Assistant Professor of Civil and Environmental Engineering* (modeling, design, control, and analysis of smart city transportation systems with emphases on shared-use autonomous mobility services and urban transit networks)

Hyunyoung Hyun, M.A. Yonsei University, *Academic Coordinator and Lecturer of Korean*

Mustafa Ibrahim, M.S. California State University, *Lecturer of Computer Science* (software engineering)

Hirohito Ichii, Ph.D. Kobe University, *Associate Professor of Surgery*

Kei Igarashi, Ph.D. University of Tokyo, *Assistant Professor of Anatomy and Neurobiology*

David B. Igler, Ph.D. University of California, Berkeley, *Professor of History* (U.S., American West, environmental, and Pacific history)

Alexander T. Ihler, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Computer Science* (artificial intelligence and machine learning, probabilistic models, sensor networks, and distributed systems)

Constance Iloh, Ph.D. University of Southern California, *Assistant Professor of Education*

Adria Imada, Ph.D. New York University, *Associate Professor of History* (indigenous and Pacific Islands studies, race, gender and medicine, visual studies)

David Imagawa, Ph.D. Johns Hopkins University, *Suzanne Dykema Endowed Chair in Pancreatic Cancer and Professor of Surgery*

Helen Ingram, Ph.D. Columbia University, *Professor Emerita of Urban Planning and Public Policy*

Matthew Inlay, Ph.D. University of California, San Diego, *Assistant Professor of Molecular Biology and Biochemistry*

Sandra S. Irani, Ph.D. University of California, Berkeley, *Professor of Computer Science* (algorithms and complexity)

Sanaz Attaripour Isfahani, M.D. Tehran University of Medical Sciences, *Health Sciences Assistant Clinical Professor of Neurology*

Paata Ivanisvili, Ph.D. Michigan State University, *Assistant Professor of Mathematics* (analysis, probability)

Autumn S. Ivy, M.D., Ph.D. University of California, Irvine, *Assistant Professor of Pediatrics; Neurology; Physiology and Biophysics*

Oren J. Izenberg, Ph.D. Johns Hopkins University, *Associate Professor of English* (poetics, modern and contemporary poetry, 20th century literature and culture, philosophy and literature)

Faryar Jabbari, Ph.D. University of California, Los Angeles, *Associate Dean for Academic Affairs and Professor of Mechanical and Aerospace Engineering* (optimal control theory, distributed parameter systems, parameter identification)

Bryan Jackson, M.F.A. University of California, Los Angeles, *Continuing Lecturer of Art* (digital filmmaking)

Jesse C. Jackson, M.A. University of Toronto, *Director of the Minor in Digital Arts and Associate Professor of Art; Informatics* (digital art, informatics, design, architecture)

Virginia W. Jackson, Ph.D. Princeton University, *Chair in Rhetoric and Communication and Associate Professor of English; Comparative Literature* (poetics, 19th, 20th and 21st century American poetry, 19th century American literature and culture, the history of literary theory)

Stephanie A. Jacobs, M.D. University of Pittsburgh, *Health Sciences Assistant Clinical Professor of Obstetrics and Gynecology*

Mireille Jacobson, Ph.D. Harvard University, *Associate Professor of Paul Merage School of Business*

Susanne M. Jaeggi, Ph.D. University of Bern, *Associate Professor of Education; Cognitive Sciences* (working memory, executive functions, cognitive training, lifespan development aging, individual differences)

Syed A. Jafar, Ph.D. Stanford University, *Professor of Electrical Engineering and Computer Science* (wireless communication and information theory)

Mahtab F. Jafari, Pharm.D. University of California, San Francisco, *Director of the Center for Healthspan Pharmacology and Professor of Pharmaceutical Sciences; Ecology and Evolutionary Biology* (anti-aging pharmacology and preventive medicine)

Hamid Jafarkhani, Ph.D. University of Maryland, College Park, *Conexant-Broadcom Chair in the Center for Pervasive Communications and UCI Chancellor's Professor of Electrical Engineering and Computer Science* (communication theory, signal processing coding, wireless networks, medical image segmentation)

Daniel Jaffurs, M.D. University of Pittsburgh, *Health Sciences Assistant Clinical Professor of Surgery*

Ramesh Chandra Jain, Ph.D. Indian Institute of Technology Kharagpur, *Donald Bren Professor of Information & Computer Sciences and Distinguished Professor of Computer Science* (computer vision, multimedia computing, image databases, machine vision, intelligent systems)

Vivek Jain, M.D. Memorial University of Newfoundland, *Health Sciences Associate Clinical Professor of Neurology*

James G. Jakowatz, M.D. University of Kansas, *Health Sciences Clinical Professor of Surgery*

Mehrdad Jalili, M.D. University of Isfahan, *Health Sciences Professor of Pediatrics*

Aaron J. James, Ph.D. Harvard University, *Professor of Philosophy*

Anthony A. James, Ph.D. University of California, Irvine, *Distinguished Professor and Donald Bren Professor of Microbiology and Molecular Genetics; Molecular Biology and Biochemistry*

Winston A. James, Ph.D. University of London, *Professor of History* (Caribbean, African American, African diaspora)

Larry D. Jamner, Ph.D. State University of New York at Stony Brook, *Professor of Psychological Science* (health psychology, psychophysiology, pain, mHealth)

Kenneth C. Janda, Ph.D. Harvard University, *Professor Emeritus of Chemistry* (physical chemistry and chemical physics)

Stanislaw M. Jarecki, Ph.D. Massachusetts Institute of Technology, *Professor of Computer Science* (algorithms and complexity, applies and distributed cryptograph)

Susan C. Jarratt, Ph.D. University of Texas at Austin, *Professor Emerita of Comparative Literature; Education* (histories and theories of rhetoric, ancient Greek rhetoric, writing studies)

Elizabeth R. Jarvo, Ph.D. Boston College, *Professor of Chemistry* (inorganic and organometallic, organic and synthetic)

Luis A. Jauregui, Ph.D. Purdue University, *Assistant Professor of Physics and Astronomy*

R. (Jay) Jayakrishnan, Ph.D. University of Texas at Austin, *Professor of Civil and Environmental Engineering* (transportation systems analysis)

Ivan G. Jeliakov, Ph.D. Washington University, *Associate Professor of Economics; Statistics*

Maxwell Y. Jen, M.D. University of California, San Francisco, *Health Sciences Assistant Clinical Professor of Emergency Medicine*

Brian C. Jenkins, Ph.D. University of North Carolina at Chapel Hill, *Assistant Professor of Teaching of Economics*

Jade Marcus Jenkins, Ph.D. University of North Carolina at Chapel Hill, *Assistant Professor of Education*

Ulysses S. Jenkins, M.F.A. Otis Art Institute, *Professor of Art; African American Studies* (video, performance art)

Angela C. Jenks, Ph.D. University of California, Berkeley, *Associate Professor of Teaching of Anthropology* (medical anthropology, race and ethnicity, urban ethnography, United States)

Valerie Jenness, Ph.D. University of California, Santa Barbara, *Distinguished Professor of Criminology, Law and Society; Sociology* (links between deviance and social control [especially law], the politics of crime control and criminalization, social movements and social change, corrections and public policy)

Linda Cohen Jennings, Ph.D. California Institute of Technology, *Professor of School of Law; Economics*

Joseph Jonghyun Jeon, Ph.D. University of California, Berkeley, *Professor of English; Asian American Studies; Culture and Theory* (Asian-American literature, film modernism)

Amanda Jerome, M.A. California State University, Fullerton, *Lecturer of Academic English/English as a Second Language*

James V. Jester, Ph.D. University of Southern California, *Jack H. Skirball Chair in Ophthalmology Research and Professor of Ophthalmology; Biomedical Engineering*

Jonathan Jewkes, M.D. Loma Linda University, *Health Sciences Clinical Instructor of Radiological Sciences*

Priyaranjan Jha, Ph.D. Columbia University, *Professor of Economics*

C. Sunny Jiang, Ph.D. University of South Florida, *Department Chair and Professor of Civil and Environmental Engineering; Ecology and Evolutionary Biology; Environmental Health Sciences* (water pollution microbiology, environmental biotechnology, aquatic microbial ecology)

Lai Jiang, Ph.D. New York University, *Lecturer of Economics*

Luohua Jiang, Ph.D. University of California, Los Angeles, *Associate Professor of Epidemiology*

Dalie Jimenez, J.D. Harvard Law School, *Professor of School of Law*

Rongsheng Jin, Ph.D. Columbia University, *Professor of Physiology and Biophysics*

Wenlong Jin, Ph.D. University of California, Davis, *Associate Professor of Civil and Environmental Engineering* (intelligent transportation systems, traffic flow theory, transportation network analysis)

Svetlana Jitomirskaya, Ph.D. Moscow State University, *Distinguished Professor of Mathematics* (mathematical physics)

Victor C. Joe, M.D. Virginia Commonwealth University, *Health Sciences Associate Clinical Professor of Surgery*

Adriana M. Johnson, Ph.D. Duke University, *Associate Professor of Comparative Literature* (Latin American literature and film, subaltern studies, postcolonial studies, politics and culture)

Jennifer Johnson, M.D. University of Münster, *Senate Emerita of Pediatrics*

Kathleen Johnson, Ph.D. University of California, Berkeley, *Associate Professor of Earth System Science*

Michael P. Johnson, Ph.D. Stanford University, *Professor Emeritus of History*

Victoria E. Johnson, Ph.D. University of Southern California, *Professor of Film and Media Studies; African American Studies; Culture and Theory; Visual Studies* (U.S. television, history, media industry studies, critical race theory, cultural geography, sound and music in popular media, media law and policy)

Wesley O. Johnson, Ph.D. University of Minnesota, *Professor Emeritus of Statistics*

Jeffrey M. Johnston, M.A. University of Southern California, *Lecturer of Education*

Stephen N. Jolley, Ph.D. Cambridge University, *Professor Emeritus of Philosophy*

James Jones, Ph.D. Georgia Institute of Technology, *Associate Professor of Informatics* (software engineering, software testing and analysis, debugging and fault localization, static and dynamic analysis, software visualization)

Neil Jones, M.D. Oxford University, *Professor of Orthopaedic Surgery*

Rose Jones, Ph.D. University of California, Irvine, *Lecturer of Academic English/English as a Second Language*

Sara M. Jordan, M.D. University of New Mexico, *Health Sciences Clinical Instructor of Obstetrics and Gynecology*

Scott A. Jordan, Ph.D. University of California, Berkeley, *Professor of Computer Science; Electrical Engineering and Computer Science* (pricing and differentiated services in the Internet, resource allocation in wireless networks, telecommunications policy)

Philippe Jorion, Ph.D. University of Chicago, *Professor of Paul Merage School of Business; Economics*

John Joseph, Ph.D. Northwestern University, *Associate Professor of Paul Merage School of Business*

Tibor Juhasz, Ph.D. Attila József University, *Professor of Ophthalmology; Biomedical Engineering*

Sang-Woo Jun, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Computer Science* (computer systems architecture, hardware acceleration, non-volatile memory)

Kwang M. Jung, Ph.D. Chung-Ang University, *Associate Adjunct Professor of Anatomy and Neurobiology*

Nii-Kabu Kabutey, M.D. Albany Medical College, *Health Sciences Assistant Clinical Professor of Surgery*

Pavan Kadandale, Ph.D. Rutgers, The State University of New Jersey, *Assistant Professor of Teaching of Molecular Biology and Biochemistry*

Tatiana Kain, M.D. Ben Gurion School of Medicine, *Health Sciences Associate Clinical Professor of Radiological Sciences*

Zeev Kain, M.D. Ben Gurion School of Medicine, *Chancellor's Professor of Anesthesiology and Perioperative Care; Medicine*

Peter Kaiser, Ph.D. University of Innsbruck, *Department Chair and Professor of Biological Chemistry*

Kamyar Kalantar-Zadeh, M.D. University of Bonn, *Professor of Medicine; Program in Public Health*

Katalin Kalman, Ph.D. Jozsef Attila University, *Associate Project Scientist of Ophthalmology*

Marek Kaminski, Ph.D. University of Maryland, College Park, *Associate Professor of Political Science; Economics* (voting models, democratization, political consequences of electoral laws)

Daniel Kang, M.D. University of Maryland, College Park, *Health Sciences Clinical Instructor of Pediatrics*

Hosun Kang, Ph.D. Michigan State University, *Associate Professor of Education*

Laura H. Kang, Ph.D. University of California, Santa Cruz, *Professor of Gender and Sexuality Studies* (feminist epistemologies and theories, cultural studies, ethnic studies)

Grace Kao, M.D. National Taiwan University, *Health Sciences Associate Clinical Professor of Neurology*

Nathan Kaplan, Ph.D. Harvard University, *Associate Professor of Mathematics* (algebra and number theory)

Manoj Kaplinghat, Ph.D. Ohio State University, *Professor of Physics and Astronomy*

Andromache Karanika, Ph.D. Princeton University, *Department Chair and Associate Professor of Classics; European Languages and Studies; Religious Studies* (Greek epic poetry, Greek lyric, ritual, gender and performance, reception of antiquity in Byzantium)

Larisa Karkafi, Ph.D. University of California, Los Angeles, *Lecturer of Academic English/English as a Second Language*

Kalev Kask, Ph.D. University of California, Irvine, *Lecturer of Computer Science* (artificial intelligence focusing on automated reasoning, graphical models)

Zak Kassas, Ph.D. University of Texas at Austin, *Assistant Professor of Mechanical and Aerospace Engineering; Electrical Engineering and Computer Science* (cyber-physical systems (CPS), autonomous vehicles (aerial, ground, indoor, underwater), satellite-based navigation, intelligent transportation systems (ITS), cognitive and software-defined radio (SDR), sensor fusion)

Kari L. Kassir, M.D. University of California, Irvine, *Health Sciences Clinical Professor of Pediatrics*

Ketu H. Katrak, Ph.D. Bryn Mawr College, *Professor of Drama; Comparative Literature; English* (drama and performance, African drama and Ancient Sanskrit drama [from India], postcolonial literature and theory, women writers and feminist theory)

David Katz, M.D. Case Western Reserve University, *Non-Senate Academic Emeritus of Radiological Sciences*

Mitchell Katz, M.D. State University of New York Downstate Medical Center, *Health Sciences Clinical Professor of Pediatrics*

Robert J. Katzer, M.D. Temple University, *Health Sciences Associate Clinical Professor of Emergency Medicine*

Friederike Kaufel, M.A. California State University, Long Beach, *Lecturer of Academic English/English as a Second Language*

Claudia H. Kawas, M.D. University of Louisville, *Nichols Term Chair in Neuroscience and Professor of Neurology; Neurobiology and Behavior*

David G. Kay, J.D. Loyola Marymount University, *Professor Emeritus of Teaching of Informatics; Computer Science* (computer law, computer science education)

David A. Kaye, J.D. University of California, Berkeley, *Clinical Professor of School of Law*

Kirk A. Keegan, M.D. University of Maryland, College Park, *Non-Senate Academic Emeritus of Obstetrics and Gynecology*

Charlene J. Keeler, M.A. California State University, Fullerton, *Lecturer of English*

Jonathan I. Keeperman, M.F.A. University of California, Irvine, *Lecturer of English*

Tarah M. Keeperman, M.A. University of California, Irvine, *Lecturer of English*

Lynn Robin Keller, Ph.D. University of California, Los Angeles, *Professor of Paul Merage School of Business*

Pamela A. Kelley, J.D. Yale University, *Lecturer of Political Science* (civil rights law, constitutional law, gender discrimination, legal profession, leadership, ethics)

Kristen M. Kelly, M.D. University of California, Irvine, *Health Sciences Professor of Dermatology; Surgery*

Richard Kelly, M.D. Stanford University, *Health Sciences Associate Clinical Professor of Anesthesiology and Perioperative Care*

Maria Cristina Kenney, M.D., Ph.D. University of California, Los Angeles; University of Arizona, *Professor of Ophthalmology; Pathology and Laboratory Medicine*

Bonnie D. Kent, Ph.D. Columbia University, *Professor Emeritus of Philosophy; Religious Studies*

Kai Kessenbrock, Ph.D. Ludwig Maximilian University of Munich, *Assistant Professor of Biological Chemistry*

Joyce H. Keyak, Ph.D. University of California, San Francisco, *Professor in Residence of Radiological Sciences; Biomedical Engineering; Mechanical and Aerospace Engineering*

Alya Khan, M.D., M.S. Saba School of Medicine, *Assistant Clinical Professor of Environmental Health Sciences; Program in Public Health*



Pramod Khargonekar, Ph.D. University of Florida, *UCI Distinguished Professor of Electrical Engineering and Computer Science* (systems and control theory; learning and intelligent systems; applications to renewable energy and smart grid, neural engineering, and economics; leadership and creativity; technology and society)

Arash Kheradvar, Ph.D. California Institute of Technology, *Professor of Biomedical Engineering; Mechanical and Aerospace Engineering* (cardiac mechanics, cardiovascular devices, cardiac imaging)

Aaron Kheriaty, M.D. Georgetown University, *Health Sciences Associate Clinical Professor of Psychiatry and Human Behavior; Religious Studies*

Michelle Khine, Ph.D. University of California, Berkeley, *Professor of Biomedical Engineering; Chemical and Biomolecular Engineering; Materials Science and Engineering* (development of novel nano- and micro-fabrication technologies and systems for single cell analysis, stem cell research, in-vitro diagnostics)

Rostam Khoshsar, M.D. University of Tehran, *Health Sciences Assistant Clinical Professor of Anesthesiology and Perioperative Care*

Shahira Khoury, M.D. Ain Shams University, *Health Sciences Associate Clinical Professor of Physical Medicine and Rehabilitation*

Solmaz S. Kia, Ph.D. University of California, Irvine, *Assistant Professor of Mechanical and Aerospace Engineering; Computer Science* (systems and control, decentralized/distributed algorithm design for multi-agent systems, cooperative robotics)

Soheila Kian, Ph.D. University of California, Los Angeles, *Lecturer of Persian*

Dennis F. Kibler, Ph.D. University of California, Irvine, *Professor Emeritus of Computer Science* (artificial intelligence and machine learning, gene regulation, biological genomes)

Nafiz M. Kiciman, M.D. Hacettepe University, *Health Sciences Professor of Pediatrics*

P. Douglas Kiester, Ph.D. University of Utah, *Health Sciences Professor of Orthopaedic Surgery*

Douglas V. Kiklowicz, M.F.A. University of California, Irvine, *Lecturer of English*

David B. Kilgore, M.D. University of Southern California, *Health Sciences Professor of Family Medicine*

Herbert P. Killackey, Ph.D. Duke University, *Professor Emeritus of Neurobiology and Behavior*

Christine M. Kim, M.D. Saint Louis University, *Health Sciences Associate Clinical Professor of Obstetrics and Gynecology*

Claire J. Kim, Ph.D. Yale University, *Professor of Asian American Studies; Political Science*

Deborah Kim, M.D. Drexel University, *Health Sciences Clinical Instructor of Ophthalmology*

Eleana Kim, Ph.D. New York University, *Associate Professor of Anthropology; Asian American Studies* (kinship, transnationalism, environment, Korea)

Jae Hong Kim, Ph.D. University of Illinois at Urbana-Champaign, *Assistant Professor of Urban Planning and Public Policy*

Kyung Hyun Kim, Ph.D. University of Southern California, *Professor of Korean Culture; Asian American Studies; Film and Media Studies; Visual Studies* (East Asian cinema, modern Korea, critical theory)

Michael J. Kim, M.D. Northwestern University, *Health Sciences Clinical Professor of Radiological Sciences*

Moon H. Kim, M.D. Yonsei University, *Non-Senate Academic Emeritus of Obstetrics and Gynecology*

Saewung Kim, Ph.D. Georgia Institute of Technology, *Associate Professor of Earth System Science*

Sharon Kim, M.D. Drexel University, *Health Sciences Clinical Professor of Pediatrics*

Sung Eun (Summer) Kim, J.D. Harvard University, *Assistant Professor of School of Law*

Young Hee Kim, Ph.D. University of California, Irvine, *Lecturer of Humanities*

Young-Suk Kim, Ed.D. Harvard University, *Professor of Education; Asian American Studies*

Virginia E. Kimonis, M.D. University of Southampton, *Professor of Pediatrics; Environmental Health Sciences; Genetic Counseling; Pathology and Laboratory Medicine*

Mari Kimura, D.M.A. Juilliard School, *Professor of Music*

Christine King, Ph.D. University of California, Irvine, *Assistant Professor of Teaching of Biomedical Engineering* (engineering and STEM education, active learning, wireless health systems, rehabilitation, brain-computer interfaces, robotics)

Susan M. King, Ph.D. Massachusetts Institute of Technology, *Professor of Teaching of Chemistry* (organic chemistry, chemical education)

Anne A. Kirkby, Ph.D. California Institute of Technology, *Lecturer of Physics and Astronomy*

David P. Kirkby, Ph.D. California Institute of Technology, *Professor of Physics and Astronomy*

Ivan I. Kirov, M.D. Medical Academy, *Health Sciences Clinical Professor of Pediatrics*

Philip D. Kiser, Pharm.D. Ph.D. Case Western Reserve University, *Assistant Professor of Physiology and Biophysics; Ophthalmology*

Masashi Kitazawa, Ph.D. Iowa State University, *Associate Professor of Medicine; Environmental Health Sciences*

Henry John Klassen, M.D. University of Pittsburgh, *Associate Professor in Residence of Ophthalmology*

Raymond O. Klefstad, Ph.D. University of California, Irvine, *Associate Professor of Teaching of Computer Science* (embedded systems, networks and distributed systems, programming languages and systems)

Abel Klein, Ph.D. Massachusetts Institute of Technology, *Distinguished Professor of Mathematics* (mathematical physics)

Christopher M. Klein, J.D. University of Chicago, *Lecturer of School of Law*

Laura Klein, Ph.D. University of California, Irvine, *Lecturer of French*

Susan B. Klein, Ph.D. Cornell University, *Professor of Japanese; Religious Studies* (premodern and modern theater and dance, Japanese religions, feminist critical theory)

Stuart A. Kleinfelder, Ph.D. Stanford University, *Professor of Electrical Engineering and Computer Science* (circuits and systems for visual imaging, X-rays, electron microscopy, particle physics, and other applications)

Michael T. Kleinman, Ph.D. New York University, *Adjunct Professor of Environmental Health Sciences; Program in Public Health*

J. Zoe Klemfuss, Ph.D. Cornell University, *Assistant Professor of Psychological Science; Language Science* (narrative development, children's autobiographical memory, sociocontextual influences on children's narrative, memory and well-being, children's eyewitness abilities)

Ruth Klüger, Ph.D. University of California, Berkeley, *Professor Emerita of German* (Kleist, nineteenth-century literature, Stifter, Holocaust literature)

Daniel J. Knauer, Ph.D. University of Nebraska, *Professor Emeritus of Developmental and Cell Biology* (human antithrombins and related serine protease inhibitors)

Daniel Knight, Ph.D. Ohio State University, *Assistant Professor of Teaching of Chemical and Biomolecular Engineering* (engineering pedagogy)

Jason M. Knight, M.D. Eastern Virginia Medical School, *Health Sciences Clinical Professor of Pediatrics*

Alfred Kobsa, Ph.D. University of Vienna, *Professor Emeritus of Informatics; Computer Science* (user modeling, human-computer interaction, artificial intelligence, cognitive science, interdisciplinary computer science)

Scott J. Koenig, M.D. New York University, *Health Sciences Clinical Instructor of Orthopaedic Surgery*

Sreya Kolay, Ph.D. University of Rochester, *Assistant Professor of Paul Merage School of Business*

Natalia Komarova, Ph.D. University of Arizona, *UCI Chancellor's Professor of Mathematics; Ecology and Evolutionary Biology* (applied and computational mathematics, mathematical and computational biology, mathematics of complex and social phenomena)

Allen P. Kong, M.D. University of California, Irvine, *Health Sciences Assistant Clinical Professor of Surgery*

Mei Kong, Ph.D. McGill University, *Associate Professor of Molecular Biology and Biochemistry*

Sarah Koo, M.M. The Juilliard School, *Lecturer of Music*

Harold Koopowitz, Ph.D. University of California, Los Angeles, *Professor Emeritus of Ecology and Evolutionary Biology*

Sharon Koppman, Ph.D. University of Arizona, *Assistant Professor of Paul Merage School of Business; Sociology* (work and occupations, sociology of culture, creative industries)

Jeffrey Kopstein, Ph.D. University of California, Berkeley, *Professor of Political Science; Religious Studies* (comparative politics, dictatorship and democracy, ethnic politics, political violence, post-communism)

Igor Kopylov, Ph.D. University of Rochester, *Associate Professor of Economics*



Jerzy Kosmala, D.M. Indiana University, *Lecturer of Music*

Madeline Kozlowski, M.F.A. Brandeis University, *Professor Emerita of Drama* (costume design)

Kenneth Kraemer, Ph.D. University of Southern California, *Professor Emeritus of Paul Merage School of Business*

Peter O. Krapp, Ph.D. University of California, Santa Barbara, *Professor of Film and Media Studies; English; European Languages and Studies; Informatics; Music; Visual Studies* (digital culture, media history, cultural memory)

Stuart M. Krassner, SCE Johns Hopkins University, *Professor Emeritus of Developmental and Cell Biology* (developmental transitions of hemoflagellates)

Diana N. Krause, Ph.D. University of California, Los Angeles, *Adjunct Professor of Pharmaceutical Sciences*

Arthur Kreitenberg, M.D. University of California, San Diego, *Health Sciences Clinical Professor of Orthopaedic Surgery*

Jeffrey L. Krichmar, Ph.D. George Mason University, *Professor of Cognitive Sciences; Computer Science* (computational neuroscience, robotics)

Lauren D. Krill, M.D. Thomas Jefferson University, Jefferson Medical College, *Health Sciences Clinical Instructor of Obstetrics and Gynecology*

Mayil S. Krishnam, M.D. Stanley Medical College, *Professor of Radiological Sciences*

Ilya N. Krivorotov, Ph.D. University of Minnesota, *Professor of Physics and Astronomy*

Judith Kroll, Ph.D. Brandeis University, *Distinguished Professor of Language Science* (psycholinguistics, bilingualism, second language acquisition, language production, lexical processing, reading, visual cognition, gender and science)

Christopher A. Kroner, M.D. Tulane University, *Health Sciences Assistant Clinical Professor of Family Medicine*

Jason Russell Kronewetter, Ph.D. University of California, Irvine, *Lecturer of Mathematics*

Frithjof Kruggel, M.D. Ludwig Maximilian University of Munich, *Professor of Biomedical Engineering* (biomedical signal and image processing, anatomical and functional neuroimaging in humans, structure-function relationship in the human brain)

Katsiaryna Krupchyk, Ph.D. Belarusian State University, *Professor of Mathematics* (analysis and partial differential equations, inverse problems, and imaging)

Anthony James Kubiak, Ph.D. University of Wisconsin-Madison, *Professor of Drama* (American and modern drama, modern poetry, critical theory, philosophy)

Charis E. Kubrin, Ph.D. University of Washington, *Professor of Criminology, Law and Society; Sociology* (crime, neighborhood effects and social processes, race/ethnicity and violence, immigration and crime)

Kate Kuhlman, Ph.D. University of Michigan, *Assistant Professor of Psychological Science* (developmental psychopathology, psychoneuroimmunology, psychoneuroendocrinology, early life stress, and adolescent depression)

Baruch D. Kuppermann, M.D., Ph.D. University of Miami, *California Institute of Technology, Director, Gavin Herbert Eye Institute; Roger F. Steinart, M.D., Endowed Chair in Ophthalmology and Department Chair and Professor of Ophthalmology; Biomedical Engineering*

Fadi J. Kurdahi, Ph.D. University of Southern California, *Director, Center for Embedded Computer Systems and Associate Dean for Graduate and Professional Studies and Professor of Electrical Engineering and Computer Science; Computer Science* (embedded and cyber-physical systems, VLSI system design, design automation of digital systems)

John A. Kusske, M.D. University of California, San Francisco, *Professor Emeritus of Neurological Surgery*

Young Jik Kwon, Ph.D. University of Southern California, *Professor of Pharmaceutical Sciences; Biomedical Engineering; Chemical and Biomolecular Engineering; Molecular Biology and Biochemistry* (gene therapy, drug delivery, cancer-targeted therapeutics, artificially-induced cellular vesicles, multi-modal therapies)

Frank M. LaFerla, Ph.D. University of Minnesota, *Dean of the School of Biological Sciences and Professor of Neurobiology and Behavior; Neurology*

John C. LaRue, Ph.D. University of California, San Diego, *Professor Emeritus of Mechanical and Aerospace Engineering* (fluid mechanics, heat transfer, turbulence)

Antoinette Lafarge, M.F.A. School of Visual Arts, *Professor of Art* (digital media)

Shadi Lahham, M.D. University of California, Irvine, *Assistant Professor of Emergency Medicine*

Anne Lai, J.D. New York University, *Assistant Clinical Professor of School of Law*

Kimberly Lakes, Ph.D. University of Wisconsin-Madison, *Associate Professor in Residence of Pediatrics; Education*

Jonathan Lakey, Ph.D. University of Alberta, *Professor of Surgery; Biomedical Engineering*

Cynthia Lakon, Ph.D. University of North Carolina at Chapel Hill, *Associate Professor of Program in Public Health*

Chandana Lall, M.D. University College of Medical Sciences, *Health Sciences Professor of Radiological Sciences*

Joleah B. Lamb, Ph.D. James Cook University, *Assistant Professor of Ecology and Evolutionary Biology*

Charles E. Lambert, Ph.D. University of California, Irvine, *Assistant Adjunct Professor of Environmental Health Sciences*

Joseph F. Lambert, Ph.D. Michigan State University, *Professor Emeritus of Philosophy*

Arthur D. Lander, Ph.D. University of California, San Francisco, *Donald Bren Professor and Professor of Developmental and Cell Biology; Biomedical Engineering; Logic and Philosophy of Science* (systems biology of development, pattern formation, growth control)

Felicia L. Lane, M.D. Georgetown University, *Health Sciences Associate Clinical Professor of Obstetrics and Gynecology*

Karen T. Lane, M.D. University of California, Los Angeles, *Health Sciences Associate Clinical Professor of Surgery*

Lance-David Bennett Langdon, Ph.D. University of California, Irvine, *Visiting Assistant Professor of Humanities*

Mark I. Langdorf, M.D. University of California, San Diego, *Professor of Emergency Medicine*

Andrew J. Lankford, Ph.D. Yale University, *Professor of Physics and Astronomy*

Joel Lanning, Ph.D. University of California, San Diego, *Assistant Professor of Teaching of Civil and Environmental Engineering* (seismic design of civil structures, large-scale testing, alternative building materials, teaching methods in engineering education)

Jenel Lao, Ed.D. University of California, Irvine and Los Angeles, *Lecturer of Education*

Kathryn M. Larsen, M.D. University of Washington, *Health Sciences Professor of Family Medicine*

Richard H. Lathrop, Ph.D. Massachusetts Institute of Technology, *Professor of Computer Science* (modeling structure and function, machine learning, intelligent systems and molecular biology, protein structure/function prediction)

P. Michelle Latiolais, M.F.A. University of California, Irvine, *Professor of English* (creative writing, fiction, contemporary literature)

Loraine Lau, Ph.D. University of California, Los Angeles, *Associate Professor of Paul Merage School of Business*

Matthew Law, Ph.D. University of California, Berkeley, *Associate Professor of Chemistry; Chemical and Biomolecular Engineering; Materials Science and Engineering* (inorganic and organometallic, physical chemistry and chemical physics, polymer, materials, nanoscience)

Jon M. Lawrence, Ph.D. University of Rochester, *Professor Emeritus of Physics and Astronomy*

Karen R. Lawrence, Ph.D. Columbia University, *Professor Emerita of English*

Devon A. Lawson, Ph.D. University of California, Los Angeles, *Assistant Professor of Physiology and Biophysics*

Rodrigo Lazo, Ph.D. University of Maryland, College Park, *Associate Professor of English; Culture and Theory* (hemispheric American studies, nineteenth century, Latino studies and the Americas, Cuba, immigrant literature)

Khanh-Van T. Le-Bucklin, M.D. University of California, San Francisco, *Associate Vice Chancellor for Education and Vice Dean for Medical Education and Health Sciences Clinical Professor of Pediatrics*

Mark A. LeVine, Ph.D. New York University, *Professor of History; Religious Studies* (modern Middle Eastern history, Islamic studies, histories of empire and globalization)

Alana Lebron, Ph.D. University of Michigan, *Assistant Professor of Program in Public Health; Chicano/Latino Studies*

Abraham P. Lee, Ph.D. University of California, Berkeley, *Professor of Biomedical Engineering; Mechanical and Aerospace Engineering* (integrated point-of-care diagnostics, engineered 'theranostic' vesicles and particles, active cell sorting microdevices, microphysiological microsystems, and high throughput droplet bioassays)

Chin C. Lee, Ph.D. Carnegie Mellon University, *Director of Materials and Manufacturing Technology and Professor of Electrical Engineering and Computer Science* (electronic packaging, bonding technology, metallurgy, thermal design, semiconductor devices, electromagnetic theory, acoustics and optoelectronics)

Eva Y. Lee, Ph.D. University of California, Berkeley, *UCI Chancellor's Professor Emerita of Biological Chemistry*

Gabseon Lee, M.A. University of Illinois at Urbana-Champaign, *Lecturer of Academic English/English as a Second Language*

Henry P. Lee, Ph.D. University of California, Berkeley, *Professor of Electrical Engineering and Computer Science* (photonics, fiber-optics and compound semiconductors)

Jaeho Lee, Ph.D. Stanford University, *Assistant Professor of Mechanical and Aerospace Engineering* (heat transfer, thermal management, thermoelectrics, phononics, nanomaterials)

James K. Lee, Ph.D. University of California, Los Angeles, *Associate Professor of Asian American Studies; Culture and Theory; English; Religious Studies* (Asian American literature and culture, contemporary U.S. literature, race and ethnic studies, urban studies, religious studies)

Jerry Won Lee, Ph.D. University of Arizona, *Associate Professor of English; Anthropology; Asian American Studies; Comparative Literature; Culture and Theory*

Julia Hyoun Joo Lee, Ph.D. University of California, Los Angeles, *Department Chair and Associate Professor of Asian American Studies; Culture and Theory; English* (Asian American literature and culture, African American literature and culture, ethnic literature, twentieth-century American literature.)

Jung-Ah Lee, Ph.D. University of Washington, *Associate Professor of Nursing*

Meredith A. Lee, Ph.D. Yale University, *Professor Emerita of German* (lyric poetry, eighteenth-century literature, Goethe, music and literature)

Michael D. Lee, Ph.D. University of Adelaide, *Professor of Cognitive Sciences* (computational models and bayesian methods in decision making, representation, categorization, individual differences, and the wisdom of the crowd)

Nancy Lee, M.D. Temple University, *Health Sciences Clinical Instructor of Ophthalmology*

Sei Young Lee, M.A. University of Arizona, *Lecturer of Academic English/English as a Second Language*

Stephen Lee, J.D. University of California, Berkeley, *Professor of School of Law; Asian American Studies*

Thay Q. Lee, Ph.D. Gothenburg School of Business, Economics and Law, *Professor in Residence of Orthopaedic Surgery; Physical Medicine and Rehabilitation*

Wen-Hwa Lee, Ph.D. University of California, Berkeley, *Professor Emeritus of Biological Chemistry*

Ying-Ying Lee, Ph.D. University of Wisconsin-Madison, *Assistant Professor of Economics*

Horacio Legras, Ph.D. Duke University, *Professor of Spanish and Portuguese; Comparative Literature; Culture and Theory; European Languages and Studies* (Latin American literature and culture, Latin American film, visual arts in Latin America, psychoanalysis, and photography)

Rachel Lehman, Ph.D. University of California, Irvine, *Lecturer of Mathematics* (mathematics education and probability)

Matthias Lehmann, Ph.D. Freie Universität Berlin, *Director of the Interdisciplinary Minor in Jewish Studies and Teller Family Chair in Jewish History and Professor of History; Religious Studies* (early modern and modern Jewish history, Sephardic studies)

Herbert H. Lehnert, Ph.D. University of Kiel, *Professor Emeritus of German* (Thomas Mann)

Daphne Pi-Wei Lei, Ph.D. Tufts University, *Head of Doctoral Studies and Professor of Drama; Asian American Studies* (Asian theatre, Asian American theatre, intercultural theatre, gender theory, performance theory)

Raul P. Lejano, Ph.D. University of California, Los Angeles, *Professor Emeritus of Urban Planning and Public Policy*

Michael E. Lekawa, M.D. Thomas Jefferson University, Jefferson Medical College, *Health Sciences Professor of Surgery*

Anne Lemnitzer, Ph.D. University of California, Los Angeles, *Associate Professor of Civil and Environmental Engineering* (geotechnical and earthquake engineering, soil structure interaction, RC design, seismic monitoring)

Karen R. Lenz, M.A. Northern Arizona University, *Lecturer of Academic English/English as a Second Language*

Michael Leon, Ph.D. University of Chicago, *Professor Emeritus of Neurobiology and Behavior*

Karen Leonard, Ph.D. University of Wisconsin, *Professor Emeritus of Anthropology; Religious Studies*

Julia C. Lerch, Ph.D. Stanford University, *Assistant Professor of Sociology* (sociology of education, global and transnational sociology, civic education, humanitarian emergencies, international organizations)

Jack I. Lerner, J.D. Harvard University, *Clinical Professor of School of Law*

Marc A. Lerner, M.D. City University of New York, Mount Sinai, *Health Sciences Clinical Professor of Pediatrics*

Rebecca L. Leshay, M.S. University of North Carolina, *Health Sciences Assistant Clinical Professor of Pediatrics; Genetic Counseling*

Christopher R. Leslie, J.D. University of California, Berkeley, *UCI Chancellor's Professor of School of Law*

Frances L. Leslie, Ph.D. University of Aberdeen, *Professor Emeritus of Pharmaceutical Sciences*

Simon Leung, B.A. University of California, Los Angeles, *Professor of Art; Asian American Studies* (new genres, critical theory, contemporary art history, performance)

Ellis Levin, M.D. Thomas Jefferson University, Jefferson Medical College, *Professor in Residence of Medicine; Biological Chemistry*

Ines Levin, Ph.D. California Institute of Technology, *Assistant Professor of Political Science* (elections, voting, statistics)

Kathie Levin, Ph.D. Bar-Ilan University, *Lecturer of Academic English/English as a Second Language*

Glenn S. Levine, Ph.D. University of Texas at Austin, *German Language Program Director and Professor of German; Education; Language Science* (applied linguistics, foreign language pedagogy, German-Jewish culture and history, Yiddish language and culture, European culinary history)

Linda J. Levine, Ph.D. University of Chicago, *Professor of Psychological Science* (bias in predicted and remembered emotion, memory and emotion, the development of children's ability to regulate emotion)

Marco Levorato, Ph.D. University of Padua, *Assistant Professor of Computer Science; Electrical Engineering and Computer Science* (artificial intelligence and machine learning, networks and distributed systems, statistics and statistical theory, stochastic modeling, signal processing)

Audrey Chen Lew, Ph.D. University of California, Los Angeles, *Assistant Professor of Teaching of Neurobiology and Behavior*

Jayne Elizabeth Lewis, Ph.D. Princeton University, *Director of Humanities Honors Program and Professor of English; European Languages and Studies; Religious Studies* (literature and medicine, restoration and 18th century British literature, literature of the supernatural and gothic fiction, history and/of fiction, atmosphere as literary concept and construct within natural philosophy)

Joseph S. Lewis, M.F.A. Maryland Institute College of Art, *Professor of Art* (public art)

Chen Li, Ph.D. Stanford University, *Professor of Computer Science* (databases and text processing, multimedia databases, data integration)

Guann-Pyng Li, Ph.D. University of California, Los Angeles, *Director of the UCI Division of the California Institute for Telecommunications and Information Technology (Calit2), Director of the Integrated Nanosystems Research Facility and Professor of Electrical Engineering and Computer Science; Biomedical Engineering* (micro/nano technology for sensors and actuators, internet of things (IoT), smart manufacturing, biomedical devices and millimeter wave wireless communication)

Han Li, Ph.D. University of California, Los Angeles, *Assistant Professor of Chemical and Biomolecular Engineering* (molecular biotechnology)

Mo Li, Ph.D. University of Michigan, *Assistant Professor of Civil and Environmental Engineering; Materials Science and Engineering* (unconventional infrastructure materials, and their interfaces with structural engineering, advanced manufacturing, spatial damage sensing, and the environment)

Peter Li, Ph.D. University of California, Berkeley, *Chancellor's Professor Emeritus of Mathematics* (geometry and topology)

Song-Ying Li, Ph.D. University of Pittsburgh, *Professor of Mathematics* (analysis and partial differential equations)

Wei Li, Ph.D. Institute of Biophysics, Chinese Academy of Sciences, *Endowed Chair and Professor of Biological Chemistry*

Zhou Li, Ph.D. Indiana University Bloomington, *Assistant Professor of Electrical Engineering and Computer Science* (data-driven security analytics, internet measurement, side-channel analysis, IoT security)

Patricia Liao, M.D. Northwestern University, *Health Sciences Clinical Professor of Pediatrics*

Lih-Huei Liaw, M.S. Northeastern University, *Project Scientist of Surgery*

Robert Liebeck, Ph.D. University of Illinois at Urbana-Champaign, *Adjunct Professor of Mechanical and Aerospace Engineering* (aerodynamics, hydrodynamics, aircraft design)

Lukas Ligeti, *Assistant Professor of Music*

Mimi Liljeholm, Ph.D. University of California, Los Angeles, *Assistant Professor of Cognitive Sciences* (neural and computational bases of learning, reasoning, and decision making)

William J. Lillyman, Ph.D. Stanford University, *Professor Emeritus of German* (Romanticism, Goethe, Tieck)

Felicidad (Bliss) Lim, Ph.D. New York University, *Professor of Film and Media Studies; Visual Studies* (Philippine cinema, temporality, postcolonial and feminist film theory, transnational horror and the fantastic, film archives)

Henry Lim, Ph.D. Northwestern University, *Professor Emeritus of Chemical and Biomolecular Engineering*

Charles L. Limoli, Ph.D. University of California, San Diego, *Professor of Radiation Oncology; Environmental Health Sciences*

Jack J. Lin, M.D. Rush University, *Associate Professor of Neurology; Biomedical Engineering*

Kwei-Jay Lin, Ph.D. University of Maryland, College Park, *Professor of Electrical Engineering and Computer Science; Computer Science* (real-time systems, distributed systems, service-oriented computing)

Shin Lin, Ph.D. University of California, Los Angeles, *Professor of Developmental and Cell Biology* (combined use of biochemistry, cell biology, molecular biology, molecular biophysics to study the structure and function of proteins involved in cytoskeletal/contractile functions and signal transduction in muscle and nonmuscle cells)

Zhihong Lin, Ph.D. Princeton University, *Professor of Physics and Astronomy*

Eric Lindsay, D.M. Indiana University, *Lecturer of Music*

Robert W. Lingua, M.D. University of Southern California, *Health Sciences Professor of Ophthalmology*

Renee Link, Ph.D. University of California, Irvine, *Associate Professor of Teaching of Chemistry* (organic chemistry, chemical education)

Mark E. Linskey, M.D. Columbia University, *Professor of Surgery*

Linda S. Lippa, M.D. Columbia University, *Health Sciences Professor of Ophthalmology*

Leah Litman, J.D. University of Michigan Law School, *Assistant Professor of School of Law*

Christophe Litwin, Ph.D. New York University, *Program Director and Assistant Professor of French; German* (early modern French literature, early modern European moral and political philosophy)

Catherine Liu, Ph.D. Yale University, *Professor of Film and Media Studies; Visual Studies* (Hou Hsiao-hsien, culture wars, Frankfurt School, historiography of critical theory/cultural studies, surveillance, cold war culture and neoliberalism)

Chang C. Liu, Ph.D. Scripps Research Institute, *Assistant Professor of Biomedical Engineering; Chemistry; Molecular Biology and Biochemistry* (genetic engineering, directed evolution, synthetic biology, chemical biology)

Feng Liu, Ph.D. Princeton University, *Professor of Mechanical and Aerospace Engineering* (computational fluid dynamics, turbomachinery, propulsion)

Fong W. Liu, M.D. University of Alabama, *Health Sciences Clinical Instructor of Obstetrics and Gynecology*

Haoping Liu, Ph.D. Cornell University, *Professor of Biological Chemistry*

Jeffrey W. Liu, M.D. Brown University, *Health Sciences Clinical Instructor of Ophthalmology*

Wendy F. Liu, Ph.D. Johns Hopkins University, *Associate Professor of Biomedical Engineering; Chemical and Biomolecular Engineering* (biomaterials, microdevices in cardiovascular engineering, cell-cell and cell-micro-environment interactions, cell functions and controls)

Feng Liu Smith, Ph.D. Iowa State University, *Assistant Professor of Epidemiology; Medicine*

Loretta Livingston, Ph.D. Texas Woman's University; Certified Laban Movement Analyst; former principal with Bella Lewitzky Dance Company, Graduate TA Advisor, Co-Advisor for B.F.A. Choreography/Senior Thesis/Honors Thesis concerts, *Professor of Dance* (choreography, Laban movement analysis, body and practice)

Erin Lockwood, Ph.D. Northwestern University, *Assistant Professor of Political Science* (financial derivatives, financial regulation, international political economy, political theory, risk and uncertainty)

Melissa Lodoen, Ph.D. University of California, San Francisco, *Associate Professor of Molecular Biology and Biochemistry*

Elizabeth F. Loftus, Ph.D. Stanford University, *UCI Distinguished Professor of Psychological Science; Cognitive Sciences; Criminology, Law and Society; School of Law* (cognitive psychology, human memory, psychology and law)



Anthony D. Long, Ph.D. McMaster University, *Professor of Ecology and Evolutionary Biology; Pharmaceutical Sciences*

Margherita Long, Ph.D. Princeton University, *Associate Professor of Japanese; Comparative Literature* (modern Japanese literature and film, environmental humanities, feminism, eco-documentary)

Kenneth J. Longmuir, Ph.D. University of Oregon, *Professor Emeritus of Physiology and Biophysics*

Mara Jane Lonner, M.F.A. California Institute of the Arts, *Associate Professor of Teaching Emerita of Art* (drawing, painting, 3D design)

Cristina V. Lopes, Ph.D. Northeastern University, *Professor of Informatics* (programming languages, acoustic communications, operating systems, software engineering)

Beth A. Lopour, Ph.D. University of California, Berkeley, *Assistant Professor of Biomedical Engineering; Mechanical and Aerospace Engineering* (computational neuroscience, signal processing, mathematical modeling, epilepsy, translational research)

Catherine B. Lord, M.F.A. State University of New York at Buffalo, *Professor Emerita of Art* (queer theory, feminism, photography)

Shahram Lotfipour, M.D. University of Iowa, *Professor of Emergency Medicine; Program in Public Health*

Shahrdad Lotfipour, Ph.D. University of California, Irvine, *Assistant Professor of Emergency Medicine; Pharmaceutical Sciences*

Ira T. Lott, M.D. Ohio State University, *Professor Emeritus of Pediatrics*

Catherine Loudon, Ph.D. Duke University, *Professor of Teaching of Ecology and Evolutionary Biology*

Annie M. Loui, *Co-Head of Acting and Professor of Drama* (movement, directing, acting)

Ben Lourie, Ph.D. University of California, Los Angeles, *Assistant Professor of Paul Merage School of Business*

John S. Lowengrub, Ph.D. Courant Institute of Mathematical Sciences, *Chancellor's Professor of Mathematics; Biomedical Engineering* (applied and computational mathematics, mathematical and computational biology)

Kim D. Lu, M.D. Tufts University, *Health Sciences Assistant Clinical Professor of Pediatrics*

Stephanie Lu, M.D. University of California, San Diego, *Health Sciences Assistant Clinical Professor of Ophthalmology*

Yunxia Lu, Ph.D. University Tongi Medical College, *Associate Professor of Program in Public Health*

Zhiqin Lu, Ph.D. Courant Institute of Mathematical Sciences, *Professor of Mathematics* (geometry and topology)

Paul Lubinsky, M.D. University of Capetown, *Health Sciences Associate Clinical Professor of Pediatrics*

Lar Lubovitch, Honorary Doctorate, Juilliard School of the Arts, *Founder and Director of New York-based Lar Lubovitch Dance Company and UCI Distinguished Professor of Dance* (choreography, repertory, technique, and special projects)

Ulrike Luderer, M.D., Ph.D. Northwestern University, *Director of the Environmental Health Sciences Graduate Program and Professor of Medicine; Developmental and Cell Biology; Environmental Health Sciences; Program in Public Health*

Jacob E. Ludwig, M.A. California State University, San Bernardino, *Lecturer of Academic English/English as a Second Language*

Jeffrey Ludwig, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Teaching of Mathematics*

George S. Lueker, Ph.D. Princeton University, *Professor Emeritus of Computer Science* (algorithms and complexity)

Angela F. Lukowski, Ph.D. University of Minnesota, *Associate Professor of Psychological Science* (contextual influences on cognitive development in infancy and early childhood)

Radhika Lunawat, Ph.D. University of Minnesota, *Assistant Professor of Paul Merage School of Business; Economics*

Ray Luo, Ph.D. University of Maryland, College Park, *Professor of Molecular Biology and Biochemistry; Biomedical Engineering; Chemical and Biomolecular Engineering; Materials Science and Engineering* (protein structure, noncovalent associations involving proteins)

Zhigang D. Luo, M.D., Ph.D. State University of New York at Buffalo, *Professor of Anesthesiology and Perioperative Care; Pharmacology*

Andrej Luptak, Ph.D. Yale University, *Professor of Pharmaceutical Sciences; Chemistry; Molecular Biology and Biochemistry* (chemical biology)

Julia R. Lupton, Ph.D. Yale University, *Associate Dean for Research and Professor of English; Comparative Literature; Education; Religious Studies* (Renaissance literature, literature and psychology)

Gyorgy Lur, Ph.D. University of Liverpool, *Assistant Professor of Neurobiology and Behavior*

Cecelia M. Lynch, Ph.D. Columbia University, *Professor of Political Science; Religious Studies* (international relations (theory, organization, law) religion and ethics, social movements and civil society actors (on peace, security, globalization, humanitarianism, and religion)

Gary S. Lynch, Ph.D. Princeton University, *Professor of Psychiatry and Human Behavior; Anatomy and Neurobiology*

Molly L. Lynch, M.F.A. University of California, Irvine; Pilates Certified; Choreographer/Artistic Director of the National Choreographers Initiative, *Department Chair and Professor of Dance* (ballet, repertory, arts management, and senior seminar)

Mona Lynch, Ph.D. University of California, Santa Cruz, *Professor of Criminology, Law and Society; School of Law* (law and society, psychology and law, punishment and society, race and criminal justice)

David C. Lyon, Ph.D. Vanderbilt University, *Department Vice Chair and Associate Professor of Anatomy and Neurobiology; Cognitive Sciences*

Juliet F. MacCannell, Ph.D. Cornell University, *Professor Emerita of English*

Grant R. MacGregor, Ph.D. University of Sussex, *Professor of Developmental and Cell Biology* (mouse reproduction, development, homeostasis)

Richard E. MacMillen, Ph.D. University of California, Los Angeles, *Professor Emeritus of Ecology and Evolutionary Biology*

Katherine Mackey, Ph.D. Stanford University, *Clare Booth Luce Assistant Professor of Earth System Science*

Salvatore R. Maddi, Ph.D. Harvard University, *Professor Emeritus of Psychological Science* (personality, psychopathology, health psychology, creativity)

Marc J. Madou, Ph.D. Ghent University, *UCI Chancellor's Professor of Mechanical and Aerospace Engineering; Biomedical Engineering; Chemical and Biomolecular Engineering* (miniaturization science (MEMS and NEMS) with emphasis on chemical and biological applications )

Gudrun Magnúsdóttir, Ph.D. Colorado State University, *Professor of Earth System Science*

Arash Mahajerin, M.S. Indiana University-Purdue University Indianapolis, *Health Sciences Clinical Professor of Pediatrics*

Viviana A. Mahieux, Ph.D. Harvard University, *Associate Professor of Spanish and Portuguese* (Latin American avant-gardes, journalism and literature, material cultures, media studies, modern and contemporary Mexico)

Stephen V. Mahler, Ph.D. University of Michigan, *Assistant Professor of Neurobiology and Behavior*

Scott Mahlke, Ph.D. University of Illinois at Urbana-Champaign, *Professor of Computer Science* (custom-fit architectures for energy efficiency and reliability, compilers and run-time systems)

Lilith Mahmud, Ph.D. Harvard University, *Associate Professor of Anthropology* (freemasonry, elites, gender, nationalism, race, citizenship, critical studies of Europe, secrecy, transparency, knowledge production, secret societies, power)

Steven J. Mailloux, Ph.D. University of Southern California, *Professor Emeritus of English; Comparative Literature* (rhetoric, critical theory, American literature, law and literature)

Monica Majoli, M.F.A. University of California, Los Angeles, *Professor of Art* (painting)

Carol A. Major, M.D. Case Western Reserve University, *Assistant Dean of Student and Inclusive Excellence and Health Sciences Professor of Obstetrics and Gynecology*

Aditi Majumder, Ph.D. University of North Carolina at Chapel Hill, *Professor of Computer Science; Electrical Engineering and Computer Science* (novel displays and cameras for computer graphics and visualization, human-computer interaction, applied computer vision)

Catherine Malabou, Ph.D. Ecole des Hautes Etudes en Sciences Sociales, *UCI Distinguished Professor of Comparative Literature; French; German* (German idealism, contemporary French philosophy, cultural theory, neurobiology, epigenetics)

David B. Malament, Ph.D. The Rockefeller University, *Professor Emeritus of Logic and Philosophy of Science*

Joan Malczewski, Ph.D. Columbia University, *Associate Professor of History* (American political development, education, progressivism, philanthropy, and American south)

Sam Malek, Ph.D. University of Southern California, *Associate Professor of Informatics* (software engineering, software architecture, software security, software analysis and testing)

Deepika Malik, MBBS BJ Medical College, Gujarat University, *Health Sciences Clinical Instructor of Ophthalmology*

Fred M. Malkin, M.D. University of Miami, *Health Sciences Associate Clinical Professor of Pediatrics*



Lynn Mally, Ph.D. University of California, Berkeley, *Professor Emerita of History*

John Manchak, Ph.D. University of California, Irvine, *Professor of Logic and Philosophy of Science; Religious Studies*

Mark A. Mandelkern, Ph.D. University of California, Berkeley, *Research Professor and Professor Emeritus of Physics and Astronomy*

Vladimir A. Mandelshtam, Ph.D. Russian Academy of Sciences, *Professor of Chemistry* (physical chemistry and chemical physics, theoretical and computational)

Stephan Mandt, Ph.D. University of Cologne, *Assistant Professor of Computer Science* (artificial intelligence and machine learning, probabilistic modeling, Bayesian deep learning, variational inference)

Alberto Manetta, M.D. University of Buenos Aires, *Professor Emeritus of Obstetrics and Gynecology*

Stephen Mang, Ph.D. University of California, Irvine, *Assistant Professor of Teaching of Chemistry* (chemical education, advanced laboratories)

Raheela Maniar, M.A. University of California, Los Angeles, *Lecturer of Arabic*

Mihai Maniutiu, Ph.D. Caragiale Academy of Theatrical Arts and Cinematography, *UCI Distinguished Professor of Drama* (directing)

Virginia Mann, Ph.D. Massachusetts Institute of Technology, *Professor of Language Science; Education* (reading ability: phenome awareness, developmental dyslexia, phonological skills, early intervention, precocious readers; speech perception: context effects, cross-linguistic comparisons)

Jerry E. Manning, Ph.D. University of Utah, *Professor Emeritus of Molecular Biology and Biochemistry*

William W. Mantulin, Ph.D. Northeastern University, *Adjunct Professor of Surgery*

Alexei A. Maradudin, Ph.D. University of Bristol, *Professor Emeritus of Physics and Astronomy*

Francesco Marangoni, Ph.D. Vita-Salute San Raffaele University, *Assistant Professor of Physiology and Biophysics*

Nicholas J. Marantz, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Urban Planning and Public Policy; School of Law*

George E. Marcus, Ph.D. Harvard University, *Distinguished Professor of Anthropology* (elites, ethnography, cultural critique, Pacific)

Newton Margulies, Ph.D. University of California, Los Angeles, *Professor Emeritus of Paul Merage School of Business*

Raffaele Mari, M.A. San Diego State University, *Lecturer of Economics*

Omri Marian, J.D., LL.M. University of Michigan Law School, *Assistant Professor of School of Law*

Gloria J. Mark, Ph.D. Columbia University, *Professor of Informatics* (computer-supported cooperative work, human-computer interaction)

Athina Markopoulou, Ph.D. Stanford University, *Nicolaos G. and Sue Curtis Alexopoulos Presidential Chair in Electrical Engineering and Computer Science and Department Chair and Professor of Electrical Engineering and Computer Science; Computer Science* (networking: including network protocols, network measurement and analysis, mobile systems and mobile data analysis, network security and privacy)

J. Lawrence Marsh, Ph.D. University of Washington, *Professor Emeritus of Developmental and Cell Biology* (mechanisms of neurodegeneration and molecular genetics of development)

John F. Marshall, Ph.D. University of Pennsylvania, *Professor Emeritus of Neurobiology and Behavior*

Craig C. Martens, Ph.D. Cornell University, *Professor of Chemistry* (physical chemistry and chemical physics, polymer, materials, nanoscience, theoretical and computational)

Donald C. Martin, M.D. University of British Columbia, *Professor Emeritus of Surgery*

Elizabeth Martin, Ph.D., University of Missouri, *Assistant Professor of Psychological Science* (adult psychopathology, schizotypy and schizophrenia, social anhedonia, emotional and social dysfunction)

Rachel Martin, Ph.D. Yale University, *Department Vice Chair and Professor of Chemistry; Molecular Biology and Biochemistry* (analytical, chemical biology, physical chemistry and chemical physics)

Theodore Martin, Ph.D. University of California, Berkeley, *Associate Professor of English; Culture and Theory* (Contemporary literature, genre fiction, literary history, crime, and the novel)

Daniel J. Martinez, B.F.A. California Institute of the Arts, *Claire Trevor Professor and Professor of Art* (public art, sculpture, installation, performance)

Adam Martiny, Ph.D. Technical University of Denmark, *Professor of Earth System Science; Ecology and Evolutionary Biology*

Jennifer Martiny, Ph.D. Stanford University, *UCI Chancellors' Fellow and Professor of Ecology and Evolutionary Biology*

G. Robert Mason, M.D. University of Chicago, *Professor Emeritus of Surgery*

Selma Masri, Ph.D. Beckman Research Institute of the City of Hope, *Assistant Professor of Biological Chemistry*

Lyle Massey, Ph.D. University of California, Los Angeles, *Associate Professor of Art History; Visual Studies* (Italian Renaissance and early modern European art, gender theory, science studies)

Richard Matthew, Ph.D. Princeton University, *Professor of Urban Planning and Public Policy; Political Science*

Joshua Mauney, Ph.D. Tufts University, *Jerry D. Choate Presidential Chair in Urology Tissue and Engineering and Associate Professor of Urology; Biomedical Engineering*

William M. Maurer, Ph.D. Stanford University, *Dean of the School of Social Sciences and Professor of Anthropology; Criminology, Law and Society; School of Law* (anthropology of law, globalization, Caribbean, anthropology of money and finance, gender and kinship)

Debra K. Mauzy-Melitz, Ph.D. Marquette University, *Assistant Professor of Teaching of Developmental and Cell Biology* (role of writing in scientific teaching)

Cheryl Lee Maxson, Ph.D. University of Southern California, *Professor Emerita of Criminology, Law and Society* (crime and delinquency, youth violence, street gangs, juvenile justice system and policing)

Melissa Mazmanian, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Informatics* (computer-mediated communication, organization studies, information and communication technologies in practice, social response to emerging technologies, work/non-work negotiations in the information age)

Sanjoy Mazumdar, Ph.D. Massachusetts Institute of Technology, *Professor of Urban Planning and Public Policy; Religious Studies*

Shampa Mazumdar, Ph.D. Northeastern University, *Lecturer of Sociology; Religious Studies* (religion, immigration, Asian American, urban sociology)

Sarah McBane, Pharm.D. University of North Carolina at Chapel Hill, *Health Sciences Clinical Professor of Clinical Pharmacy Practice*

Michael T. McBride, Ph.D. Yale University, *Professor of Economics; Logic and Philosophy of Science; Religious Studies*

J. Michael McCarthy, Ph.D. Stanford University, *Director of the Performance Engineering Program and Professor of Mechanical and Aerospace Engineering* (design of mechanical systems, computer aided design, kinematic theory of spatial motion)

Katherine T. McCartney, M.D. Stritch School of Medicine, *Health Sciences Associate Clinical Professor of Anesthesiology and Perioperative Care*

Philip McCarty, Ph.D. University of California, Santa Barbara, *Associate Professor of Teaching of Global and International Studies*

Annie McClanahan, Ph.D. University of California, Berkeley, *Associate Professor of English; Culture and Theory* (U.S. culture, the novel, political and economic theory)

Richard D. McCleary, Ph.D. Northwestern University, *Professor of Criminology, Law and Society; Urban Planning and Public Policy* (criminal justice, research methodology, statistics)

Michael McClelland, Ph.D. University of Georgia, *Professor of Microbiology and Molecular Genetics*

Gregory J. McClure, M.F.A. University of California, Irvine, *Lecturer of English*

Christopher E. McCoy, M.D. University of California, San Francisco, *Health Sciences Associate Clinical Professor of Emergency Medicine*

Jack R. McCullough, Ph.D. United States International University, *Associate Professor of Teaching Emeritus of Education*

Vincent G. McDonell, Ph.D. University of California, Irvine, *Adjunct Professor of Mechanical and Aerospace Engineering* (combustion, alternative fuels, gas turbines, sprays, diagnostics, combined heat and power, emissions, autoignition/flashback)

James L. McGaugh, Ph.D. University of California, Berkeley, *Research Professor and Professor Emeritus of Neurobiology and Behavior; Logic and Philosophy of Science*

Martin C. McGuire, Ph.D. Harvard University, *UCI Endowed Chair and Professor Emeritus of Economics*

Matthew J. McHenry, Ph.D. University of California, Berkeley, *Professor of Ecology and Evolutionary Biology*

Lowell B. McKay, M.F.A. University of California, Irvine, *Lecturer of English*

Joseph H. McKenna, Ph.D. Fordham University, *Lecturer of History; Religious Studies* (history of religious ideas)

Kevin McKeown, M.A. University of California, Los Angeles, *Lecturer of Music*

Nancy Ann McLoughlin, Ph.D. University of California, Santa Barbara, *Associate Professor of History; European Languages and Studies; Religious Studies* (late Medieval Europe, intellectual history, gender)

James L. McMichael, Ph.D. Stanford University, *Professor Emeritus of English*

Michael G. McNally, Ph.D. University of California, Irvine, *Professor of Civil and Environmental Engineering; Urban Planning and Public Policy* (travel behavior, transportation systems analysis)

Bruce L. McNaughton, Ph.D. Carleton University, *UCI Distinguished Professor of Neurobiology and Behavior*

Alexander McPherson, Ph.D. Purdue University, *Professor Emeritus of Molecular Biology and Biochemistry*

Mary McThomas, Ph.D. University of California, Los Angeles, *Associate Professor of Political Science* (immigration, theories of citizenship, feminist political theory, gender and politics)

Roger D. McWilliams, Ph.D. Princeton University, *Associate Dean of the School of Physical Sciences and Professor of Physics and Astronomy*

Toby Meadows, Ph.D. University of Melbourne, *Assistant Professor of Logic and Philosophy of Science*

Kenneth D. Mease, Ph.D. University of Southern California, *Professor Emeritus of Mechanical and Aerospace Engineering* (nonlinear dynamics and control; flight guidance and control)

Martha L. Mecartney, Ph.D. Stanford University, *Professor Emeritus of Materials Science and Engineering; Chemical and Biomolecular Engineering* (ceramics for energy applications and for extreme environments, flash sintering, interfacial design of thermal conductivity, transmission electron microscopy)

Sara Mednick, Ph.D. Harvard University, *Associate Professor of Cognitive Sciences* (memory consolidation, sleep, pharmacology, aging, brain stimulation)

James W. Meeker, J.D., Ph.D. State University of New York at Buffalo, *Professor Emeritus of Criminology, Law and Society; Sociology* (sociology of law, criminal justice, research methodology, statistics, access to civil justice)

Gopi Meenakshisundaram, Ph.D. University of North Carolina at Chapel Hill, *Professor of Computer Science* (geometry and topology for computer graphics, image-based rendering, object representation, surface reconstruction, collision detection, virtual reality, telepresence)

Sharad Mehrotra, Ph.D. University of Texas at Austin, *Professor of Computer Science* (databases and data mining, multimedia computing, networks and distributed systems)

Richard Mendelsohn, Ph.D. Massachusetts Institute of Technology, *Adjunct Professor of Logic and Philosophy of Science*

Carrie Menkel-Meadow, J.D. University of Pennsylvania, *UCI Chancellor's Professor of Political Science; School of Law*

Dan Mercola, M.D., Ph.D. University of California, Los Angeles, *Professor of Pathology and Laboratory Medicine*

Natasha Mesinkovska, M.D., Ph.D. Mayo Medical School, *Health Sciences Assistant Clinical Professor of Dermatology; Surgery*

Irene Messoloras, D.M.A. University of California, Los Angeles, *Lecturer of Music*

Raju Metherate, Ph.D. McGill University, *Professor of Neurobiology and Behavior*

David S. Meyer, Ph.D. Boston University, *Professor of Sociology; Political Science; Urban Planning and Public Policy* (social movements, public policy, peace and war, social justice)

Ronald L. Meyer, Ph.D. California Institute of Technology, *Professor Emeritus of Developmental and Cell Biology* (development of nerve connections, nerve injury, and regeneration)

Frank L. Meyskens, M.D. University of California, San Francisco, *Daniel G. Aldrich, Jr. Endowed Chair and Professor of Medicine; Biological Chemistry; Program in Public Health*

David E. Michalik, D.O. College of Osteopathic Medicine of the Pacific, *Health Sciences Clinical Professor of Pediatrics*

John Middlebrooks, Ph.D. University of California, San Francisco, *Professor of Otolaryngology; Biomedical Engineering; Cognitive Sciences; Neurobiology and Behavior*

Milena Mihail, Ph.D. Harvard University, *Associate Professor of Computer Science* (randomization, expander graphs, Markov chains, network design)

Maryse J. Mijalski, Ed.D. University of Southern California, *Director of the French Language Program and Lecturer of French* (Second-language pedagogy and teaching.)

Michel Mikhael, M.D. Cairo University School of Medicine, *Health Sciences Clinical Professor of Pediatrics*

Alison Mikkor, J.D. New York University School of Law, *Assistant Professor of Lawyering Skills of School of Law*

Fabio Milani, Ph.D. Princeton University, *Professor of Economics*

John Miles, Ph.D. Harvard University, *Professor Emeritus of English; Religious Studies* (religion, literature, international relations, western scriptures [Jewish, Christian, Muslim] as literature; religious poetry and music, religion, science, and the environment)

George E. Miller, Ph.D. Oxford University, *Professor of Teaching Emeritus of Chemistry* (analytical and radioanalytical chemistry and chemical education)

J. Hillis Miller, Ph.D. Harvard University, *UCI Endowed Chair and Distinguished Professor Emeritus of Comparative Literature; English* (Victorian literature, critical theory)

Tyrus Miller, Ph.D. Stanford University, *Dean of the School of Humanities and Professor of English; Art History; Comparative Literature; Visual Studies* (modernist and avant-garde studies in literature and visual arts; critical theory and aesthetics; modern architecture and urbanism; East-Central European studies; culture of socialism and post-socialism; Frankfurt School theory)

Jeffrey C. Milliken, M.D. University of Michigan, *Health Sciences Professor of Surgery*

Steven D. Mills, M.D. New York Medical College, *Associate Professor of Surgery*

Jessica Millward, Ph.D. University of California, Los Angeles, *Associate Professor of History; African American Studies; Culture and Theory* (U.S., slavery, African diaspora, African American gender and women)

Glen M. Mimura, Ph.D. University of California, Santa Cruz, *Associate Professor of Film and Media Studies; Visual Studies* (minoritarian and political film; media and race; popular culture and social movements)

David K. Min, J.D. Harvard University, *Assistant Professor of School of Law*

Yong Soon Min, M.F.A. University of California, Berkeley, *Professor Emerita of Art* (minority, diasporic, and third cinemas; media, nationalism, and globalization; race, sexuality, and popular culture)

Donald S. Minckler, M.D. University of Oregon School of Medicine, *Professor Emeritus of Ophthalmology*

Volodymyr Minin, Ph.D. University of California, Los Angeles, *Professor of Statistics*

Carey Minnis, M.A. California State Polytechnic University, Pomona, *Lecturer of Academic English/English as a Second Language*

Laura J. Mitchell, Ph.D. University of California, Los Angeles, *Associate Professor of History* (social and cultural history of South Africa, Africa, and the world)

Eric D. Mjolsness, Ph.D. California Institute of Technology, *Professor of Computer Science; Mathematics* (artificial intelligence and machine learning, biomedical informatics and computational biology, applied mathematics, mathematical biology, modeling languages)

Lora D. Mjolsness, Ph.D. University of Southern California, *Lecturer of Russian* (Soviet and Russian Animation; 19th century, 20th century and Contemporary Children's Literature; Russian Folklore.)

Lilit Mnatsakanyan, M.D. Yerevan State Medical University, *Health Sciences Assistant Clinical Professor of Neurology*

David L. Mobley, Ph.D. University of California, Davis, *Vice Chair and Professor of Pharmaceutical Sciences; Chemistry* (chemical biology, physical chemistry and chemical physics, theoretical and computational)

John Moeller, M.D. University of Chicago, *Health Sciences Clinical Instructor of Emergency Medicine*

Robert G. Moeller, Ph.D. University of California, Berkeley, *Professor Emeritus of History* (modern European history)

Ali Mohraz, Ph.D. University of Michigan, *Associate Professor of Chemical and Biomolecular Engineering; Materials Science and Engineering* (colloid science, soft matter engineering with applications in health care and energy materials)

Kristine Molina, Ph.D. University of Michigan, *Associate Professor of Psychological Science* (racism and discrimination, social inequality, health disparities, Latinx health)

Sabee Y. Molloy, Ph.D. University of Wisconsin-Madison, *Professor of Radiological Sciences; Biomedical Engineering*

William R. Molzon, Ph.D. University of Chicago, *Professor of Physics and Astronomy*

Kristen R. Monroe, Ph.D. University of Chicago, *UCI Chancellor's Professor of Political Science* (ethics, international relations, political and moral psychology, normative political theory, politics of difference, conflict resolution)

Michael J. Montoya, Ph.D. Stanford University, *Professor Emeritus of Anthropology*

Edwin S. Monuki, M.D., Ph.D. University of California, San Diego, *Department Chair and Warren L. Bostick Chair in Pathology and Professor of Pathology and Laboratory Medicine; Developmental and Cell Biology*

Connor Mooney, Ph.D. Columbia University, *Assistant Professor of Mathematics* (partial differential equations)

Kailen Mooney, Ph.D. University of Colorado Boulder, *Professor of Ecology and Evolutionary Biology*

Jefferson Moore, Ph.D. Oregon State University, *Professor of Earth System Science*

Liron Mor, Ph.D. Cornell University, *Assistant Professor of Comparative Literature* (literary and critical theory, contemporary Israeli and Palestinian literature and film, postcolonial theories, conflict, sympathy, questions of translation and literary adaptation)

Alejandro Morales, Ph.D. Rutgers, The State University of New Jersey, *Professor Emeritus of Chicano/Latino Studies* (Latin American and Chicano literature, film studies)

Joseph M. Morales, Ph.D. University of California, Berkeley, *Lecturer of Humanities*

Santiago Morales-Rivera, Ph.D. Harvard University, *Associate Professor of Spanish and Portuguese; European Languages and Studies* (Modern Peninsular literature and culture, critical theory, literary history, narrative, music)

Elliott Moreau, M.M. University of Southern California, *Lecturer of Music*

Mathieu Morlighem, Ph.D. Ecole Centrale Paris, *Vice Chair and Associate Professor of Earth System Science*

David K. Morohashi, M.D. University of Washington, *Health Sciences Professor of Family Medicine*

Debra E. Morrison, M.D. Northwestern University, *Health Sciences Clinical Professor of Anesthesiology and Perioperative Care; Urology*

Naomi Morrisette, Ph.D. University of Pennsylvania, *Associate Professor of Molecular Biology and Biochemistry*

Susan Katharine Morrissey, Ph.D. University of California, Berkeley, *Professor of History; European Languages and Studies* (Russia, terrorism and political violence, suicide)

Seyed Ali Mortazavi, Ph.D. California Institute of Technology, *Professor of Developmental and Cell Biology; Biological Chemistry* (functional genomics to study transcriptional regulation in development)

Sameh Mosaed, M.D. New York Medical College, *Health Sciences Associate Clinical Professor of Ophthalmology*

Ayman S. Mosallam, Ph.D. Catholic University of America, *Professor of Civil and Environmental Engineering* (advanced composites and hybrid systems, seismic repair and rehabilitation of structures, diagnostic/prognostic structural health monitoring techniques, 3D printing in Construction and sustainable and green building technology)

Harry David Mosier, M.D. Johns Hopkins University, *Professor Emeritus of Pediatrics*

Peter J. Mostert, D.O. Oklahoma State University, *Health Sciences Clinical Instructor of Radiological Sciences*

Tahseen Mozaffar, MBBS Aga Kahn University, *Dr. Stanley van den Noort Endowed Chair and Interim Department Chair and Professor of Neurology; Pathology and Laboratory Medicine*

Laurence D. Mueller, Ph.D. University of California, Davis, *Professor of Ecology and Evolutionary Biology*

Dana Mukamel, Ph.D. University of Rochester, *Professor of Medicine; Program in Public Health*

Shaul Mukamel, Ph.D. Tel Aviv University, *UCI Distinguished Professor of Chemistry; Physics and Astronomy* (physical chemistry and chemical physics, polymer, materials, nanoscience, theoretical and computational)

Jogeshwar Mukherjee, Ph.D. Jodhpur National University, *Professor in Residence of Radiological Sciences; Biomedical Engineering*

J. Dennis Mull, M.D. Medical College of Virginia, *Professor Emeritus of Family Medicine*

R. Michael Mulligan, Ph.D. Michigan State University, *Biological Sciences Associate Dean of Graduate Studies and Professor of Developmental and Cell Biology; Ecology and Evolutionary Biology* (RNA editing in plant mitochondria and chloroplasts)



Ruth A. Mulnard, D.N.Sc. University of San Diego, *Professor Emerita of Nursing*

Ian Andrew Munro, Ph.D. Harvard University, *Associate Professor of Drama; English* (European drama and performance, early modern popular culture, theatrical performance of wit)

Margaret Murata, Ph.D. University of Chicago, *Professor Emerita of Music*

Penny R. Murata, M.D. Women's Medical College of Pennsylvania, *Health Sciences Professor of Pediatrics*

Yuji Murata, M.D. Osaka University, *Professor Emeritus of Obstetrics and Gynecology*

Simona Murgia, Ph.D. Michigan State University, *Associate Professor of Physics and Astronomy*

John Murillo III, Ph.D. Brown University, *Assistant Professor of African American Studies* (Afro-pessimism, theoretical physics, radical black feminism, literary theory, 20th/21st century black literature, black speculative fiction)

Cynthia T. Murphy, M.D. University of South Dakota, *Health Sciences Associate Clinical Professor of Physical Medicine and Rehabilitation*

Keith Murphy, Ph.D. University of California, Los Angeles, *Associate Professor of Anthropology* (linguistics, design, aesthetics and morality, Sweden)

Craig Murray, Ph.D. University of Edinburgh, *Associate Professor of Chemistry* (atmospheric and environmental, physical chemistry and chemical physics)

Sandra Murray, M.D. University of California, Irvine, *Health Sciences Associate Clinical Professor of Pediatrics*

Lawrence Muzio, Ph.D. University of California, Berkeley, *Adjunct Professor of Mechanical and Aerospace Engineering* (thermodynamics, combustion and combustion in practical systems, air pollution formation and control, advanced diagnostics applied to practical combustion systems)

Ana Muñoz, Ph.D. University of California, Los Angeles, *Assistant Professor of Criminology, Law and Society* (gang profiling, youth justice, gang injunctions and databases, immigration enforcement, policing, race, state violence)

Angela Myers, M.C.H., M.D. Stanford University, *Health Sciences Assistant Clinical Professor of Pediatrics; Genetic Counseling*

Farzad Naeim, Ph.D. University of Southern California, *Adjunct Professor of Civil and Environmental Engineering* (performance-based earthquake engineering; structural health monitoring; seismic instrumentation; structural design of tall buildings; nonlinear response of structures; seismic isolation; energy dissipation systems and devices; design characteristics of earthquake ground motions; seismic analysis and design of complex structures)

Ayako Nagai, Ph.D. University of Illinois at Urbana-Champaign, *Lecturer of Japanese*

Ajanta Naidu, M.D., M.B.A. University of California, Irvine, *Interim Department Chair and Health Sciences Clinical Professor of Pediatrics*

Orhan Nalcioğlu, Ph.D. University of Oregon, *Professor Emeritus of Radiological Sciences*

Sylvia Nam, Ph.D. University of California, Berkeley, *Assistant Professor of Anthropology; Biological Chemistry; Urban Planning and Public Policy* (urban studies, property, transnational expertise, Southeast Asia)

Victorya S. Nam, M.A. Biola University, *Lecturer of Academic English/English as a Second Language*

Bin Nan, Ph.D. University of Washington, *Professor of Statistics*

Patricia W. Nance, M.D. University of South Florida, *Health Sciences Clinical Professor of Physical Medicine and Rehabilitation*

Shoba Narayan, M.D. University of California, Los Angeles, *Health Sciences Clinical Professor of Pediatrics*

Bonnie A. Nardi, Ph.D. University of California, Irvine, *Professor Emeritus of Informatics* (computer-supported collaborative work, human-computer interaction, computer-mediated communication, user studies methods, activity theory, cultural responses to technology development)

Louis E. Narens, Ph.D. University of California, Los Angeles, *Professor of Cognitive Sciences; Logic and Philosophy of Science* (measurement, logic, metacognition)

Alexandra Natapoff, J.D. Stanford Law School, *Professor of School of Law*

Deepika Nathan, M.S. Northwestern University, *Health Sciences Assistant Clinical Professor of Pediatrics; Genetic Counseling*

Daniel Nation, Ph.D. University of Miami, *Associate Professor of Psychological Science* (clinical neuropsychology)

Lisa Marie Naugle, Ph.D. New York University, *Director of International Initiative for CTSA, Artistic Director for DTM2 Performance Ensemble and Professor of Dance* (modern dance, choreography, online/interactive technology, improvisation, teaching of dance)

Gonzalo Navajas, Ph.D. University of California, Los Angeles, *Distinguished Professor of Spanish and Portuguese* (eighteenth through twentieth-first century Spanish literature and intellectual history, film, critical theory, cultural criticism, creative writing)

Emily Navarro, Ph.D. University of California, Irvine, *Lecturer of Informatics*

Peter Navarro, Ph.D. Harvard University, *Professor Emeritus of Paul Merage School of Business*

Emre Neftci, Ph.D. University of Zurich, *Assistant Professor of Cognitive Sciences; Computer Science* (computational neuroscience, neuromorphic engineering, machine learning)

Alan Nelson, Ph.D. University of Illinois at Chicago, *Professor Emeritus of Philosophy*

Ariana M. Nelson, M.D. University of Michigan, *Health Sciences Assistant Clinical Professor of Anesthesiology and Perioperative Care*

Corey Nelson, M.D. Thomas Jefferson University, *Health Sciences Associate Clinical Professor of Anesthesiology and Perioperative Care*

Edward L. Nelson, M.D. University of Oregon, *Associate Professor of Medicine; Molecular Biology and Biochemistry*

J. Stuart Nelson, Ph.D. University of California, Irvine, *Professor of Surgery; Biomedical Engineering*

Kari J. Nelson, M.D. Medical College of Wisconsin, *Health Sciences Clinical Instructor of Radiological Sciences*

Keith L. Nelson, Ph.D. University of California, Berkeley, *UCI Endowed Chair and Edward A. Dickson Professor Emeritus of History; Religious Studies*

Linda D. Nelson, Ph.D. Ohio State University, *Senate Emerita of Neurology*

Thomas L. Nelson, M.D. University of California, San Francisco, *Professor Emeritus of Pediatrics*

Zoran Nenadic, Ph.D. Washington University, *William J. Link Chair in Biomedical Engineering and Department Chair and Professor of Biomedical Engineering; Electrical Engineering and Computer Science* (adaptive biomedical signal processing, control algorithms for biomedical devices, brain-machine interfaces, modeling and analysis of biological neural networks)

Anthony B. Nesburn, M.D. Harvard University, *Adjunct Professor of Ophthalmology*

David Neumark, Ph.D. Harvard University, *Distinguished Professor of Economics; Paul Merage School of Business*

Robert L. Newcomb, Ph.D. University of California, Santa Barbara, *Senior Lecturer with Security of Employment Emeritus of Pediatrics; Clinical Translational Science*

Jane O. Newman, Ph.D. Princeton University, *Professor of Comparative Literature; English; European Languages and Studies; Religious Studies* (comparative Renaissance and early modern literature and culture [English, French, German, Italian, neo-Latin], Mediterranean Renaissance studies, Baroque, afterlives of antiquity, Walter Benjamin, Erich Auerbach, pre-modern lessons for the modern and post-modern)

Riley D. Newman, Ph.D. University of California, Berkeley, *Professor Emeritus of Physics and Astronomy; Logic and Philosophy of Science; Physics and Astronomy*

Robert W. Newsom, Ph.D. Columbia University, *Professor Emeritus of English*

Hanh T. Nguyen, M.D. Medical College of Virginia, *Health Sciences Assistant Clinical Professor of Family Medicine*

Ninh T. Nguyen, M.D. University of Texas at San Antonio, *John E. Connolly Chair in Surgery and Department Chair and Professor of Surgery*

Phu Dinh Nguyen, Ph.D. University of California, Irvine, *Assistant Adjunct Professor of Civil and Environmental Engineering* (hydrology, GIS, satellite precipitation estimation algorithms, databases and visualization tools for remotely-sensed data and information, crowdsourcing, water resources systems)

Tan Quoc Viet Nguyen, M.D. Michigan State University, *Health Sciences Assistant Clinical Professor of Family Medicine*

Y. Vien T. Nguyen, D.O. Western University of Health Sciences, *Health Sciences Clinical Instructor of Radiological Sciences*

Tingting Nian, Ph.D. New York University, *Assistant Professor of Paul Merage School of Business*

Andrea C. Nicholas, Ph.D. University of Chicago, *Associate Professor of Teaching of Neurobiology and Behavior*

Walter Nicholls, Ph.D. University of California, Los Angeles, *Associate Professor of Urban Planning and Public Policy; Sociology* (urban sociology, politics and policy, social movements, immigration, comparative urbanism, theory, planning conflicts)

Bruce Nickerson, M.D. University of California, Los Angeles, *Health Sciences Associate Clinical Professor of Pediatrics*



Alexandru Nicolau, Ph.D. Yale University, *Department Chair and Professor of Computer Science* (architecture, parallel computation, programming languages and compilers)

Qing Nie, Ph.D. Ohio State University, *Director of the NSF-Simons Center for Multiscale Cell Fate Research and Chancellor's Professor of Mathematics; Biomedical Engineering* (applied and computational mathematics, mathematical and computational biology)

Robert J. Nielsen, Ph.D. California Institute of Technology, *Assistant Professor of Chemical and Biomolecular Engineering* (electronic structure, electrocatalysis, mechanism, alkane activation, homogenous catalysis)

Tiffany K. Nielsen, D.N.P. Brandman University, *Health Sciences Assistant Clinical Professor of Nursing*

Delma J. Nieves, M.D. University of Washington, *Health Sciences Clinical Professor of Pediatrics*

Mikael Nilsson, Ph.D. Chalmers University of Technology, *Adjunct Professor of Chemical and Biomolecular Engineering; Materials Science and Engineering* (actinide chemistry, solvent extraction fundamental chemistry and process development, extraction and detection equipment development, radiolysis and phase composition of organic solvent)

James P. Nisbet, Ph.D. Stanford University, *Associate Professor of Art History; Visual Studies* (modern and contemporary art)

Sergey Nizkorodov, Ph.D. University of Basel, *Co-Director, AirUCI and Department Vice Chair and Professor of Chemistry* (analytical, atmospheric and environmental, physical chemistry and chemical physics)

Karen L. Noblett, M.D. University of California, Irvine, *Health Sciences Professor of Obstetrics and Gynecology*

Carrie J. Noland, Ph.D. Harvard University, *Director of the International Center for Writing and Translation and Director of French and Professor of French; Comparative Literature* (20th-century poetry and poetics, avant-garde movements in art and literature, critical theory, performance studies)

Trina Norden-Krichmar, Ph.D. University of California, San Diego, *Assistant Professor of Epidemiology; Biological Chemistry; Computer Science; Pharmaceutical Sciences*

Margot Norris, Ph.D. State University of New York College at Buffalo, *Professor Emerita of English; Comparative Literature* (modern Irish, British, American and continental modernism, literature and war)

Raymond W. Novaco, Ph.D. Indiana University, *Professor of Psychological Science* (anger, violence, stress, trauma, and interventions)

James S. Nowick, Ph.D. Massachusetts Institute of Technology, *Professor of Chemistry; Pharmaceutical Sciences* (chemical biology, organic and synthetic, polymer, materials, nanoscience)

Andrew Noymer, Ph.D. University of California, Berkeley, *Associate Professor of Program in Public Health; Sociology*

Diane J. Nugent, M.D. University of California, Los Angeles, *Health Sciences Clinical Professor of Pediatrics*

Dayle S. Nunez, Ph.D. Stanford University, *Professor Emeritus of Spanish and Portuguese*

Eliezer Nussbaum, M.D. Tel Aviv University, *Professor of Pediatrics*

Adeline Nyamathi, Ph.D. Case Western Reserve University, *Founding Dean and Distinguished Professor of Nursing*

Cailin O'Connor, Ph.D. University of California, Irvine, *Associate Professor of Logic and Philosophy of Science*

Laura B. O'Connor, Ph.D. Columbia University, *Associate Professor of English; Comparative Literature* (Irish literature, twentieth-century poetry, Anglo-American modernism)

Diane K. O'Dowd, Ph.D. University of California, San Diego, *Professor of Developmental and Cell Biology; Anatomy and Neurobiology* (regulation of activity in developing and adult nervous systems)

Rachel S. O'Toole, Ph.D. University of North Carolina at Chapel Hill, *Associate Professor of History* (Colonial Latin America, African Diaspora, colonialisms, race, racism, indigenous histories, gender, Atlantic worlds)

Andre Obenhaus, Ph.D. University of British Columbia, *Professor in Residence of Pediatrics; Anatomy and Neurobiology*

Juan Pedro Ochoa-Ricoux, Ph.D. California Institute of Technology, *Assistant Professor of Physics and Astronomy*

Andrew O. Odegaard, Ph.D. University of Minnesota, *Assistant Professor of Epidemiology*

Candice Odgers, Ph.D. University of Virginia, *Professor of Psychological Science; Criminology, Law and Society* (developmental and quantitative psychology; social inequalities and child health; new technologies and adolescent development)

Adedeji Ogunfolu, M.M. University of Michigan, Ann Arbor, *Lecturer of Music*

Oladele A. Ogunseitan, Ph.D. University of Tennessee, *Department Chair and Professor of Program in Public Health; Environmental Health Sciences*

Gerardo Okhuysen, Ph.D. Stanford University, *Professor of Paul Merage School of Business*

Ronke Olabisi, Ph.D. University of Wisconsin-Madison, *Assistant Professor of Biomedical Engineering* (orthopedic tissue engineering and regenerative medicine for injury, aging, disease, and space flight)

Dariusz Oleszkiewicz, B.A. California Institute of the Arts, *Lecturer of Music*

Spencer C. Olin, Ph.D. Claremont Graduate University, *Professor Emeritus of History*

Gustavo Oliveira, Ph.D. University of California, Berkeley, *Assistant Professor of Global and International Studies*

Deborah Oliver, M.F.A. California Institute of the Arts, *Lecturer of Art* (performance art, new genres)

Leticia Oliveros, M.D. University of Iowa, *Health Sciences Professor of Pediatrics*

Vincent Olivieri, M.F.A. Yale University, *Associate Dean of Graduate Affairs and Professor of Drama* (sound design)

Bonnie Jean Olsen, Ph.D. California School of Professional Psychology, *Health Sciences Professor of Family Medicine*

Ellen Olshansky, Ph.D. University of California, San Francisco, *Professor Emerita of Nursing*

Betty H. Olson, Ph.D. University of California, Berkeley, *Professor Emeritus of Civil and Environmental Engineering* (molecular applications for optimizing biological processes in wastewater treatment, environmental health, drinking water microbiology)

Carol Booth Olson, Ph.D. University of California, Los Angeles, *Professor Emerita of Education*

Gary Olson, Ph.D. Stanford University, *Professor Emeritus of Informatics* (interactive and collaborative technology, human-computer interaction, computer-supported cooperative work)

Judith Olson, Ph.D. University of Michigan, *Professor Emeritus of Informatics; Paul Merage School of Business; Urban Planning and Public Policy* (interactive and collaborative technology, human-computer interaction, computer-supported cooperative work)

Kevin E. Olson, Ph.D. Northwestern University, *Professor of Political Science; Culture and Theory; European Languages and Studies* (political theory, history of political thought, legal theory, philosophy of the social sciences)

Valerie A. Olson, Ph.D. Rice University, *Associate Professor of Anthropology* (environmental systems, science and technology, U.S., extreme environments)

Hossein Omoumi, Ph.D. University of Florence, *Maseeh Professor in Persian Performing Arts and Professor of Music*

Hector H. Orjuela, Ph.D. University of Kansas, *Professor Emeritus of Spanish and Portuguese*

Kathryn Osann, Ph.D. University of California, Berkeley, *Adjunct Professor of Medicine; Environmental Health Sciences*

Megan Boysen Osborn, M.D. University of California, Irvine, *Associate Dean for Students and Associate Professor of Emergency Medicine*

Donald R. Ostergard, M.D. University of California, San Francisco, *Senate Emeritus of Obstetrics and Gynecology*

Sean B. Ostlund, Ph.D. University of California, Los Angeles, *Assistant Professor of Anesthesiology and Perioperative Care*

Larry E. Overman, Ph.D. University of Wisconsin-Madison, *UCI Distinguished Professor of Chemistry* (inorganic and organometallic, organic and synthetic)

Emily Owens, Ph.D. University of Maryland at College Park, *Professor of Criminology, Law and Society; Economics* (how government policies affect the prevalence of criminal activity as well as how agents within the criminal justice system, particularly police, prosecutors, and judges, respond to policy changes)

Jon Pltt, Ph.D. University of California, Berkeley, *Assistant Professor of Japanese* (Japanese literature, cinema, and sound media, environmental philosophy, ecocriticism, affect theory, new materialism, speculative realism/object oriented ontology)

Bihter Padak, Ph.D. Stanford University, *Assistant Professor of Mechanical and Aerospace Engineering; Chemical and Biomolecular Engineering*

Brian Paegel, Ph.D. University of California, Berkeley, *Professor of Pharmaceutical Sciences* (chemical biology, drug discovery, drug discovery, miniaturization, evolution)

Jane M. Page, M.F.A. Indiana University, *Head of Directing and Professor of Drama* (directing, acting)

Marilyn J. Pais, M.D. Women's Medical College of Pennsylvania, *Senior Lecturer with Security of Employment Emerita of Radiological Sciences*

Krzysztof Palczewski, Ph.D. Wrocław University of Science and Technology, *Irving H. Leopold Chair of Ophthalmology and Professor of Ophthalmology; Physiology and Biophysics*

Andrew A. Palermo, B.F.A. University of Cincinnati, College-Conservatory of Music, *Associate Professor of Drama* (music theatre choreography)

Julian I. Palley, Ph.D. University of New Mexico, *Professor Emeritus of Spanish and Portuguese*

David T. Pan, Ph.D. Columbia University, *Professor of German* (18th-, 19th-, and early 20th-century German literature and intellectual history)

Xiaoqing Pan, Ph.D. Saarland University, *Henry Samuelli Endowed Chair and Director of Irvine Materials Research Institute (IMRI) and Professor of Materials Science and Engineering; Physics and Astronomy* (atomic-scale structure, properties and dynamic behaviors of advanced materials including thin films and nanostructures for memories, catalysts, and energy conversion and storage devices)

Mitradas M. Panicker, Ph.D. Carnegie-Mellon University, *Associate Adjunct Professor of Physiology and Biophysics*

Nicholas R. Pannunzio, Ph.D. Beckman Research Institute of City of Hope, *Assistant Professor of Medicine; Biological Chemistry*

Alessandra Pantano, Ph.D. Princeton University, *Associate Professor of Teaching of Mathematics* (algebra and number theory)

Maria C. Pantelia, Ph.D. Ohio State University, *Director, Thesaurus Linguae Graecae® and Professor of Classics; Religious Studies* (Greek epic, Hellenistic poetry, digital technologies in the humanities)

Marios Papaefthymiou, Ph.D. Massachusetts Institute of Technology, *Ted and Janice Smith Family Foundation Dean and Professor of Computer Science* (computer architecture and design, networks and distributed systems)

Dimitri Papamoschou, Ph.D. California Institute of Technology, *Professor of Mechanical and Aerospace Engineering* (compressible turbulence, jet and fan aeroacoustics, jet noise reduction, mixing enhancement, microphone phased array methods)

Sara R. Paradise, M.D. George Washington University, *Health Sciences Clinical Instructor of Emergency Medicine*

Gerard C. Pardo, Ph.D. Stanford University, *Professor Emeritus of Civil and Environmental Engineering* (structural analysis, experimental structural dynamics)

Kyle P. Paredes, M.D. M.B.A. University of California, San Francisco, *Assistant Dean of Student Affairs and Health Sciences Assistant Clinical Professor of Anesthesiology and Perioperative Care*

Ellen Park, M.D. Tufts University, *Health Sciences Associate Clinical Professor of Anesthesiology and Perioperative Care*

Hannah L. Park, Ph.D. Stanford University, *Assistant Professor in Residence of Epidemiology*

Jung In Park, Ph.D. University of Minnesota, *Assistant Professor of Nursing*

Ian Parker, Ph.D. University College London, *Professor of Neurobiology and Behavior; Physiology and Biophysics*

William H. Parker, Ph.D. University of Pennsylvania, *Professor Emeritus of Physics and Astronomy*

Michael J. Parsons, Ph.D. University of London, *Associate Professor of Developmental and Cell Biology* (development and regeneration of the endocrine pancreas)

Jennifer Pastor, M.F.A. University of California, Los Angeles, *Professor of Art* (sculpture)

Alka Patel, Ph.D. Harvard University, *Associate Professor of Art History; History; Religious Studies; Visual Studies* (South Asian and Islamic art and architecture, historiographies, Islamic diasporas in Cuba)

Anup Patel, M.D. University of Nevada, *Health Sciences Clinical Professor of Pediatrics*

Hiren Patel, M.D. Philadelphia College of Osteopathic Medicine, *Health Sciences Assistant Clinical Professor of Obstetrics and Gynecology*

Pranav Patel, M.D. Saint Louis University, *Chief, Division of Cardiology; Director of Cardiac Catheterization Laboratory and Cardiac Care Unit (CCU) and Health Sciences Associate Clinical Professor of Medicine; Biomedical Engineering*

Medha Pathak, Ph.D. University of California, Berkeley, *Assistant Professor of Physiology and Biophysics*

Sameer S. Pathare, M.D. Medical College of Wisconsin, *Health Sciences Clinical Professor of Pediatrics*

Joseph Patterson, Ph.D. University of Warwick, *Assistant Professor of Chemistry; Materials Science and Engineering* (polymer, materials, nanoscience)

Richard Pattis, M.S. Stanford University, *Professor of Teaching of Computer Science; Informatics* (MicroWorlds for teaching programming, debugging, computational tools for non-computer scientists)

Keyianoosh Paydar, M.D. University of Tennessee, *Health Sciences Associate Clinical Professor of Surgery*

Jone Pearce, Ph.D. Yale University, *Professor of Paul Merage School of Business*

Lisa Pearl, Ph.D. University of Maryland, College Park, *Professor of Language Science; Cognitive Sciences; Logic and Philosophy of Science* (language development, linguistics, computational sociolinguistics, cognitive modeling)

Eric Pearlman, Ph.D. University of Texas Health Sciences Center at San Antonio, *Director of the Institute for Immunology and Chancellor's Professor of Physiology and Biophysics; Ophthalmology*

Cornelia Pechmann, Ph.D. Vanderbilt University, *Professor of Paul Merage School of Business*

Roberto Pelayo, Ph.D. California Institute of Technology, *Assistant Professor of Teaching of Mathematics* (algebra and data science)

Elizabeth Pena, Ph.D. Temple University, *Professor of Education; Language Science*

Andrew Penner, Ph.D. University of California, Berkeley, *UCI Chancellor's Fellow and Professor of Sociology* (gender, inequality, education, family, race)

Emily K. Penner, Ph.D. University of California, Irvine, *Assistant Professor of Education*

Kristine R. Penner, M.D. University of California, San Francisco, *Health Sciences Assistant Clinical Professor of Obstetrics and Gynecology*

Reginald M. Penner, Ph.D. Texas A&M University, *UCI Chancellor's Professor of Chemistry* (analytical, physical chemistry and chemical physics, polymer, materials, nanoscience)

Simon G. Penny, M.F.A. Sydney College of the Arts, *Professor of Art; Informatics* (informatics, robotic sculpture, interactive environments, electronic media)

James W. Penrod, M.F.A. University of California, Irvine; C.M.A. Laban Institute of Movement Studies, *Professor Emeritus of Dance* (ballet, modern, dance notation, choreography, movement analysis)

Kylie Peppler, Ph.D. University of California, Los Angeles, *Associate Professor of Informatics; Education* (learning sciences, design, maker culture, arts, game design, computer programming, wearables)

Edwin Peraza Hernandez, Ph.D. Texas A&M University, *Assistant Professor of Mechanical and Aerospace Engineering* (morphing structures, deployable structures, origami, tensegrity, active materials, structural optimization)

Casey C. Perin, Ph.D. University of California, Berkeley, *Associate Professor of Philosophy*

Barry Perkins, M.A. New England Conservatory of Music, *Lecturer of Music*

Allison J. Perlman, Ph.D. University of Texas at Austin, *Associate Professor of History; Film and Media Studies; Visual Studies* (history of broadcasting, American social movements, media law and policy, media activism, popular memory)

Megan Peters, Ph.D. University of California, Los Angeles, *Assistant Professor of Cognitive Sciences* (perception, metacognition, consciousness, computational modeling, computational cognitive neuroscience)

Robert L. Peters, Ph.D. University of Wisconsin-Madison, *Professor Emeritus of English*

Ying Y. Petersen, Ph.D. University of California, Berkeley, *Lecturer of Chinese*

Ellena Peterson, Ph.D. Georgetown University, *Professor Emerita of Pathology and Laboratory Medicine*

Kristin Peterson, Ph.D. Rice University, *Associate Professor of Anthropology* (science and technology, feminism, pharmaceuticals, West Africa)

Bojan M. Petrovic, Ph.D. University of California, Irvine, *Lecturer of Social Sciences*

Parham Pezeshk, M.D. Shahid Beheshti University of Medical Sciences and Health Services, *Health Sciences Clinical Instructor of Radiological Sciences*

Robert F. Phalen, Ph.D. University of Rochester, *Professor of Medicine; Environmental Health Sciences*

Peter H. Pham, M.D. University of California, Los Angeles, *Associate Professor of Radiological Sciences*

Son Phan, M.D. University of Vermont, *Health Sciences Assistant Clinical Professor of Radiological Sciences*

Nicolas M. Phielipp, M.D. University of Buenos Aires, *Health Sciences Assistant Clinical Professor of Neurology*

Kavita S. Philip, Ph.D. Cornell University, *Professor of History; Informatics* (history of modern South Asia, science and technology, political ecology, critical theoretical studies of race, gender, colonialism, new media, and globalization)

Susanne J. Phillips, D.N.P. Yale University, *Health Sciences Clinical Professor of Nursing*

Davin Phoenix, Ph.D. University of Michigan, *Assistant Professor of Political Science* (racial attitudes, affect and behavior, public opinion, political communication, urban politics, mobilization of marginalized groups)

Aimee Pierce, M.D. Columbia University College of Physicians and Surgeons, *Health Sciences Assistant Clinical Professor of Neurology*

Paul Piff, Ph.D. University of California, Berkeley, *Assistant Professor of Psychological Science* (social psychology, group processes, altruism and cooperation, socioeconomic status, inequality, social emotion, moral judgment, ethics, uncertainty)

Alessio Pigazzi, M.D. Boston University, *Associate Professor of Surgery*

Morton Pincus, Ph.D. Washington University, *Professor of Paul Merage School of Business*

Gerald Pinter, B.A. University of North Texas, *Lecturer of Music*

Melissa Pinto, Ph.D. University of Louisville, *Associate Professor of Nursing*

Daniele Piomelli, Ph.D. Columbia University, *Louise Turner Arnold Chair in the Neurosciences and Distinguished Professor of Anatomy and Neurobiology; Biological Chemistry; Pharmaceutical Sciences*

Seth D. Pipkin, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Urban Planning and Public Policy*

Zygmunt Pizlo, Ph.D. University of Maryland at College Park, *Falmagne Endowed Chair and Professor of Cognitive Sciences* (human and machine vision, 3D shape, symmetry, virtual reality, robotics, problem solving)

Janice G. Plastino, Ph.D. University of Southern California, *Professor Emerita of Dance* (kinesiology/anatomy, research methods, choreography, dance science/medicine)

Maksim Plikus, Ph.D. University of Southern California, *Associate Professor of Developmental and Cell Biology* (mechanisms of regeneration, stem cell control)

Lawrence Plon, Pharm.D. M.A. University of Southern California, *Assistant Adjunct Professor of Pharmaceutical Sciences*

Dale J. Poirier, Ph.D. University of Wisconsin-Madison, *Professor Emeritus of Economics*

Andrew Policano, Ph.D. Brown University, *Professor Emeritus of Paul Merage School of Business*

Alice Police, M.D. Loma Linda University, *Health Sciences Assistant Clinical Professor of Surgery*

Francesca Polletta, Ph.D. Yale University, *Professor of Sociology* (social movements, democracy, culture, sociology of law, political sociology, social theory)

Henry N. Pontell, Ph.D. State University of New York at Stony Brook, *Professor Emeritus of Criminology, Law and Society; Sociology* (white-collar and corporate crime, criminology, criminal justice, deviance and social control, sociology of law)

Katherine M. Porter, J.D. Harvard University, *Professor of School of Law*

Robert W. Porter, M.D. Northwestern University, *Senate Emeritus of Neurological Surgery*

Dmitry Portnoy, M.D. Moscow State University, *Health Sciences Clinical Professor of Anesthesiology and Perioperative Care*

Manuel Porto, M.D. Rutgers, the State University of New Jersey, *The Edward J. Quilligan Chair in Maternal-Fetal Medicine and Professor of Obstetrics and Gynecology*

Eric Potma, Ph.D. University of Groningen, *Professor of Chemistry; Electrical Engineering and Computer Science* (analytical, chemical biology, physical chemistry and chemical physics)

Thomas L. Poulos, Ph.D. University of California, San Diego, *Distinguished Professor of Molecular Biology and Biochemistry; Chemistry; Pharmaceutical Sciences* (chemical biology)



Ilhem Messaoudi Powers, Ph.D. Weill Cornell Graduate School of Medical Sciences, *Associate Professor of Molecular Biology and Biochemistry; Microbiology and Molecular Genetics*

Michael J. Prather, Ph.D. Yale University, *UCI Distinguished Professor of Earth System Science*

Jessica Pratt, Ph.D. University of California, Irvine, *Associate Professor of Teaching of Ecology and Evolutionary Biology*

Joann Prause, Ph.D. University of California, Irvine, *Professor of Teaching Emerita of Psychological Science* (statistics, quantitative epidemiology, employment typology)

Adrian Preda, M.D. Carol Davila University, *Health Sciences Professor of Psychiatry and Human Behavior; Religious Studies*

Daryl Preece, Ph.D. University of Glasglow, *Assistant Professor of Biomedical Engineering* (nano-optics, neuro-photonics, optical forces and mechanotransduction, singular optics, and biophotonics)

Jennifer A. Prescher, Ph.D. University of California, Berkeley, *Professor of Chemistry; Molecular Biology and Biochemistry; Pharmaceutical Sciences* (chemical biology, organic and synthetic)

Sarah D. Pressman, Ph.D. Carnegie Mellon University, *Associate Professor of Psychological Science* (health psychology, positive emotions, stress physiology, psychosocial effects on physiology and health)

Henry W. Pribram, MB BChir Cambridge University, *Professor Emeritus of Radiological Sciences*

Douglas W. Priestly, M.D. University of Manitoba, *Health Sciences Clinical Professor of Physical Medicine and Rehabilitation*

Francois W. Primeau, Ph.D. Massachusetts Institute of Technology, *Professor of Earth System Science*

Michael D. Prislín, M.D. Georgetown University, *Professor of Family Medicine*

Duncan Pritchard, Ph.D. University of St. Andrews, *Professor of Philosophy*

Michael S. Pritchard, Ph.D. University of California, San Diego, *Associate Professor of Earth System Science*

Sergey V. Pronin, Ph.D. University of Chicago, *Assistant Professor of Chemistry* (organic and synthetic chemistry)

Aaron Przybysz, M.D. University of Michigan, *Health Sciences Assistant Clinical Professor of Anesthesiology and Perioperative Care*

Ralph Purdy, Ph.D. University of California, Los Angeles, *Professor Emeritus of Pharmaceutical Sciences*

Geetha Puthenveetil, MBBS St. Johns Medical College, *Health Sciences Clinical Professor of Pediatrics*

Feng Qiao, Ph.D. University of California, Los Angeles, *Associate Professor of Biological Chemistry*

Annie Qu, Ph.D. The Pennsylvania State University, *Professor of Statistics*

Lisa K. Quane, M.D. University of Illinois at Urbana-Champaign, *Health Sciences Professor of Radiological Sciences*

Jodi A. Quas, Ph.D. University of California, Davis, *Professor of Psychological Science* (memory development, children's involvement in the legal system)

Bradley A. Queen, Ph.D. Boston University, *Associate Professor of Teaching of English*

Edward J. Quilligan, M.D. Ohio State University, *Professor Emeritus of Obstetrics and Gynecology*

W. Leslie Quinlivan, MBBS University of London, *Professor Emeritus of Obstetrics and Gynecology*

Isabela Seong Leong Quintana, Ph.D. University of Michigan, *Assistant Professor of Asian American Studies* (comparative and relational ethnic studies; Asian American history; Chicanx/Latinx history; race and gender; borderlands, diasporas, and empire)

Aziz-Ul-Haq Qureshi, M.A. California State University, Long Beach, *Lecturer of Academic English/English as a Second Language*

Rajagopalan Radhakrishnan, Ph.D. Binghamton University, State University of New York, *Distinguished Professor of English; African American Studies; Comparative Literature; Culture and Theory* (critical theory, postcoloniality, nationalisms and diasporas, poststructuralism, postmodernism, democracy and minority discourse, cultural studies, globalization and transnationalism)

Leslie J. Raffel, M.D. Medical College of Pennsylvania, *Health Sciences Clinical Professor of Pediatrics; Genetic Counseling*

Gregory Rafijah, M.D. Chicago Medical School, *Health Sciences Assistant Clinical Professor of Orthopaedic Surgery*

Regina Ragan, Ph.D. California Institute of Technology, *Endowed Chair for the Center for Diversity in Engineering Education and Professor of Materials Science and Engineering; Chemical and Biomolecular Engineering* (exploration and development of novel material systems for nanoscale electronic and optoelectronic devices)

Charles C. Ragin, Ph.D. University of North Carolina at Chapel Hill, *UCI Chancellor's Professor of Sociology* (comparative and historical sociology, social inequality, political sociology, quantitative methodology, qualitative methodology)

Kathryn Ragsdale, Ph.D. University of Chicago, *Lecturer of History* (Japan: Meiji to present; Asia-Pacific War; Japanese film and popular culture)

Ramin Rahimian, M.D. University of California, Los Angeles, *Health Sciences Assistant Clinical Professor of Anesthesiology and Perioperative Care*

Nasrin Rahimieh, Ph.D. University of Alberta, *Director of the Humanities Core Program and Howard Baskerville Professor of Comparative Literature; European Languages and Studies; Gender and Sexuality Studies* (Modern Persian literature and culture, diaspora studies, women's writing.)

Amir M. Rahmani, Ph.D. University of Turku, Finland, *Assistant Professor of Nursing*

Yvonne Rainer, *Claire Trevor Professor and Professor Emerita of Art* (performance, dance, video)

Govind R. Rajan, MBBS University of Delhi, *Health Sciences Clinical Professor of Anesthesiology and Perioperative Care*

Arvind Rajaraman, Ph.D. Stanford University, *Professor of Physics and Astronomy*

Vibhuti Ramachandran, Ph.D. New York University, *Assistant Professor of Global and International Studies; Criminology, Law and Society*

Leslie M. Randall, M.D. University of Louisville, *Assistant Professor of Obstetrics and Gynecology*

James T. Randerson, Ph.D. Stanford University, *UCI Chancellor's Professor of Earth System Science; Civil and Environmental Engineering; Ecology and Evolutionary Biology*

Roger H. Rangel, Ph.D. University of California, Berkeley, *Department Chair and Professor of Mechanical and Aerospace Engineering* (heat transfer, fluid mechanics, two-phase flows, fluid instability and atomization)

Jose Mari Ranz Navapotro, Ph.D. Universidad Autónoma de Madrid, *Associate Professor of Ecology and Evolutionary Biology*

Bahram Raofi, M.D. University of Tehran, *Health Sciences Clinical Professor of Radiological Sciences*

Darren R. Raphael, M.D. University of California, Irvine, *Health Sciences Associate Clinical Professor of Anesthesiology and Perioperative Care*

Renee J. Raphael, Ph.D. Princeton University, *Associate Professor of History; European Languages and Studies; Religious Studies* (early modern Europe, history of science, intellectual history)

Michael Ratz, Ph.D. Technical University of Munich, *Professor of Physics and Astronomy*

Radoslav Raychev, M.D. Sofia Medical University, *Health Sciences Assistant Clinical Professor of Neurological Surgery*

Olga Razorenova, Ph.D. Institute of Molecular Genetics, *Assistant Professor of Molecular Biology and Biochemistry*

Elizabeth L. Read, Ph.D. University of California, Berkeley, *Assistant Professor of Chemical and Biomolecular Engineering; Molecular Biology and Biochemistry* (dynamics of complex biochemical systems, regulation of immune responses)

Colleen Reardon, Ph.D. University of California, Los Angeles, *Professor of Music*

Wilfred W. Recker, Ph.D. Carnegie Mellon University, *Distinguished Professor of Civil and Environmental Engineering* (transportation systems modeling, traffic control, and urban systems analysis)

Michael R. Recto, M.D. University of the Philippines, College of Medicine, *Health Sciences Clinical Professor of Pediatrics*

David L. Rector, Ph.D. Massachusetts Institute of Technology, *Professor Emeritus of Mathematics* (algebraic topology and computer algebra)

Varalakshmi Reddy, M.D. Osmania Medical College, *Health Sciences Professor of Pediatrics*

David F. Redmiles, Ph.D. University of Colorado Boulder, *Professor of Informatics* (computer-supported cooperative work, human computer interaction, software engineering, globally distributed development teams, user interfaces, software tools)

John L. Redpath, Ph.D. University of Newcastle, *Professor Emeritus of Radiation Oncology; Environmental Health Sciences*

William S. Reeburgh, Ph.D. Johns Hopkins University, *Professor Emeritus of Earth System Science*

Barbara L. Reed, Ph.D. Indiana University, *Associate Professor of Teaching Emerita of English*



Karin E. Reed, M.D. Wayne State University, *Health Sciences Assistant Clinical Professor of Emergency Medicine*

R. Anthony Reese, J.D. Stanford University, *UCI Chancellor's Professor of School of Law*

Amelia C. Regan, Ph.D. University of Texas at Austin, *Professor of Computer Science* (algorithm development and complexity, networks and distributed systems, network optimization)

Christina M. Reh, M.D. Loma Linda University, *Health Sciences Clinical Professor of Pediatrics*

Stephanie Reich, Ph.D. Vanderbilt University, *Associate Professor of Education; Informatics; Psychological Science* (child development, parenting, peer interactions, media, program evaluation)

Janelle Reinelt, Ph.D. Stanford University, *Professor Emerita of Drama* (British theatre, political theory, performance)

David J. Reinkensmeyer, Ph.D. University of California, Berkeley, *Professor of Anatomy and Neurobiology; Biomedical Engineering; Mechanical and Aerospace Engineering; Physical Medicine and Rehabilitation*

Keramet Reiter, Ph.D. University of California, Berkeley, *Associate Professor of Criminology, Law and Society; School of Law* (prisons and extreme punishments, legal history, criminal justice policy, criminal and civil rights law, law and society)

Maria G. Rendón, Ph.D. Harvard University, *Assistant Professor of Urban Planning and Public Policy; Sociology* (urban sociology, immigration, race/ethnicity, sociology of education and social policy)

Bryan R. Reynolds, Ph.D. Harvard University, *UCI Chancellor's Professor and Claire Trevor and Professor of Drama* (Shakespeare, Renaissance drama, critical theory, feminist theory, performance theory, cultural studies)

Sherif Rezk, M.D. Alexandria University, *Professor of Pathology and Laboratory Medicine*

Katherine Rhodes, Ph.D. Georgia State University, *Assistant Professor of Education* (mathematical cognition and achievement, linguistic minority equity and inclusion, child development, psychometrics, latent trait modeling)

Markus W. Ribbe, Ph.D. University of Bayreuth, *UCI Chancellor's Professor of Molecular Biology and Biochemistry; Chemistry* (chemical biology, inorganic and organometallic)

Virginia Richards, Ph.D. University of California, Berkeley, *Professor of Cognitive Sciences* (auditory perception and cognition, human psychophysics)

Debra J. Richardson, Ph.D. University of Massachusetts, *Professor Emeritus of Informatics* (software engineering, program testing, life-cycle validation, software environments)

Gary Richardson, Ph.D. University of California, Berkeley, *Professor of Economics; Religious Studies*

L. Song Richardson, J.D. Yale Law School, *Dean of the School of Law and Professor of School of Law; Asian American Studies*

Justin Richland, Ph.D. University of California, Los Angeles, *Associate Professor of Anthropology* (legal discourse analysis and semiotics, anthropology of law; contemporary native American law, politics, art, and ethnographic museology)

Lindsey Richland, Ph.D. University of California, Los Angeles, *Associate Professor of Education*

Cameron Ricks, M.D. American University of the Caribbean, *Health Sciences Associate Clinical Professor of Anesthesiology and Perioperative Care*

Hidemi Riggs, Ph.D. University of California, Los Angeles, *Academic Coordinator and Lecturer of Japanese*

Eric Rignot, Ph.D. University of Southern California, *Department Chair and Donald Bren Professor of Earth System Science; Civil and Environmental Engineering*

Jenna Riis, Ph.D. Johns Hopkins University, *Assistant Professor of Psychological Science* (early life adversity; stress; salivary bioscience; neuroendocrine-immune relations; program implementation and evaluation)

Jenny K. Rinehart, Ph.D. University of New Mexico, *Assistant Professor of Teaching of Psychological Science* (health psychology, clinical psychology, sexual victimization prevention, risk perception)

Joseph Rinehart, M.D. Loyola University Chicago, *Associate Clinical Professor of Anesthesiology and Perioperative Care*

Stephen G. Ritchie, Ph.D. Cornell University, *Director of the Institute of Transportation Studies and Professor of Civil and Environmental Engineering* (transportation engineering, advanced traffic management and control systems, development and application of emerging technologies in transportation)

Thorsten Ritz, Ph.D. University of Ulm, *Professor of Physics and Astronomy*

Monica B. Rivera, M.D. University of California, Los Angeles School of Medicine, *Health Sciences Clinical Professor of Radiological Sciences*

Annie E. Ro, Ph.D. University of California, Los Angeles, *Assistant Professor of Program in Public Health; Asian American Studies*

Ty Robbins, Ph.D. University of California, Santa Barbara, *Lecturer of Economics*

Hugh J. Roberts, Ph.D. McGill University, *Associate Professor of English* (romantic literature, Shelley, literature and science, chaos theory and literature, politics and literature)

William S. Roberts, M.F.A. California Institute of the Arts, *Associate Professor of Teaching of Art* (photography)

James Robertson, Ph.D. New York University, *Assistant Professor of History* (intellectual and cultural history of Europe and the Balkans)

Paul M. Robertson, Ph.D. University of Texas at Austin, *Assistant Professor of Physics and Astronomy*

Michael J. Robinson-Dorn, J.D. Cornell University, *Clinical Professor of School of Law*

Trilby Robinson-Dorn, J.D. Tulane University, *Associate Dean and Professor of School of Law*

Belinda Robnett, Ph.D. University of Michigan, *Professor of Sociology* (social movements, race and ethnicity, gender, social change, African Americans)

Guillaume Rocheteau, Ph.D. University of Paris, *Professor of Economics*

Tara Rodman, Ph.D. Northwestern University, *Assistant Professor of Drama; Asian American Studies* (modernist performance, Japanese theatre and dance, transnationalism, racial formation, global Asias)

Bobby Rodriguez, D.M.A. University of California, Los Angeles, *Lecturer of Music*

Fernando Rodriguez, Ph.D. University of Michigan, *Assistant Professor of Teaching of Education*

Jaime E. Rodriguez, Ph.D. University of Texas at Austin, *Professor Emeritus of History*

Nancy Rodriguez, Ph.D. Washington State University, *Professor of Criminology, Law and Society* (race, crime, and justice; juvenile justice; collateral consequences of imprisonment; criminal justice policy)

Vanessa Rodriguez, M.S.N. Samuel Merritt University, *Health Sciences Assistant Clinical Professor of Nursing*

Jose Antonio Rodriguez Lopez, Ph.D. University of California, Berkeley, *Associate Professor of Economics*

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Judit Romhanyi, Ph.D. Budapest University of Technology and Economy, *Assistant Professor of Physics and Astronomy*

A. K. Romney, Ph.D. Harvard University, *Professor Emeritus of Anthropology*

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Karen S. Rook, Ph.D. University of California, Los Angeles, *Distinguished Professor of Psychological Science* (gerontology, social relationships and health)

Rocio Rosales, Ph.D. University of California, Los Angeles, *Assistant Professor of Sociology; Chicano/Latino Studies* (international migration, immigrant and ethnic economics, urban sociology, ethnography, Latino/a studies, race and ethnicity, immigrant detention)

Ana Rosas, Ph.D. University of Southern California, *Associate Professor of Chicano/Latino Studies; History* (Chicana/o comparative history, immigration, ethnicity)

Michael R. Rose, Ph.D. University of Sussex, *Professor of Ecology and Evolutionary Biology*

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Mark Rosenbaum, J.D. Harvard University, *Adjunct Professor of School of Law*

Emily S. Rosenberg, Ph.D. State University of New York at Stony Brook, *Professor Emerita of History* (U.S. and the world, transnational/global history, international relations)

Shawn W. Rosenberg, M.Litt. University of Oxford, *Professor of Political Science* (political psychology, deliberative democracy, ideology, social theory, social and development psychology)

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Lauren Ross, Ph.D. University of Pittsburgh, *Assistant Professor of Logic and Philosophy of Science*

Richard I. Ross, M.D. University of Maryland, *Health Sciences Assistant Clinical Professor of Emergency Medicine*

Steven D. Ross, M.D. University of Southern California, *Health Sciences Professor of Orthopaedic Surgery*

Amanda Ross-Ho, M.F.A. University of Southern California, *Associate Professor of Art* (sculpture)

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Jeffrey Rouder, Ph.D. University of California, Irvine, *Falmagne Endowed Chair and Professor of Cognitive Sciences* (mathematical and statistical models of perception and cognition, bayesian mixed models, psychometrics)

John C. Rowe, Ph.D. State University of New York College at Buffalo, *Professor Emeritus of English; Comparative Literature*

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Ruben G. Rumbaut, Ph.D. Brandeis University, *Distinguished Professor of Sociology; Chicano/Latino Studies; Criminology, Law and Society; Education* (international migration, immigration laws, criminalization, incarceration, social inequality and mobility, race and ethnicity)

Elizabeth A. Runcie, D.O. Des Moines University, *Health Sciences Clinical Instructor of Emergency Medicine*

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James E. Rutledge, Ph.D. University of Illinois at Chicago Circle, *Professor Emeritus of Physics and Astronomy*

Nancy L. Ruyter, Ph.D. Claremont Graduate University, *Professor Emerita of Dance* (dance history, Spanish dance, bibliography and research)

Michael Ryan, Ph.D. University of Iowa, *Professor of English; Religious Studies* (American literature, creative writing, poetry, poetics, autobiography)

Scott D. Rychnovsky, Ph.D. Columbia University, *UCI Distinguished Professor of Chemistry* (chemical biology, organic and synthetic)

Nathan Rynn, Ph.D. Stanford University, *Professor Emeritus of Physics and Astronomy*

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Kamal Sadiq, Ph.D. University of Chicago, *Associate Professor of Political Science* (comparative politics, immigration and citizenship in developing countries, India and southeast Asia, Asian security)

Hamid M. Said, Pharm.D., Ph.D. Baghdad University, Aston University, *Distinguished Professor of Medicine; Physiology and Biophysics*

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Maritza Salazar, Ph.D. New York University, *Assistant Professor of Paul Merage School of Business; Psychological Science* (team science, group dynamics and processes, team-based organizations, global teams, impact of culture on work behavior, international management, management of innovation and learning)

Katie Salen Tekinba#, M.F.A. Rhode Island School of Design, *Professor of Informatics* (game design, connected learning design, human-computer interaction)

Sharon V. Salinger, Ph.D. University of California, Los Angeles, *Professor Emerita of History* (early America and early Modern Caribbean—social and labor history, race, gender)

Eric S. Saltzman, Ph.D. University of Miami, *UCI Distinguished Professor of Earth System Science; Chemistry*

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Catherine Z. Sameh, Ph.D. Rutgers, The State University of New Jersey, *Assistant Professor of Gender and Sexuality Studies* (Iranian feminism, human rights, transnational feminisms, gender and social movements in the Middle East and Muslim world, Islam, women of color feminisms)

Henry Samueli, Ph.D. University of California, Los Angeles, *Adjunct Professor of Electrical Engineering and Computer Science* (digital signal processing, communications systems engineering, CMOS integrated circuit design for applications in high-speed data transmission systems)

G. Scott Samuelsen, Ph.D. University of California, Berkeley, *Director of Advanced Power and Energy Program, Research Professor and Professor Emeritus of Mechanical and Aerospace Engineering; Civil and Environmental Engineering* (combustion, sprays, laser diagnostics, air quality, turbulent transport, alternative fuels, modeling reacting flows, practical systems, energy and environmental conflict)

Javier D. Sanchez-Yamagishi, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Physics and Astronomy*

Zlatina Sandalska, Ph.D. University of Southern California, *Lecturer of Russian*

Brett F. Sanders, Ph.D. University of Michigan, *Professor of Civil and Environmental Engineering; Urban Planning and Public Policy* (urban flooding, coastal flooding, dam-break flooding, flood hazard modeling, flood risk management, sediment management, shallow-water hydrodynamics and morphodynamics, computational methods, remote-sensing with drones, translational research for flood modeling targeting community resilience, population health and poverty alleviation)

Judith Haymore Sandholtz, Ph.D. Stanford University, *Professor of Education*

Suzanne B. Sandmeyer, Ph.D. University of Washington, *Grace Beekhuis Bell Chair in Biological Chemistry and Professor of Biological Chemistry; Microbiology and Molecular Genetics*

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Rozanne M. Sandri-Goldin, Ph.D. Johns Hopkins University, *Department Chair and Chancellor's Professor of Microbiology and Molecular Genetics*

Terry Sanger, M.D. Harvard Medical School, *Vice President and Chief Scientific Officer for Children's Hospital Orange County and Professor of Electrical Engineering and Computer Science*

Ardalan Amiri Sani, Ph.D. Rice University, *Assistant Professor of Computer Science* (involves building efficient, high performance, and reliable systems)

Rossella Santagata, Ph.D. University of California, Los Angeles, *Professor of Education* (teacher preparation and professional development, teaching and learning in STEM fields, video technologies, teaching and learning as cultural practices, equity and education)

Gerasimos X. Santas, Ph.D. Cornell University, *Professor Emeritus of Philosophy*

Jean-Daniel M. Saphores, Ph.D. Cornell University, *Professor of Civil and Environmental Engineering; Economics; Urban Planning and Public Policy* (transportation and environmental systems (with a focus on air pollution and energy use), travel behavior analysis, alternative fuel vehicles, automated vehicles, transit use, sustainable infrastructure management, and decision making under uncertainty using real options)

I. James Sarfeh, M.D. Albany Medical College, *Professor Emeritus of Surgery*

Barbara W. Sarnecka, Ph.D. University of Michigan, *Professor of Cognitive Sciences; Logic and Philosophy of Science* (cognitive development, language development, number concepts, conceptual change, individual cognitive development, historical development of science and mathematics)

George Sarraf, Ph.D. Claremont Graduate University, *Lecturer of Economics*

Erdem Sasmaz, Ph.D. Stanford University, *Assistant Professor of Chemical and Biomolecular Engineering* (heterogenous catalysis and nanoparticle synthesis for clean energy production and carbon dioxide utilization)

Jon F. Sassin, M.D. Saint Louis University, *Professor Emeritus of Neurology*

Paolo Sassone-Corsi, Ph.D. University of Naples Federico II, *Donald Bren Professor and Distinguished Professor of Biological Chemistry; Microbiology and Molecular Genetics; Pharmaceutical Sciences*

Brian Sato, Ph.D. University of California, San Diego, *Associate Professor of Teaching of Molecular Biology and Biochemistry; Education*

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David Schaefer, Ph.D. University of Arizona, *Associate Professor of Sociology* (social networks, social psychology, criminology, health, human development)

Karl Schafer, Ph.D. New York University, *Professor of Philosophy*

Martin Schechter, Ph.D. New York University, *Professor Emeritus of Mathematics* (analysis and partial differential equations, mathematical physics)

Stephen Scheinberg, Ph.D. Princeton University, *Professor Emeritus of Mathematics*

Edgar T. Schell, Ph.D. University of California, Berkeley, *Professor Emeritus of English*

Jeanne Scheper, Ph.D. University of California, Santa Barbara, *Department Chair and Associate Professor of Gender and Sexuality Studies* (feminist performance studies and visual culture, cultural studies, theories of race, gender and sexuality, trans-Atlantic modernism)

Jan W. Scherfig, Ph.D. University of California, Berkeley, *Professor Emeritus of Civil and Environmental Engineering* (water reclamation, waste treatment processes, environmental engineering)

Isaac D. Scherson, Ph.D. Weizmann Institute of Science, *Professor of Computer Science; Electrical Engineering and Computer Science* (parallel computing architectures, massively parallel systems, parallel algorithms, interconnection networks, performance evaluation)

Chelsea Schields, Ph.D. City University of New York, *Assistant Professor of History* (history of modern Europe, colonialism, decolonization, gender and sexuality)

Thomas F. Schilling, Ph.D. University of Oregon, *Department Chair and Professor of Developmental and Cell Biology* (zebrafish development, vertebrate genetics, craniofacial development)

Shira A. Schlesinger, M.D. University of California, San Diego, *Health Sciences Assistant Clinical Professor of Emergency Medicine*

Annette M. Schlichter, Ph.D. Humboldt University of Berlin, *Associate Professor Emerita of Comparative Literature* (feminist theory and criticism, queer theory, critiques of heterosexuality, contemporary American literature, gender and literature, voice studies)

Beryl F. Schlossman, Doctorate University of Paris 7, Ph.D. Johns Hopkins University, *Professor of Comparative Literature* (Modern literature, critical theory, film studies, psychoanalysis, the arts in society.)

Sanford Schneider, M.D. New York University, *Health Sciences Clinical Professor of Pediatrics*

John Schneiderman, M.F.A. University of California, Irvine, *Professor of Teaching of Music*

Richard M. Schoen, Ph.D. Stanford University, *UCI Excellence in Teaching Chair in Mathematics and Distinguished Professor of Mathematics* (differential geometry, partial differential equations, general relativity)

Evan Schofer, Ph.D. Stanford University, *Professor of Sociology* (comparative political sociology, sociology of education, quantitative methods and statistics, globalization, sociology of the environment, organizations, sociology of science)

Natalie B. Schonfeld, Ph.D. Claremont Graduate University, *Senior Lecturer of Undergraduate Education*

William R. Schonfeld, Ph.D. Princeton University, *Professor Emeritus of Political Science*

Claudia Schoonhoven, Ph.D. Stanford University, *Professor Emerita of Paul Merage School of Business*



Merritt D. Schreiber, Ph.D. Ohio State University, *Associate Professor Emeritus of Emergency Medicine*

Steven S. Schreiber, M.D. Albany Medical College, *Professor in Residence of Neurology; Anatomy and Neurobiology; Psychiatry and Human Behavior*

Samuel E. Schriner, Ph.D. University of Washington, *Vice Chair and Assistant Professor of Teaching of Pharmaceutical Sciences* (aging, genetics, biochemistry, mitochondria)

Sabrina E. Schuck, Ph.D. University of California, Riverside, *Health Sciences Assistant Clinical Professor of Pediatrics; Education; Psychological Science*

Stephen Schueller, Ph.D. University of Pennsylvania, *Assistant Professor of Psychological Science* (clinical psychology, depression, mHealth, technology, implementation science, treatment and prevention, positive psychology)

Carl Schultz, M.D. University of California, Irvine, *Professor Emeritus of Emergency Medicine*

Jonas Schultz, Ph.D. Columbia University, *Professor Emeritus of Physics and Astronomy; Logic and Philosophy of Science*

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Gabriele M. Schwab, Ph.D. University of Konstanz, *UCI Chancellor's Professor of Comparative Literature; Anthropology; Culture and Theory; English; European Languages and Studies; German* (modern literature, critical theory, psychoanalysis, comparative literature)

Martin Schwab, Ph.D. Heidelberg University, *Professor Emeritus of Philosophy*

Adam J. Schwarz, M.D. Stanford University, *Health Sciences Associate Clinical Professor of Pediatrics*

Christopher Schwarz, Ph.D. University of Massachusetts, *Associate Professor of Paul Merage School of Business*

Ran Schwarzkopf, M.D. Ben Gurion University of Negev, *Health Sciences Assistant Clinical Professor of Orthopaedic Surgery*

Armin Schwegler, Ph.D. University of California, Berkeley, *Professor of Spanish and Portuguese* (Spanish linguistics, history of the Spanish language, Creole languages, language contact, African influences in Latin America, language origins)

Howard Schwid, M.D. University of Wisconsin-Madison, *Health Sciences Clinical Professor of Anesthesiology and Perioperative Care*

John A. Scolaro, M.D. Boston College, *Health Sciences Assistant Clinical Professor of Orthopaedic Surgery*

Nina Scolnik, B.M. Oberlin College, *Professor of Teaching of Music*

Gregory Scontras, Ph.D. Harvard University, *Assistant Professor of Language Science* (semantics, pragmatics, computational modeling, heritage bilingualism)

Carlton Scott, Ph.D. University of New South Wales, *Professor Emeritus of Paul Merage School of Business*

Bert Scruggs, Ph.D. University of Pennsylvania, *Associate Professor of Chinese* (Taiwanese literature, postcolonial discourse)

Nicholas I. Scurich, Ph.D. University of Southern California, *Associate Professor of Psychological Science; Criminology, Law and Society; School of Law* (judgment and decision making, juridical proof, violence risk assessment)

Patricia Seed, Ph.D. University of Wisconsin-Madison, *Professor of History; Informatics* (mapping: history and design, game design, navigation)

Christopher Seeds, Ph.D. New York University, *Assistant Professor of Criminology, Law and Society* (punishment and social control, law and society, criminal justice, social theory, life sentencing and capital punishment)

Jacobo Sefami, Ph.D. University of Texas at Austin, *Professor of Spanish and Portuguese* (Latin American literature, with emphasis in 20th/21st century poetry; Latin American Jewish writers)

Magdalene J. Seiler, Ph.D. University of Munich, *Associate Professor in Residence of Anatomy and Neurobiology; Physical Medicine and Rehabilitation*

Marcus M. Seldin, Ph.D. Johns Hopkins University, *Assistant Professor of Biological Chemistry*

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Bert L. Semler, Ph.D. University of California, San Diego, *Distinguished Professor of Microbiology and Molecular Genetics*

Donald F. Senear, Ph.D. University of Washington, *Professor of Molecular Biology and Biochemistry*

Stefano Sensi, M.D. Gabriele D'Annunzio University of Chieti Pescara, *Associate Adjunct Professor of Neurology*

Cagin Senturk, M.D. Hacettepe University Medical School, *Health Sciences Clinical Professor of Radiological Sciences*

Arnold K. Seong, M.F.A. University of Washington, *Lecturer of Academic English/English as a Second Language*

Caesar D. Sereseres, Ph.D. University of California, Riverside, *Associate Professor of Political Science* (U.S. foreign policy, U.S. Latin American relations, Mexican-American politics)

Carroll S. Seron, Ph.D. New York University, *Professor Emerita of Criminology, Law and Society; School of Law* (sociology of law, sociology of professions, law and society, sociology of legal profession, methods and police misconduct)

Jared Charles Sexton, Ph.D. University of California, Berkeley, *Professor of African American Studies; Culture and Theory; Film and Media Studies; Visual Studies* (race and sexuality, policing and imprisonment, contemporary U.S. cinema and political culture, multiracial coalition, critical theory)

Gregory Shaffer, J.D. Stanford University, *Director, Center of Globalization, Law and Society and UCI Chancellor's Professor of School of Law; Political Science*

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Yanning Shen, Ph.D. University of Minnesota, *Assistant Professor of Electrical Engineering and Computer Science* (machine learning, data science, network science, and statistical-signal processing)

Lavonne Sheng, M.D. University of California, Irvine, *Health Sciences Clinical Professor of Pediatrics*

Phillip C-Y Sheu, Ph.D. University of California, Berkeley, *Professor of Electrical Engineering and Computer Science; Biomedical Engineering; Computer Science* (semantic computing, robotic computing, artificial intelligence, biomedical computing, multimedia computing)

Terrence Shevlin, Ph.D. Stanford University, *Paul Merage Chair in Business Growth and Professor of Paul Merage School of Business*

Frank G. Shi, Ph.D. California Institute of Technology, *Professor of Chemical and Biomolecular Engineering; Materials Science and Engineering* (optoelectronic devices and materials, optoelectronic device packaging materials, optoelectronic medical devices and packaging, white LED technologies, high power LED packaging)

Yongsheng Shi, Ph.D. Syracuse University, *Professor of Microbiology and Molecular Genetics*

Aomawa Shields, Ph.D. University of Washington, *Assistant Professor of Physics and Astronomy*

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Yuri Shirman, Ph.D. University of California, Santa Cruz, *Professor of Physics and Astronomy*

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Yasser Shoukry, Ph.D. University of California, Los Angeles, *Assistant Professor of Electrical Engineering and Computer Science* (resilience, safety, security and privacy of artificial intelligence (AI), controlled cyber-physical systems (CPS), internet-of-things (IoT), and robotic systems)

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Jack H. Sills, M.D. Northwestern University, *Health Sciences Clinical Professor of Pediatrics*

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Victoria A. Silver, Ph.D. University of California, Los Angeles, *Professor of English; Religious Studies* (early modern literature and culture, religious studies, history and theory of rhetoric, literature and philosophy)

Alice Silverberg, Ph.D. Princeton University, *Distinguished Professor Emerita of Mathematics; Computer Science* (algebra and number theory)

Dennis J. Silverman, Ph.D. Stanford University, *Professor Emeritus of Physics and Astronomy*

Eli Simon, M.F.A. Brandeis University, *UCI Chancellor's Professor and Professor of Drama* (acting, directing)

Valeria B. Simon, M.D. University of Illinois at Urbana-Champaign, *Health Sciences Clinical Instructor of Obstetrics and Gynecology*

Kenneth W. Simons, J.D. University of Michigan Law School, *UCI Chancellor's Professor of School of Law*

Sandra Simpkins, Ph.D. University of California, Riverside, *Professor of Education* (organized after-school activities, motivation, family influences, diversity and equity, immigration and culture, STEM)

Jennifer L. Simpson, M.D. University of Michigan, *Health Sciences Professor of Ophthalmology*

Richard A. Sims, M.F.A. University of California, Irvine, *Lecturer of English*

Jasjit Singh, M.D. Duke University, *Health Sciences Associate Clinical Professor of Pediatrics*

Kathryn E. Singh, M.P.H., M.S. University of California, Irvine, *Health Sciences Associate Clinical Professor of Pediatrics; Genetic Counseling*

Sameer Singh, Ph.D. University of Massachusetts Amherst, *Assistant Professor of Computer Science; Electrical Engineering and Computer Science; Language Science* (artificial intelligence and machine learning, databases and data mining, scientific and numerical computing)

William A. Sirignano, Ph.D. Princeton University, *Henry Samueli Endowed Chair in Engineering and Distinguished Professor of Mechanical and Aerospace Engineering* (combustion theory, multiphase flows, turbulent reacting flows, computational methods, rocket and jet propulsion, gas turbine and internal combustion engines)

Albert Siryaporn, Ph.D. University of Pennsylvania, *Assistant Professor of Physics and Astronomy; Molecular Biology and Biochemistry*

Eiko Sithi-Amnuai, M.A. University of Sydney, *Lecturer of Japanese*

Zuzanna S. Siwy, Ph.D. Silesian University of Technology, *Professor of Physics and Astronomy; Biomedical Engineering; Chemistry*

Stergios Skaperdas, Ph.D. Johns Hopkins University, *Clifford S. Heinz Chair and Professor of Economics; Political Science*

Kira Skavinski, D.O. New York Inst of Technology, *Health Sciences Assistant Clinical Professor of Family Medicine*

Harry B. Skinner, M.D. Medical University of South Carolina, *Professor Emeritus of Orthopaedic Surgery*

Dorota Skowronska-Krawczyk, Ph.D. University of Geneva, *Assistant Professor of Physiology and Biophysics*

Brian Skyrms, Ph.D. University of Pittsburgh, *UCI Distinguished Professor of Logic and Philosophy of Science; Economics; Philosophy*

Kenneth A. Small, Ph.D. University of California, Berkeley, *Professor Emeritus of Economics*

Tammy Ann Smecker-Hane, Ph.D. Johns Hopkins University, *Associate Professor of Physics and Astronomy*

Keyue M. Smedley, Ph.D. California Institute of Technology, *Professor of Electrical Engineering and Computer Science* (power electronics, renewables, energy storage and grid stabilization)

Brian Smith, M.D. Universidad Autonoma De Guadalajara, *Health Sciences Assistant Clinical Professor of Surgery*

Charles Smith, Ph.D. University of California, San Diego, *Professor of Political Science; Criminology, Law and Society* (law and legal institutions, comparative and international law)

David A. Smith, Ph.D. University of North Carolina at Chapel Hill, *Professor of Sociology; Urban Planning and Public Policy* (world systems analysis, urbanization, development, comparative-historical sociology, dependent development in east Asia)

David W. Smith, Ph.D. Stanford University, *Professor of Philosophy*

James N. Smith, Ph.D. California Institute of Technology, *Professor of Chemistry* (analytical, atmospheric and environmental, physical chemistry and chemical physics)

Jaymi Smith, B.F.A. DePaul University, *Professor of Drama* (lighting design)

John H. Smith, Ph.D. Princeton University, *Professor of Comparative Literature; Culture and Theory; German; Religious Studies* (18th- and 19th-century literature and intellectual history, literary theory)

Moyra Smith, M.D., Ph.D., M.F.A. University of Pretoria, *Professor Emerita of Pediatrics; Genetic Counseling*

William H. Smoke, Ph.D. University of California, Berkeley, *Professor Emeritus of Mathematics* (homological algebra)

Padhraic J. Smyth, Ph.D. California Institute of Technology, *Professor of Computer Science; Education; Statistics* (artificial intelligence and machine learning, pattern recognition, applied statistics, data mining, information theory)

David M. Snow, J.D. Loyola Marymount University, *Lecturer of Urban Planning and Public Policy*

David A. Snow, Ph.D. University of California, Los Angeles, *Professor Emeritus of Sociology* (collective behavior, protest and social movements, framing processes, social psychology and culture, homelessness and social problems, qualitative methods)

Richard Snyder, Ph.D. University of Southern California, *Undergraduate Advisor and Assistant Professor of Teaching of Classics* (philosophy and literature, epic tradition, Latin poetry)

Kut So, Ph.D. Stanford University, *Professor of Paul Merage School of Business*

Henry W. Sobel, Ph.D. Case Western Reserve University, *Professor Emeritus of Physics and Astronomy*

Braxton Soderman, Ph.D. Brown University, *Assistant Professor of Film and Media Studies; Visual Studies* (digital and new media studies, video games, networks, digital art and electronic literature)

Damien Sojoyner, Ph.D. University of Texas at Austin, *Associate Professor of Anthropology; Culture and Theory* (prisons; public education; urban anthropology; race; African diaspora theory; public policy and law; gender; United States)

Antoine N. Soliman, M.D. Pennsylvania State University, *Health Sciences Clinical Professor of Pediatrics*

Etel Solingen, Ph.D. University of California, Los Angeles, *Thomas T. and Elizabeth C. Tierney Chair in Global Peace and Conflict Studies and Professor of Political Science* (international relations theory, international political economy, international cooperation, macropolitics/institutions, comparative politics, world politics and regional orders)

Dorothy J. Solinger, Ph.D. Stanford University, *Professor Emeritus of Political Science* (Chinese domestic politics and political economy, comparative politics, East Asian politics)

Knut Solna, Ph.D. Stanford University, *Professor of Mathematics* (applied and computational mathematics, inverse problems and imaging, probability)

Robert A. Solomon, J.D. George Washington University, *Clinical Professor of School of Law*

Charles A. Sondhaus, Ph.D. University of California, Berkeley, *Professor Emeritus of Radiological Sciences*

Amit Soni, M.D. St. George's University, *Health Sciences Clinical Professor of Pediatrics*

Dara H. Sorkin, Ph.D. University of California, Irvine, *Associate Professor in Residence of Medicine; Program in Public Health; Psychological Science*

Soroosh Sorooshian, Ph.D. University of California, Los Angeles, *Director of the Center for Hydrometeorology and Remote Sensing (CHRS) and UCI Distinguished Professor of Civil and Environmental Engineering; Earth System Science* (hydrology, hydrometeorology and hydroclimate modeling, remote sensing, water sources management)

Cascade J. Sorte, Ph.D. University of California, Davis, *Associate Professor of Ecology and Evolutionary Biology*

Ann Southworth, J.D. Stanford University, *Professor of School of Law; Criminology, Law and Society*

Marian Sowa, M.D. , *Health Sciences Associate Clinical Professor of Neurology*

Eric Spangenberg, Ph.D. University of Washington, M.B.A. Portland State University, *Dean of The Paul Merage School of Business and Professor of Paul Merage School of Business; Psychological Science* (sensory cues in the retail environment and the effects of self-prediction on behavior)

M. Anne Spence, Ph.D. University of Hawaii at Manoa, *Professor Emerita of Pediatrics; Genetic Counseling*

Paul J. Spencer, M.A. Trinity College Dublin, *Lecturer of Academic English/English as a Second Language*

Robert Spitale, Ph.D. University of Rochester, *Director of the UCI Transcriptomics Core and Associate Professor of Pharmaceutical Sciences; Chemistry; Molecular Biology and Biochemistry* (chemistry, chemical biology, RNA biology)

Kurt Squire, Ph.D. Indiana University, *Professor of Informatics; Education* (video game design, games for learning, mobile technologies, civic engagement, place-based learning)

Ramesh Srinivasan, Ph.D. Tulane University, *Department Chair and Professor of Cognitive Sciences; Biomedical Engineering* (perception, attention, decision-making, cognitive and clinical neuroscience)

Michael J. Stamos, M.D. Case Western Reserve University, *Dean and Professor of Surgery*

Eric J. Stanbridge, Ph.D. Stanford University, *Professor Emeritus of Microbiology and Molecular Genetics*

Thomas A. Standish, Ph.D. Carnegie Institute of Technology, *Professor Emeritus of Information and Computer Sciences* (software testing and analysis, software semantics and epistemology, programming and cognition, software comprehension)

P. Kyle Stanford, Ph.D. University of California, San Diego, *Professor of Logic and Philosophy of Science; Philosophy*

Craig Stark, Ph.D. Carnegie Mellon University, *James L. McGaugh Chair in the Neurobiology of Learning and Memory and Professor of Neurobiology and Behavior*

Arnold Starr, M.D. New York University, *Research Professor of Neurobiology and Behavior*

Robert E. Steele, Ph.D. Yale University, *Professor of Biological Chemistry*

Robin Steinberg-Epstein, M.D. University of California, Irvine, *Health Sciences Professor of Pediatrics*

Roger F. Steinert, M.D. Harvard University, *Irving H. Leopold Chair in Ophthalmology and Professor of Ophthalmology*

Constance Steinkuehler, Ph.D. University of Wisconsin-Madison, *Professor of Informatics; Education* (video games for impact, game-mediated cognition and learning, online social interaction, video games and policy)

Barry A. Steinmetz, M.D. Baylor College of Medicine, *Health Sciences Associate Clinical Professor of Pediatrics*

James Steintrager, Ph.D. Columbia University, *Director of the Emphasis in Critical Theory and Professor of English; European Languages and Studies* (eighteenth-century comparative literature, ethical philosophy and literature, systems theory, amatory and erotic fiction)

Judith Stepan-Norris, Ph.D. University of California, Los Angeles, *Professor of Sociology* (labor unions, sociology of work, political sociology, American society, research methods, historical-comparative methods, class formation)

Megan L. Stephenson, M.D. University of California, Irvine, *Health Sciences Clinical Instructor of Obstetrics and Gynecology*

Hal S. Stern, Ph.D. Stanford University, *UCI Chancellor's Professor of Statistics; Cognitive Sciences*

Heather Stern, M.S. California State University, Fullerton, *Lecturer of Academic English/English as a Second Language*

Ronald J. Stern, Ph.D. University of California, Los Angeles, *Professor Emeritus of Mathematics* (geometry and topology)

Sharon M. Stern, Ph.D. University of Utah, *Professor of Teaching Emerita of Program in Public Health*

David Stetson, B.M. University of Southern California, *Lecturer of Music*

Oswald Steward, Ph.D. University of California, Irvine, *Director, Reeve-Irvine Research Center and Reeve-Irvine Chair in Spinal Cord Injury Research and Distinguished Professor of Anatomy and Neurobiology; Neurobiology and Behavior*

Cassandra L. Stewart, M.D. Medical University of South Carolina, *Health Sciences Clinical Instructor of Pediatrics*

Robin S. Stewart, M.A. University of California, Irvine, *Lecturer of Academic English/English as a Second Language*

Mark Steyvers, Ph.D. Indiana University, *Professor of Cognitive Sciences; Computer Science; Psychological Science* (higher-order cognition, cognitive neuroscience, computational modeling, collective intelligence)

Svetlana R. Stivi, M.D. University of California, Irvine, *Health Sciences Associate Clinical Professor of Family Medicine*

Jane K. Stoeber, J.D. Harvard University, *Clinical Professor of School of Law*

Daniel Stokols, Ph.D. University of North Carolina, Chapel Hill, *Professor Emeritus of Psychological Science; Religious Studies; Urban Planning and Public Policy*

Jeanne M. Stone, M.A. California State University, Long Beach, *Lecturer of Education*

Ian Straughn, Ph.D. University of Chicago, *Assistant Professor of Teaching of Anthropology; Religious Studies* (archaeology, cultural heritage, middle east and Islamic studies, space and landscape, material culture)

Jeffrey D. Streets, Ph.D. Duke University, *Professor of Mathematics* (geometry and topology)

Anna K. Striedter, Ph.D. University of California, San Diego, *Lecturer of Academic English/English as a Second Language*

Georg F. Striedter, Ph.D. University of California, San Diego, *Professor of Neurobiology and Behavior*

Sabrina Strings, Ph.D. University of California, San Diego, *Assistant Professor of Sociology* (race, gender, embodiment, sociology of medicine, sociology of media)

Suzanne L. Strom, M.D. University of Texas, *Health Sciences Associate Clinical Professor of Anesthesiology and Perioperative Care*

Allen R. Stubberud, Ph.D. University of California, Los Angeles, *Professor Emeritus of Electrical Engineering and Computer Science*

Min-Ying Su, Ph.D. University of California, Irvine, *Professor of Radiological Sciences; Physics and Astronomy*

Yang Su, Ph.D. Stanford University, *Associate Professor of Sociology* (social movements and collective action, political sociology, China's political transition)

Luis Suarez-Villa, Ph.D. Cornell University, *Professor Emeritus of Urban Planning and Public Policy*

Mohammad A. Subeh, M.D. Oregon Health Sciences University, *Health Sciences Assistant Clinical Professor of Emergency Medicine*

Jeffrey R. Suchard, M.D. University of California, Los Angeles, *Associate Dean of Basic Science Education and Professor of Emergency Medicine*

Gabriel R. Sudario, M.D. University of California, San Francisco, *Health Sciences Clinical Instructor of Emergency Medicine*

Erik B. Sudderth, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Computer Science; Statistics* (artificial intelligence and machine learning, computer vision, statistics and statistical theory)

Christine Suetterlin, Ph.D. University of Basel, *Associate Professor of Developmental and Cell Biology* (centrosome and cilia regulation, Golgi, host-pathogen interaction)

Naomi Sugie, Ph.D. Princeton University, *Associate Professor of Criminology, Law and Society; Sociology* (sociology of crime and punishment, inequality, families, demography, methods, new technologies for data collection)

Serk Bae Suh, Ph.D. University of California, Los Angeles, *Associate Professor of Korean* (modern Korean literature)

Katumi Sumikawa, Ph.D. Imperial College London, *Professor of Neurobiology and Behavior*

Coral Sun, M.D. University of Florida, *Health Sciences Associate Clinical Professor of Anesthesiology and Perioperative Care*

Lizhi Sun, Ph.D. University of California, Los Angeles, *Professor of Civil and Environmental Engineering* (micro- and nano-mechanics, composites and nanocomposites, smart materials and structures, multiscale modeling, elastography)

Sha Sun, Ph.D. University of Chicago, *Assistant Professor of Developmental and Cell Biology* (long noncoding RNAs in epigenetic programming)

Zheng Sun, Ph.D. New York University, *Associate Professor of Paul Merage School of Business*

Shuichi Suzuki, M.D. Kitasato University, *Associate Professor of Neurological Surgery; Neurology*

Morgan L. Swank, M.D. Creighton University, *Health Sciences Clinical Instructor of Obstetrics and Gynecology*

Eric Swanson, Ph.D. Stanford University, *Professor of Economics*

James M. Swanson, Ph.D. Ohio State University, *Professor Emeritus of Pediatrics*

Vivek Swarup, Ph.D. University of Laval, *Assistant Professor of Neurobiology and Behavior*

A. Lee Swindlehurst, Ph.D. Stanford University, *Professor of Electrical Engineering and Computer Science* (signal processing, estimation and detection theory, applications in wireless communications, geo-positioning, radar, sonar, biomedicine)

Bryan Sykes, Ph.D. University of California, Berkeley, *Associate Professor of Criminology, Law and Society; Program in Public Health; Sociology* (demography, criminology, research methods, health, social inequality, statistics)

Elizabeth Symanski, M.S.N. University of California, Irvine, *Health Sciences Clinical Instructor of Nursing*

Richard Symanski, Ph.D. Syracuse University, *Professor of Teaching of Ecology and Evolutionary Biology*

Celia Symons, Ph.D. University of California, San Diego, *Assistant Professor of Ecology and Evolutionary Biology*

Michael F. Szalay, Ph.D. Johns Hopkins University, *Department Chair and Professor of English; Film and Media Studies; Visual Studies* (contemporary television and literature)

Rein Taagepera, Ph.D. University of Delaware, *Professor Emeritus of Political Science*

Peter Taborek, Ph.D. California Institute of Technology, *Professor of Physics and Astronomy*

Timothy Tackett, Ph.D. Stanford University, *Professor Emeritus of History*

Yona Tadir, M.D. Tel Aviv University, *Adjunct Professor of Surgery*

Agnes Taffard, Ph.D. University of Liverpool, *Professor of Physics and Astronomy*

Haithem Taha, Ph.D. Virginia Polytechnic Institute and State University, *Assistant Professor of Mechanical and Aerospace Engineering* (geometric nonlinear control theory; unsteady aerodynamics and aeroelasticity; optimization, calculus of variations and optimal control; flight dynamics and autopilot design; airplane performance and configuration aerodynamics)

Timothy Tait, Ph.D. Michigan State University, *Department Chair and Professor of Physics and Astronomy*

Fumiko Tajima, Ph.D. University of Tokyo, *Lecturer of Physics and Astronomy*

Toshiki Tajima, Ph.D. University of California, Irvine, *UCI Endowed Chair and Adjunct Professor of Physics and Astronomy*

Ronald Takemoto, M.D. University of Southern California, *Health Sciences Clinical Professor of Physical Medicine and Rehabilitation*

Shauhin A. Talesh, J.D., Ph.D. University of Connecticut, University of California, Berkeley, *Director, Law and Graduate Studies Program and Professor of School of Law; Criminology, Law and Society; Sociology*

Eli Talmor, Ph.D. University of North Carolina at Chapel Hill, *Professor Emeritus of Paul Merage School of Business*

Harry H. Tan, Ph.D. University of California, Los Angeles, *Professor Emeritus of Electrical Engineering and Computer Science* (communication and information theory, stochastic processes)

Ming Tan, M.D. Johns Hopkins University, *Professor of Microbiology and Molecular Genetics; Medicine*

Theresa Tanenbaum, Ph.D. Simon Fraser University, *Assistant Professor of Informatics* (digital games and narrative, tangible and wearable interaction, maker and DIY culture, nonverbal communication and virtual worlds)



William C. Tang, Ph.D. University of California, Berkeley, *Professor of Biomedical Engineering; Chemical and Biomolecular Engineering; Electrical Engineering and Computer Science* (micro-electro-mechanical systems (MEMS) nanoscale engineering for biomedical applications, microsystems integration, microimplants, microbiomechanics, microfluidics)

Sora P. Tanjasiri, Ph.D. University of California, Los Angeles, *Professor of Epidemiology*

Dawn T. Tanner, M.D. Creighton University, *Health Sciences Clinical Instructor of Radiological Sciences*

Jeremiah Tao, M.D. University of South Carolina, *Health Sciences Associate Clinical Professor of Ophthalmology*

Blanca Tapia-Zuniga, M.D. University of California, Irvine, *Health Sciences Assistant Clinical Professor of Family Medicine*

Sharief K. Taraman, M.D. Wayne State University, *Health Sciences Clinical Professor of Pediatrics*

William B. Tate, J.D. Stanford University, *Lecturer of School of Law*

Candice E. Taylor, M.D. University of Southern California School of Medicine, *Health Sciences Assistant Clinical Professor of Pediatrics*

Darryl Taylor, D.M.A. University of Michigan, *Professor of Music; African American Studies*

Richard N. Taylor, Ph.D. University of Colorado Boulder, *Professor Emeritus of Informatics* (software engineering, user interfaces, environments, team support)

Emily Taylor Poppe, J.D. Northwestern University School of Law, *Assistant Professor of School of Law*

Jamshid Tehranzadeh, M.D. Pahlavi University, *Professor Emeritus of Radiological Sciences*

Andrea Tenner, Ph.D. University of California, San Diego, *Professor of Molecular Biology and Biochemistry; Neurobiology and Behavior*

Rei Terada, Ph.D. Boston University, *Professor of Comparative Literature; Culture and Theory* (theory, poststructuralism, nineteenth- and twentieth-century poetry)

Chuu-Lian Terng, Ph.D. Brandeis University, *Professor Emerita of Mathematics* (differential geometry and integrable systems)

Alan Terricciano, M.A. Eastman School of Music, *Associate Dean for Undergraduate Affairs and Professor of Dance; Music* (music for dance, musical resources, critical issues in dance, music theory, keyboard skills, and repertoire)

Jennifer Terry, Ph.D. University of California, Santa Cruz, *Professor of Gender and Sexuality Studies; Comparative Literature* (cultural studies, social theory; science and technology studies, formations of gender and sexuality, critical approaches to modernity, American studies in transnational perspective, processes of militarization)

Michael Tesler, Ph.D. University of California, Los Angeles, *Associate Professor of Political Science* (American politics, race, ethnicity and politics, quantitative methods)

Krishnansu S. Tewari, M.D. University of California, Irvine, *Professor of Obstetrics and Gynecology*

Gaby T. Thai, M.D. Tufts University, *Health Sciences Professor of Neurology*

Julian F. Thayer, Ph.D. New York University, *Professor of Psychological Science* (health psychology, psychopathology, health disparities, heart rate variability, emotions, stress)

Debra S. Thiercof, M.S. California State University, Fullerton, *Lecturer of Academic English/English as a Second Language*

Ngugi Wa Thiong'O, B.A. Makerere University, *UCI Distinguished Professor of Comparative Literature; English* (African and Caribbean literatures, theater and film, performance studies, cultural and political theory)

Brook Thomas, Ph.D. University of California, Santa Barbara, *UCI Chancellor's Professor Emeritus of English* (U.S. literature and culture, law and literature, literature and history)

Leslie M. Thompson, Ph.D. University of California, Irvine, *Chancellor's Professor and Donald Bren Professor of Psychiatry and Human Behavior; Biological Chemistry; Neurobiology and Behavior*

Philip D. Thompson, M.F.A. University of California, Irvine, *Professor of Drama* (voice, speech for actors, acting)

William C. Thompson, Ph.D. Stanford University, *Professor Emeritus of Criminology, Law and Society; Psychological Science; School of Law* (psychology and law, criminal justice, forensic science, expert evidence, human judgment and decision making, use of social science in appellate litigation)

Katherine L. Thompson-Peer, Ph.D. Harvard Medical School, *Assistant Professor of Developmental and Cell Biology* (investigating how neurons respond and recover after injury)

Danielle M. Thomsen, Ph.D. Cornell University, *Assistant Professor of Political Science* (American politics, U.S. congress, political parties, gender and politics)

Alexander W. Thornton, B.S. University of California, Irvine, *Continuing Lecturer of Computer Science*

Kevin Thornton, Ph.D. University of Chicago, *Associate Professor of Ecology and Evolutionary Biology*

Kara L. Thorsen, Ph.D. University of California, Irvine, *Lecturer of Social Ecology*

Beatrice Tice, J.D. Stanford University, *Associate Dean for LL.M. and International Student Programs and Professor of School of Law*

Timothy M. Tift, M.A. Pepperdine University, *Associate Professor of Teaching Emeritus of Education*

David Timberlake, Ph.D. University of California, San Diego, *Associate Professor of Program in Public Health*

Roberto Tinoco, Ph.D. University of California, San Diego, *Assistant Professor of Molecular Biology and Biochemistry*

Elizabeth Tinsley, Ph.D. Otani University, *Assistant Professor of Religious Studies; Chinese* (Buddhism in East Asia, Japanese Buddhism, East Asian religions, Buddhist visual and textual cultures, visual theory)

Heidi E. Tinsman, Ph.D. Yale University, *Department Chair and Professor of History; Gender and Sexuality Studies* (Latin America, gender and sexuality, world history)

Katharine Tinto, J.D. New York University, *Assistant Clinical Professor of School of Law*

Pornchai Tirakitsoontorn, M.D. University of California, San Diego, *Health Sciences Associate Clinical Professor of Pediatrics*

Susan M. Tiso, D.N.P. George Washington University, *Health Sciences Clinical Professor of Nursing*

George E. Tita, Ph.D. Carnegie Mellon University, *Professor of Criminology, Law and Society; Urban Planning and Public Policy* (criminology, community context of violence, urban youth gangs, homicide studies)

Edriss S. Titi, Ph.D. Indiana University, *Professor Emeritus of Mathematics* (analysis and partial differential equations, applied and computational mathematics)

Hector Tobar, M.F.A. University of California, Irvine, *Associate Professor of Chicano/Latino Studies; English* (storytelling, literature, history of Los Angeles, Latin American history, Latino history)

Douglas J. Tobias, Ph.D. Carnegie Mellon University, *Department Chair and Professor of Chemistry* (atmospheric and environmental, chemical biology, physical chemistry and chemical physics, theoretical and computational)

Jerome S. Tobis, M.D. Chicago Medical School, *Professor Emeritus of Physical Medicine and Rehabilitation*

Harold E. Toliver, Ph.D. University of Washington, *Professor Emeritus of English*

Francesco Tombola, Ph.D. University of Padua, *Associate Professor of Physiology and Biophysics*

William M. Tomlinson, Ph.D. Massachusetts Institute of Technology, *Professor of Informatics; Education* (environmental informatics, educational technology, computer graphics/visualization/digital arts)

Corey Tong, M.D. Robert Wood Johnson Medical School, *Health Sciences Clinical Instructor of Anesthesiology and Perioperative Care*

Andrew T. Tonkovich, M.F.A. University of California, Irvine, *Lecturer of English*

Grace Tonner, J.D. Loyola Marymount University, *Clinical Professor of Law of School of Law*

Julianne S. Toohey, M.D. University of California, Irvine, *Health Sciences Clinical Professor of Obstetrics and Gynecology*

Shannon L. Toohey Dean, M.D. University of California, Irvine, *Assistant Professor of Emergency Medicine*

Nojan Toomari, M.D. Western University of Health Sciences, *Health Sciences Clinical Instructor of Surgery*

Steven Topik, Ph.D. University of Texas at Austin, *Professor Emeritus of History* (Brazil, Latin America, world history, commodities especially coffee, the state in the economy)



Keith Topper, Ph.D. University of California, Los Angeles, *Associate Professor of Political Science; Culture and Theory* (political theory, critical theory, poststructuralism, theories of power, language and politics, theory and politics of interpretation, politics of culture, philosophy of the social sciences)

Jason D. Toranto, M.D. University of Michigan, *Health Sciences Assistant Clinical Professor of Surgery*

Lillibeth Torno, M.D. University of Santo Tomas, *Health Sciences Associate Clinical Professor of Pediatrics*

Julio R. Torres, Ph.D. Georgetown University, *Assistant Professor of Spanish and Portuguese; Language Science* (heritage and second language acquisition; multilingualism)

Rodolfo D. Torres, Ph.D. Claremont Graduate University, *Professor of Urban Planning and Public Policy; Political Science*

Minodora Totoiu, M.D. University of Medicine and Pharmacy of Targu-Mures, *Health Sciences Clinical Professor of Pediatrics*

Paul E. Touchette, Ed.D. Harvard University, *Recall Non-Senate Academic of Pediatrics*

Anne E. Tournay, MBBS University College London, *Health Sciences Associate Clinical Professor of Pediatrics*

Aaron Trammell, Ph.D. Rutgers University, *Assistant Professor of Visual Studies* (analog games and video games, sound, fan studies, digital subjectivity)

Bao Q. Tran, M.D. Creighton University, *Health Sciences Assistant Clinical Professor of Physical Medicine and Rehabilitation*

Huy T. Tran, M.D. Western University of Health Sciences, *Health Sciences Professor of Family Medicine*

Lily H. Tran, M.D. University of Rochester, *Health Sciences Clinical Professor of Pediatrics*

Tri Chan Tran, Ph.D. University of California, Los Angeles, *Lecturer of Vietnamese; Vietnamese*

Bernard H. Tranel, Ph.D. University of California, San Diego, *Professor of Language Science*

Judith Treas, Ph.D. University of California, Los Angeles, *UCI Chancellor's Professor of Sociology* (gender, inequality, family, aging and life course, social demography)

David K. Trend, Ph.D. Miami University, *Professor of Art* (visual culture)

Kathleen K. Treseder, Ph.D. Stanford University, *UCI Chancellor's Fellow and Professor of Ecology and Evolutionary Biology*

Virginia L. Trimble, Ph.D. California Institute of Technology, *Professor of Physics and Astronomy*

Lien N. Trinh, M.D. St. George's University, *Health Sciences Clinical Professor of Pediatrics*

Richard J. Triplett, M.A. Otis Art Institute, *Professor Emeritus of Drama* (scenery and costume design, history of design)

Susan E. Trumbore, Ph.D. Columbia University, *Professor of Earth System Science*

Chen S. Tsai, Ph.D. Stanford University, *Distinguished Professor of Electrical Engineering and Computer Science* (integrated microwave magnetics, Ultrasonic Atomization for Nanoparticles Synthesis, silicon photonics)

Fong Y. Tsai, M.D. Taipei Medical University, *Senate Emeritus of Radiological Sciences*

Shiou-Chuan (Sheryl) Tsai, Ph.D. University of California, Berkeley, *Professor of Molecular Biology and Biochemistry; Chemistry; Pharmaceutical Sciences*

Wei Kang (Kevin) Tsai, Ph.D. Massachusetts Institute of Technology, *Professor Emeritus of Electrical Engineering and Computer Science* (data communication networks, control systems)

Li Sheng Tseng, Ph.D. University of Chicago, *Associate Professor of Mathematics* (geometry and topology, mathematical physics)

Peter Tseng, Ph.D. University of California, Los Angeles, *Assistant Professor of Electrical Engineering and Computer Science; Biomedical Engineering* ((bio) Micro-Electro-Mechanical systems, wearable technology, materials-by-design, bioelectromagnetism, nanotechnology)

Gene Y. Tsudik, Ph.D. University of Southern California, *UCI Chancellor's Professor of Computer Science* (computer and network security and privacy; applied cryptography)

Khoa M. Tu, M.D. University of California, Irvine, *Health Sciences Assistant Clinical Professor of Emergency Medicine*

Irene Tucker, Ph.D. University of California, Berkeley, *Professor of English* (Victorian studies)

Laura Tucker, Ph.D. University of California, San Diego, *Assistant Professor of Teaching of Physics and Astronomy*

Stephen Tucker, D.M.A. University of California, Los Angeles, *Robert and Marjorie Rawlins Chair in Music and Associate Professor of Music*

John Turner, Ph.D. Carnegie Mellon University, *Associate Professor of Paul Merage School of Business*

Susan F. Turner, Ph.D. University of North Carolina at Chapel Hill, *Professor of Criminology, Law and Society* (sentencing and corrections, applied research methods)

Kristin E. Turney, Ph.D. University of Pennsylvania, *Associate Professor of Sociology; Criminology, Law and Society* (social inequality, family demography, population health, incarceration and punishment, intergenerational transmission of disadvantage, child well-being)

Rajeev Tyagi, Ph.D. University of Pennsylvania, *Walter B. Gerken Chair in Enterprise and Society and Professor of Paul Merage School of Business*

Martin Tynan, M.D. Trinity College, *Health Sciences Professor of Orthopaedic Surgery*

Carole J. Uhlaner, Ph.D. Harvard University, *Professor Emeritus of Political Science* (comparative political behavior, formal theory/social choice)

Kojiro Umezaki, M.A. Dartmouth College, *Professor of Music; Computer Science*

Robert M. Uriu, Ph.D. Columbia University, *Associate Professor of Political Science* (international relations, international political economy, international politics of East Asia/Japan, U.S. foreign policy toward East Asia)

Jessica Utts, Ph.D. Pennsylvania State University, *Professor Emeritus of Statistics*

Cherry C. Uy, M.D. Far Eastern University, *Health Sciences Professor of Pediatrics*

Mark Vagins, Ph.D. Yale University, *Adjunct Professor of Physics and Astronomy*

Duane J. Vajgrt, M.D. University of California, San Francisco, *Health Sciences Professor of Radiological Sciences*

Shermeen B. Vakharia, M.D. Aga Khan University, *Health Sciences Clinical Professor of Anesthesiology and Perioperative Care*

Lorenzo Valdevit, Ph.D. Princeton University, *Director of Institute for Design and Manufacturing Innovation (IDMI) and Associate Professor of Materials Science and Engineering; Mechanical and Aerospace Engineering* (architected materials, mechanical metamaterials, additive manufacturing, optimal design)

Alfonso Valdez, Ph.D. University of Southern California, *Lecturer of Social Sciences*

Georges Y. Van Den Abbeele, Ph.D. Cornell University, *Professor of Comparative Literature; English; European Languages and Studies* (French and European philosophical literature, travel narrative and tourism/migration studies, critical theory and aesthetics, francophone literature, history of cartography, media history and theory)

Richard A. Van Etten, M.D., Ph.D. Stanford University, *Director, Chao Family Comprehensive Cancer Center; Chao Family Endowed Director's Chair in Cancer Research and Treatment and Senior Associate Dean and Associate Vice Chancellor for Cancer and Professor of Medicine; Biological Chemistry*

Ann J. Van Sant, Ph.D. University of California, Berkeley, *Associate Professor Emerita of English* (restoration and 18th century literature)

André W. Van der Hoek, Ph.D. University of Colorado Boulder, *Professor of Informatics* (software engineering)

Joachim S. Vandekerckhove, Ph.D. University of Leuven, *Associate Professor of Cognitive Sciences; Statistics* (response time modeling, model fitting, computational statistics, psychometrics, bayesian statistics)

Deborah Lowe Vandell, Ph.D. Boston University, *Chancellor's Professor Emerita of Education; Psychological Science* (longitudinal studies of development, early childhood education, after-school programs, summer learning, child development, adolescent development)

Kerry Vandell, Ph.D. Massachusetts Institute of Technology, *Professor Emeritus of Paul Merage School of Business; School of Law; Urban Planning and Public Policy*

Christopher Vanderwal, Ph.D. Scripps Research Institute, *Professor of Chemistry; Pharmaceutical Sciences* (organic and synthetic)

Gerard Vanhoven, Ph.D. Stanford University, *Professor Emeritus of Physics and Astronomy*

Roxanne Varzi, Ph.D. Columbia University, *Professor of Anthropology; Culture and Theory; Film and Media Studies; Religious Studies; Visual Studies* (Iran, media, war, visual anthropology, film studies, ethnographic and fiction writing)

Douglas Vaughn, M.D. Drexel University, *Health Sciences Associate Clinical Professor of Anesthesiology and Perioperative Care*

Vijay Vazirani, Ph.D. University of California, Berkeley, *Distinguished Professor of Computer Science* (algorithms and complexity, scientific and numerical computing)

Nosratola D. Vaziri, M.D. University of Tehran, *Professor Emeritus of Medicine; Physiology and Biophysics*

Joel R. Veenstra, M.F.A. University of California, Irvine, *Co-Head of Stage Management and Associate Professor of Teaching of Drama* (stage management, acting)

Charles P. Vega, M.D. University of Wisconsin-Madison, *Assistant Dean of Cultural and Community Education and Health Sciences Clinical Professor of Family Medicine*

Irene I. Vega, Ph.D. University of California, Los Angeles, *Assistant Professor of Sociology* (international migration, socio-legal studies, race/ethnicity, educational inequality)

Alexander Veidenbaum, Ph.D. University of Illinois at Urbana-Champaign, *Professor of Computer Science* (computer architecture, embedded systems, compilers, programming languages and systems, database and data mining)

Isabella Velicogna, Ph.D. Università degli Studi di Trieste, *UCI Chancellor's Fellow and Professor of Earth System Science*

Swapna Vemuri, M.D. Wayne State University, *Health Sciences Clinical Instructor of Ophthalmology*

Nalini Venkatasubramanian, Ph.D. University of Illinois at Urbana-Champaign, *Professor of Computer Science* (multimedia computing, networks and distributed systems, global information infrastructure, multiple resource management services)

Alladi Venkatesh, Ph.D. Syracuse University, *Professor of Paul Merage School of Business* (social impacts of information technology, Internet and the New Economy, Smart Home technologies, children and multimedia)

Vasan Venugopalan, Sc.D. Massachusetts Institute of Technology, *Department Chair and Professor of Chemical and Biomolecular Engineering; Biomedical Engineering; Materials Science and Engineering; Mechanical and Aerospace Engineering; Surgery* (laser-generated thermal, mechanical and radiative transport processes for application in medical diagnostics, imaging, therapeutics, biotechnology)

Sunil P. Verma, M.D. University of Southern California, *Assistant Dean of Workforce Development and Health Sciences Associate Clinical Professor of Otolaryngology; Music*

Roman Vershynin, Ph.D. University of Missouri-Columbia, *Professor of Mathematics* (probability, data science)

Jeffrey Viaclovsky, Ph.D. Princeton University, *Professor of Mathematics* (differential geometry, geometric analysis)

Veronica M. Vieira, D.Sc. Boston University, *Professor of Program in Public Health; Environmental Health Sciences*

James D. Vigil, Ph.D. University of California, Los Angeles, *Professor Emeritus of Criminology, Law and Society* (urban research, urban poverty, culture change, socialization and education, psychological anthropology, street gangs in cross-cultural perspective, Mexico and U.S. southwestern ethnohistory, comparative ethnicity)

S. Armando Villalta, Ph.D. University of California, Los Angeles, *Assistant Professor of Physiology and Biophysics; Neurology*

Luis P. Villarreal, Ph.D. University of California, San Diego, *Professor Emeritus of Molecular Biology and Biochemistry*

Roberto Villaverde, Ph.D. University of Illinois at Urbana-Champaign, *Professor Emeritus of Civil and Environmental Engineering* (structural dynamics and earthquake engineering)

Adriana Villavicencio, Ph.D. New York University, *Assistant Professor of Education*

Juan Villegas, Ph.D. University of Chile, *Professor Emeritus of Spanish and Portuguese*

Catherine Vimuttinan, M.A. University of Southern California, *Lecturer of Academic English/English as a Second Language*

Baoquan N. Vo, M.D. University of California, San Francisco, *Health Sciences Assistant Clinical Professor of Family Medicine*

Samantha Vortherms, Ph.D. University of Wisconsin, Madison, *Assistant Professor of Political Science* (comparative political economy, development, social welfare)

David Van Vranken, Ph.D. Stanford University, *Associate Dean of the School of Physical Sciences and Professor of Chemistry* (organic and synthetic)

Jasper A. Vrugt, Ph.D. University of Amsterdam, *Associate Professor of Civil and Environmental Engineering; Earth System Science* (examining how (eco)systems work, why theories deviate from data, how scientists diagnose change, as applied to biogeosciences, ecology, geomorphology, geophysics, hydrology, soils)

Trung Q. Vu, M.D. University of California, Irvine, *Health Sciences Associate Clinical Professor of Anesthesiology and Perioperative Care*

K. Mark Vuchinich, M.D. University of California, San Diego, *Health Sciences Professor of Obstetrics and Gynecology*

Linda T. Võ, Ph.D. University of California, San Diego, *Professor of Asian American Studies; Culture and Theory; Sociology; Urban Planning and Public Policy* (race and ethnic relations, immigrants and refugees, gender relations, community and urban studies)

Matthew Wade, M.D. George Washington University, *Health Sciences Assistant Clinical Professor of Ophthalmology*

Wilima Wadhwa, Ph.D. University of California, Irvine, *Lecturer of Economics*

Feizal Waffarn, MBBS University of Madras, *Professor Emeritus of Pediatrics*

Akio Wakabayashi, M.D. University of Tokyo, *Professor Emeritus of Surgery*

Amanda Jane Walker, M.F.A. University of California, Los Angeles, *Lecturer of Music*

Richard F. Wallis, Ph.D. Catholic University of America, *Professor Emeritus of Physics and Astronomy*

Craig Walsh, Ph.D. University of California, Los Angeles, *Professor of Molecular Biology and Biochemistry*

Katharine R. Walsh, Ph.D. University of California, Irvine, *Lecturer of Humanities*

Philip Walsh, Ph.D. University of California, Irvine, *Lecturer of Humanities*

Roger Walsh, Ph.D. University of Queensland, *Professor of Psychiatry and Human Behavior; Religious Studies*

Mark Walter, Ph.D. California Institute of Technology, *Professor of Teaching of Mechanical and Aerospace Engineering* (mechanics of multifunctional materials, building energy efficiency)

Anne Walthall, Ph.D. University of Chicago, *Professor Emerita of History*

Daqing Wan, Ph.D. University of Washington, *Professor of Mathematics* (algebra and number theory)

Frederic Yui-Ming Wan, Ph.D. Massachusetts Institute of Technology, *Professor Emeritus of Mathematics* (applied and computational mathematics, mathematical and computational biology)

Annabel Wang, M.D. McGill University, *Health Sciences Associate Clinical Professor of Neurology*

Beverly Wang, M.D. Jiangxi Medical College, *Professor of Pathology and Laboratory Medicine; Otolaryngology*

Feng Wang, Ph.D. University of Michigan, *Professor of Sociology* (contemporary demographic, economic, and social processes, social inequality in state socialisms, contemporary China)

Ping H. Wang, M.D. Harvard University, *Professor of Medicine; Physiology and Biophysics*

Raymond Wang, M.D. University of California, Los Angeles, *Health Sciences Clinical Professor of Pediatrics*

Richert Wang, Ph.D. University of California, Irvine, *Lecturer of Computer Science*

Szu-Wen Wang, Ph.D. Stanford University, *Professor of Chemical and Biomolecular Engineering; Biomedical Engineering* (combining principles of self-assembly with nature-inspired macromolecular systems to engineer new materials and therapeutic strategies)

Tommy Wang, M.D. Albany Medical College, *Health Sciences Assistant Clinical Professor of Pediatrics*

Tong Wang, M.F.A. University of Utah; Principal dancer with the Shanghai Ballet, Tulsa Ballet Theatre, Dayton Ballet, Ballet West, *Associate Professor of Dance* (ballet, choreography, men's ballet, pas de deux)

Wenqi Wang, Ph.D. Shanghai Institutes for Biological Sciences, *Assistant Professor of Developmental and Cell Biology* (the signaling networks underlying tissue homeostasis and organ size control)

Yun Wang, Ph.D. Pennsylvania State University, *Professor of Mechanical and Aerospace Engineering* (fuel cells, computational modeling, thermo-fluidics, two-phase flows, electrochemistry, Computational Fluid Dynamics (CFD), turbulent combustion)

Zhiying Wang, Ph.D. California Institute of Technology, *Assistant Professor of Electrical Engineering and Computer Science* (information theory, coding theory for data storage, modeling, compression, and computation for genomic data)

Geoff Ward, Ph.D. University of Michigan, *Associate Professor of School of Law; School of Law*

Andrzej J. Warminski, Ph.D. Yale University, *Associate Dean for Academic Personnel and Professor of English; Humanities* (romanticism, history of literary theory, contemporary theory, literature and philosophy)

Rahul Warrior, Ph.D. Yale University, *Associate Professor of Developmental and Cell Biology* (developmental genetics of transcription and proteoglycan synthesis)

Mark J. Warschauer, Ph.D. University of Hawaii at Manoa, *Professor of Education; Informatics* (language, literacy, technology, STEM)

Gregory N. Washington, Ph.D. North Carolina State University at Raleigh, *Professor Emeritus of Mechanical and Aerospace Engineering* (dynamic systems with emphasis on modeling and control of smart material systems and devices)

Jeffrey N. Wasserstrom, Ph.D. University of California, Berkeley, *UCI Chancellor's Professor of History; School of Law* (modern China, protest, world history)

Marian L. Waterman, Ph.D. University of California, San Diego, *Professor of Microbiology and Molecular Genetics*

Martin P. Wattenberg, Ph.D. University of Michigan, *Professor of Political Science* (American and comparative political behavior)

Jacqueline Y. Way, Ph.D. University of California, Irvine, *Lecturer of English*

James O. Weatherall, Ph.D. Stevens Institute of Technology, *Professor of Logic and Philosophy of Science*

Zidia O. Webb, M.A. Michigan State University, *Associate Professor of Teaching Emeritus of Spanish and Portuguese*

Libby Weber, Ph.D. University of Southern California, *Associate Professor of Paul Merage School of Business*

Steven L. Wechsler, Ph.D. University of North Carolina at Chapel Hill, *Professor of Ophthalmology*

Kai Wehmeier, Ph.D. University of Münster, *Director, Center for the Advancement of Logic, its Philosophy, History, and Applications and Professor of Logic and Philosophy of Science; Language Science; Philosophy*

Henry Weinstein, J.D. University of California, Berkeley, *Professor of School of Law*

Arthur Weis, Ph.D. University of Illinois at Urbana-Champaign, *Professor Emeritus of Ecology and Evolutionary Biology*

Gregory A. Weiss, Ph.D. Harvard University, *Professor of Chemistry; Molecular Biology and Biochemistry; Pharmaceutical Sciences* (analytical, chemical biology, organic and synthetic, polymer, materials, nanoscience)

John H. Weiss, M.D., Ph.D. Stanford University, *Professor of Neurology; Anatomy and Neurobiology*

Stephen G. Weller, Ph.D. University of California, Berkeley, *Professor Emeritus of Ecology and Evolutionary Biology*

Patricia A. Wellmeyer, M.S. California State University, Fullerton, *Assistant Professor of Teaching of Paul Merage School of Business*

Tracie A. Welser, M.A. University of South Florida, *Senior Lecturer of Undergraduate Education*

Christopher H. Wen, M.D. Baylor College of Medicine, *Health Sciences Associate Clinical Professor of Radiological Sciences*

Lari B. Wenzel, Ph.D. Arizona State University, *Professor of Medicine; Program in Public Health*

Frank J. Wessel, Ph.D. University of California, Irvine, *Project Scientist of Physics and Astronomy*

Robert W. West, Ph.D. University of Michigan, *Professor Emeritus of Mathematics* (algebraic topology)

Joel J. Westman, Ph.D. University of California, Los Angeles, *Professor Emeritus of Mathematics* (analysis)

Douglas R. White, Ph.D. University of Minnesota, *Professor Emeritus of Anthropology*

Nicholas P. White, Ph.D. Harvard University, *Professor Emeritus of Philosophy*

Stephen H. White, Ph.D. University of Washington, *Professor Emeritus of Physiology and Biophysics*

Steven R. White, Ph.D. Cornell University, *Professor of Physics and Astronomy*

Daniel Whiteson, Ph.D. University of California, Berkeley, *Professor of Physics and Astronomy; Logic and Philosophy of Science*

Katrine Whiteson, Ph.D. University of Chicago, *Assistant Professor of Molecular Biology and Biochemistry*

Cécile Marie Whiting, Ph.D. Stanford University, *Chancellor's Professor of Art History; Visual Studies* (American art, 20th century visual culture)



Robert J. Whitley, Ph.D. New Mexico State University, *Professor Emeritus of Mathematics* (analysis)

Christopher A. Whytock, J.D. Georgetown University, *Professor of School of Law; Political Science*

H. Kumar Wickramasinghe, Ph.D. University of London, *Henry Samueli Endowed Chair in Engineering and Professor of Electrical Engineering and Computer Science; Biomedical Engineering* (nanoscale measurements and characterization, scanning probe microscopy, storage technology, nano-bio measurement technology)

Warren F. Wiechmann, M.D., M.B.A. University of California, Irvine, *Associate Dean of Clinical Science Education and Associate Dean of Education Technology and Associate Professor of Emergency Medicine*

Jonathan M. Wiener, Ph.D. Harvard University, *Professor Emeritus of History*

Margarethe Wiersema, Ph.D. University of Michigan, *Professor of Paul Merage School of Business*

Jamie Wikenheiser, Ph.D. Case Western Reserve University, *Associate Adjunct Professor of Anatomy and Neurobiology*

Petra E. Wilder-Smith, Ph.D. University of Bern, *Associate Professor in Residence of Surgery*

Frank B. Wilderson III, Ph.D. University of California, Berkeley, *Department Chair and Professor of African American Studies; Culture and Theory* (Afro-Pessimism, film theory, Marxism, narratology)

Amy Wilentz, B.A. Harvard University, *Professor of English* (formal mechanisms of literary journalism, travel journalism as a literary form, explanatory journalism, role of journalism for the everyday reader)

Janet L. Williams, Ph.D. Brandeis University, *Professor Emerita of Mathematics* (probability and statistics)

Kirk Williams, Ph.D. University of Arizona, *Professor of Criminology, Law and Society; Sociology* (family violence, youth violence, homicide studies, risk assessment, violence prevention program evaluation)

Russell A. Williams, MBBS University of Sydney, *Professor of Surgery*

Tiffany Willoughby-Herard, Ph.D. University of California, Santa Barbara, *Associate Professor of African American Studies; Comparative Literature; Culture and Theory; Political Science* (South Africa, poor whites, race in foreign policy, diaspora, comparative racial politics, third world feminisms, feminist pedagogy, black political thought)

Samuel E. Wilson, M.D. Wayne State University, *Professor of Surgery*

William C. Wilson, M.D. Temple University, *Chief Medical Officer for UCI Health and Health Sciences Professor of Anesthesiology and Perioperative Care*

Jessica L. Wimer, J.D. Indiana University, *Associate Dean for the Law Library and Research Professor of School of Law*

Deborah A. Wing, M.D. Tulane University, *Professor in Residence of Obstetrics and Gynecology*

Bert Winther-Tamaki, Ph.D. New York University, *Department Chair and Professor of Art History; Asian American Studies; Visual Studies* (modern Japanese art and visual culture, Asian American art, art and globalization)

Dolores Wirth, M.A. California State University, Fullerton, *Lecturer of Education*

Garrett A. Wirth, M.D. Albany Medical College, *Health Sciences Associate Clinical Professor of Surgery*

Dominik Franz X. Wodarz, Ph.D. Oxford University, *Professor of Ecology and Evolutionary Biology; Mathematics*

Brandon S. Wolff, M.A. University of San Francisco, *Lecturer of Academic English/English as a Second Language*

Geoffrey Wolff, B.A. Princeton University, *Professor Emeritus of English*

Jesse Wolfson, Ph.D. Northwestern University, *Assistant Professor of Mathematics* (topology)

Yoon Jin Won, Ph.D. Stanford University, *Assistant Professor of Mechanical and Aerospace Engineering; Chemical and Biomolecular Engineering* (multi-scale structures for thermal and energy applications, in particular fabrication, characterization, and integration of structured materials)

Brian Wong, M.D. Johns Hopkins University, *Professor of Otolaryngology; Biomedical Engineering*

Edward K. Wong, M.D. University of Southern California, *Professor Emeritus of Ophthalmology*

Karna Wong, Ph.D. University of California, Los Angeles, ; *Asian American Studies*

Nathan D. Wong, Ph.D. Yale University, *Adjunct Professor of Medicine; Epidemiology*

Waylan Wong, M.D. University of California, San Diego, *Health Sciences Assistant Clinical Professor of Anesthesiology and Perioperative Care*

Jennifer Wong-Ma, Ph.D. University of California, Los Angeles, *Associate Professor of Teaching of Computer Science* (computer architecture and design, embedded systems, hardware intellectual property protection, statistical optimization)

Marcelo A. Wood, Ph.D. Princeton University, *UCI Chancellor's Fellow and Department Chair and Professor of Neurobiology and Behavior*

Peter W. Woodruff, Ph.D. University of Pittsburgh, *Professor Emeritus of Philosophy*

Clifford A. Woolfolk, Ph.D. University of Washington, *Professor Emeritus of Molecular Biology and Biochemistry*

Alisa V. Wray, M.D. Tulane University, *Health Sciences Assistant Clinical Professor of Emergency Medicine*

S. Ama Wray, Ph.D. University of Surrey, *Associate Professor of Dance; African American Studies* (jazz, choreography, improvisation, teaching of dance, jazz ensemble)

Charles E. Wright, Ph.D. University of Michigan, *Associate Professor of Cognitive Sciences* (cognitive psychology, human motor control, fitts task, aimed movements, handwriting, immersive virtual reality, 1/f noise, quantitative models)

Valerie L. Wright, Ph.D. Fuller Theological Seminary, *Lecturer of Social Sciences*

Judy Tzu-Chun Wu, Ph.D. Stanford University, *Director of Humanities Center and Chancellor's Professor of Asian American Studies; Culture and Theory* (Asian American history; comparative racialization and immigration; empire and decolonization; gender and sexuality)

Jun Wu, Ph.D. University of California, Los Angeles, *Associate Professor of Program in Public Health; Environmental Health Sciences*

Patrick Wu, M.D. University of Virginia, *Health Sciences Assistant Clinical Professor of Anesthesiology and Perioperative Care*

Ruqian Wu, Ph.D. Institute of Physics, Chinese Academy of Science, *Professor of Physics and Astronomy*

Sing-Yung Wu, M.D. Johns Hopkins University, *Senate Emeritus of Radiological Sciences*

Roberta Wue, Ph.D. New York University, *Associate Professor of Art History; Visual Studies* (modern Chinese art, photography, print culture)

Zeba Wunderlich, Ph.D. Harvard University, *Assistant Professor of Developmental and Cell Biology* (understanding the organization of regulatory information in the genome)

Jing Xia, Ph.D. Stanford University, *Professor of Physics and Astronomy*

Xiaohui Xie, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Computer Science; Developmental and Cell Biology* (computational biology, bioinformatics, genomics, neural computation, machine learning)

Huolin Xin, Ph.D. Cornell University, *Assistant Professor of Physics and Astronomy; Materials Science and Engineering*

Jack Xin, Ph.D. New York University, *Chancellor's Professor of Mathematics* (applied and computational mathematics, mathematical and computational biology, probability)

Mingdi Xin, Ph.D. New York University, *Assistant Professor of Paul Merage School of Business*

Danli L. Xing, M.D. Robert Wood Johnson Medical School, *Health Sciences Clinical Instructor of Ophthalmology*

Di Xu, Ph.D. Columbia University, *Associate Professor of Education*

Xiangmin Xu, Ph.D. Vanderbilt University, *Professor of Anatomy and Neurobiology; Biomedical Engineering; Computer Science*

Vahid Yaghmai, M.D. New York Medical College, *Department and Hasso Brothers Endowed Chair in Radiological Sciences and Health Sciences Clinical Professor of Radiological Sciences*

Guiyun Yan, Ph.D. University of Vermont, *Professor of Program in Public Health; Ecology and Evolutionary Biology*

David Yang, Ph.D. Harvard University, *Assistant Professor of Paul Merage School of Business*

Jann N. Yang, DSc Columbia University, *Professor Emeritus of Civil and Environmental Engineering* (system identification and damage detection, structural health monitoring, structural control, earthquake engineering, structural dynamics)

Jenny Y. Yang, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Chemistry* (inorganic and organometallic, organic and synthetic, polymer, materials, nanoscience)



Jing Yang, M.D. Norman Bethune Health Science Center, *Assistant Professor in Residence of Ophthalmology*

Qin Yang, M.D. Ph.D. Nanjing University of Chinese Medicine, Osaka University, *Associate Professor of Medicine; Physiology and Biophysics*

Daniel S. Yanni, M.D. University of California, San Diego, *Assistant Professor of Neurological Surgery*

Michael Yassa, Ph.D. University of California, Irvine, *UCI Chancellor's Fellow and Director of the Center for the Neurobiology of Learning and Memory and Associate Professor of Neurobiology and Behavior*

Albert Fan Yee, Ph.D. University of California, Berkeley, *Professor of Chemical and Biomolecular Engineering; Biomedical Engineering* (physics of polymers and soft materials, and their applications in nanotechnology and biomedical devices. Mechanics and toughening of polymers and composites)

James J. Yeh, Ph.D. University of Minnesota, *Professor Emeritus of Mathematics* (analysis and partial differential equations, probability)

Brent Yeung, M.D. Georgetown University, *Assistant Professor of Anesthesiology and Perioperative Care*

Douglas B. Yim, M.D. University of Southern California, *Health Sciences Associate Clinical Professor of Radiological Sciences; Surgery*

Ilona S. Yim, Ph.D. University of Trier, *Associate Professor of Psychological Science* (stress, pregnancy and postpartum depression, biopsychology of stress, developmental psychobiology)

Hong Zhen Yin, M.D. , *Specialist of Neurology*

Shuya Yin, Ph.D. University of British Columbia, *Associate Professor of Paul Merage School of Business*

Kyoko Yokomori, Ph.D. University of Tokyo, *Professor of Biological Chemistry*

Bruce N. Yonemoto, M.F.A. Otis Art Institute, *Professor of Art; Asian American Studies* (video, experimental media, film theory)

Gregory Y. Yoshikawa, M.D. New York Medical College, *Health Sciences Assistant Clinical Professor of Anesthesiology and Perioperative Care*

Hiroshi Yoshioka, Ph.D. University of Tsukuba, *Professor in Residence of Radiological Sciences*

Julie H. Youm, Ph.D. Columbia University, *Assistant Dean of Education Compliance and Quality and Assistant Adjunct Professor of Emergency Medicine*

Bassam Younes, M.D. Semmelweis University of Medicine, *Health Sciences Associate Clinical Professor of Pediatrics*

Christopher Young, M.D. Duke University, *Health Sciences Clinical Instructor of Obstetrics and Gynecology*

Maia Young, Ph.D. Stanford University, *Assistant Professor of Paul Merage School of Business*

Robert R. Young, M.D. Harvard University, *Senate Emeritus of Neurology*

Ronald F. Young, Ph.D. State University of New York Downstate Medical Center, *Professor Emeritus of Neurological Surgery*

Homayoun Yousefi'zadeh, Ph.D. University of Southern California, *Adjunct Professor of Electrical Engineering and Computer Science* (communications networks)

Julie N. Youssef, D.O. New York Institute of Technology College of Osteopathic Medicine, *Health Sciences Assistant Clinical Professor of Pediatrics*

Clare C. Yu, Ph.D. Princeton University, *Professor of Physics and Astronomy*

Jin Yu, Ph.D. University of Illinois at Urbana-Champaign, *Assistant Professor of Physics and Astronomy*

Jin Yi Yu, Ph.D. University of Washington, *Vice Chair and Professor of Earth System Science*

Yaming Yu, Ph.D. Harvard University, *Associate Professor of Statistics*

Yifeng Yu, Ph.D. University of California, Berkeley, *Professor of Mathematics* (analysis and partial differential equations)

Zhaoxia Yu, Ph.D. William Marsh Rice University, *Associate Professor of Statistics*

Alyson K. Zalta, Ph.D. University of Pennsylvania, *Assistant Professor of Psychological Science* (clinical psychology, trauma, posttraumatic stress disorder, resilience, prevention, treatment, cognitive behavioral therapy)

David Zamorano, M.D. University of Southern California, *Health Sciences Associate Clinical Professor of Orthopaedic Surgery*

Michael V. Zaragoza, M.D., Ph.D. Case Western Reserve University, *Associate Professor of Pediatrics; Biological Chemistry; Genetic Counseling*

Farzin Zareian, Ph.D. Stanford University, *Associate Professor of Civil and Environmental Engineering* (structural engineering, performance-based earthquake engineering, structural reliability, structural control)

Omaima A. Zayed, Ph.D. University of California, Irvine, *Lecturer of Academic English/English as a Second Language*

Martin Zeman, Ph.D. Humboldt University of Berlin, *Professor of Mathematics; Logic and Philosophy of Science* (logic and foundations)

Charles S. Zender, Ph.D. University of Colorado Boulder, *Professor of Earth System Science; Computer Science*

Fan-Gang Zeng, Ph.D. Syracuse University, *Director of Hearing Research and Professor of Otolaryngology; Anatomy and Neurobiology; Biomedical Engineering; Cognitive Sciences*

Iryna Zenyuk, Ph.D. Carnegie Mellon University, *Associate Director of National Fuel Cell Research Center and Assistant Professor of Chemical and Biomolecular Engineering; Materials Science and Engineering; Mechanical and Aerospace Engineering* (renewable energy, fuel cells, electrolyzers, batteries, X-ray imaging techniques, multi-scale modeling, transport phenomena)

Mei Zhan, Ph.D. Stanford University, *Associate Professor of Anthropology* (medical anthropology, cultural and social studies of science, globalization, transnationalism, gender, China and United States)

Xiangwen Zhang, Ph.D. McGill University, *Assistant Professor of Mathematics* (geometry and topology)

Hong-Kai Zhao, Ph.D. University of California, Los Angeles, *Chancellor's Professor of Mathematics; Computer Science* (applied and computational mathematics, inverse problems and imaging)

Shuang Zhao, Ph.D. Cornell University, *Assistant Professor of Computer Science* (computer graphics with a focus on material appearance modeling and physically-based rendering)

Weian Zhao, Ph.D. McMaster University, *Associate Professor of Pharmaceutical Sciences; Biological Chemistry; Biomedical Engineering; Materials Science and Engineering* (stem cell therapy, diagnostics, biosensors, immunotherapy, single-cell analysis)

Kai Zheng, Ph.D. Carnegie Mellon University, *Associate Professor of Informatics* (health informatics, human factors and human-computer interaction, technology adoption and acceptance, outcomes and evaluation)

Lu Zheng, Ph.D. Yale University, *Professor of Paul Merage School of Business*

Weian Zheng, Ph.D. University of Strasbourg, *Professor Emeritus of Mathematics* (probability theory and financial engineering)

Qun-Yong Zhou, Ph.D. Oregon Health & Science University, *Professor of Pharmaceutical Sciences*

Xiaolin Zi, Ph.D. Shanghai University, *Associate Professor of Urology; Pharmaceutical Sciences*

Joanne F. Zinger, Ph.D. University of California, Riverside, *Associate Professor of Teaching of Psychological Science* (expressive writing, meta-analysis, positive psychology, health psychology, preventive medicine, educational psychology)

Paul Andrew Zissos, Ph.D. Princeton University, *Humanities Language Learning Program Director and Professor of Classics; European Languages and Studies* (Latin epic, medieval Latin, Roman history and culture, Classical reception)

Hadar Ziv, Ph.D. University of California, Irvine, *Associate Professor of Teaching of Informatics* (software testing, requirements engineering, Bayesian modeling)

Mary L. Zupanc, M.D. University of California, Los Angeles, *Health Sciences Clinical Professor of Pediatrics*

Elizabeth van Es, Ph.D. Northwestern University, *Associate Professor of Education* (teacher cognition, pre-service teacher education, in-service teacher professional development, teacher learning communities, uses of video in teacher learning)

# Undergraduate Academic Advising

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At the time of admission to UCI every undergraduate student is assigned to the school that offers the student's selected major. Students who have indicated "Undergraduate/Undeclared" as a major on their UC application for admission and scholarships receive assistance from the Undergraduate/Undeclared Advising Program until they select an academic major.

Jurisdiction over all questions of academic regulations and academic standing rests with the dean or associate dean of the school to which a student is assigned or, in the case of undergraduate/undeclared majors, with the Dean of the Division of Undergraduate Education. Each academic unit provides academic advising for its students and processes requests to add or drop courses, waive or change graduation or other requirements, or change majors. Students are responsible for knowing the governing regulations of the school or program to which they are assigned.

While each academic unit is responsible for maintaining a system that provides academic advising, these systems differ from unit to unit. All advising offices include academic advisors, professionals who assist students in planning their program, selecting a major, and making progress toward a degree. Peer academic advisors (trained upper-division students) assist students in many of the same areas as academic advisors. In addition, they are able to answer questions related to student life issues, providing a student perspective. Students may find contact information for their academic advising offices here (<https://ps.uci.edu/stuaff/ac.html>).

New students are required to plan their academic programs with an academic counselor shortly after being admitted. New students are sent information regarding group academic advising sessions during the summer prior to matriculation. An academic advisor can help the student determine whether the classes the student wishes to take are appropriate to the student's level of preparation, whether the proposed classes fit within the student's educational goals, and whether the classes will help meet some of the requirements for graduation.

Some schools have faculty advisors, where consultation between students and their faculty advisors is mandatory. Regardless of whether or not consultation between student and advisor is required, students are responsible for initiating and maintaining periodic contact with their assigned faculty advisor. The actual frequency of these meetings is determined by the desires of the student, the advisor, and the unit's governing regulations.

Each quarter, students are encouraged to go to the appropriate academic advising office prior to registration for advice concerning class enrollment.

## Peer Academic Advising Program

684 Aldrich Hall  
949-824-4319  
<http://peeradvisor.uci.edu> (<http://peeradvisor.uci.edu>)

The Peer Academic Advising Program provides valuable services for all UCI undergraduate students. The program provides student-to-student academic counseling based on the academic and personal experiences of fellow UCI students. Peer Academic Advisors (PAAs) are juniors and seniors who rigorously train in academic counseling before beginning work as PAAs. They are found in the academic advising offices of academic units across campus. PAA training prepares them to manage issues related to academic counseling and provides them with a wide knowledge of campus resources available to students, such as the Division of Career Pathways, the Disability Services Center, Financial Aid, Housing, and the Learning and Academic Resource Center (LARC). PAAs can also provide students with information and perspectives that come from their personal experience as successful UCI undergraduates.

During the academic year, PAAs maintain regular office hours in their respective academic units. They assist students with selecting courses to best fit their college and career paths, planning quarterly programs of study, learning about the various majors and minors, information about UCI's resources and opportunities, and simply adjusting to life as UCI undergraduates.

256 Aldrich Hall  
949-824-6987  
<http://uu.uci.edu>

Students who enter the University as freshmen or sophomores may be uncertain about which major they should choose and may not feel ready to declare their major or even to identify their interests with a particular school. Such students participate in the Undergraduate/Undeclared Advising Program, which is administered by the Division of Undergraduate Education. The goal of the Undergraduate/Undeclared Advising Program is to help students make the best informed choice of a major that is possible to meet their academic goals. All students at UCI are required to choose their major by the time they reach junior status.

To make a good decision about which major to declare, students should know the range of programs UCI offers and have some experience with them, have a good knowledge of their own abilities and interests, have clear educational goals, and have a sense of their vocational goals and of the academic programs at UCI that will provide appropriate preparation. Students in the Undergraduate/Undeclared Advising Program receive quarterly individualized staff counseling that helps them explore the variety of course offerings on campus, become more aware of their own interests and abilities, formulate sound educational goals, and learn how to prepare for graduate education and/or possible careers.

To assist students in choosing a major, the program offers a course designed to expose undeclared students to a variety of opportunities and resources available to them and to introduce students to the schools and majors offered. In addition, students learn about research and career opportunities within different disciplines.

# Undergraduate Honors Programs

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## Campuswide Honors Collegium

**Charles E. Wright, Associate Dean**

1200 Student Services II

949-824-5461

<http://honors.uci.edu>

[honors@uci.edu](mailto:honors@uci.edu)

The Campuswide Honors Collegium is dedicated to promoting high standards of scholastic excellence and personal growth by combining the qualities and support of a liberal arts college with the resources and prestige offered by a major research university. The unique opportunities provided by the Campuswide Honors Collegium for students to learn and engage with other talented and motivated students and with faculty in a supportive learning community help students get the most out of their education, achieve ambitious goals, and prepare for future careers and graduate and professional school.

Special features of the Campuswide Honors Collegium include:

- A General Education curriculum designed especially for honors students and taught by leading faculty
- Undergraduate research under the mentorship of a member of the faculty
- Special activities involving faculty, visiting scholars, and community leaders
- Personalized one-on-one honors academic advising
- Academic workshops and social activities with peers
- Leadership and service activities
- Opportunities for professional development and mentorship
- Honors theme housing
- Four-year eligibility for on-campus housing
- Priority enrollment in courses
- Honors notation on the transcript and the diploma
- Campuswide Honors Alumni chapter

Additional information about opportunities for Campuswide Honors students, the honors curriculum, and admission to the Campuswide Honors Collegium is available on the Campuswide Honors Collegium website (<http://honors.uci.edu/>).

## Requirements for completion

Successful completion of the Campuswide Honors Collegium requires that students take required honors courses, engage in faculty mentored research that culminates in an honors thesis or project, and fulfill Campuswide Honors Collegium GPA requirements. Specifically, students must meet/fulfill the following requirements in order to be certified as completing the Campuswide Honors Collegium:

1. Enroll in a minimum of 12 graded units each quarter
2. Achieve an overall GPA of 3.2 or above by graduation
3. Complete required honors courses with a letter grade of C or better
4. Complete two quarters of research and develop it into an approved honors thesis project

Campuswide Honors Collegium students must also meet various designated academic progress and advising requirements as appropriate.

## How to join the Campuswide Honors Collegium

The Campuswide Honors Collegium seeks to admit students who have a demonstrated passion for learning, a willingness to explore and be challenged, and an interest in pursuing academic excellence in a range of disciplines outside of their major area. **Incoming freshmen** may be admitted to the Campuswide Honors Collegium upon entering the university on the basis of their UCI application. **Incoming transfer students** who have completed a community college honors program with a specific GPA may be eligible for special consideration for admission to the Campuswide Honors Collegium through the Honors to Honors Program agreement with the UCI Office of Admissions (<https://www.admissions.uci.edu/>). **Current UCI students** may also apply to the Campuswide Honors Collegium after completion of at least one quarter at UCI with 12 or more graded units and a grade point average of 3.5 or better. The application is available via the Campuswide Honors Collegium website (<http://honors.uci.edu/>).

## Campuswide Honors Collegium classes

The Campuswide Honors curriculum is designed to provide a comprehensive educational experience for students of all backgrounds and interests. It is composed of honors core courses and seminars in the Humanities, Social Sciences, and Sciences that build on each other, and which hone

students' writing, communication, and critical thinking skills. Students who take honors classes will learn deeply about a broad variety of topics and will develop transferable skills that will prepare them well for future careers as well as graduate and professional school. Most Campuswide Honors students complete 3-9 honors courses, depending on major. Current Campuswide Honors students should contact an honors advisor for more information about their specific honors curriculum requirement.

## Campuswide Honors Collegium research and thesis project

Honors research provides important preparation for life after college. Students who complete honors research and a culminating research project will have practical experience in their field that demonstrates their ability to take initiative, work independently and as part of a team, solve problems, and communicate professionally. Campuswide Honors students are also strongly encouraged to participate in major-specific and school honors programs. Research and thesis projects completed by Campuswide Honors students in major-specific or school honors programs can meet the requirements of both their major-specific or school honors program and the Campuswide Honors Collegium. Additional research and thesis support is provided by the Campuswide Honors faculty and staff, major-specific and school honors faculty, and the Undergraduate Research Opportunities Program (<http://www.urop.uci.edu/>). (<http://catalogue.uci.edu/divisionofundergraduateeducation/www.urop.uci.edu>)

## Honors Opportunities

UCI offers many challenging and enriching honors opportunities to its most accomplished and motivated students. These include the comprehensive Campuswide Honors Collegium (<http://www.honors.uci.edu/>), which enrolls outstanding students of all majors from the freshman through senior years, including transfer students; a variety of major-specific honors programs at the upper-division level; the Humanities Honors Program, also offered at the upper-division level, but open to all majors on campus; and several Excellence in Research programs.

These programs offer some of the advantages usually associated with selective liberal arts colleges: rigorous, personalized classes and the intellectual exchange that creates a community of scholars. The difference, however, is that UCI's programs are supported by and benefit from the resources of a major research university, including renowned faculty, research opportunities, and the 40.8-million-print volume University of California Library system.

Honors students enhance their education by participating in the UC Education Abroad Program (<http://uc.eap.ucop.edu/>), the International Opportunities Program (<http://www.studyabroad.uci.edu/prospective/index.shtml/>), and the Capital Internship Program (<http://capitalinternships.uci.edu/>). Qualified honors students are also encouraged to take advantage of resources available through the Scholarship Opportunities Program (<http://scholars.uci.edu/>) and the Undergraduate Research Opportunities Program (<http://www.urop.uci.edu/>). These programs are also described in other sections of this *Catalogue*.

## Major-Specific and School Honors Programs

Honors programs for qualified junior- and senior-level students also are available to Drama, Music, and Art majors in the Claire Trevor School of the Arts, and to all qualified junior- and senior-level majors in the following Schools: School of Biological Sciences, Humanities, Donald Bren School of Information and Computer Sciences, Physical Sciences, Social Ecology, and Social Sciences; and to qualified junior- and senior-level majors in the Program in Public Health. The focal point of each of these programs is the development of analytical and research skills through the pursuit of research under faculty supervision. An honors-level thesis or creative project is required by most of the programs. Campuswide Honors Collegium students are encouraged to participate in these programs as well as in the Collegium. The honors thesis or creative project that is developed through these programs by Campuswide Honors students also satisfies the Campuswide Honors Collegium research and thesis requirement. Additional information is available in the specific academic unit sections of this *Catalogue*.

## Excellence in Research Programs

The School of Biological Sciences and the School of Social Ecology offer students the opportunity to pursue research through their Excellence in Research Programs. Students work on their research projects under faculty supervision and have the opportunity to present their results to peers and faculty and, in certain instances, to have their research papers published. Additional information is available in the specific academic unit sections of this *Catalogue*.

## Phi Beta Kappa

Founded in 1776, Phi Beta Kappa is the oldest and most respected undergraduate honor society in the United States. It supports and recognizes academic excellence and scholarly achievement in the liberal arts and sciences, and promotes the principles of freedom of inquiry and liberty of thought and expression. UC Irvine's Phi Beta Kappa Chapter (Mu of California) was founded in 1974. Phi Beta Kappa is UCI's most selective honor society, with only 5 percent of graduating seniors and 1 percent of juniors invited to become members each year. An annual initiation ceremony for new members is held in June. For additional information, including selection criteria, visit the Phi Beta Kappa website (<http://phibetakappa.uci.edu/>).

## Honors Recognition

Students who graduate during the academic year with academic honors, and those who receive special school awards, are honored in school-based ceremonies. Some honors societies may also hold special ceremonies for selected students. Of the graduating seniors, no more than 16 percent will receive academic honors: approximately 2 percent *summa cum laude*, 4 percent *magna cum laude*, and 10 percent *cum laude*. The criteria used in selecting candidates for these honors are available at the counseling office of each school. One general criterion is that students must have completed at least 72 quarter units in residence at a University of California campus. The student's cumulative record at the end of the final quarter is the basis for consideration for awarding Latin Honors. Students who have on file recorded acts of academic dishonesty, as defined in *University of California*

*Policies Applying to Campus Activities, Organizations and Students*, may be excluded by the Associate Deans from consideration for academic honors at graduation. For further information contact the academic counseling office of each school.

## Honors at Graduation

Of the graduating seniors, no more than 16 percent will receive academic honors: approximately 2 percent *summa cum laude*, 4 percent *magna cum laude*, and 10 percent *cum laude*. The criteria used by each School in selecting candidates for these honors are included in each School's section of the *Catalogue*. A general criterion is that students must have completed at least 72 units in residence at a University of California campus. The student's cumulative record at the end of the final quarter is the basis for consideration for awarding Latin Honors.



# Undergraduate Information

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- Information for Admitted Students
- Information for Prospective Students
- Requirements for a Bachelor's Degree

**ALSO:**

Majors, minors, and programs  
Schools and Programs  
Admissions  
Expenses, Tuition, and Fees  
Financial Aid  
Academic Calendar  
Advising  
Honors Programs  
Academic Regulations and Procedures  
Student Programs and Services  
Division of Undergraduate Education  
Life on Campus  
Principles, Policies, and Information  
Office of Research  
About UCI

# Undergraduate Majors and Minors

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## UNDERGRADUATE MAJORS AND MINORS (organized alphabetically)

### A

- Accounting, Minor
- Aerospace Engineering, B.S.
- African American Studies, B.A.
- African American Studies, Minor
- Anthropology, B.A.
- Anthropology, Minor
- Applied Physics, B.S.
- Archaeology, Minor
- Armenian Studies, Minor
- Art, B.A.
- Art History, B.A.
- Art History, Minor
- Asian American Studies, B.A.
- Asian American Studies, Minor
- Asian Studies, Minor

### B

- Biochemistry and Molecular Biology, B.S.
- Bioinformatics, Minor
- Biological Sciences, B.S.
- Biological Sciences, Minor
- Biology/Education, B.S.
- Biomedical Engineering, B.S.
- Biomedical Engineering, Minor
- Biomedical Engineering: Premedical, B.S.
- Business Administration, B.A.
- Business Economics, B.A.
- Business Information Management, B.S.

### C

- Chemical Engineering, B.S.
- Chemistry, B.S.
- Chicano/Latino Studies, B.A.
- Chicano/Latino Studies, Minor
- Chinese Language and Literature, Minor
- Chinese Studies, B.A.
- Chinese Studies, Minor
- Civic and Community Engagement, Minor
- Civil Engineering, B.S.
- Classical Civilization, Minor
- Classics, B.A.
- Cognitive Sciences, B.S.
- Comparative Literature, B.A.
- Comparative Literature, Minor
- Computer Engineering, B.S.
- Computer Game Science, B.S.
- Computer Science, B.S.

- Computer Science and Engineering, B.S.
- Creative Writing, Minor
- Criminology, Law and Society, B.A.
- Criminology, Law and Society, Minor

## D

- Dance, B.A.
- Dance, B.F.A.
- Data Science, B.S.
- Developmental and Cell Biology, B.S.
- Digital Arts, Minor
- Digital Filmmaking, Minor
- Digital Information Systems, Minor
- Drama, B.A.

## E

- Earth and Atmospheric Sciences, Minor
- Earth System Science, B.S.
- East Asian Cultures, B.A.
- Ecology and Evolutionary Biology, B.S.
- Economics, B.A.
- Economics, Minor
- Education, Minor
- Education Sciences, B.A.
- Electrical Engineering, B.S.
- Engineering, B.S.
- English, B.A.
- English, Minor
- Environmental Engineering, B.S.
- Environmental Science and Policy, B.A.
- European Studies, B.A.
- European Studies, Minor
- Exercise Sciences, B.S.

## F

- Film and Media Studies, B.A.
- Film and Media Studies, Minor
- French, B.A.
- French, Minor

## G

- Gender and Sexuality Studies, B.A.
- Gender and Sexuality Studies, Minor
- Genetics, B.S.
- German Studies, B.A.
- German Studies, Minor
- Global Cultures, B.A.
- Global Cultures, Minor
- Global Health, Minor
- Global Middle East Studies, B.A.
- Global Middle East Studies, Minor

- Global Sustainability, Minor
- Greek, Minor

## H

- Hearing and Speech Sciences, Minor
- Health Informatics, Minor
- History, B.A.
- History, Minor
- History and Philosophy of Science, Minor
- Human Biology, B.S.
- Humanities and Law, Minor

## I

- Informatics, B.S.
- Informatics, Minor
- Information and Computer Science, B.S.
- Information and Computer Science, Minor
- Innovation and Entrepreneurship, Minor
- International Studies, B.A.
- International Studies, Minor
- Italian Studies, Minor

## J

- Japanese Language and Literature, B.A.
- Japanese Language and Literature, Minor
- Japanese Studies, Minor
- Jewish Studies, Minor

## K

- Korean Literature and Culture, B.A.
- Korean Literature and Culture, Minor

## L

- Language Science, B.A.
- Latin, Minor
- Latin American Studies, Minor
- Linguistics, Minor
- Literary Journalism, B.A.
- Literary Journalism, Minor

## M

- Management, Minor
- Materials Science and Engineering, B.S.
- Materials Science and Engineering, Minor
- Mathematics, B.S.
- Mathematics, Minor
- Mathematics for Biology, Minor
- Mechanical Engineering, B.S.
- Medical Anthropology, Minor
- Medical Humanities, Minor
- Microbiology and Immunology, B.S.
- Music, B.A.

- Music, B.Mus.
- Music Theatre, B.F.A.

## N

- Native American Studies, Minor
- Neurobiology, B.S.
- Nursing Science, B.S.

## P

- Persian Studies, Minor
- Pharmaceutical Sciences, B.S.
- Philosophy, B.A.
- Philosophy, Minor
- Physics, B.S.
- Political Science, B.A.
- Political Science, Minor
- Psychology, B.A.
- Psychology, B.S.
- Psychology, Minor
- Psychological Science, B.A.
- Psychological Science, Minor
- Public Health, Minor
- Public Health Policy, B.A.
- Public Health Sciences, B.S.

## Q

- Quantitative Economics, B.A.
- Queer Studies, Minor

## R

- Religious Studies, B.A.
- Religious Studies, Minor
- Russian Studies, Minor

## S

- Social Ecology, B.A.
- Social Ecology, Minor
- Social Policy and Public Service, B.A.
- Sociology, B.A.
- Sociology, Minor
- Software Engineering, B.S.
- Spanish, B.A.
- Spanish, Minor
- Spanish/English Bilingual Education, Minor
- Statistics, Minor

## U

- Undergraduate/Undeclared, Advising Program
- Urban and Regional Planning, Minor
- Urban Studies, B.A.
- Urban Studies, Minor

## UNDERGRADUATE MAJORS AND MINORS (organized by focus/interest)

### Arts

- Art, B.A.
- Art History, B.A.
- Art History, Minor
- Creative Writing, Minor
- Dance, B.A.
- Digital Arts, Minor
- Digital Filmmaking, Minor
- Drama, B.A.
- Film and Media Studies, B.A.
- Film and Media Studies, Minor
- Music, B.A.
- Music, B.Mus.
- Music Theatre, B.F.A.

### Biological Sciences

- Biochemistry and Molecular Biology, B.S.
- Biological Sciences, B.S.
- Biological Sciences, Minor
- Biology/Education, B.S.
- Developmental and Cell Biology, B.S.
- Ecology and Evolutionary Biology, B.S.
- Exercise Sciences, B.S.
- Genetics, B.S.
- Human Biology, B.S.
- Mathematics for Biology, Minor
- Microbiology and Immunology, B.S.
- Neurobiology, B.S.

### Business

- Accounting, Minor
- Business Administration, B.A.
- Business Information Management, B.S.
- Innovation and Entrepreneurship, Minor
- Management, Minor

### Communications

- Hearing and Speech Sciences, Minor
- Language Science, B.A.
- Linguistics, Minor
- Literary Journalism, B.A.
- Literary Journalism, Minor

### Design

- Art History, B.A.
- Civil Engineering, B.S.
- Digital Filmmaking, Minor
- Urban and Regional Planning, Minor
- Urban Studies, B.A.
- Urban Studies, Minor

## Economics

- Business Economics, B.A.
- Economics, B.A.
- Economics, Minor
- International Studies, B.A.
- International Studies, Minor
- Quantitative Economics, B.A.

## Education

- Biology/Education, B.S.
- Education, Minor
- Education Sciences, B.A.
- English, B.A.
- English, Minor
- History, B.A.
- History, Minor
- History and Philosophy of Science, Minor
- Spanish, B.A.
- Spanish, Minor
- Spanish/English Bilingual Education, Minor

## Engineering

- Aerospace Engineering, B.S.
- Biomedical Engineering, B.S.
- Biomedical Engineering, Minor
- Biomedical Engineering: Premedical, B.S.
- Chemical Engineering, B.S.
- Civil Engineering, B.S.
- Computer Engineering, B.S.
- Computer Science and Engineering, B.S.
- Electrical Engineering, B.S.
- Engineering, B.S.
- Environmental Engineering, B.S.
- Materials Science and Engineering, B.S.
- Materials Science and Engineering, Minor
- Mechanical Engineering, B.S.
- Software Engineering, B.S.

## Government

- Civic and Community Engagement, Minor
- Criminology, Law and Society, B.A.
- Criminology, Law and Society, Minor
- Environmental Engineering, B.S.
- Environmental Science and Policy, B.A.
- Humanities and Law, Minor
- International Studies, B.A.
- International Studies, Minor
- Political Science, B.A.
- Political Science, Minor
- Public Health Policy, B.A.
- Social Ecology, B.A.
- Social Policy and Public Service, B.A.



- Urban and Regional Planning, Minor
- Urban Studies, B.A.
- Urban Studies, Minor

## Health and Medicine

- Exercise Sciences, B.S.
- Genetics, B.S.
- Global Health, Minor
- Health Informatics, Minor
- Hearing and Speech Sciences, Minor
- Medical Anthropology, Minor
- Medical Humanities, Minor
- Microbiology and Immunology, B.S.
- Nursing Science, B.S.
- Pharmaceutical Sciences, B.S.
- Public Health Policy, B.A.
- Public Health, Minor
- Public Health Sciences, B.S.
- Psychological Science, B.A.
- Psychology, B.A.
- Psychology, Minor
- Psychological Science, Minor

## Information and Computer Science

- Bioinformatics, Minor
- Computer Game Science, B.S.
- Computer Science, B.S.
- Computer Science and Engineering, B.S.
- Data Science, B.S.
- Digital Information Systems, Minor
- Health Informatics, Minor
- Informatics, B.S.
- Informatics, Minor
- Information and Computer Science, B.S.
- Information and Computer Science, Minor
- Software Engineering, B.S.
- Statistics, Minor

## Language and Culture

- African American Studies, B.A.
- African American Studies, Minor
- Archaeology, Minor
- Armenian Studies, Minor
- Art History, B.A.
- Art History, Minor
- Asian American Studies, B.A.
- Asian American Studies, Minor
- Asian Studies, Minor
- Chicano/Latino Studies, B.A.
- Chicano/Latino Studies, Minor
- Chinese Language and Literature, Minor
- Chinese Studies, B.A.
- Chinese Studies, Minor

- Classical Civilization, Minor
- Classics, B.A.
- Comparative Literature, B.A.
- Comparative Literature, Minor
- Creative Writing, Minor
- East Asian Cultures, B.A.
- English, B.A.
- English, Minor
- European Studies, B.A.
- European Studies, Minor
- Film and Media Studies, B.A.
- Film and Media Studies, Minor
- French, B.A.
- French, Minor
- Gender and Sexuality Studies, B.A.
- Gender and Sexuality Studies, Minor
- German Studies, B.A.
- German Studies, Minor
- Global Cultures, B.A.
- Global Cultures, Minor
- Global Middle East Studies, B.A.
- Global Middle East Studies, Minor
- Greek, Minor
- History and Philosophy of Science, Minor
- International Studies, B.A.
- Italian Studies, Minor
- Japanese Language and Literature, B.A.
- Japanese Language and Literature, Minor
- Japanese Studies, Minor
- Jewish Studies, Minor
- Korean Literature and Culture, B.A.
- Korean Literature and Culture, Minor
- Language Science, B.A.
- Latin, Minor
- Linguistics, Minor
- Latin American Studies, Minor
- Literary Journalism, B.A.
- Literary Journalism, Minor
- Medical Humanities, Minor
- Native American Studies, Minor
- Persian Studies, Minor
- Philosophy, B.A.
- Philosophy, Minor
- Queer Studies, Minor
- Religious Studies, B.A.
- Religious Studies, Minor
- Russian Studies, Minor
- Spanish, B.A.
- Spanish, Minor
- Spanish/English Bilingual Education, Minor

## Mathematics

- Accounting, Minor
- Business Economics, B.A.
- Chemistry, B.S.
- Economics, B.A.
- Mathematics, B.S.
- Mathematics, Minor
- Mathematics for Biology, Minor
- Physics, B.S.
- Statistics, Minor

## Environment and Natural Resources

- Civil Engineering, B.S.
- Earth and Atmospheric Sciences, Minor
- Earth System Science, B.S.
- Ecology and Evolutionary Biology, B.S.
- Environmental Engineering, B.S.
- Environmental Science and Policy, B.A.
- Global Sustainability, Minor
- Social Ecology, B.A.
- Social Ecology, Minor
- Urban Studies, B.A.
- Urban Studies, Minor

## Physical Sciences

- Applied Physics, B.S.
- Chemistry, B.S.
- Earth and Atmospheric Sciences, Minor
- Earth System Science, B.S.
- Environmental Science and Policy, B.A.
- Mathematics, B.S.
- Mathematics, Minor
- Mathematics for Biology, Minor
- Physics, B.S.

## Pre-Med

- Biochemistry and Molecular Biology, B.S.
- Biological Sciences, B.S.
- Biological Sciences, Minor
- Biology/Education, B.S.
- Biomedical Engineering, B.S.
- Biomedical Engineering, Minor
- Biomedical Engineering; Premedical, B.S.
- Developmental and Cell Biology, B.S.
- Ecology and Evolutionary Biology, B.S.
- Exercise Sciences, B.S.
- Genetics, B.S.
- Global Health, Minor
- Health Informatics, Minor
- Human Biology, B.S.
- Medical Anthropology, Minor
- Medical Humanities, Minor

- Microbiology and Immunology, B.S.
- Neurobiology, B.S.
- Nursing Science, B.S.
- Pharmaceutical Sciences, B.S.
- Public Health, Minor
- Public Health Sciences, B.S.

## **Social Sciences**

- Anthropology, B.A.
- Anthropology, Minor
- Business Economics, B.A.
- Chicano/Latino Studies, B.A.
- Chicano/Latino Studies, Minor
- Cognitive Sciences, B.S.
- Economics, B.A.
- Economics, Minor
- Hearing and Speech Sciences, Minor
- International Studies, B.A.
- International Studies, Minor
- Language Science, B.A.
- Linguistics, Minor
- Medical Anthropology, Minor
- Political Science, B.A.
- Political Science, Minor
- Psychology, B.A.
- Psychology, B.S.
- Psychology, Minor
- Quantitative Economics, B.A.
- Social Policy and Public Service, B.A.
- Sociology, B.A.
- Sociology, Minor

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